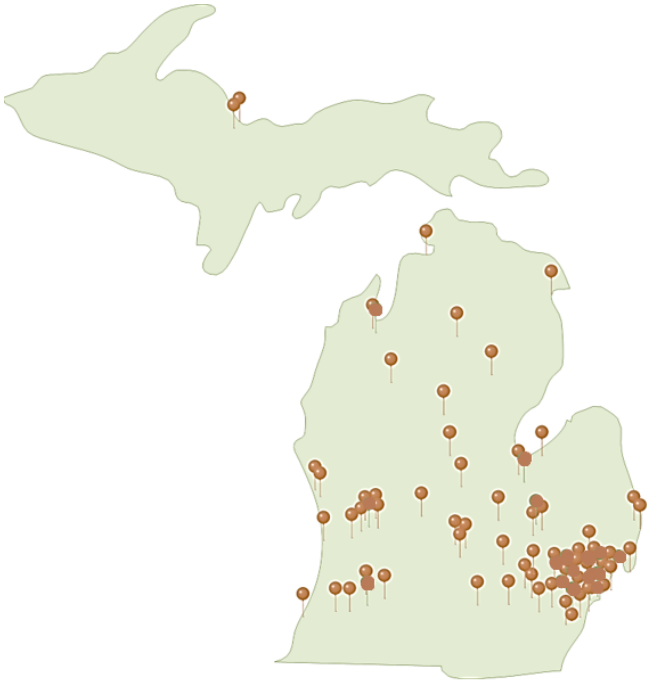
2025 Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI) Annual Report

December 2025

Comprehensive Version

MARCQI Sites



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Beacon Kalamazoo
Bronson Battle Creek
Bronson Lakeview Hospital, Paw Paw
Bronson Methodist Hospital, Kalamazoo
Bronson Orthopedic Surgery Center, Kalamazoo
Corewell Health Beaumont Grosse Pointe Hospital
Corewell Health Beaumont Troy Hospital
Corewell Health Dearborn Hospital
Corewell Health Farmington Hills Hospital
Corewell Health Gerber Hospital
Corewell Health Grand Haven Center
Corewell Health Grand Rapids Hospitals Blodgett
Corewell Health Greenville Hospital
Corewell Health Lake Drive Surgery Center, Grand Rapids
Corewell Health Lakeland Hospitals - Niles
Corewell Health Lakeland Hospitals - St. Joseph
Corewell Health Ludington Hosptial
Corewell Health Pennock Hospital
Corewell Health Taylor Hospital
Corewell Health Watervliet Hospital
Corewell Health Zeeland Hospital
Corewell Health William Beaumont University Hospital
Copper Ridge Surgery Center
Covenant Medical Center, Saginaw
DMC Harper University Hospital, Detroit
DMC Huron Valley-Sinai Hospital, Commerce Township
DMC Sinai-Grace Hospital, Detroit
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Grand Rapids Surgical Suites
Henry Ford - Cottage
Henry Ford - Jackson
Henry Ford - Macomb
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Henry Ford - Warren & Madison Heights
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Suggested citation

Hughes, R.E., Zheng, H., and Hallstrom, B.R. (2025) *2025 Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI) Annual Report*. University of Michigan, Ann Arbor.

Conflict of interest disclosure

None of the authors have financial relationships with the pharmaceutical or medical device industries.

Disclaimer

Although Blue Cross Blue Shield of Michigan/Blue Care Network (BCBSM/BCN) and the Michigan Arthroplasty Registry Collaborative Quality Initiative work collaboratively, the opinions, beliefs, and viewpoints expressed by the authors do not necessarily reflect the opinions, beliefs, and viewpoints of BCBSM/BCN or any of its employees.

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Preface

We are proud to share the 2025 MARCQI Annual Report with you. This is MARCQI's eighth Annual report since 2017. These reports would not have been possible without the tireless work of Dr. Richard Hughes, PhD, the Co-Founder of MARCQI and previous Co-Director for more than a decade. We are indebted to him for the years of advice, ideas, and effort. Each report also takes an enormous effort by our analytic team, especially Huiyong “Thomas” Zheng.

This MARCQI annual report is made up of data on over 550,000 hip and knee replacement cases performed in Michigan since February of 2012. MARCQI continues to work collaboratively with the hospitals, surgeons, clinical data abstractors, quality leads, and patients in Michigan to improve the quality of care. We meet together three times annually and work on improvement projects at every MARCQI site throughout the year.

This report allows us to provide detailed information about the performance of the implants used in Michigan. It is shared publicly to help inform decisions about implant choice, materials, and fixation method. The revision risks for implants are presented by patient age and sex, keeping patient factors in mind, to allow for individual and appropriate device selection for all patients.

As the database has grown and implant groups have met the 500-case threshold for reporting, we have been able to improve the granularity of the report. Several knee implants are now broken down by constraint into cruciate retaining and posterior stabilized categories based on the femoral component used. The report also presents data on newer implants and techniques as they have been introduced, such as uncemented knee replacements and triple taper femoral stems. This year's report has eight new implant categorizations, providing more detail than in previous reports. We also seek to provide valuable performance information to the implant industry for quality assurance and regulatory purposes.

For each implant, in addition to patient demographics, material specifics, and other details, the utilization of the implant in Michigan is shown. These graphs demonstrate the rapid adoption of some implants and the trends over time in the usage of various designs. These help us know where to focus and which improvements are likely to have the greatest impact for our patients. This work would not be possible without all the MARCQI participants, the Coordinating Center team, Curvo Labs for the use of their implant library, and the support from Blue Cross Blue Shield of Michigan and the Blue Care Network through their Collaborative Quality Initiative Program.

Thanks for using the report. We hope that it helps you in your work and improves hip and knee replacement in Michigan, the United States, and around the world.

Sincerely,



Brian R. Hallstrom, MD, MARCQI Co-Director



Elizabeth Dailey, MD, MARCQI Co-Director

Acknowledgements

We thank all members of MARCQI, including clinical data abstractors, clinical champions, site quality leads, and orthopaedic surgeons across the state. Without their participation, MARCQI would not exist. We are grateful to the MARCQI device committee for reviewing this document. We also thank specific MARCQI staff for helping produce this report; Jeanette Lamphere, MA, CHES (proofreading); Charlotte Provagna, MHSA (cover design); Alex Wong, DAT, AT (cover design); Qi Zhu, MS (database management).

We would like to acknowledge and thank Curvo Labs for making their device library available to us and the Michigan Health & Hospital Association for providing access to the Michigan Inpatient and Outpatient Database. Within the University of Michigan, we thank Derek Granzow, MHSA, for his help with administration.

Support for the Michigan Arthroplasty Registry Collaborative Quality Initiative is provided by Blue Cross and Blue Shield of Michigan and Blue Care Network (BCBSM/BCN) as part of their Value Partnerships program. We express our gratitude to BCBSM/BCN staff who have pioneered the CQI model in Michigan and supported MARCQI: Faris Ahmad, MD, MBA, FACOG; Marc Cohen, MHSA; Sheri Lee, BS; Tom Leyden, MBA; Emily Santer, MHSA; and Monica Whitted, BS.

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Chapter 1

Hip Overview

These data are based on cases performed from 2/15/2012 to 12/31/2024.

1.1 Descriptive Statistics of All Total Hip Arthroplasty (THA) Cases

This section presents data on all THA cases, including primary and revision cases.

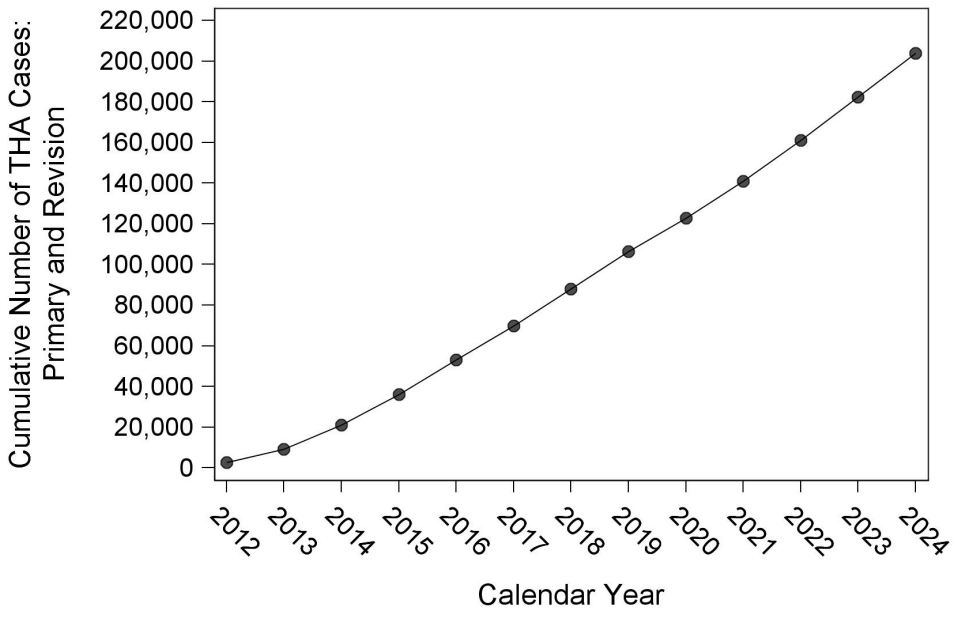


Figure 1. THA Cases Over Time (in 171,868 Patients)

Table 1. THA Cases Over Time (Numerical Values)

Year	Annual cases	Cumulative cases
2012	2,490	2,490
2013	6,724	9,214
2014	11,886	21,100
2015	15,019	36,119
2016	16,821	52,940
2017	16,978	69,918
2018	17,889	87,807
2019	18,679	106,486
2020	16,189	122,675
2021	18,259	140,934
2022	20,008	160,942
2023	21,376	182,318
2024	21,661	203,979

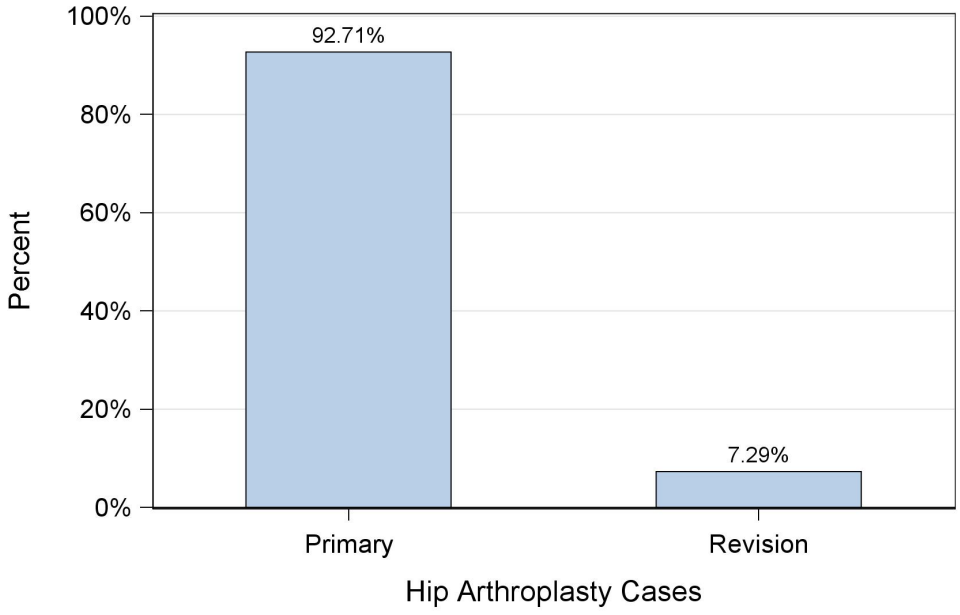


Figure 2. Percent of THA Cases by Primary or Revision

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Table 2. Descriptive Statistics of THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	111,444	54.6	
Age (years)	203,979	65.6 (11.1)	66 (14)
Height (cm)	203,283	169.8 (10.5)	170 (15.2)
Weight (kg)	203,283	88.5 (21.2)	86.5 (28.8)
BMI (kg/m^2)	203,280	30.5 (6.3)	29.8 (8.3)
Smoker - Never (%)	99,364	48.7	
Smoker - Previous (%)	76,197	37.4	
Smoker - Current (%)	27,662	13.6	
Smoker - Unknown (%)	756	0.4	

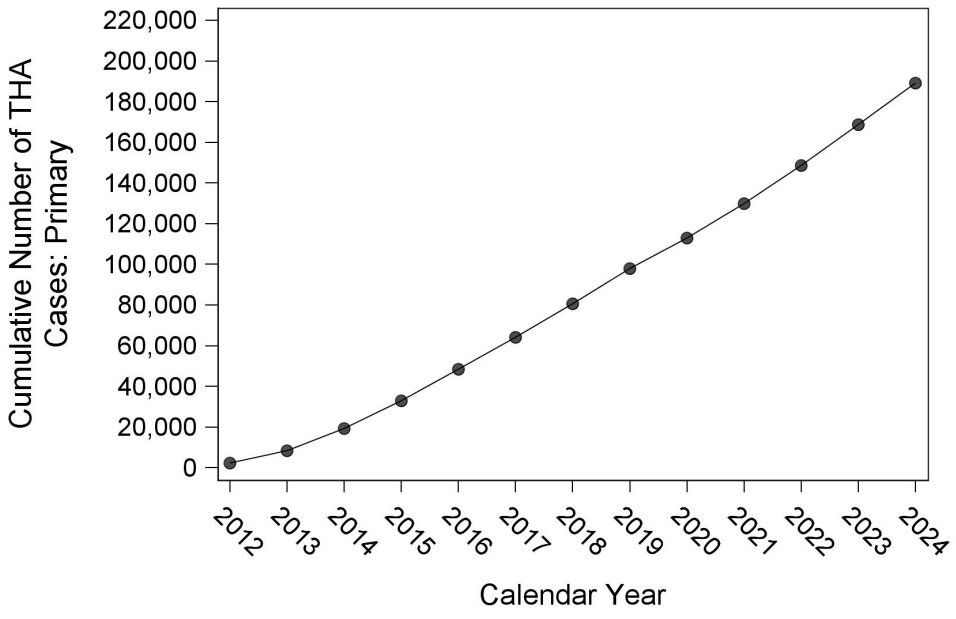


Figure 3. Primary THA Cases Over Time (in 141,908 Patients)

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Table 3. Primary THA Cases Over Time (Numerical Values)

Year	Annual cases	Cumulative cases
2012	2,249	2,249
2013	6,090	8,339
2014	10,911	19,250
2015	13,625	32,875
2016	15,523	48,398
2017	15,681	64,079
2018	16,506	80,585
2019	17,293	97,878
2020	15,018	112,896
2021	16,924	129,820
2022	18,762	148,582
2023	20,092	168,674
2024	20,443	189,117

Table 4. Descriptive Statistics of Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	103,146	54.5	
Age (years)	189,117	65.4 (11)	66 (14)
Height (cm)	188,458	169.9 (10.5)	170 (15.2)
Weight (kg)	188,458	88.6 (21.1)	86.8 (28.7)
BMI (kg/m^2)	188,456	30.6 (6.3)	29.9 (8.3)
Smoker - Never (%)	92,742	49	
Smoker - Previous (%)	70,244	37.1	
Smoker - Current (%)	25,463	13.5	
Smoker - Unknown (%)	668	0.4	

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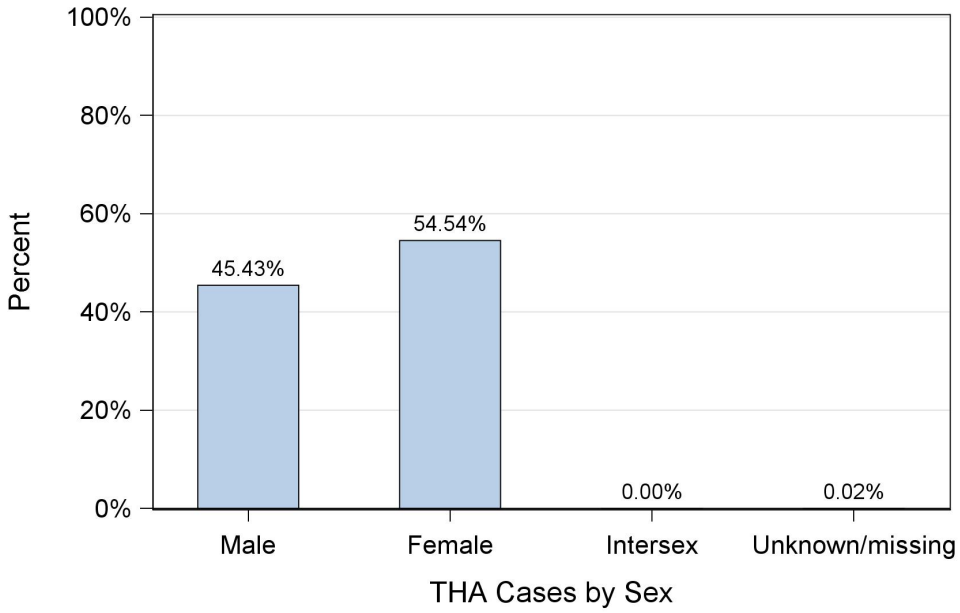


Figure 4. Percent of Primary THA Cases by Sex

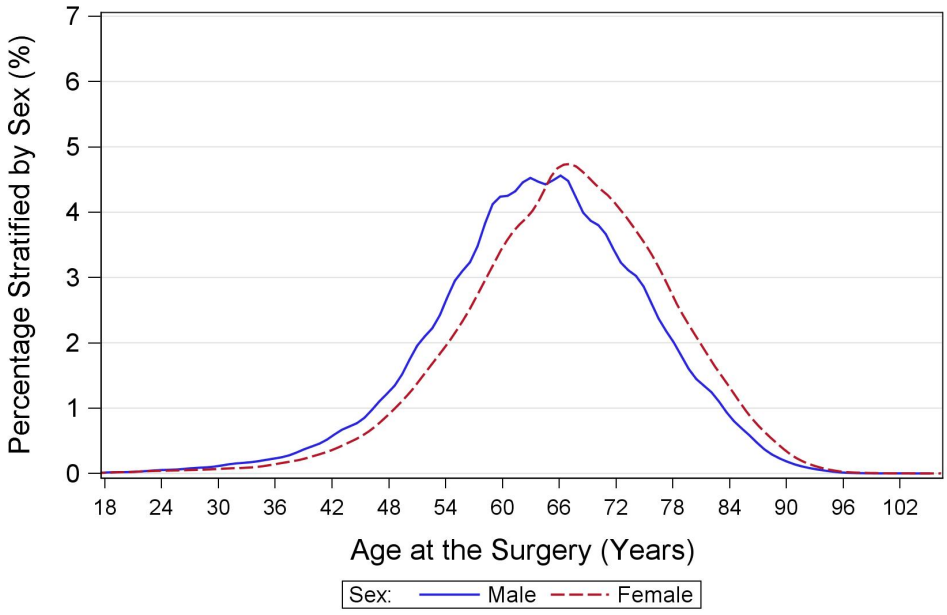


Figure 5. Age Distribution of Primary THA Cases by Sex

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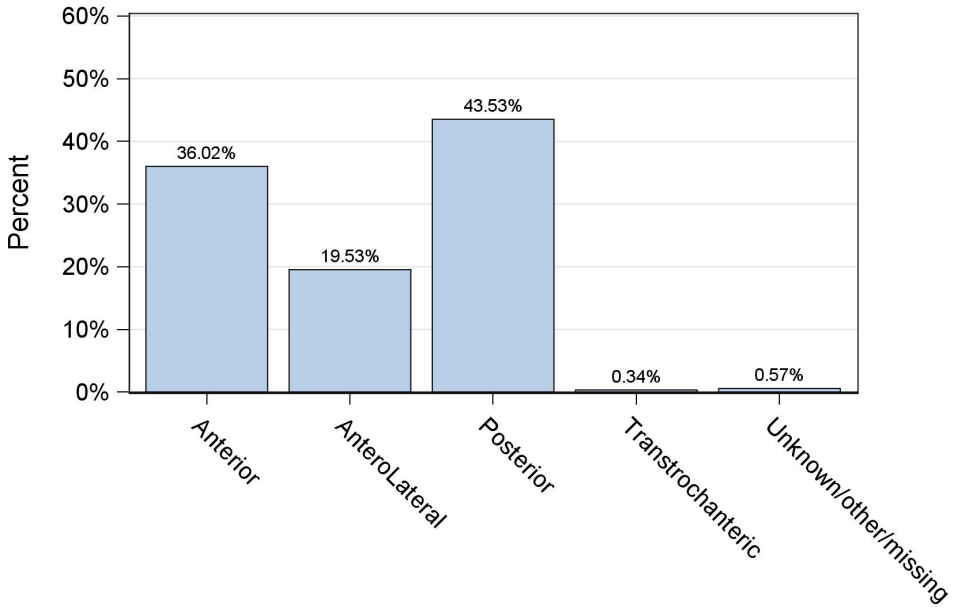


Figure 6. Percent of Primary THA Cases by Approach

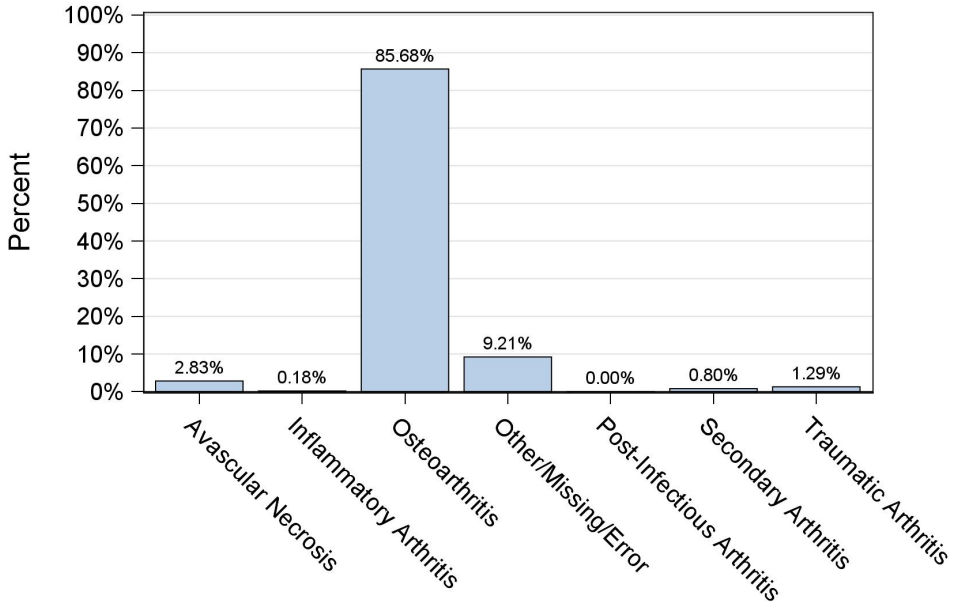


Figure 7. Percent of Primary THA Cases by Diagnosis

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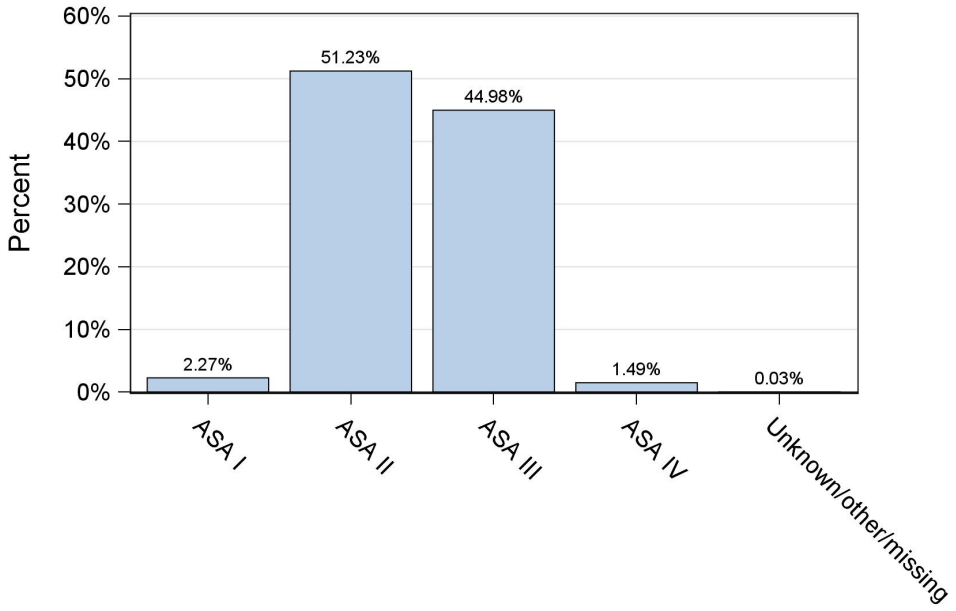


Figure 8. Percent of Primary THA Cases by ASA Class

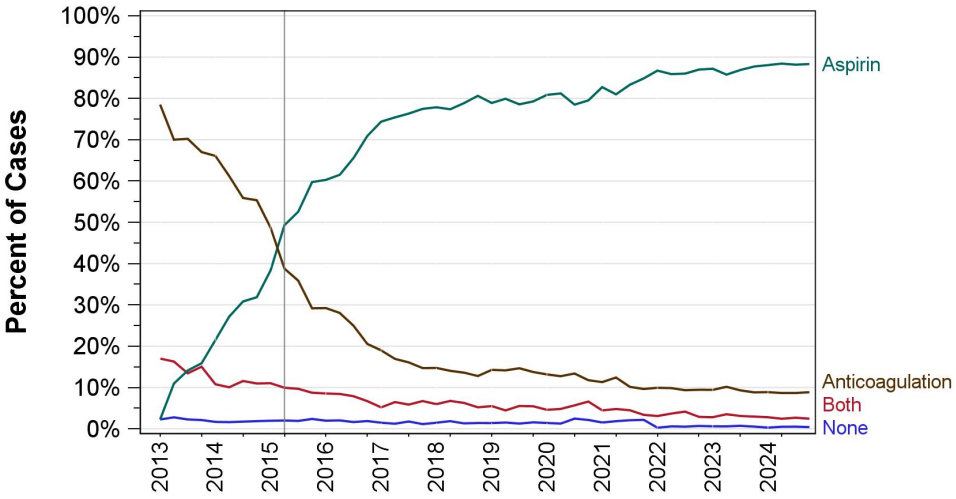


Figure 9. Percent of Primary THA Patients (First Case) by Thrombosis Prophylaxis

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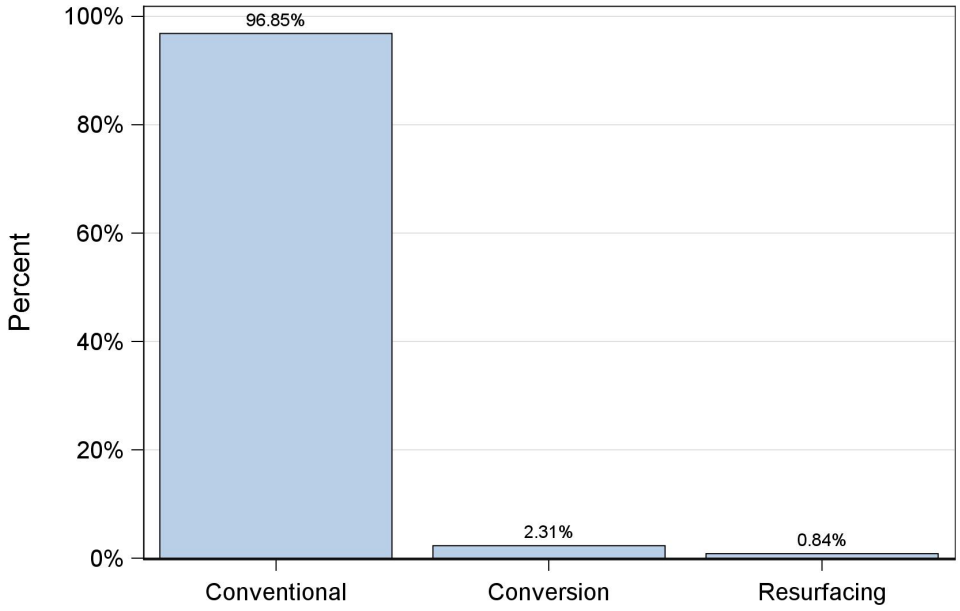


Figure 10. Percent of Primary THA Cases by Procedure

Note the data element for procedure, which was used to create the figure above, was changed in January of 2015 to include conversion.

1.2 Conventional THA

1.2.1 Descriptive Statistics

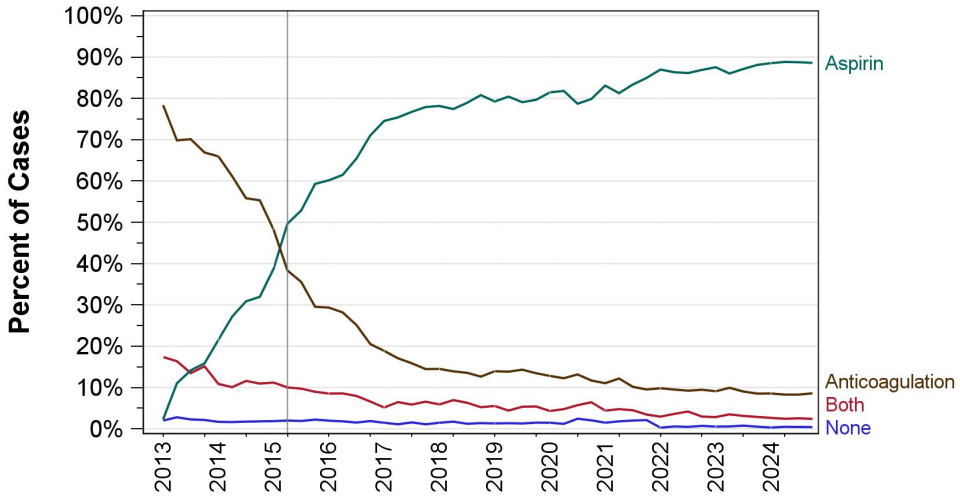


Figure 11. Percent of Primary Conventional THA Patients (First Case) by Thrombosis Prophylaxis

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1.2.2 Revision Risk (Overall, by Sex, and by Diagnosis)

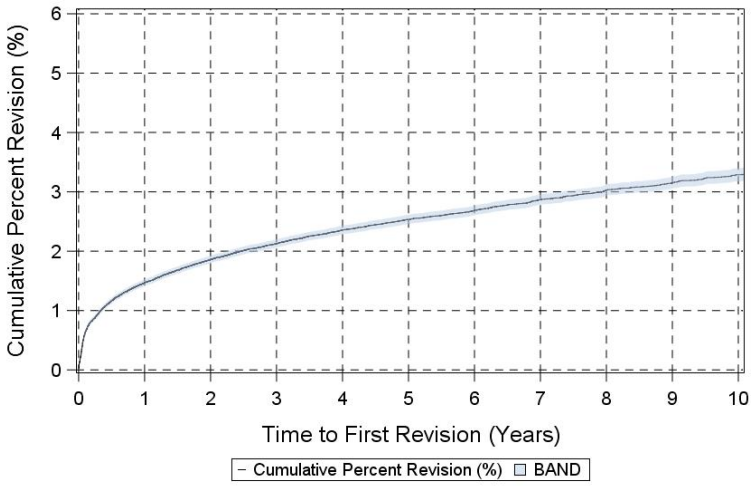


Figure 12. Cumulative Percent Revision for Primary Conventional THA

Table 5. Cumulative Percent Revision and Number at Risk for Primary Conventional THA (Numerical Values)

	1 year	3 years	5 years	7 years	10 years
CPR	1.47 (1.42,1.53)	2.13 (2.06,2.20)	2.53 (2.46,2.61)	2.87 (2.78,2.96)	3.29 (3.18,3.40)
Number at risk	163,507	124,511	93,141	60,553	18,153

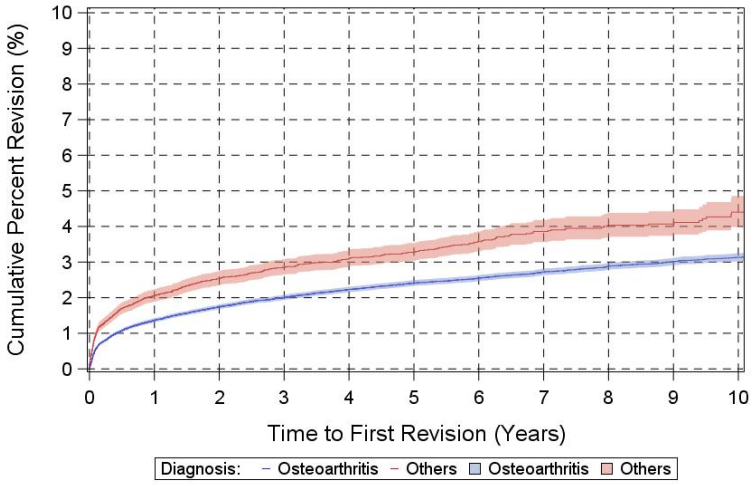


Figure 13. Cumulative Percent Revision for Primary Conventional THA by Diagnosis

Table 6. Cumulative Percent Revision for Primary Conventional THA by Diagnosis (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Osteoarthritis	159,558	1.37 (1.31,1.43)	2.01 (1.94,2.08)	2.41 (2.33,2.49)	2.72 (2.63, 2.82)	3.13 (3.02, 3.25)
Others	26,170	2.05 (1.89,2.24)	2.85 (2.64,3.08)	3.27 (3.03,3.53)	3.86 (3.56, 4.18)	4.40 (3.99, 4.86)
Unknown/Missing	599					

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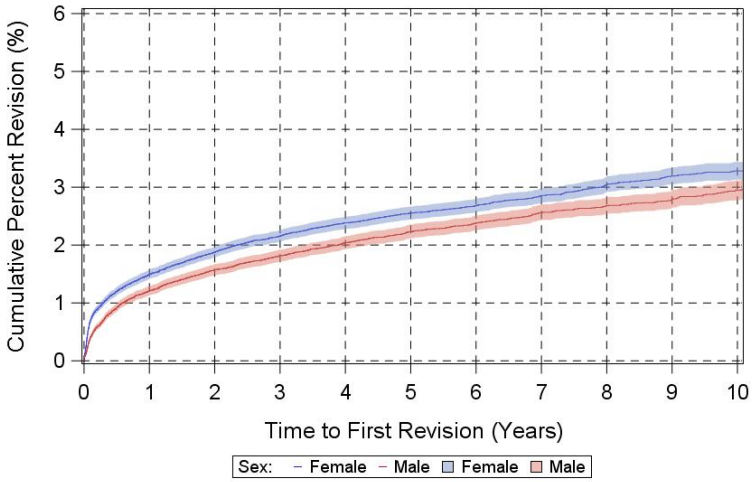


Figure 14. Cumulative Percent Revision for Primary Conventional THA by Sex for Osteoarthritis Diagnosis

Table 7. Cumulative Percent Revision for Primary Conventional THA by Sex for Osteoarthritis Diagnosis (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Female	88,634	1.50 (1.42,1.58)	2.16 (2.06,2.26)	2.55 (2.44,2.67)	2.85 (2.73, 2.98)	3.28 (3.13, 3.44)
Male	70,889	1.21 (1.13,1.30)	1.82 (1.72,1.92)	2.23 (2.12,2.35)	2.56 (2.43, 2.70)	2.94 (2.78, 3.12)
Missing	35					

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1.2.3 Effect of Stem Fixation on Revision Risk

MARCQI began abstracting component fixation as of 1/1/2017, so the analyses presented in this section are based on cases performed between 1/1/2017 and 12/31/2024.

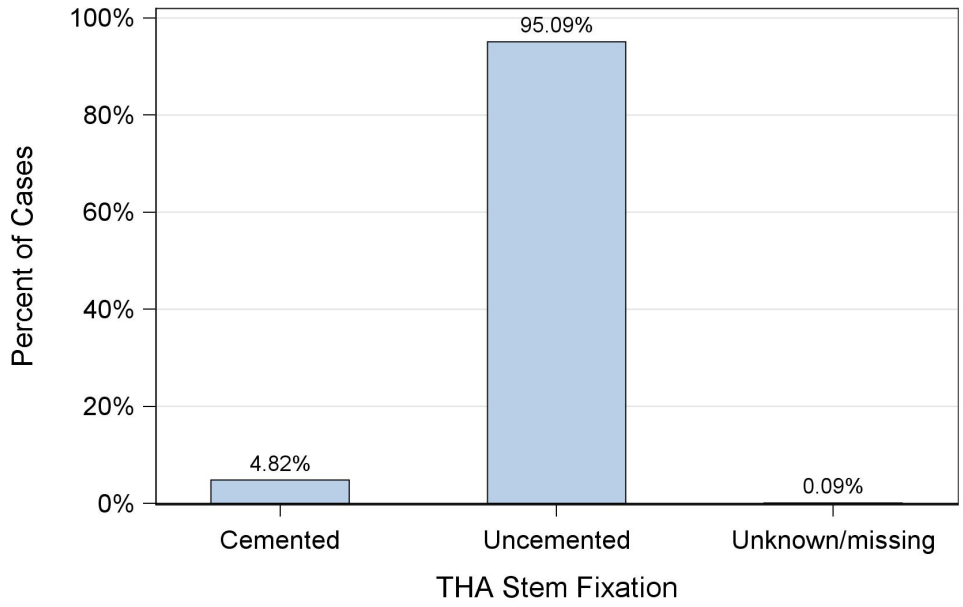


Figure 15. Distribution of Stem Fixation in Primary Conventional THA Cases

Table 8. Descriptive Statistics of Primary Conventional THA Cases by Stem Fixation

Quantity	Cemented N	Cemented Mean (SD)	Cemented Median (IQR)	Uncemented N	Uncemented Mean (SD)	Uncemented Median (IQR)
Female (%)	5,351	82.3		68,403	53.3	
Age (years)	6,504	77.1 (8.3)	78 (11)	128,416	65.2 (10.4)	66 (13)
Height (cm)	6,480	163.6 (9.3)	162.6 (11.5)	127,801	170.2 (10.4)	170.2 (15.2)
Weight (kg)	6,480	75.5 (17.4)	73 (23.6)	127,801	89.7 (21)	88 (28)
BMI (kg/m^2)	6,480	28.2 (5.7)	27.4 (7.7)	127,801	30.8 (6.3)	30.1 (8.3)
Smoker - Never (%)	3,505	53.9		63,602	49.5	
Smoker - Previous (%)	2,579	39.7		47,077	36.7	
Smoker - Current (%)	382	5.9		17,426	13.6	
Smoker - Unknown (%)	38	0.6		311	0.2	

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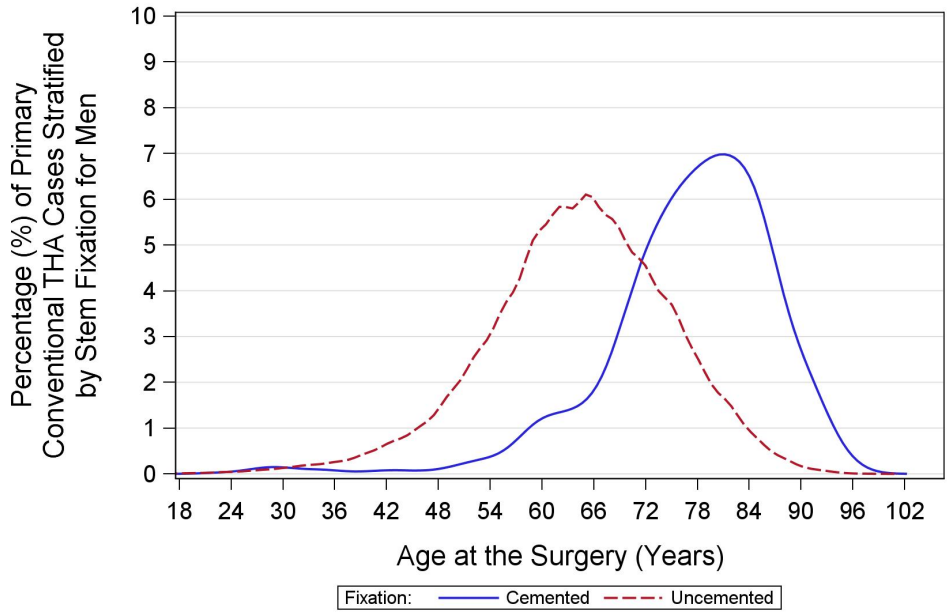


Figure 16. Age Distribution for Primary Conventional THA Cases by Stem Fixation for Men



Figure 17. Age Distribution for Primary Conventional THA Cases by Stem Fixation for Women

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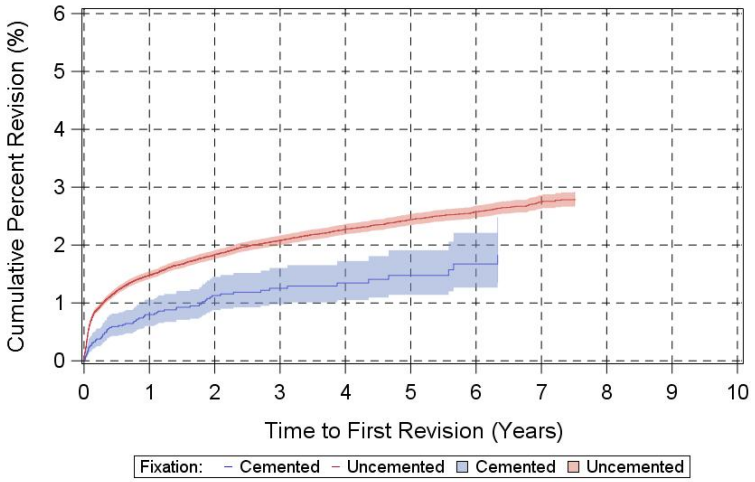


Figure 18. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation

Table 9. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Cemented stem	6,461	0.80 (0.60,1.06)	1.25 (0.98,1.60)	1.48 (1.14,1.91)	1.83 (1.35, 2.48)	N/A
Uncemented stem	127,997	1.48 (1.42,1.55)	2.08 (2.00,2.16)	2.44 (2.35,2.54)	2.74 (2.63, 2.86)	N/A
Unknown/missing	120					

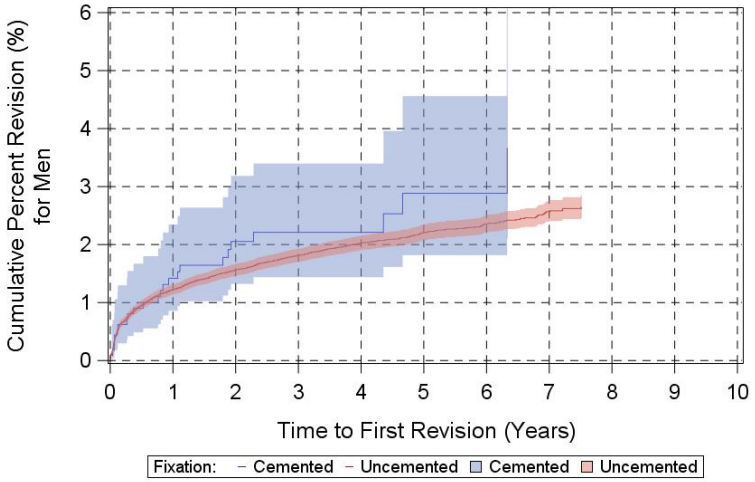


Figure 19. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation for Men

Table 10. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation for Men (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Cemented stem	1,141	1.42 (0.86,2.35)	2.21 (1.44,3.40)	2.88 (1.82,4.56)	3.67 (2.11, 6.33)	N/A
Uncemented stem	59,759	1.23 (1.14,1.32)	1.81 (1.70,1.93)	2.20 (2.07,2.35)	2.57 (2.40, 2.75)	N/A
Unknown/missing	60					

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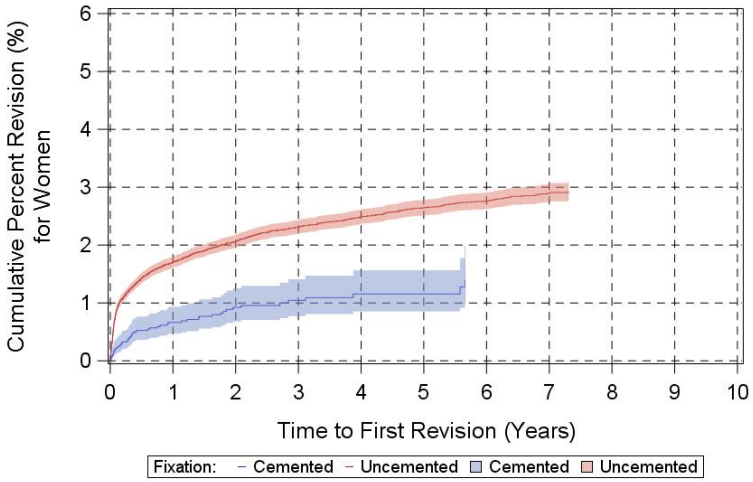


Figure 20. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation for Women

Table 11. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation for Women (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Cemented stem	5,318	0.66 (0.47,0.93)	1.04 (0.77,1.41)	1.16 (0.85,1.56)	1.40 (0.99, 1.98)	N/A
Uncemented stem	68,213	1.71 (1.61,1.81)	2.31 (2.19,2.43)	2.64 (2.51,2.78)	2.90 (2.74, 3.06)	N/A
Unknown/missing	60					

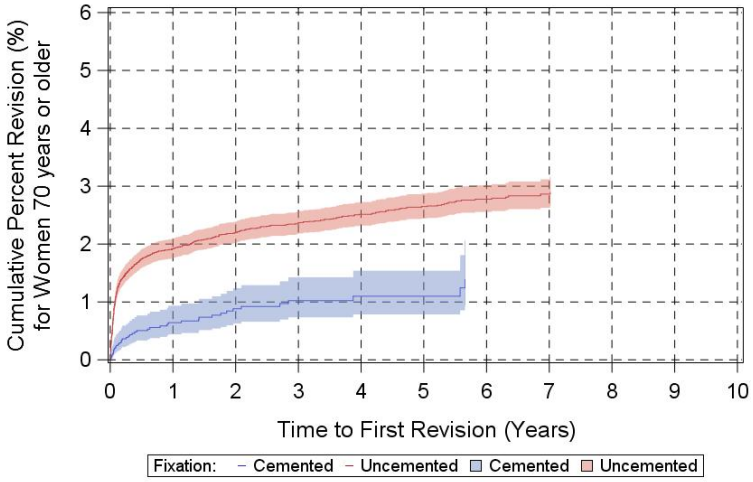


Figure 21. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation for Women 70 Years or Older

Table 12. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation for Women 70 Years or Older (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Cemented stem	4,480	0.64 (0.44,0.93)	1.02 (0.73,1.43)	1.10 (0.78,1.54)	1.39 (0.94, 2.06)	N/A
Uncemented stem	25,856	1.92 (1.76,2.10)	2.36 (2.18,2.57)	2.65 (2.44,2.87)	2.86 (2.63, 3.12)	N/A
Unknown/missing	23					

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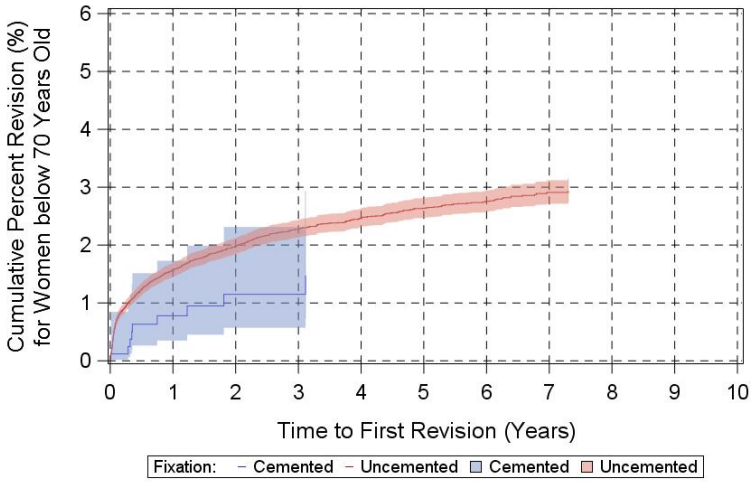


Figure 22. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation for Women Under 70 Years

Table 13. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation for Women Under 70 Years (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Cemented stem	838	0.78 (0.35,1.73)	1.15 (0.57,2.31)	1.47 (0.73,2.94)	1.47 (0.73, 2.94)	N/A
Uncemented stem	42,357	1.58 (1.46,1.70)	2.27 (2.13,2.43)	2.64 (2.47,2.82)	2.91 (2.71, 3.12)	N/A
Unknown/missing	37					

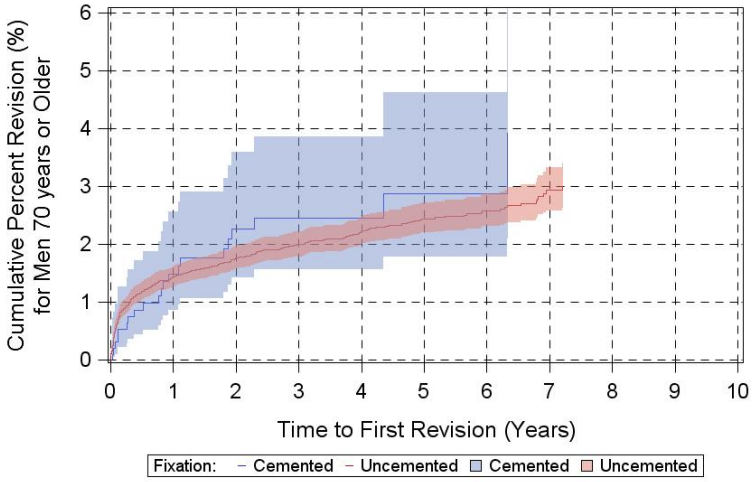


Figure 23. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation for Men 70 Years or Older

Table 14. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation for Men 70 Years or Older (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Cemented stem	958	1.49 (0.87,2.56)	2.46 (1.56,3.86)	2.87 (1.78,4.63)	3.93 (2.09, 7.32)	N/A
Uncemented stem	18,554	1.44 (1.27,1.62)	2.00 (1.79,2.23)	2.45 (2.20,2.72)	2.93 (2.59, 3.32)	N/A
Unknown/missing	18					

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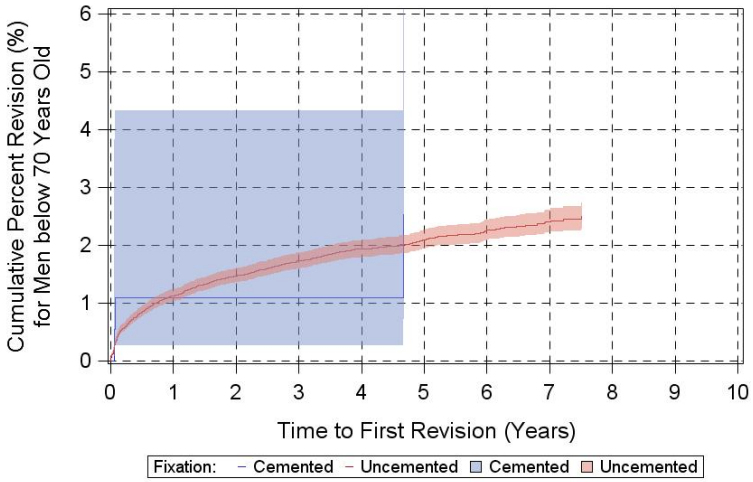


Figure 24. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation for Men Under 70 Years

Table 15. Cumulative Percent Revision for Primary Conventional THA by Stem Fixation for Men Under 70 Years (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Cemented stem	183	1.10 (0.28,4.32)	1.10 (0.28,4.32)	2.53 (0.72,8.69)	2.53 (0.72, 8.69)	N/A
Uncemented stem	41,205	1.13 (1.03,1.24)	1.73 (1.60,1.87)	2.10 (1.94,2.26)	2.41 (2.22, 2.62)	N/A
Unknown/missing	42					

Table 16. Reasons for First Revision Following Primary Cemented Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	21	28.8
2	Aseptic Loosening	18	24.7
3	Joint Infection	15	20.6
4	Peri-prosthetic fracture - Femur	11	15.1
5	Peri-prosthetic fracture - Acetabulum	4	5.5
6	Implant Failure	3	4.1
7	Metal Reaction/Metallosis	1	1.4

Table 17. Reasons for First Revision Following Primary Cemented Stem Cases in First Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	17	35.4
2	Joint Infection	14	29.2
3	Aseptic Loosening	7	14.6
4	Peri-prosthetic fracture - Femur	5	10.4
5	Peri-prosthetic fracture - Acetabulum	4	8.3
6	Implant Failure	1	2.1

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Table 18. Reasons for First Revision Following Primary Cemented Stem Cases in Second Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	8	57.1
2	Implant Failure	2	14.3
3	Peri-prosthetic fracture - Femur	2	14.3
4	Dislocation/Instability	1	7.1
5	Joint Infection	1	7.1

Table 19. Reasons for First Revision Following Primary Cemented Stem Cases in Third Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	2	50.0
2	Aseptic Loosening	1	25.0
3	Dislocation/Instability	1	25.0

Table 20. Reasons for First Revision Following Primary Uncemented Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	691	25.6
2	Joint Infection	576	21.3
3	Dislocation/Instability	568	21.0
4	Aseptic Loosening	489	18.1
5	Malalignment	122	4.5
6	Implant Failure	99	3.7
7	Pain	78	2.9
8	Peri-prosthetic fracture - Acetabulum	40	1.5
9	Metal Reaction/Metallosis	25	0.9
10	Poly liner wear	8	0.3
	Unknown/missing/other	5	0.2

Table 21. Reasons for First Revision Following Primary Uncemented Stem Cases in First Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	626	34.2
2	Dislocation/Instability	393	21.5
3	Joint Infection	372	20.3
4	Aseptic Loosening	224	12.2
5	Implant Failure	70	3.8
6	Malalignment	61	3.3
7	Pain	40	2.2
8	Peri-prosthetic fracture - Acetabulum	36	2.0
9	Poly liner wear	4	0.2
10	Metal Reaction/Metallosis	4	0.2
	Unknown/missing/other	1	0.1

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Table 22. Reasons for First Revision Following Primary Uncemented Stem Cases in Second Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	114	32.0
2	Joint Infection	94	26.4
3	Dislocation/Instability	65	18.3
4	Malalignment	24	6.7
5	Peri-prosthetic fracture - Femur	23	6.5
6	Pain	19	5.3
7	Implant Failure	12	3.4
8	Peri-prosthetic fracture - Acetabulum	2	0.6
9	Metal Reaction/Metallosis	2	0.6
10	Osteolysis	1	0.3

Table 23. Reasons for First Revision Following Primary Uncemented Stem Cases in Third Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	59	28.6
2	Dislocation/Instability	46	22.3
3	Joint Infection	39	18.9
4	Malalignment	18	8.7
5	Pain	13	6.3
6	Peri-prosthetic fracture - Femur	12	5.8
7	Implant Failure	10	4.8
8	Metal Reaction/Metallosis	7	3.4
9	Poly liner wear	1	0.5
10	Peri-prosthetic fracture - Acetabulum	1	0.5

Table 24. Reasons for First Revision Following Primary Cemented Stem Cases in Women at Least 70 Years of Age

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	16	26.2
2	Aseptic Loosening	15	24.6
3	Joint Infection	15	24.6
4	Peri-prosthetic fracture - Femur	11	18.0
5	Peri-prosthetic fracture - Acetabulum	2	3.3
6	Implant Failure	1	1.6
7	Metal Reaction/Metallosis	1	1.6

Table 25. Reasons for First Revision Following Primary Cemented Stem Cases in Women at Least 70 Years of Age in First Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	8	29.6
2	Joint Infection	8	29.6
3	Peri-prosthetic fracture - Femur	5	18.5
4	Aseptic Loosening	4	14.8
5	Peri-prosthetic fracture - Acetabulum	2	7.4

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Table 26. Reasons for First Revision Following Primary Cemented Stem cases in Women at Least 70 Years of Age in Second Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	3	42.9
2	Dislocation/Instability	1	14.3
3	Joint Infection	1	14.3
4	Implant Failure	1	14.3
5	Peri-prosthetic fracture - Femur	1	14.3

Table 27. Reasons for First Revision Following Primary Cemented Stem Cases in Women at Least 70 Years of Age in Third Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	33.3
2	Dislocation/Instability	1	33.3
3	Peri-prosthetic fracture - Femur	1	33.3

Table 28. Reasons for First Revision Following Primary Uncemented Stem Cases in Women at Least 70 Years of Age

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	365	36.5
2	Dislocation/Instability	233	23.3
3	Aseptic Loosening	152	15.2
4	Joint Infection	142	14.2
5	Implant Failure	34	3.4
6	Malalignment	29	2.9
7	Peri-prosthetic fracture - Acetabulum	26	2.6
8	Pain	10	1.0
9	Metal Reaction/Metallosis	7	0.7
10	Osteolysis	1	0.1
	Unknown/missing/other	1	0.1

Table 29. Reasons for First Revision Following Primary Uncemented Stem Cases in Women at Least 70 Years of Age in First Year post-operatively

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	243	50.1
2	Dislocation/Instability	97	20.0
3	Joint Infection	45	9.3
4	Aseptic Loosening	44	9.1
5	Implant Failure	22	4.5
6	Peri-prosthetic fracture - Acetabulum	19	3.9
7	Malalignment	9	1.9
8	Pain	4	0.8
9	Poly liner wear	1	0.2
10	Metal Reaction/Metallosis	1	0.2

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Table 30. Reasons for First Revision Following Primary Uncemented Stem Cases in Women at Least 70 Years of Age in Second Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	25	44.6
2	Aseptic Loosening	19	33.9
3	Joint Infection	5	8.9
4	Peri-prosthetic fracture - Femur	2	3.6
5	Pain	2	3.6
6	Malalignment	2	3.6
7	Peri-prosthetic fracture - Acetabulum	1	1.8

Table 31. Reasons for First Revision Following Primary Uncemented Stem Cases in Women at Least 70 Years of Age in Third Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	10	34.5
2	Joint Infection	8	27.6
3	Aseptic Loosening	3	10.3
4	Malalignment	3	10.3
5	Implant Failure	2	6.9
6	Peri-prosthetic fracture - Femur	2	6.9
7	Metal Reaction/Metallosis	1	3.4

1.2.4 Reasons for Revision

The reasons for revision are of central importance to quality improvement because it helps focus attention on specific causes that may be addressed. Therefore, the data are presented in two formats below: tabular and Pareto chart. The tabular format is consistent with how other arthroplasty registries report the cause(s) of revision. The Pareto chart figure presents the same data in a format commonly used in quality improvement. The Pareto chart sorts the reasons for revision by frequency (bar chart on the bottom, from left to right) and presents a cumulative percent using a line graph above.

It is important to note that the time window for the cases reported in the reasons for revision tables and figure differs from the time window used for other figures because the reason for revision was added to the database on 1/1/2015. While these data capture revisions for primaries performed back to 2/15/2012, only revisions occurring on or after 1/1/2015 are included in the reasons for revision figure and tables.

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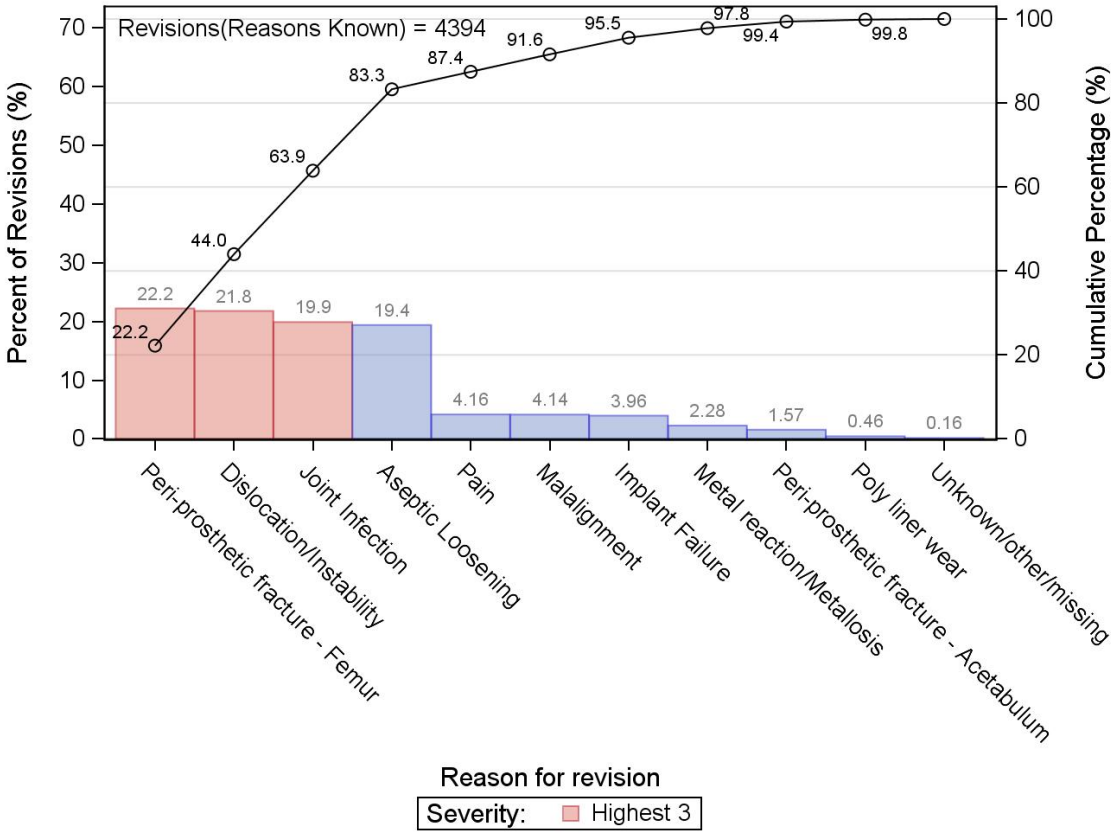


Figure 25. Reasons for First Revision Following Primary Conventional THA (Pareto Chart)

Table 32. Reasons for First Revision Following Primary Conventional THA

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	976	22.2
2	Dislocation/Instability	957	21.8
3	Joint Infection	874	19.9
4	Aseptic Loosening	852	19.4
5	Pain	183	4.2
6	Malalignment	182	4.1
7	Implant Failure	174	4.0
8	Metal Reaction/Metallosis	100	2.3
9	Peri-prosthetic fracture - Acetabulum	69	1.6
10	Poly liner wear	20	0.5
	Unknown/missing/other	7	0.2

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Table 33. Reasons for First Revision Following Primary Conventional THA in First Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	793	31.3
2	Dislocation/Instability	589	23.2
3	Joint Infection	512	20.2
4	Aseptic Loosening	309	12.2
5	Implant Failure	103	4.1
6	Pain	84	3.3
7	Malalignment	78	3.1
8	Peri-prosthetic fracture - Acetabulum	57	2.2
9	Poly liner wear	5	0.2
10	Metal Reaction/Metallosis	4	0.2
	Unknown/missing/other	1	0.0

Table 34. Reasons for First Revision Following Primary Conventional THA in Second Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	196	33.3
2	Joint Infection	136	23.1
3	Dislocation/Instability	109	18.5
4	Pain	52	8.8
5	Peri-prosthetic fracture - Femur	35	5.9
6	Malalignment	29	4.9
7	Implant Failure	22	3.7
8	Peri-prosthetic fracture - Acetabulum	5	0.8
9	Metal Reaction/Metallosis	4	0.7
10	Osteolysis	1	0.2

Table 35. Reasons for First Revision Following Primary Conventional THA in Third Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	109	29.9
2	Dislocation/Instability	76	20.8
3	Joint Infection	69	18.9
4	Pain	31	8.5
5	Peri-prosthetic fracture - Femur	25	6.8
6	Malalignment	23	6.3
7	Implant Failure	16	4.4
8	Metal Reaction/Metallosis	10	2.7
9	Peri-prosthetic fracture - Acetabulum	3	0.8
10	Poly liner wear	2	0.6
	Unknown/missing/other	1	0.3

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1.2.5 Most Commonly Used Implants

Table 36. Ten Most Commonly Used Femoral Components in Primary Conventional THA

Rank	Stem	N	Percent
1	Accolade II	43,873	23.4
2	Taperloc 133	17,689	9.4
3	M/L Taper*	17,384	9.3
4	Actis DuoFix	10,786	5.8
5	Avenir Complete	9,248	4.9
6	Summit	8,411	4.5
7	Anthology	6,893	3.7
8	Fitmore	6,343	3.4
9	Insignia	6,236	3.3
10	Taperloc 133 Microplasty	5,585	3.0
11	Others	55,075	29.3

* M/L Taper does not include M/L Taper Kinectiv

Table 37. Ten Most Commonly Used Acetabular Components in Primary Conventional THA

Rank	Cup	N	Percent
1	G7	46,913	25.0
2	Trident II	31,917	17.0
3	Trident	31,199	16.6
4	Pinnacle	30,776	16.4
5	Continuum	17,061	9.1
6	Reflection 3	13,140	7.0
7	RingLoc	2,655	1.4
8	Trabecular Metal	2,056	1.1
9	Trilogy	1,616	0.9
10	Regenerex RingLoc+	1,031	0.6
11	Others	9,159	4.9

Table 38. Ten Most Commonly Used Femoral/Acetabular Component Combinations Used in Primary Conventional THA

Rank	Stem/cup combination	N	Percent
1	Accolade II / Trident II	21,931	11.7
2	Accolade II / Trident	21,227	11.3
3	Taperloc 133 / G7	13,828	7.4
4	Actis DuoFix / Pinnacle	10,119	5.4
5	Avenir Complete / G7	9,013	4.8
6	M/L Taper* / Continuum	8,713	4.7
7	Summit / Pinnacle	8,342	4.5
8	Anthology / Reflection 3	6,243	3.3
9	Insignia / Trident II	6,046	3.2
10	M/L Taper* / G7	5,349	2.9
11	Others	76,712	40.7

* M/L Taper does not include M/L Taper Kinectiv

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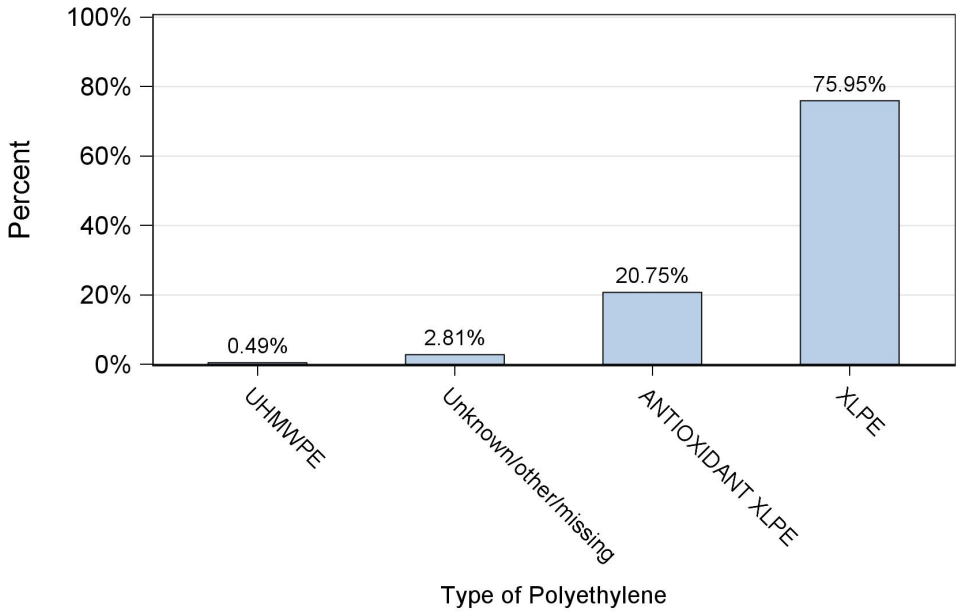


Figure 26. Percentage of Polyethylene Liners by Type of Polyethylene for Primary Conventional THA

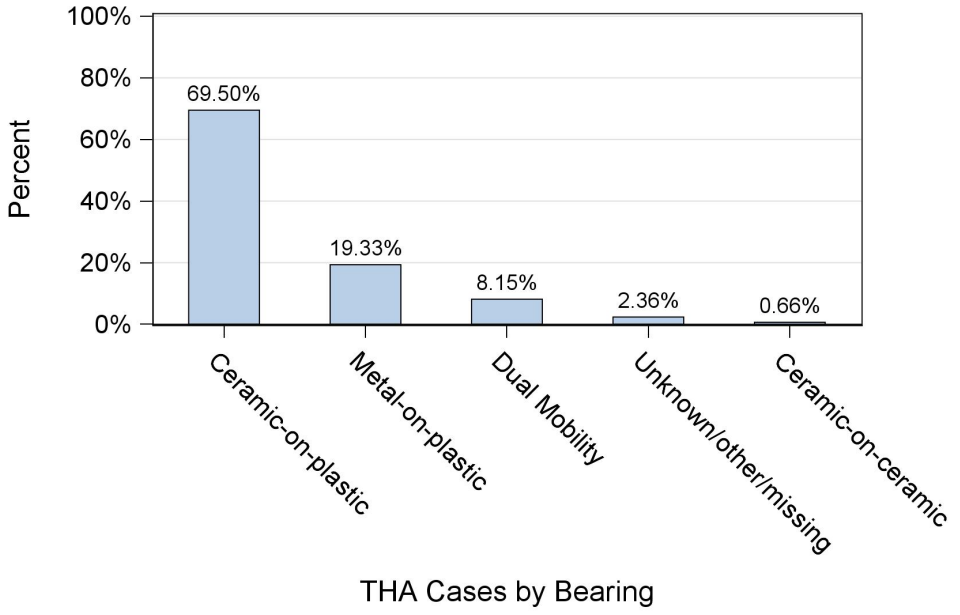


Figure 27. Percentage of Bearing Surface Couple for Primary Conventional THA

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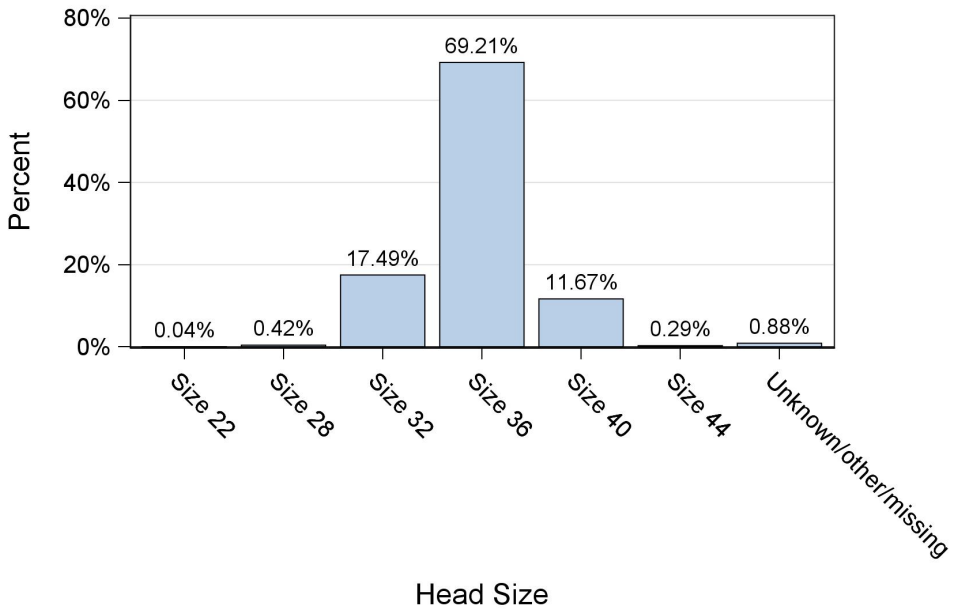


Figure 28. Distribution of Head Sizes for Primary Conventional THA, Excluding Dual Mobility Cases

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1.2.6 Revision Risk by Stem/Cup Implant Combination Summary

There is variation in revision risk across implants. This section provides revision risk data by stem/cup implant combination.

Table 39. Summary of Cumulative Percent Revision Following Primary THA for Stem/Cup Combinations Having at Least 500 Cases, Sorted Alphabetically

Stem/Cup Combination	N*	1 year	3 years	5 years	7 years	10 years
Accolade C / Trident II	1,176	0.67 (0.32,1.40)	1.13 (0.59,2.13)	1.13 (0.59,2.13)	1.13 (0.59,2.13)	N/A
Accolade II / Trident	21,076	1.18 (1.04,1.33)	1.92 (1.74,2.11)	2.44 (2.24,2.66)	2.86 (2.64,3.10)	3.34 (3.06,3.63)
Accolade II / Trident II	21,869	1.45 (1.30,1.62)	2.04 (1.85,2.25)	2.40 (2.17,2.65)	2.56 (2.29,2.85)	N/A
Accolade TMZF / Trident	880	0.91 (0.46,1.81)	2.05 (1.29,3.23)	2.84 (1.93,4.18)	3.30 (2.30,4.71)	4.25 (3.08,5.87)
Actis DuoFix / Pinnacle	10,090	0.75 (0.59,0.94)	1.02 (0.82,1.26)	1.13 (0.91,1.41)	1.20 (0.95,1.51)	N/A
AML / Pinnacle	804	1.37 (0.76,2.46)	2.01 (1.23,3.25)	2.85 (1.89,4.30)	3.21 (2.15,4.76)	3.21 (2.15,4.76)
Anthology / PolarCup	560	0.54 (0.17,1.66)	1.45 (0.73,2.87)	1.83 (0.99,3.38)	2.68 (1.54,4.63)	N/A
Anthology / Reflection 3	6,211	1.85 (1.54,2.22)	2.67 (2.29,3.12)	3.03 (2.61,3.53)	3.45 (2.96,4.02)	3.57 (3.06,4.16)
Avenir (Cemented) / G7	2,060	1.16 (0.76,1.76)	1.44 (0.96,2.16)	1.64 (1.07,2.51)	4.30 (1.27, 13.99)	N/A
Avenir (Cementless) / Continuum	520	1.35 (0.64,2.80)	1.92 (1.04,3.54)	2.12 (1.18,3.79)	2.52 (1.47,4.30)	2.52 (1.47,4.30)
Avenir (Cementless) / G7	833	1.57 (0.91,2.68)	1.72 (1.02,2.88)	1.94 (1.16,3.22)	1.94 (1.16,3.22)	N/A
Avenir Complete / G7	8,993	1.12 (0.91,1.38)	1.35 (1.09,1.66)	1.35 (1.09,1.66)	N/A	N/A
Corail / Pinnacle	4,141	1.31 (1.01,1.72)	2.03 (1.63,2.53)	2.11 (1.69,2.62)	2.19 (1.76,2.72)	2.40 (1.92,2.99)
Corail Coxa Vara / Pinnacle	881	0.12 (0.02,0.82)	0.64 (0.26,1.52)	0.79 (0.36,1.76)	0.79 (0.36,1.76)	0.79 (0.36,1.76)
C-Stem AMT / Pinnacle	549	0.19 (0.03,1.32)	0.52 (0.12,2.19)	0.52 (0.12,2.19)	0.52 (0.12,2.19)	0.52 (0.12,2.19)
Echo Bi-Metric / G7	1,674	2.75 (2.07,3.66)	3.49 (2.71,4.49)	3.76 (2.94,4.79)	4.26 (3.25,5.58)	4.87 (3.63,6.52)
Echo Bi-Metric Microplasty / G7	2,298	1.86 (1.38,2.51)	2.48 (1.90,3.23)	2.81 (2.18,3.62)	3.72 (2.77,4.98)	N/A
Echo FX / G7	497	1.01 (0.42,2.42)	2.21 (1.19,4.09)	2.93 (1.65,5.19)	2.93 (1.65,5.19)	2.93 (1.65,5.19)
Fitmore / Continuum	2,802	1.36 (0.99,1.86)	2.03 (1.57,2.63)	2.32 (1.83,2.95)	2.79 (2.24,3.47)	3.19 (2.56,3.96)
Fitmore / G7	3,041	1.35 (1.00,1.84)	1.75 (1.34,2.29)	1.90 (1.46,2.47)	1.97 (1.51,2.57)	N/A
Insignia / Trident II	6,031	0.65 (0.46,0.91)	N/A	N/A	N/A	N/A
M/L Taper** / Continuum	8,621	1.68 (1.43,1.97)	2.34 (2.04,2.69)	2.74 (2.41,3.12)	3.02 (2.67,3.42)	3.40 (3.00,3.85)
M/L Taper** / G7	5,320	1.79 (1.46,2.19)	2.54 (2.14,3.03)	2.80 (2.35,3.33)	2.88 (2.41,3.45)	N/A
M/L Taper** / Trabecular Metal	1,064	2.54 (1.75,3.68)	3.30 (2.38,4.57)	3.73 (2.74,5.07)	4.16 (3.08,5.61)	4.95 (3.60,6.79)
M/L Taper** / Trilogy	1,325	1.58 (1.04,2.42)	3.17 (2.35,4.27)	3.80 (2.89,4.98)	4.61 (3.59,5.92)	5.04 (3.95,6.41)
Polarstem / Reflection 3	3,812	1.26 (0.95,1.68)	1.66 (1.28,2.15)	2.16 (1.68,2.78)	2.26 (1.75,2.91)	2.26 (1.75,2.91)
ProFemur Gladiator / Procotyl Prime	509	0.81 (0.30,2.14)	1.63 (0.77,3.41)	1.63 (0.77,3.41)	N/A	N/A
Secur-Fit / Trident	1,093	3.75 (2.78,5.06)	4.94 (3.81,6.40)	5.59 (4.37,7.12)	6.17 (4.89,7.77)	6.56 (5.22,8.23)
Secur-Fit / Trident II	938	2.70 (1.83,3.98)	3.19 (2.20,4.61)	3.68 (2.54,5.31)	3.68 (2.54,5.31)	N/A
Secur-Fit Max / Trident	3,058	2.13 (1.67,2.70)	3.06 (2.50,3.73)	3.86 (3.22,4.61)	4.29 (3.61,5.09)	4.70 (3.95,5.58)
Secur-Fit Plus Max / Trident	1,981	1.72 (1.23,2.39)	2.12 (1.57,2.86)	2.52 (1.92,3.32)	3.04 (2.37,3.90)	3.44 (2.72,4.35)
SROM / Pinnacle	1,117	1.25 (0.75,2.11)	2.52 (1.75,3.63)	3.07 (2.20,4.27)	3.68 (2.71,4.98)	4.35 (3.25,5.81)
Summit / Pinnacle	8,250	1.48 (1.24,1.77)	2.06 (1.77,2.39)	2.25 (1.94,2.60)	2.43 (2.10,2.80)	2.71 (2.35,3.14)
Synergy / Reflection 3	1,474	2.21 (1.56,3.11)	3.13 (2.34,4.19)	3.42 (2.58,4.54)	4.13 (3.15,5.40)	4.49 (3.42,5.89)
Taperloc 133 / Continuum	842	3.21 (2.21,4.65)	4.98 (3.69,6.70)	5.92 (4.49,7.78)	6.22 (4.74,8.13)	N/A
Taperloc 133 / G7	13,779	1.68 (1.48,1.91)	2.26 (2.01,2.53)	2.61 (2.33,2.92)	2.78 (2.47,3.13)	2.94 (2.57,3.36)
Taperloc 133 / Regenerex RingLoc+	496	1.61 (0.81,3.20)	2.22 (1.23,3.97)	2.82 (1.68,4.72)	3.03 (1.83,4.97)	3.60 (2.24,5.76)
Taperloc 133 / RingLoc	1,679	1.73 (1.20,2.48)	2.50 (1.85,3.37)	2.68 (2.01,3.57)	2.74 (2.06,3.65)	3.27 (2.48,4.30)
Taperloc 133 Microplasty / Continuum	803	2.00 (1.23,3.25)	2.57 (1.63,4.03)	2.85 (1.81,4.46)	2.85 (1.81,4.46)	N/A
Taperloc 133 Microplasty / G7	4,095	1.17 (0.88,1.55)	1.45 (1.12,1.88)	1.98 (1.56,2.50)	2.13 (1.69,2.69)	2.13 (1.69,2.69)
Trabecular Metal / Continuum	784	2.17 (1.35,3.46)	3.08 (2.08,4.56)	3.36 (2.30,4.90)	3.52 (2.43,5.10)	4.48 (3.11,6.44)
Tri-Lock BPS / Pinnacle	4,272	0.75 (0.53,1.06)	1.36 (1.05,1.77)	1.71 (1.35,2.17)	1.84 (1.45,2.33)	2.22 (1.74,2.85)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision

** M/L Taper does not include M/L Taper Kinectiv

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Table 40. Summary of Cumulative Percent Revision Following Primary THA for Stem/Cup Combinations Having at Least 500 Cases, Sorted by Five-year CPR

Stem/Cup Combination	N*	1 year	3 years	5 years	7 years	10 years
C-Stem AMT / Pinnacle	549	0.19 (0.03,1.32)	0.52 (0.12,2.19)	0.52 (0.12,2.19)	0.52 (0.12,2.19)	0.52 (0.12,2.19)
Corail Coxa Vara / Pinnacle	881	0.12 (0.02,0.82)	0.64 (0.26,1.52)	0.79 (0.36,1.76)	0.79 (0.36,1.76)	0.79 (0.36,1.76)
Accolade C / Trident II	1,176	0.67 (0.32,1.40)	1.13 (0.59,2.13)	1.13 (0.59,2.13)	1.13 (0.59,2.13)	N/A
Actis DuoFix / Pinnacle	10,090	0.75 (0.59,0.94)	1.02 (0.82,1.26)	1.13 (0.91,1.41)	1.20 (0.95,1.51)	N/A
Avenir Complete / G7	8,993	1.12 (0.91,1.38)	1.35 (1.09,1.66)	1.35 (1.09,1.66)	N/A	N/A
ProFemur Gladiator / Procotyl Prime	509	0.81 (0.30,2.14)	1.63 (0.77,3.41)	1.63 (0.77,3.41)	N/A	N/A
Avenir (Cemented) / G7	2,060	1.16 (0.76,1.76)	1.44 (0.96,2.16)	1.64 (1.07,2.51)	4.30 (1.27, 13.99)	N/A
Tri-Lock BPS / Pinnacle	4,272	0.75 (0.53,1.06)	1.36 (1.05,1.77)	1.71 (1.35,2.17)	1.84 (1.45,2.33)	2.22 (1.74,2.85)
Anthology / PolarCup	560	0.54 (0.17,1.66)	1.45 (0.73,2.87)	1.83 (0.99,3.38)	2.68 (1.54,4.63)	N/A
Fitmore / G7	3,041	1.35 (1.00,1.84)	1.75 (1.34,2.29)	1.90 (1.46,2.47)	1.97 (1.51,2.57)	N/A
Avenir (Cementless) / G7	833	1.57 (0.91,2.68)	1.72 (1.02,2.88)	1.94 (1.16,3.22)	1.94 (1.16,3.22)	N/A
Taperloc 133 Microplasty / G7	4,095	1.17 (0.88,1.55)	1.45 (1.12,1.88)	1.98 (1.56,2.50)	2.13 (1.69,2.69)	2.13 (1.69,2.69)
Corail / Pinnacle	4,141	1.31 (1.01,1.72)	2.03 (1.63,2.53)	2.11 (1.69,2.62)	2.19 (1.76,2.72)	2.40 (1.92,2.99)
Avenir (Cementless) / Continuum	520	1.35 (0.64,2.80)	1.92 (1.04,3.54)	2.12 (1.18,3.79)	2.52 (1.47,4.30)	2.52 (1.47,4.30)
Polarstem / Reflection 3	3,812	1.26 (0.95,1.68)	1.66 (1.28,2.15)	2.16 (1.68,2.78)	2.26 (1.75,2.91)	2.26 (1.75,2.91)
Summit / Pinnacle	8,250	1.48 (1.24,1.77)	2.06 (1.77,2.39)	2.25 (1.94,2.60)	2.43 (2.10,2.80)	2.71 (2.35,3.14)
Fitmore / Continuum	2,802	1.36 (0.99,1.86)	2.03 (1.57,2.63)	2.32 (1.83,2.95)	2.79 (2.24,3.47)	3.19 (2.56,3.96)
Accolade II / Trident II	21,869	1.45 (1.30,1.62)	2.04 (1.85,2.25)	2.40 (2.17,2.65)	2.56 (2.29,2.85)	N/A
Accolade II / Trident	21,076	1.18 (1.04,1.33)	1.92 (1.74,2.11)	2.44 (2.24,2.66)	2.86 (2.64,3.10)	3.34 (3.06,3.63)
Secur-Fit Plus Max / Trident	1,981	1.72 (1.23,2.39)	2.12 (1.57,2.86)	2.52 (1.92,3.32)	3.04 (2.37,3.90)	3.44 (2.72,4.35)
Taperloc 133 / G7	13,779	1.68 (1.48,1.91)	2.26 (2.01,2.53)	2.61 (2.33,2.92)	2.78 (2.47,3.13)	2.94 (2.57,3.36)
Taperloc 133 / RingLoc	1,679	1.73 (1.20,2.48)	2.50 (1.85,3.37)	2.68 (2.01,3.57)	2.74 (2.06,3.65)	3.27 (2.48,4.30)
M/L Taper** / Continuum	8,621	1.68 (1.43,1.97)	2.34 (2.04,2.69)	2.74 (2.41,3.12)	3.02 (2.67,3.42)	3.40 (3.00,3.85)
M/L Taper** / G7	5,320	1.79 (1.46,2.19)	2.54 (2.14,3.03)	2.80 (2.35,3.33)	2.88 (2.41,3.45)	N/A
Echo Bi-Metric Microplasty / G7	2,298	1.86 (1.38,2.51)	2.48 (1.90,3.23)	2.81 (2.18,3.62)	3.72 (2.77,4.98)	N/A
Taperloc 133 / Regenerex RingLoc+	496	1.61 (0.81,3.20)	2.22 (1.23,3.97)	2.82 (1.68,4.72)	3.03 (1.83,4.97)	3.60 (2.24,5.76)
Accolade TMZF / Trident	880	0.91 (0.46,1.81)	2.05 (1.29,3.23)	2.84 (1.93,4.18)	3.30 (2.30,4.71)	4.25 (3.08,5.87)
Taperloc 133 Microplasty / Continuum	803	2.00 (1.23,3.25)	2.57 (1.63,4.03)	2.85 (1.81,4.46)	2.85 (1.81,4.46)	N/A
AML / Pinnacle	804	1.37 (0.76,2.46)	2.01 (1.23,3.25)	2.85 (1.89,4.30)	3.21 (2.15,4.76)	3.21 (2.15,4.76)
Echo FX / G7	497	1.01 (0.42,2.42)	2.21 (1.19,4.09)	2.93 (1.65,5.19)	2.93 (1.65,5.19)	2.93 (1.65,5.19)
Anthology / Reflection 3	6,211	1.85 (1.54,2.22)	2.67 (2.29,3.12)	3.03 (2.61,3.53)	3.45 (2.96,4.02)	3.57 (3.06,4.16)
SROM / Pinnacle	1,117	1.25 (0.75,2.11)	2.52 (1.75,3.63)	3.07 (2.20,4.27)	3.68 (2.71,4.98)	4.35 (3.25,5.81)
Trabecular Metal / Continuum	784	2.17 (1.35,3.46)	3.08 (2.08,4.56)	3.36 (2.30,4.90)	3.52 (2.43,5.10)	4.48 (3.11,6.44)
Synergy / Reflection 3	1,474	2.21 (1.56,3.11)	3.13 (2.34,4.19)	3.42 (2.58,4.54)	4.13 (3.15,5.40)	4.49 (3.42,5.89)
Secur-Fit / Trident II	938	2.70 (1.83,3.98)	3.19 (2.20,4.61)	3.68 (2.54,5.31)	3.68 (2.54,5.31)	N/A
M/L Taper** / Trabecular Metal	1,064	2.54 (1.75,3.68)	3.30 (2.38,4.57)	3.73 (2.74,5.07)	4.16 (3.08,5.61)	4.95 (3.60,6.79)
Echo Bi-Metric / G7	1,674	2.75 (2.07,3.66)	3.49 (2.71,4.49)	3.76 (2.94,4.79)	4.26 (3.25,5.58)	4.87 (3.63,6.52)
M/L Taper** / Trilogy	1,325	1.58 (1.04,2.42)	3.17 (2.35,4.27)	3.80 (2.89,4.98)	4.61 (3.59,5.92)	5.04 (3.95,6.41)
Secur-Fit Max / Trident	3,058	2.13 (1.67,2.70)	3.06 (2.50,3.73)	3.86 (3.22,4.61)	4.29 (3.61,5.09)	4.70 (3.95,5.58)
Secur-Fit / Trident	1,093	3.75 (2.78,5.06)	4.94 (3.81,6.40)	5.59 (4.37,7.12)	6.17 (4.89,7.77)	6.56 (5.22,8.23)
Taperloc 133 / Continuum	842	3.21 (2.21,4.65)	4.98 (3.69,6.70)	5.92 (4.49,7.78)	6.22 (4.74,8.13)	N/A

* Number of patients that contribute to survival analysis used to compute cumulative percent revision

** M/L Taper does not include M/L Taper Kinectiv

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Table 41. Summary of Cumulative Percent Revision Following Primary THA for Stem/Cup Combinations Having at Least 500 Cases, Sorted by Ten-year CPR

Stem/cup combination	N*	1 year	3 years	5 years	7 years	10 years
C-Stem AMT / Pinnacle	549	0.19 (0.03,1.32)	0.52 (0.12,2.19)	0.52 (0.12,2.19)	0.52 (0.12,2.19)	0.52 (0.12,2.19)
Corail Coxa Vara / Pinnacle	881	0.12 (0.02,0.82)	0.64 (0.26,1.52)	0.79 (0.36,1.76)	0.79 (0.36,1.76)	0.79 (0.36,1.76)
Taperloc 133 Microplasty / G7	4,095	1.17 (0.88,1.55)	1.45 (1.12,1.88)	1.98 (1.56,2.50)	2.13 (1.69,2.69)	2.13 (1.69,2.69)
Tri-Lock BPS / Pinnacle	4,272	0.75 (0.53,1.06)	1.36 (1.05,1.77)	1.71 (1.35,2.17)	1.84 (1.45,2.33)	2.22 (1.74,2.85)
Polarstem / Reflection 3	3,812	1.26 (0.95,1.68)	1.66 (1.28,2.15)	2.16 (1.68,2.78)	2.26 (1.75,2.91)	2.26 (1.75,2.91)
Corail / Pinnacle	4,141	1.31 (1.01,1.72)	2.03 (1.63,2.53)	2.11 (1.69,2.62)	2.19 (1.76,2.72)	2.40 (1.92,2.99)
Avenir (Cementless) / Continuum	520	1.35 (0.64,2.80)	1.92 (1.04,3.54)	2.12 (1.18,3.79)	2.52 (1.47,4.30)	2.52 (1.47,4.30)
Summit / Pinnacle	8,250	1.48 (1.24,1.77)	2.06 (1.77,2.39)	2.25 (1.94,2.60)	2.43 (2.10,2.80)	2.71 (2.35,3.14)
Echo FX / G7	497	1.01 (0.42,2.42)	2.21 (1.19,4.09)	2.93 (1.65,5.19)	2.93 (1.65,5.19)	2.93 (1.65,5.19)
Taperloc 133 / G7	13,779	1.68 (1.48,1.91)	2.26 (2.01,2.53)	2.61 (2.33,2.92)	2.78 (2.47,3.13)	2.94 (2.57,3.36)
Fitmore / Continuum	2,802	1.36 (0.99,1.86)	2.03 (1.57,2.63)	2.32 (1.83,2.95)	2.79 (2.24,3.47)	3.19 (2.56,3.96)
AML / Pinnacle	804	1.37 (0.76,2.46)	2.01 (1.23,3.25)	2.85 (1.89,4.30)	3.21 (2.15,4.76)	3.21 (2.15,4.76)
Taperloc 133 / RingLoc	1,679	1.73 (1.20,2.48)	2.50 (1.85,3.37)	2.68 (2.01,3.57)	2.74 (2.06,3.65)	3.27 (2.48,4.30)
Accolade II / Trident	21,076	1.18 (1.04,1.33)	1.92 (1.74,2.11)	2.44 (2.24,2.66)	2.86 (2.64,3.10)	3.34 (3.06,3.63)
M/L Taper** / Continuum	8,621	1.68 (1.43,1.97)	2.34 (2.04,2.69)	2.74 (2.41,3.12)	3.02 (2.67,3.42)	3.40 (3.00,3.85)
Secur-Fit Plus Max / Trident	1,981	1.72 (1.23,2.39)	2.12 (1.57,2.86)	2.52 (1.92,3.32)	3.04 (2.37,3.90)	3.44 (2.72,4.35)
Anthology / Reflection 3	6,211	1.85 (1.54,2.22)	2.67 (2.29,3.12)	3.03 (2.61,3.53)	3.45 (2.96,4.02)	3.57 (3.06,4.16)
Taperloc 133 / Regenerex RingLoc+	496	1.61 (0.81,3.20)	2.22 (1.23,3.97)	2.82 (1.68,4.72)	3.03 (1.83,4.97)	3.60 (2.24,5.76)
Accolade TMZF / Trident	880	0.91 (0.46,1.81)	2.05 (1.29,3.23)	2.84 (1.93,4.18)	3.30 (2.30,4.71)	4.25 (3.08,5.87)
SROM / Pinnacle	1,117	1.25 (0.75,2.11)	2.52 (1.75,3.63)	3.07 (2.20,4.27)	3.68 (2.71,4.98)	4.35 (3.25,5.81)
Trabecular Metal / Continuum	784	2.17 (1.35,3.46)	3.08 (2.08,4.56)	3.36 (2.30,4.90)	3.52 (2.43,5.10)	4.48 (3.11,6.44)
Synergy / Reflection 3	1,474	2.21 (1.56,3.11)	3.13 (2.34,4.19)	3.42 (2.58,4.54)	4.13 (3.15,5.40)	4.49 (3.42,5.89)
Secur-Fit Max / Trident	3,058	2.13 (1.67,2.70)	3.06 (2.50,3.73)	3.86 (3.22,4.61)	4.29 (3.61,5.09)	4.70 (3.95,5.58)
Echo Bi-Metric / G7	1,674	2.75 (2.07,3.66)	3.49 (2.71,4.49)	3.76 (2.94,4.79)	4.26 (3.25,5.58)	4.87 (3.63,6.52)
M/L Taper** / Trabecular Metal	1,064	2.54 (1.75,3.68)	3.30 (2.38,4.57)	3.73 (2.74,5.07)	4.16 (3.08,5.61)	4.95 (3.60,6.79)
M/L Taper** / Trilogy	1,325	1.58 (1.04,2.42)	3.17 (2.35,4.27)	3.80 (2.89,4.98)	4.61 (3.59,5.92)	5.04 (3.95,6.41)
Secur-Fit / Trident	1,093	3.75 (2.78,5.06)	4.94 (3.81,6.40)	5.59 (4.37,7.12)	6.17 (4.89,7.77)	6.56 (5.22,8.23)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision

** M/L Taper does not include M/L Taper Kinectiv

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1.2.7 Revision Risk by Stem Implant Summary

Table 42. Summary of Cumulative Percent Revision Following Primary THA for Stems Having at Least 500 Cases, Sorted Alphabetically

Stem	N*	1 year	3 years	5 years	7 years	10 years
Accolade C	1,478	0.66 (0.34,1.27)	1.09 (0.62,1.88)	1.47 (0.85,2.53)	2.52 (1.28,4.95)	2.52 (1.28,4.95)
Accolade II	43,650	1.31 (1.21,1.43)	1.99 (1.86,2.13)	2.47 (2.32,2.63)	2.88 (2.71,3.07)	3.34 (3.11,3.59)
Accolade TMZF	882	0.91 (0.45,1.81)	2.04 (1.29,3.22)	2.83 (1.92,4.17)	3.29 (2.30,4.70)	4.24 (3.07,5.86)
Actis DuoFix	10,757	0.75 (0.59,0.93)	1.01 (0.82,1.24)	1.13 (0.91,1.39)	1.19 (0.95,1.49)	N/A
AML	807	1.36 (0.76,2.45)	2.00 (1.23,3.24)	2.84 (1.88,4.29)	3.19 (2.15,4.74)	3.19 (2.15,4.74)
Anthology	6,859	1.73 (1.45,2.07)	2.55 (2.19,2.97)	2.93 (2.53,3.39)	3.41 (2.94,3.94)	3.55 (3.06,4.12)
Avenir (Cemented)	2,215	1.13 (0.75,1.70)	1.39 (0.94,2.06)	1.82 (1.16,2.84)	2.85 (1.33,6.07)	2.85 (1.33,6.07)
Avenir (Cementless)	1,376	1.61 (1.06,2.44)	1.94 (1.33,2.84)	2.15 (1.48,3.10)	2.41 (1.68,3.45)	2.41 (1.68,3.45)
Avenir Complete	9,227	1.11 (0.91,1.37)	1.35 (1.09,1.66)	1.35 (1.09,1.66)	N/A	N/A
Corail	4,161	1.36 (1.04,1.77)	2.07 (1.66,2.57)	2.15 (1.73,2.66)	2.23 (1.80,2.76)	2.44 (1.96,3.03)
Corail Coxa Vara	894	0.11 (0.02,0.81)	0.77 (0.35,1.72)	0.93 (0.44,1.95)	0.93 (0.44,1.95)	0.93 (0.44,1.95)
C-Stem AMT	573	0.18 (0.03,1.28)	0.50 (0.12,2.10)	0.50 (0.12,2.10)	0.50 (0.12,2.10)	0.50 (0.12,2.10)
Echelon	509	2.75 (1.64,4.60)	3.94 (2.56,6.05)	4.17 (2.74,6.32)	4.66 (3.12,6.94)	5.48 (3.67,8.12)
Echo Bi-Metric	2,013	2.64 (2.02,3.44)	3.35 (2.64,4.24)	3.62 (2.88,4.54)	3.96 (3.14,4.98)	5.26 (3.82,7.21)
Echo Bi-Metric Microplasty	2,310	1.85 (1.37,2.50)	2.47 (1.89,3.21)	2.79 (2.16,3.60)	3.70 (2.76,4.95)	N/A
Echo FX	519	1.16 (0.52,2.57)	2.31 (1.28,4.14)	2.98 (1.72,5.15)	2.98 (1.72,5.15)	2.98 (1.72,5.15)
Fitmore	6,312	1.35 (1.09,1.67)	1.94 (1.62,2.31)	2.19 (1.85,2.59)	2.56 (2.17,3.00)	2.96 (2.50,3.51)
Insignia	6,220	0.68 (0.49,0.94)	N/A	N/A	N/A	N/A
Integral X	594	2.69 (1.66,4.36)	3.20 (2.06,4.98)	3.58 (2.35,5.45)	3.58 (2.35,5.45)	4.43 (2.86,6.83)
LCU	501	0.41 (0.10,1.62)	0.69 (0.22,2.17)	0.69 (0.22,2.17)	N/A	N/A
M/L Taper**	17,231	1.74 (1.56,1.95)	2.54 (2.31,2.79)	2.96 (2.71,3.24)	3.29 (3.02,3.59)	3.74 (3.42,4.09)
M/L Taper Kinectiv	995	2.05 (1.33,3.16)	3.35 (2.38,4.71)	3.97 (2.89,5.45)	4.11 (3.00,5.61)	4.61 (3.35,6.33)
Polarstem	3,916	1.28 (0.97,1.70)	1.67 (1.29,2.15)	2.17 (1.69,2.77)	2.26 (1.76,2.91)	2.26 (1.76,2.91)
ProFemur Gladiator	953	0.87 (0.44,1.74)	1.42 (0.77,2.60)	1.42 (0.77,2.60)	N/A	N/A
Restoration Modular	607	4.73 (3.29,6.77)	6.17 (4.46,8.50)	6.41 (4.65,8.80)	7.20 (5.22,9.89)	7.20 (5.22,9.89)
Secur-Fit	2,037	3.27 (2.58,4.14)	4.16 (3.37,5.15)	4.79 (3.91,5.86)	5.35 (4.38,6.52)	5.74 (4.70,7.00)
Secur-Fit Max	3,263	2.12 (1.67,2.67)	2.99 (2.46,3.64)	3.80 (3.18,4.53)	4.22 (3.56,5.00)	4.63 (3.91,5.49)
Secur-Fit Plus Max	2,138	1.87 (1.38,2.55)	2.25 (1.70,2.98)	2.64 (2.04,3.42)	3.15 (2.48,3.99)	3.55 (2.83,4.45)
SROM	1,166	1.29 (0.78,2.13)	2.67 (1.89,3.78)	3.29 (2.41,4.50)	3.88 (2.90,5.18)	4.53 (3.43,5.97)
Summit	8,319	1.51 (1.27,1.80)	2.12 (1.82,2.46)	2.31 (2.00,2.66)	2.48 (2.16,2.86)	2.79 (2.42,3.22)
Synergy	1,706	2.14 (1.55,2.96)	3.13 (2.38,4.10)	3.45 (2.66,4.48)	4.12 (3.21,5.27)	4.40 (3.43,5.63)
Taperloc	517	1.55 (0.78,3.07)	2.13 (1.18,3.81)	2.51 (1.47,4.29)	2.73 (1.62,4.56)	2.73 (1.62,4.56)
Taperloc 133	17,594	1.75 (1.56,1.96)	2.43 (2.20,2.68)	2.80 (2.55,3.08)	2.96 (2.70,3.26)	3.39 (3.02,3.81)
Taperloc 133 Microplasty	5,568	1.31 (1.04,1.65)	1.63 (1.32,2.01)	2.04 (1.68,2.48)	2.15 (1.77,2.61)	2.67 (1.91,3.73)
Trabecular Metal	1,462	1.73 (1.17,2.55)	2.49 (1.80,3.46)	2.75 (2.00,3.76)	2.85 (2.09,3.89)	3.65 (2.60,5.11)
Tri-Lock BPS	4,878	0.80 (0.59,1.10)	1.42 (1.12,1.81)	1.72 (1.38,2.15)	1.88 (1.51,2.34)	2.20 (1.75,2.76)
Versys Advocate	860	1.54 (0.90,2.64)	1.54 (0.90,2.64)	2.05 (1.20,3.50)	2.05 (1.20,3.50)	2.05 (1.20,3.50)
Versys Heritage	694	1.17 (0.59,2.33)	1.53 (0.83,2.84)	1.77 (0.98,3.20)	2.16 (1.18,3.91)	2.16 (1.18,3.91)
Wagner Cone	763	1.72 (1.00,2.94)	3.47 (2.35,5.09)	3.99 (2.77,5.74)	4.76 (3.33,6.77)	5.34 (3.65,7.78)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision
** M/L Taper does not include M/L Taper Kinectiv

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Table 43. Summary of Cumulative Percent Revision Following Primary THA for Stems Having at Least 500 Cases, Sorted by Five-year CPR

Stem	N*	1 year	3 years	5 years	7 years	10 years
C-Stem AMT	573	0.18 (0.03,1.28)	0.50 (0.12,2.10)	0.50 (0.12,2.10)	0.50 (0.12,2.10)	0.50 (0.12,2.10)
LCU	501	0.41 (0.10,1.62)	0.69 (0.22,2.17)	0.69 (0.22,2.17)	N/A	N/A
Corail Coxa Vara	894	0.11 (0.02,0.81)	0.77 (0.35,1.72)	0.93 (0.44,1.95)	0.93 (0.44,1.95)	0.93 (0.44,1.95)
Actis DuoFix	10,757	0.75 (0.59,0.93)	1.01 (0.82,1.24)	1.13 (0.91,1.39)	1.19 (0.95,1.49)	N/A
Avenir Complete	9,227	1.11 (0.91,1.37)	1.35 (1.09,1.66)	1.35 (1.09,1.66)	N/A	N/A
ProFemur Gladiator	953	0.87 (0.44,1.74)	1.42 (0.77,2.60)	1.42 (0.77,2.60)	N/A	N/A
Accolade C	1,478	0.66 (0.34,1.27)	1.09 (0.62,1.88)	1.47 (0.85,2.53)	2.52 (1.28,4.95)	2.52 (1.28,4.95)
Tri-Lock BPS	4,878	0.80 (0.59,1.10)	1.42 (1.12,1.81)	1.72 (1.38,2.15)	1.88 (1.51,2.34)	2.20 (1.75,2.76)
Versys Heritage	694	1.17 (0.59,2.33)	1.53 (0.83,2.84)	1.77 (0.98,3.20)	2.16 (1.18,3.91)	2.16 (1.18,3.91)
Avenir (Cemented)	2,215	1.13 (0.75,1.70)	1.39 (0.94,2.06)	1.82 (1.16,2.84)	2.85 (1.33,6.07)	2.85 (1.33,6.07)
Taperloc 133 Microplasty	5,568	1.31 (1.04,1.65)	1.63 (1.32,2.01)	2.04 (1.68,2.48)	2.15 (1.77,2.61)	2.67 (1.91,3.73)
Versys Advocate	860	1.54 (0.90,2.64)	1.54 (0.90,2.64)	2.05 (1.20,3.50)	2.05 (1.20,3.50)	2.05 (1.20,3.50)
Avenir (Cementless)	1,376	1.61 (1.06,2.44)	1.94 (1.33,2.84)	2.15 (1.48,3.10)	2.41 (1.68,3.45)	2.41 (1.68,3.45)
Corail	4,161	1.36 (1.04,1.77)	2.07 (1.66,2.57)	2.15 (1.73,2.66)	2.23 (1.80,2.76)	2.44 (1.96,3.03)
Polarstem	3,916	1.28 (0.97,1.70)	1.67 (1.29,2.15)	2.17 (1.69,2.77)	2.26 (1.76,2.91)	2.26 (1.76,2.91)
Fitmore	6,312	1.35 (1.09,1.67)	1.94 (1.62,2.31)	2.19 (1.85,2.59)	2.56 (2.17,3.00)	2.96 (2.50,3.51)
Summit	8,319	1.51 (1.27,1.80)	2.12 (1.82,2.46)	2.31 (2.00,2.66)	2.48 (2.16,2.86)	2.79 (2.42,3.22)
Accolade II	43,650	1.31 (1.21,1.43)	1.99 (1.86,2.13)	2.47 (2.32,2.63)	2.88 (2.71,3.07)	3.34 (3.11,3.59)
Taperloc	517	1.55 (0.78,3.07)	2.13 (1.18,3.81)	2.51 (1.47,4.29)	2.73 (1.62,4.56)	2.73 (1.62,4.56)
Secur-Fit Plus Max	2,138	1.87 (1.38,2.55)	2.25 (1.70,2.98)	2.64 (2.04,3.42)	3.15 (2.48,3.99)	3.55 (2.83,4.45)
Trabecular Metal	1,462	1.73 (1.17,2.55)	2.49 (1.80,3.46)	2.75 (2.00,3.76)	2.85 (2.09,3.89)	3.65 (2.60,5.11)
Echo Bi-Metric Microplasty	2,310	1.85 (1.37,2.50)	2.47 (1.89,3.21)	2.79 (2.16,3.60)	3.70 (2.76,4.95)	N/A
Taperloc 133	17,594	1.75 (1.56,1.96)	2.43 (2.20,2.68)	2.80 (2.55,3.08)	2.96 (2.70,3.26)	3.39 (3.02,3.81)
Accolade TMZF	882	0.91 (0.45,1.81)	2.04 (1.29,3.22)	2.83 (1.92,4.17)	3.29 (2.30,4.70)	4.24 (3.07,5.86)
AML	807	1.36 (0.76,2.45)	2.00 (1.23,3.24)	2.84 (1.88,4.29)	3.19 (2.15,4.74)	3.19 (2.15,4.74)
Anthology	6,859	1.73 (1.45,2.07)	2.55 (2.19,2.97)	2.93 (2.53,3.39)	3.41 (2.94,3.94)	3.55 (3.06,4.12)
M/L Taper**	17,231	1.74 (1.56,1.95)	2.54 (2.31,2.79)	2.96 (2.71,3.24)	3.29 (3.02,3.59)	3.74 (3.42,4.09)
Echo FX	519	1.16 (0.52,2.57)	2.31 (1.28,4.14)	2.98 (1.72,5.15)	2.98 (1.72,5.15)	2.98 (1.72,5.15)
SROM	1,166	1.29 (0.78,2.13)	2.67 (1.89,3.78)	3.29 (2.41,4.50)	3.88 (2.90,5.18)	4.53 (3.43,5.97)
Synergy	1,706	2.14 (1.55,2.96)	3.13 (2.38,4.10)	3.45 (2.66,4.48)	4.12 (3.21,5.27)	4.40 (3.43,5.63)
Integral X	594	2.69 (1.66,4.36)	3.20 (2.06,4.98)	3.58 (2.35,5.45)	3.58 (2.35,5.45)	4.43 (2.86,6.83)
Echo Bi-Metric	2,013	2.64 (2.02,3.44)	3.35 (2.64,4.24)	3.62 (2.88,4.54)	3.96 (3.14,4.98)	5.26 (3.82,7.21)
Secur-Fit Max	3,263	2.12 (1.67,2.67)	2.99 (2.46,3.64)	3.80 (3.18,4.53)	4.22 (3.56,5.00)	4.63 (3.91,5.49)
M/L Taper Kinectiv	995	2.05 (1.33,3.16)	3.35 (2.38,4.71)	3.97 (2.89,5.45)	4.11 (3.00,5.61)	4.61 (3.35,6.33)
Wagner Cone	763	1.72 (1.00,2.94)	3.47 (2.35,5.09)	3.99 (2.77,5.74)	4.76 (3.33,6.77)	5.34 (3.65,7.78)
Echelon	509	2.75 (1.64,4.60)	3.94 (2.56,6.05)	4.17 (2.74,6.32)	4.66 (3.12,6.94)	5.48 (3.67,8.12)
Secur-Fit	2,037	3.27 (2.58,4.14)	4.16 (3.37,5.15)	4.79 (3.91,5.86)	5.35 (4.38,6.52)	5.74 (4.70,7.00)
Restoration Modular	607	4.73 (3.29,6.77)	6.17 (4.46,8.50)	6.41 (4.65,8.80)	7.20 (5.22,9.89)	7.20 (5.22,9.89)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision

** M/L Taper does not include M/L Taper Kinectiv

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Table 44. Summary of Cumulative Percent Revision Following Primary THA for Stems having at Least 500 Cases, Sorted by Ten-year CPR

Stem	N*	1 year	3 years	5 years	7 years	10 years
C-Stem AMT	573	0.18 (0.03,1.28)	0.50 (0.12,2.10)	0.50 (0.12,2.10)	0.50 (0.12,2.10)	0.50 (0.12,2.10)
Corail Coxa Vara	894	0.11 (0.02,0.81)	0.77 (0.35,1.72)	0.93 (0.44,1.95)	0.93 (0.44,1.95)	0.93 (0.44,1.95)
Versys Advocate	860	1.54 (0.90,2.64)	1.54 (0.90,2.64)	2.05 (1.20,3.50)	2.05 (1.20,3.50)	2.05 (1.20,3.50)
Versys Heritage	694	1.17 (0.59,2.33)	1.53 (0.83,2.84)	1.77 (0.98,3.20)	2.16 (1.18,3.91)	2.16 (1.18,3.91)
Tri-Lock BPS	4,878	0.80 (0.59,1.10)	1.42 (1.12,1.81)	1.72 (1.38,2.15)	1.88 (1.51,2.34)	2.20 (1.75,2.76)
Polarstem	3,916	1.28 (0.97,1.70)	1.67 (1.29,2.15)	2.17 (1.69,2.77)	2.26 (1.76,2.91)	2.26 (1.76,2.91)
Avenir (Cementless)	1,376	1.61 (1.06,2.44)	1.94 (1.33,2.84)	2.15 (1.48,3.10)	2.41 (1.68,3.45)	2.41 (1.68,3.45)
Corail	4,161	1.36 (1.04,1.77)	2.07 (1.66,2.57)	2.15 (1.73,2.66)	2.23 (1.80,2.76)	2.44 (1.96,3.03)
Accolade C	1,478	0.66 (0.34,1.27)	1.09 (0.62,1.88)	1.47 (0.85,2.53)	2.52 (1.28,4.95)	2.52 (1.28,4.95)
Taperloc 133 Microplasty	5,568	1.31 (1.04,1.65)	1.63 (1.32,2.01)	2.04 (1.68,2.48)	2.15 (1.77,2.61)	2.67 (1.91,3.73)
Taperloc	517	1.55 (0.78,3.07)	2.13 (1.18,3.81)	2.51 (1.47,4.29)	2.73 (1.62,4.56)	2.73 (1.62,4.56)
Summit	8,319	1.51 (1.27,1.80)	2.12 (1.82,2.46)	2.31 (2.00,2.66)	2.48 (2.16,2.86)	2.79 (2.42,3.22)
Avenir (Cemented)	2,215	1.13 (0.75,1.70)	1.39 (0.94,2.06)	1.82 (1.16,2.84)	2.85 (1.33,6.07)	2.85 (1.33,6.07)
Fitmore	6,312	1.35 (1.09,1.67)	1.94 (1.62,2.31)	2.19 (1.85,2.59)	2.56 (2.17,3.00)	2.96 (2.50,3.51)
Echo FX	519	1.16 (0.52,2.57)	2.31 (1.28,4.14)	2.98 (1.72,5.15)	2.98 (1.72,5.15)	2.98 (1.72,5.15)
AML	807	1.36 (0.76,2.45)	2.00 (1.23,3.24)	2.84 (1.88,4.29)	3.19 (2.15,4.74)	3.19 (2.15,4.74)
Accolade II	43,650	1.31 (1.21,1.43)	1.99 (1.86,2.13)	2.47 (2.32,2.63)	2.88 (2.71,3.07)	3.34 (3.11,3.59)
Taperloc 133	17,594	1.75 (1.56,1.96)	2.43 (2.20,2.68)	2.80 (2.55,3.08)	2.96 (2.70,3.26)	3.39 (3.02,3.81)
Secur-Fit Plus Max	2,138	1.87 (1.38,2.55)	2.25 (1.70,2.98)	2.64 (2.04,3.42)	3.15 (2.48,3.99)	3.55 (2.83,4.45)
Anthology	6,859	1.73 (1.45,2.07)	2.55 (2.19,2.97)	2.93 (2.53,3.39)	3.41 (2.94,3.94)	3.55 (3.06,4.12)
Trabecular Metal	1,462	1.73 (1.17,2.55)	2.49 (1.80,3.46)	2.75 (2.00,3.76)	2.85 (2.09,3.89)	3.65 (2.60,5.11)
M/L Taper**	17,231	1.74 (1.56,1.95)	2.54 (2.31,2.79)	2.96 (2.71,3.24)	3.29 (3.02,3.59)	3.74 (3.42,4.09)
Accolade TMZF	882	0.91 (0.45,1.81)	2.04 (1.29,3.22)	2.83 (1.92,4.17)	3.29 (2.30,4.70)	4.24 (3.07,5.86)
Synergy	1,706	2.14 (1.55,2.96)	3.13 (2.38,4.10)	3.45 (2.66,4.48)	4.12 (3.21,5.27)	4.40 (3.43,5.63)
Integral X	594	2.69 (1.66,4.36)	3.20 (2.06,4.98)	3.58 (2.35,5.45)	3.58 (2.35,5.45)	4.43 (2.86,6.83)
SROM	1,166	1.29 (0.78,2.13)	2.67 (1.89,3.78)	3.29 (2.41,4.50)	3.88 (2.90,5.18)	4.53 (3.43,5.97)
M/L Taper Kinectiv	995	2.05 (1.33,3.16)	3.35 (2.38,4.71)	3.97 (2.89,5.45)	4.11 (3.00,5.61)	4.61 (3.35,6.33)
Secur-Fit Max	3,263	2.12 (1.67,2.67)	2.99 (2.46,3.64)	3.80 (3.18,4.53)	4.22 (3.56,5.00)	4.63 (3.91,5.49)
Echo Bi-Metric	2,013	2.64 (2.02,3.44)	3.35 (2.64,4.24)	3.62 (2.88,4.54)	3.96 (3.14,4.98)	5.26 (3.82,7.21)
Wagner Cone	763	1.72 (1.00,2.94)	3.47 (2.35,5.09)	3.99 (2.77,5.74)	4.76 (3.33,6.77)	5.34 (3.65,7.78)
Echelon	509	2.75 (1.64,4.60)	3.94 (2.56,6.05)	4.17 (2.74,6.32)	4.66 (3.12,6.94)	5.48 (3.67,8.12)
Secur-Fit	2,037	3.27 (2.58,4.14)	4.16 (3.37,5.15)	4.79 (3.91,5.86)	5.35 (4.38,6.52)	5.74 (4.70,7.00)
Restoration Modular	607	4.73 (3.29,6.77)	6.17 (4.46,8.50)	6.41 (4.65,8.80)	7.20 (5.22,9.89)	7.20 (5.22,9.89)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision

** M/L Taper does not include M/L Taper Kinectiv

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1.2.8 Revision Risk by Cup Implant Summary

Table 45. Summary of Cumulative Percent Revision Following Primary THA for Cups Having at Least 500 Cases, Sorted Alphabetically

Cup	N*	1 year	3 years	5 years	7 years	10 years
BiMobile	788	0.70 (0.29,1.68)	0.89 (0.40,2.00)	0.89 (0.40,2.00)	N/A	N/A
Continuum	16,920	1.83 (1.64,2.04)	2.61 (2.38,2.87)	3.05 (2.80,3.33)	3.37 (3.10,3.67)	3.75 (3.45,4.08)
Converge	572	0.87 (0.36,2.09)	1.40 (0.70,2.78)	1.57 (0.82,3.00)	1.75 (0.94,3.22)	1.94 (1.08,3.48)
G7	46,743	1.59 (1.47,1.71)	2.11 (1.97,2.25)	2.43 (2.28,2.60)	2.65 (2.47,2.84)	2.83 (2.61,3.07)
Mpact	514	2.14 (1.19,3.83)	2.72 (1.62,4.56)	2.98 (1.80,4.90)	2.98 (1.80,4.90)	N/A
Pinnacle	30,558	1.05 (0.94,1.17)	1.60 (1.46,1.76)	1.85 (1.69,2.02)	2.04 (1.86,2.23)	2.35 (2.14,2.59)
PolarCup	637	0.80 (0.33,1.91)	1.64 (0.88,3.02)	2.00 (1.14,3.50)	2.81 (1.68,4.69)	3.16 (1.91,5.23)
Procotyl Prime	909	1.46 (0.85,2.50)	1.85 (1.14,3.00)	2.36 (1.45,3.82)	2.36 (1.45,3.82)	N/A
Reflection	549	1.64 (0.86,3.13)	2.73 (1.66,4.49)	3.10 (1.94,4.93)	3.83 (2.52,5.82)	4.32 (2.89,6.45)
Reflection 3	13,045	1.76 (1.54,2.00)	2.54 (2.27,2.84)	2.92 (2.62,3.25)	3.27 (2.94,3.65)	3.45 (3.08,3.85)
Regenerex RingLoc+	1,012	1.68 (1.05,2.69)	2.17 (1.44,3.28)	2.57 (1.76,3.75)	2.77 (1.92,3.98)	3.57 (2.54,4.99)
Restoration ADM	526	0.57 (0.18,1.76)	1.33 (0.64,2.77)	2.11 (1.17,3.77)	2.51 (1.46,4.28)	2.74 (1.63,4.58)
RingLoc	2,615	1.72 (1.29,2.30)	2.41 (1.89,3.07)	2.60 (2.06,3.29)	2.69 (2.13,3.39)	3.29 (2.62,4.14)
Trabecular Metal	2,031	2.17 (1.62,2.90)	3.27 (2.58,4.14)	3.91 (3.15,4.86)	4.36 (3.53,5.36)	5.06 (4.11,6.23)
Trident	30,896	1.44 (1.31,1.58)	2.21 (2.05,2.38)	2.77 (2.59,2.96)	3.21 (3.02,3.42)	3.69 (3.46,3.93)
Trident II	31,810	1.36 (1.23,1.49)	1.95 (1.79,2.13)	2.32 (2.12,2.55)	2.46 (2.23,2.73)	N/A
Trilogy	1,602	1.81 (1.26,2.59)	3.25 (2.48,4.24)	3.89 (3.04,4.96)	4.62 (3.68,5.78)	4.97 (3.98,6.19)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision.

Table 46. Summary of Cumulative Percent Revision Following Primary THA for Cups Having at Least 500 Cases, Sorted by Five-year CPR

Cup	N*	1 year	3 years	5 years	7 years	10 years
BiMobile	788	0.70 (0.29,1.68)	0.89 (0.40,2.00)	0.89 (0.40,2.00)	N/A	N/A
Converge	572	0.87 (0.36,2.09)	1.40 (0.70,2.78)	1.57 (0.82,3.00)	1.75 (0.94,3.22)	1.94 (1.08,3.48)
Pinnacle	30,558	1.05 (0.94,1.17)	1.60 (1.46,1.76)	1.85 (1.69,2.02)	2.04 (1.86,2.23)	2.35 (2.14,2.59)
PolarCup	637	0.80 (0.33,1.91)	1.64 (0.88,3.02)	2.00 (1.14,3.50)	2.81 (1.68,4.69)	3.16 (1.91,5.23)
Restoration ADM	526	0.57 (0.18,1.76)	1.33 (0.64,2.77)	2.11 (1.17,3.77)	2.51 (1.46,4.28)	2.74 (1.63,4.58)
Trident II	31,810	1.36 (1.23,1.49)	1.95 (1.79,2.13)	2.32 (2.12,2.55)	2.46 (2.23,2.73)	N/A
Procotyl Prime	909	1.46 (0.85,2.50)	1.85 (1.14,3.00)	2.36 (1.45,3.82)	2.36 (1.45,3.82)	N/A
G7	46,743	1.59 (1.47,1.71)	2.11 (1.97,2.25)	2.43 (2.28,2.60)	2.65 (2.47,2.84)	2.83 (2.61,3.07)
Regenerex RingLoc+	1,012	1.68 (1.05,2.69)	2.17 (1.44,3.28)	2.57 (1.76,3.75)	2.77 (1.92,3.98)	3.57 (2.54,4.99)
RingLoc	2,615	1.72 (1.29,2.30)	2.41 (1.89,3.07)	2.60 (2.06,3.29)	2.69 (2.13,3.39)	3.29 (2.62,4.14)
Trident	30,896	1.44 (1.31,1.58)	2.21 (2.05,2.38)	2.77 (2.59,2.96)	3.21 (3.02,3.42)	3.69 (3.46,3.93)
Reflection 3	13,045	1.76 (1.54,2.00)	2.54 (2.27,2.84)	2.92 (2.62,3.25)	3.27 (2.94,3.65)	3.45 (3.08,3.85)
Mpact	514	2.14 (1.19,3.83)	2.72 (1.62,4.56)	2.98 (1.80,4.90)	2.98 (1.80,4.90)	N/A
Continuum	16,920	1.83 (1.64,2.04)	2.61 (2.38,2.87)	3.05 (2.80,3.33)	3.37 (3.10,3.67)	3.75 (3.45,4.08)
Reflection	549	1.64 (0.86,3.13)	2.73 (1.66,4.49)	3.10 (1.94,4.93)	3.83 (2.52,5.82)	4.32 (2.89,6.45)
Trilogy	1,602	1.81 (1.26,2.59)	3.25 (2.48,4.24)	3.89 (3.04,4.96)	4.62 (3.68,5.78)	4.97 (3.98,6.19)
Trabecular Metal	2,031	2.17 (1.62,2.90)	3.27 (2.58,4.14)	3.91 (3.15,4.86)	4.36 (3.53,5.36)	5.06 (4.11,6.23)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision

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Table 47. Summary of Cumulative Percent Revision Following Primary THA for Cups Having at Least 500 Cases, Sorted by Ten-year CPR

Cup	N*	1 year	3 years	5 years	7 years	10 years
Converge	572	0.87 (0.36,2.09)	1.40 (0.70,2.78)	1.57 (0.82,3.00)	1.75 (0.94,3.22)	1.94 (1.08,3.48)
Pinnacle	30,558	1.05 (0.94,1.17)	1.60 (1.46,1.76)	1.85 (1.69,2.02)	2.04 (1.86,2.23)	2.35 (2.14,2.59)
Restoration ADM	526	0.57 (0.18,1.76)	1.33 (0.64,2.77)	2.11 (1.17,3.77)	2.51 (1.46,4.28)	2.74 (1.63,4.58)
G7	46,743	1.59 (1.47,1.71)	2.11 (1.97,2.25)	2.43 (2.28,2.60)	2.65 (2.47,2.84)	2.83 (2.61,3.07)
PolarCup	637	0.80 (0.33,1.91)	1.64 (0.88,3.02)	2.00 (1.14,3.50)	2.81 (1.68,4.69)	3.16 (1.91,5.23)
RingLoc	2,615	1.72 (1.29,2.30)	2.41 (1.89,3.07)	2.60 (2.06,3.29)	2.69 (2.13,3.39)	3.29 (2.62,4.14)
Reflection 3	13,045	1.76 (1.54,2.00)	2.54 (2.27,2.84)	2.92 (2.62,3.25)	3.27 (2.94,3.65)	3.45 (3.08,3.85)
Regenerex RingLoc+	1,012	1.68 (1.05,2.69)	2.17 (1.44,3.28)	2.57 (1.76,3.75)	2.77 (1.92,3.98)	3.57 (2.54,4.99)
Trident	30,896	1.44 (1.31,1.58)	2.21 (2.05,2.38)	2.77 (2.59,2.96)	3.21 (3.02,3.42)	3.69 (3.46,3.93)
Continuum	16,920	1.83 (1.64,2.04)	2.61 (2.38,2.87)	3.05 (2.80,3.33)	3.37 (3.10,3.67)	3.75 (3.45,4.08)
Reflection	549	1.64 (0.86,3.13)	2.73 (1.66,4.49)	3.10 (1.94,4.93)	3.83 (2.52,5.82)	4.32 (2.89,6.45)
Trilogy	1,602	1.81 (1.26,2.59)	3.25 (2.48,4.24)	3.89 (3.04,4.96)	4.62 (3.68,5.78)	4.97 (3.98,6.19)
Trabecular Metal	2,031	2.17 (1.62,2.90)	3.27 (2.58,4.14)	3.91 (3.15,4.86)	4.36 (3.53,5.36)	5.06 (4.11,6.23)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision

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1.3 Resurfacing THA

1.3.1 Descriptive Statistics

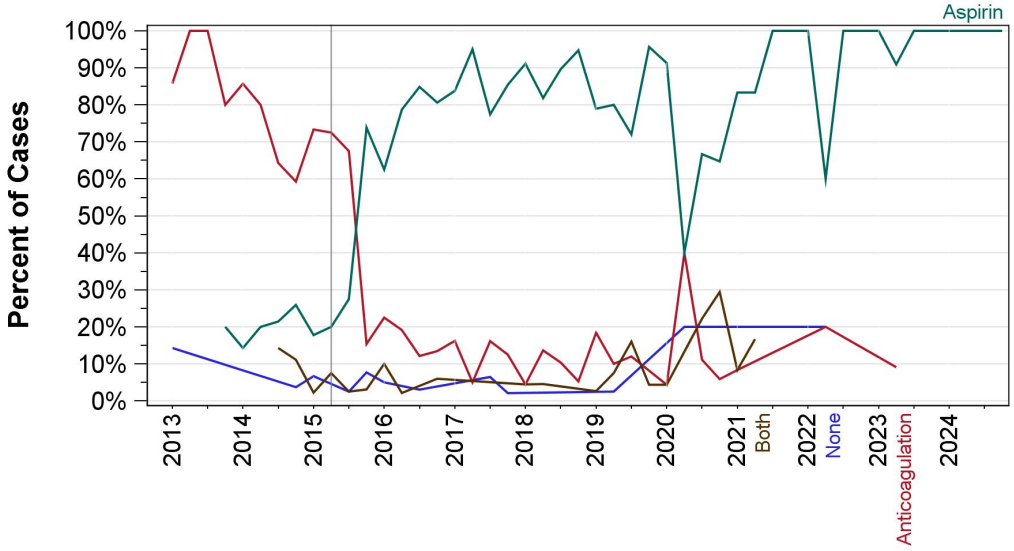


Figure 29. Percent of Primary Resurfacing THA patients (first case) by Thrombosis Prophylaxis

1.3.2 Reasons for Revision

The reason for revision is of central importance to quality improvement because it helps focus attention on specific causes that may be addressed. Therefore, the data are presented in two formats below: tabular and Pareto chart. The tabular format is consistent with how other arthroplasty registries report the cause of revision. The Pareto chart figure presents the same data in a format commonly used in quality improvement. The Pareto chart sorts the reasons for revision by frequency (bar chart on bottom, from left to right) and presents a cumulative percent using a line graph above.

In addition to an overall summary of the reasons for revision, tables showing reason for revision for the first, second, and third year post-operatively are provided because the reasons change over this time horizon. It is important to note that the time window for the cases reported in the reasons for revision tables and figures differs from the time window used for other figures because the reason for revision was added to the database on 1/1/2015. While these data capture revisions for primaries performed back to 2/15/2012, only revisions occurring on or after 1/1/2015 are included in the reasons for revision figure and tables.

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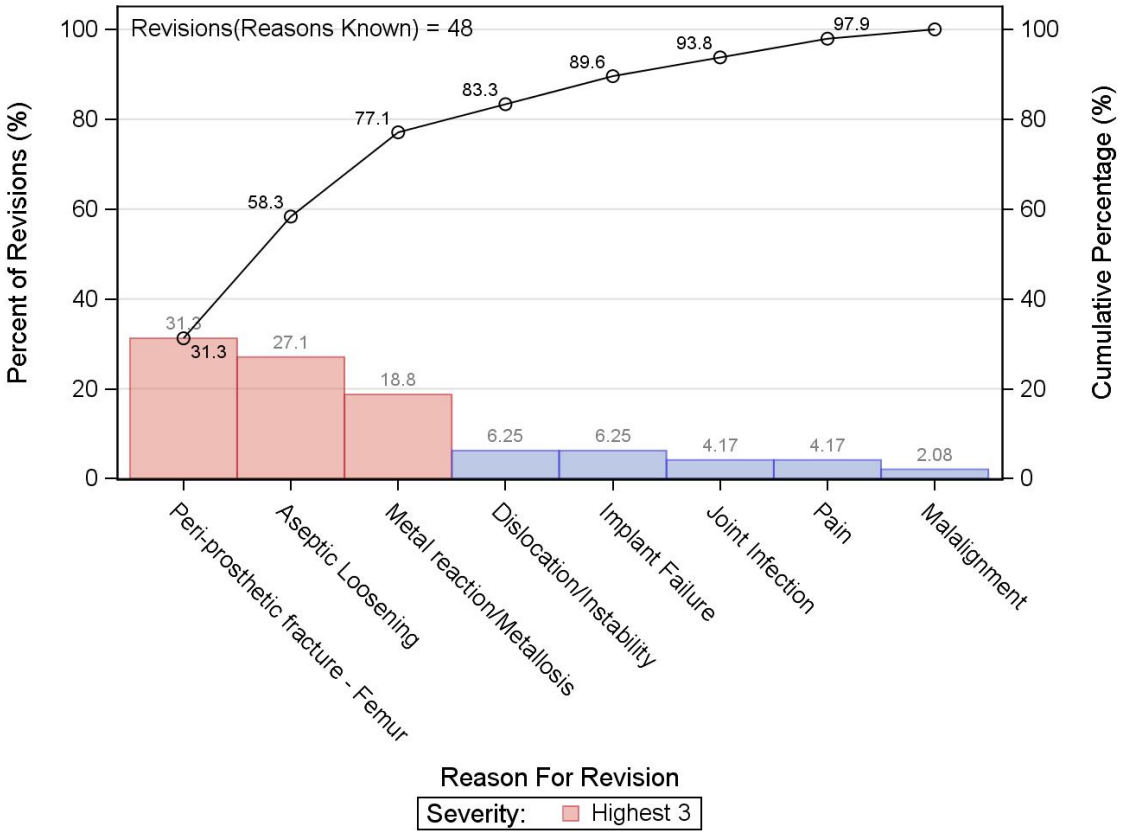


Figure 30. Reasons for First Revision Following Primary Resurfacing THA (Pareto Chart)

Table 48. Reasons for First Revision Following Primary Resurfacing THA

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	15	31.2
2	Aseptic Loosening	13	27.1
3	Metal Reaction/Metallosis	9	18.8
4	Dislocation/Instability	3	6.2
5	Implant Failure	3	6.2
6	Joint Infection	2	4.2
7	Pain	2	4.2
8	Malalignment	1	2.1

Table 49. Reasons for First Revision Following Primary Resurfacing THA in First Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	13	72.2
2	Dislocation/Instability	2	11.1
3	Implant Failure	2	11.1
4	Aseptic Loosening	1	5.6

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Table 50. Reasons for First Revision Following Primary Resurfacing THA in Second Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Metal Reaction/Metallosis	2	50.0
2	Implant Failure	1	25.0
3	Malalignment	1	25.0

Table 51. Reasons for First Revision Following Primary Resurfacing THA in Third Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	20.0
2	Joint Infection	1	20.0
3	Peri-prosthetic fracture - Femur	1	20.0
4	Metal Reaction/Metallosis	1	20.0
5	Pain	1	20.0

1.3.3 Most Commonly Used Implants

The following three tables provide utilization data of implants used in primary resurfacing THA

Table 52. Most Commonly Used Femoral Components in Primary Resurfacing THA

Rank	Stem	N	Percent
1	BHR	1,294	100.0

Table 53. Most Commonly Used Acetabular Components in Primary Resurfacing THA

Rank	Cup	N	Percent
1	BHR	1,294	100.0

Table 54. Most Commonly Used Femoral/Acetabular Component Combinations in Primary Resurfacing THA

Rank	Stem/cup combination	N	Percent
1	BHR / BHR	1,294	100.0

1.3.4 Revision Risk by Implant Summary

Table 55. Summary of Cumulative Percent Revision Following Primary THA for Stem/Cup Combinations Having at Least 500 Cases

Implant	N*	1 year	3 years	5 years	7 years	10 years
BHR / BHR	1,292	1.40 (0.88,2.21)	2.22 (1.54,3.20)	2.92 (2.12,4.03)	3.70 (2.75,4.98)	5.14 (3.75,7.05)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision

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Chapter 2

Knee Overview

The data reported in this chapter is based on primary knee cases performed from 2/15/2012 to 12/31/2024.

2.1 Descriptive Statistics of All Knee Arthroplasty Cases

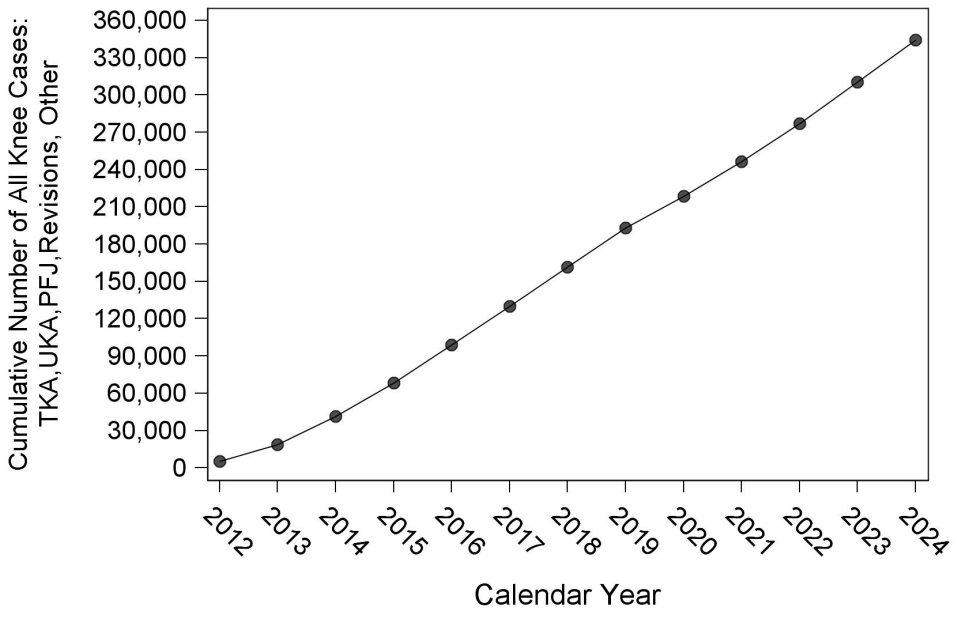


Figure 31. All Knee Cases Over Time (in 208,539 Patients)

Table 56. All Knee Cases Over Time (Numerical Values)

Year	Annual cases	Cumulative cases
2012	4,994	4,994
2013	13,778	18,772
2014	22,701	41,473
2015	26,805	68,278
2016	30,562	98,840
2017	31,089	129,929
2018	31,555	161,484
2019	31,640	193,124
2020	25,214	218,338
2021	27,969	246,307
2022	30,816	277,123
2023	33,202	310,325
2024	33,728	344,053

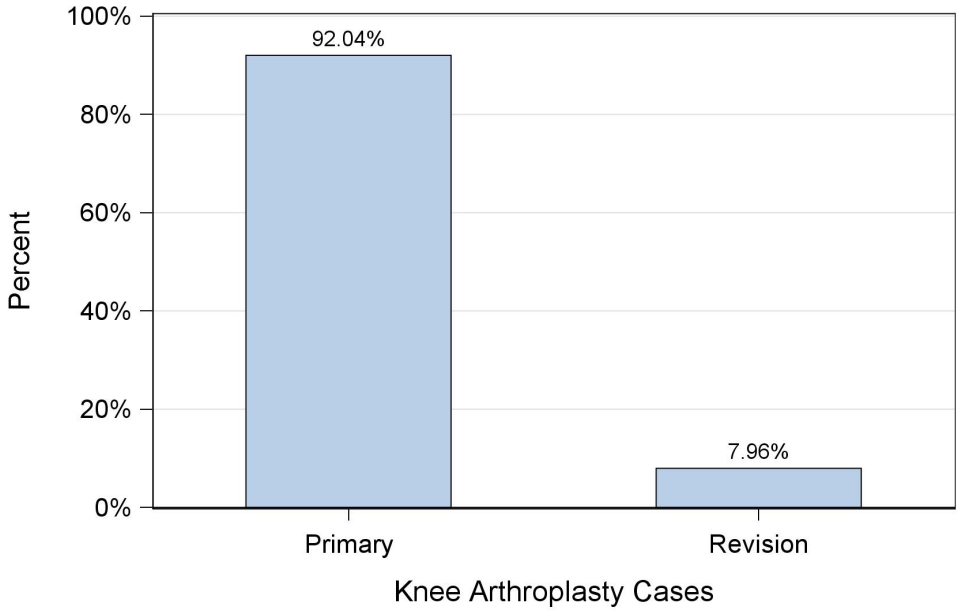


Figure 32. Percent of Knee Arthroplasty Cases by Primary or Revision

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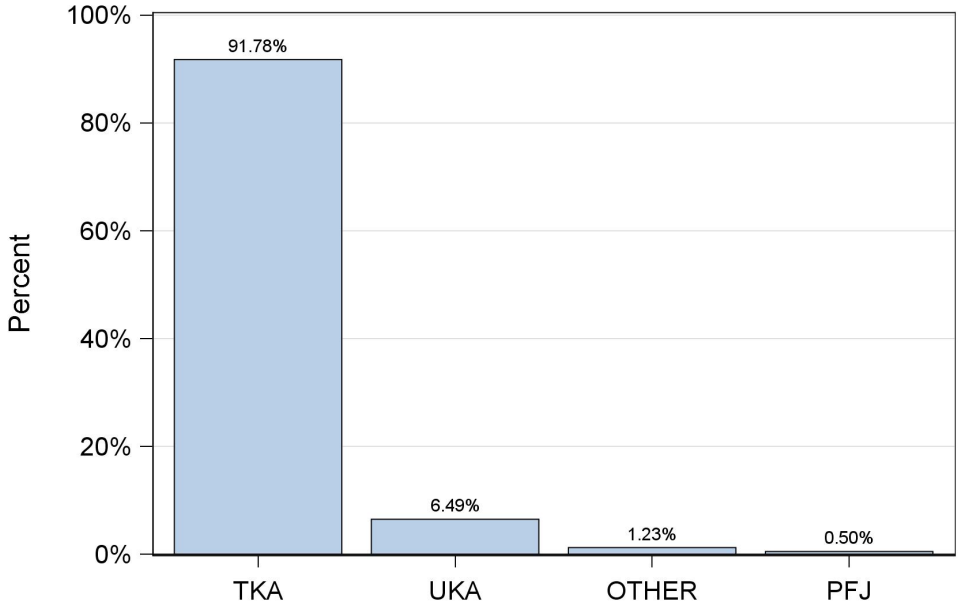


Figure 33. Percent of Primary Knee Arthroplasty Cases Performed as TKA, UKA, PFJ, and Other

2.2 Total Knee Arthroplasty (TKA)

2.2.1 Descriptive Statistics

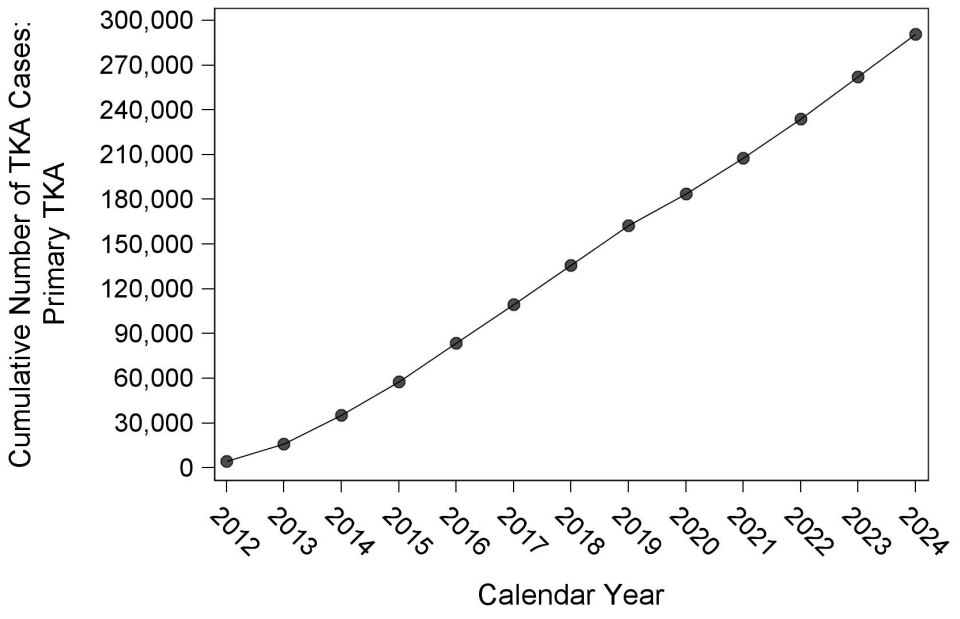


Figure 34. TKA Cases Over Time (in 187,442 Patients)

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Table 57. TKA Cases Over Time (Numerical Values)

Year	Annual cases	Cumulative cases
2012	4,166	4,166
2013	11,672	15,838
2014	19,476	35,314
2015	22,383	57,697
2016	25,690	83,387
2017	26,248	109,635
2018	26,243	135,878
2019	26,605	162,483
2020	21,299	183,782
2021	23,823	207,605
2022	26,201	233,806
2023	28,223	262,029
2024	28,598	290,627

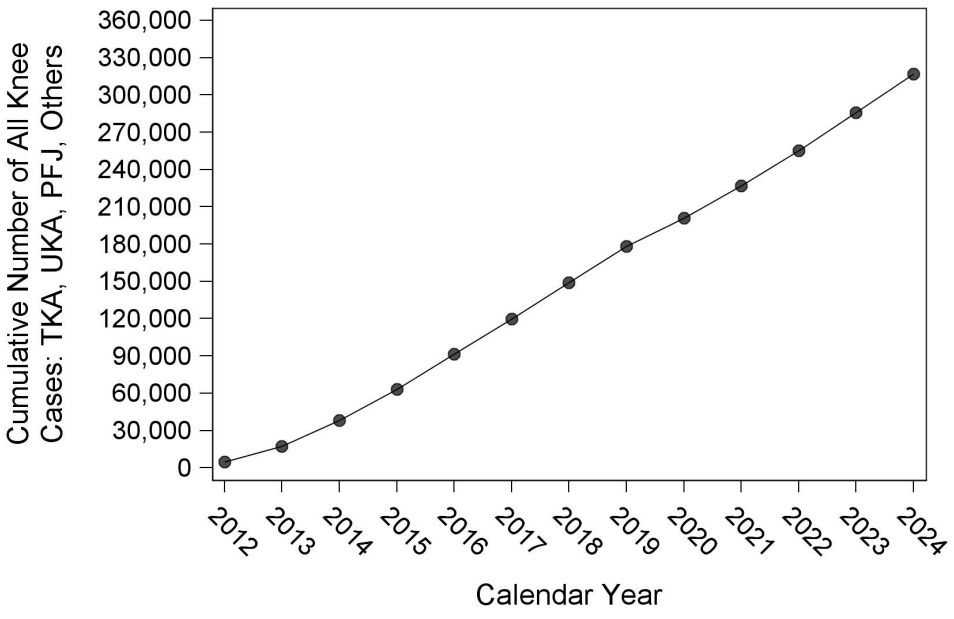


Figure 35. Primary TKA Cases Over Time

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Table 58. Primary TKA Cases Over Time (Numerical Values)

Year	Annual cases	Cumulative cases
2012	4,613	4,613
2013	12,658	17,271
2014	21,012	38,283
2015	24,740	63,023
2016	28,221	91,244
2017	28,664	119,908
2018	28,966	148,874
2019	29,106	177,980
2020	23,003	200,983
2021	25,694	226,677
2022	28,359	255,036
2023	30,529	285,565
2024	31,096	316,661

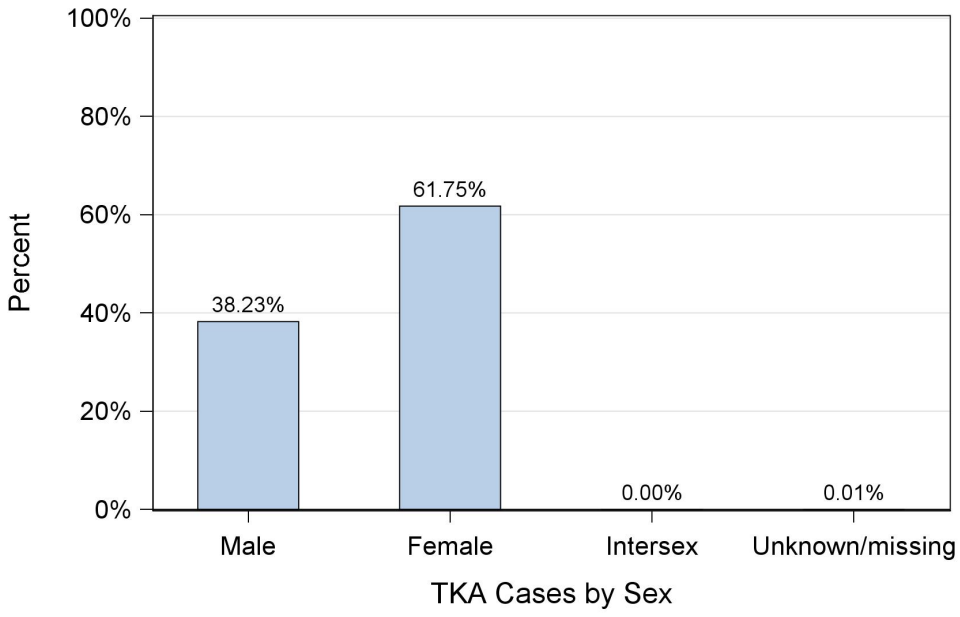


Figure 36. Percent of Primary TKA Cases by Sex

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Figure 37. Age Distribution of Primary TKA Cases by Sex

Table 59. Descriptive Statistics of Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	179,470	61.8	
Age (years)	290,626	66.8 (9.4)	67 (12)
Height (cm)	289,493	168.6 (10.5)	167.6 (17)
Weight (kg)	289,493	94.4 (21.4)	92.7 (28.3)
BMI (kg/m^2)	289,491	33.2 (6.7)	32.4 (9)
Smoker - Never (%)	155,166	53.4	
Smoker - Previous (%)	108,526	37.3	
Smoker - Current (%)	25,719	8.9	
Smoker - Unknown (%)	1,216	0.4	

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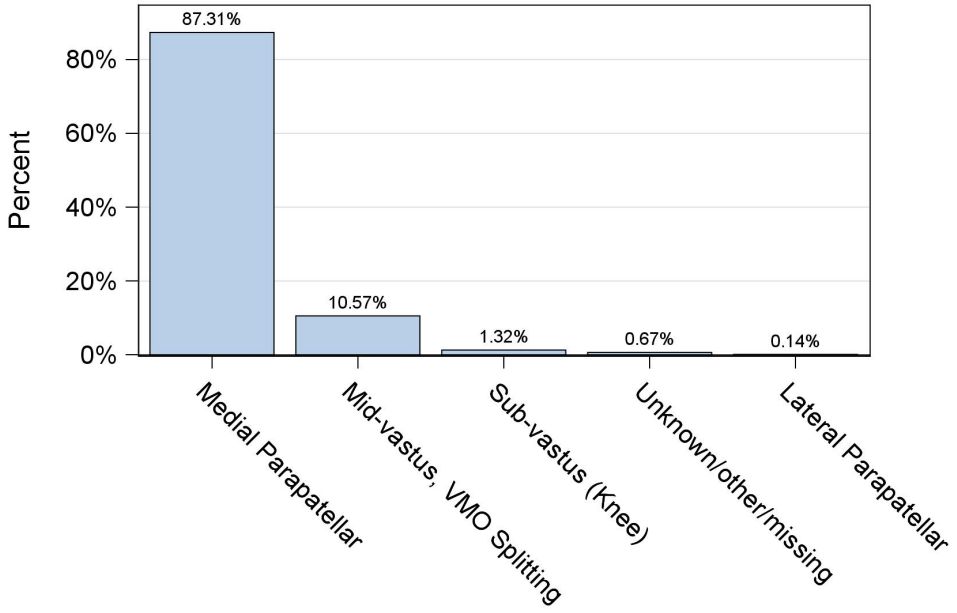


Figure 38. Percent of Primary TKA Cases by Approach

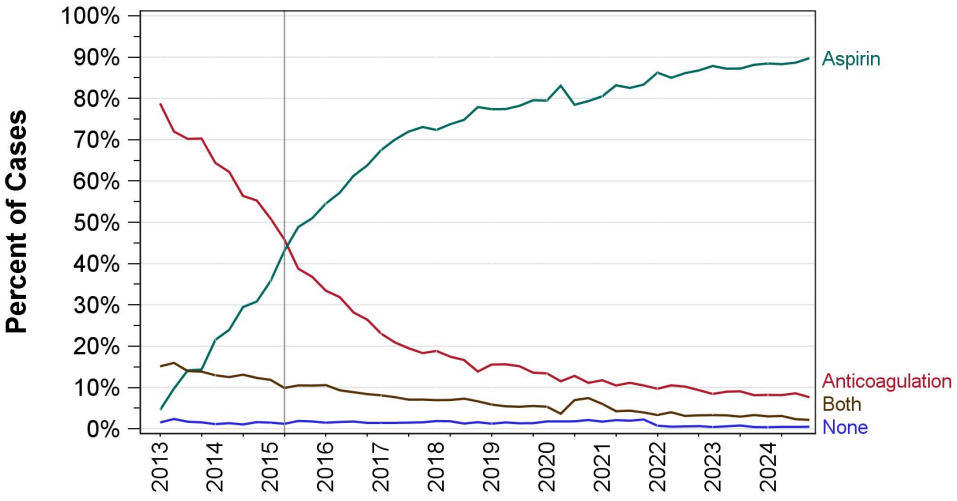


Figure 39. Percent of Primary TKA Patients (First Case) by Thrombosis Prophylaxis

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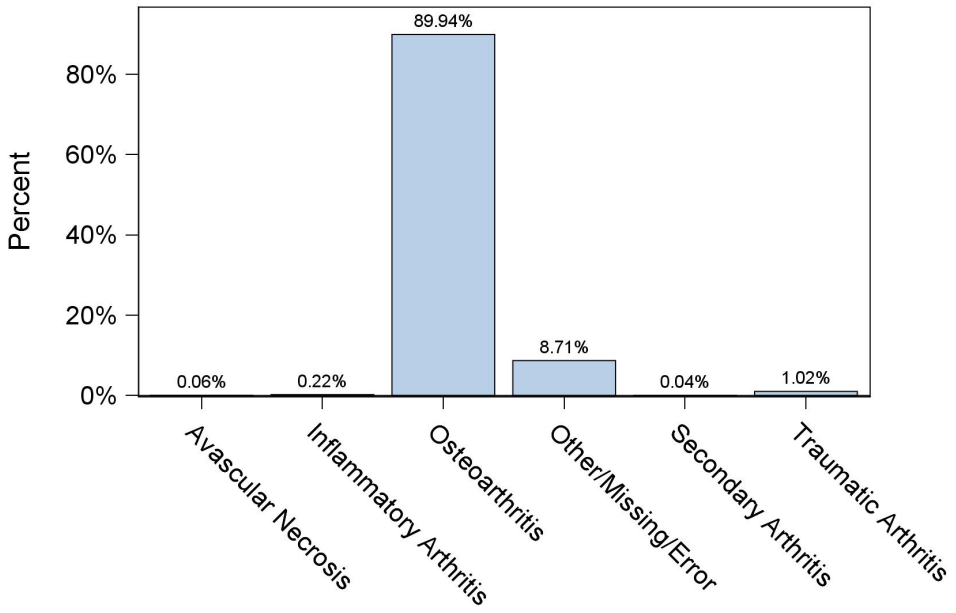


Figure 40. Percent of Primary TKA Cases by Diagnosis

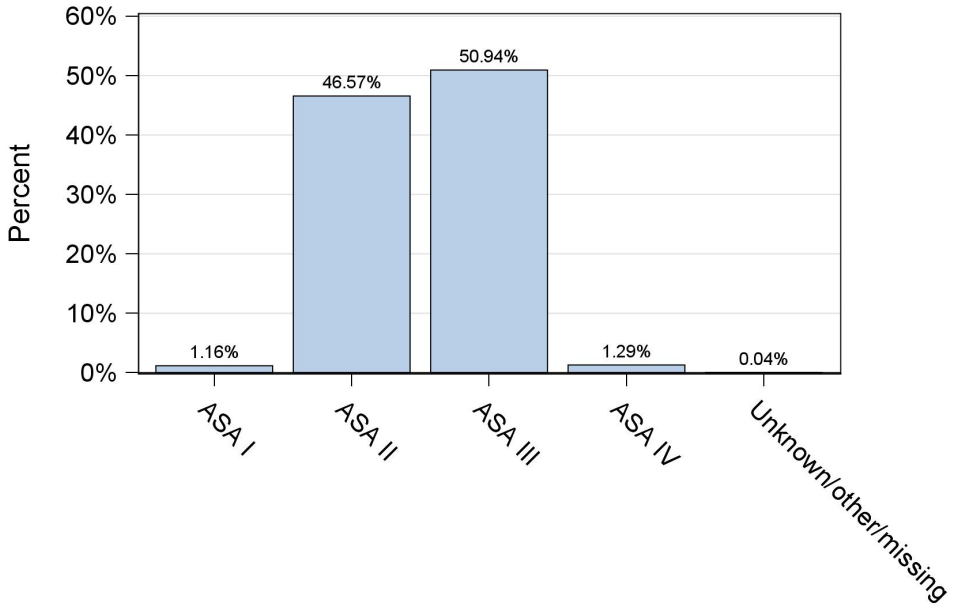


Figure 41. Percent of Primary TKA Cases by ASA Class

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2.2.2 Revision Risk (Overall, by Sex, and by Diagnosis)

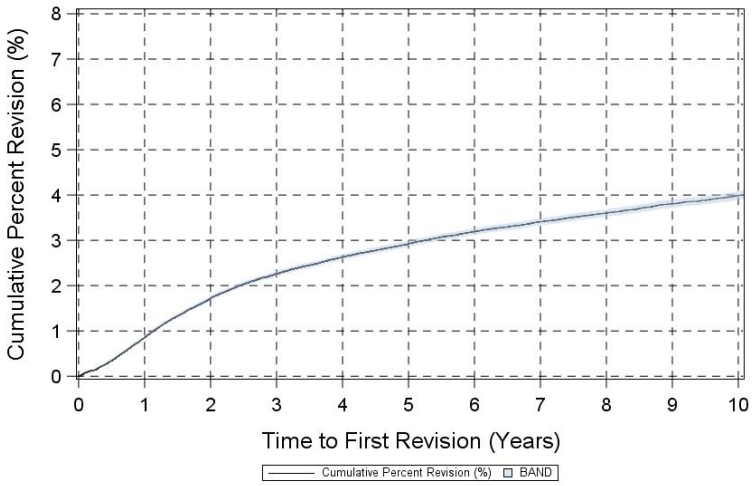


Figure 42. Cumulative Percent Revision for Primary TKA

Table 60. Cumulative Percent Revision for Primary TKA (Numerical Values)

	1 year	3 years	5 years	7 years	10 years
CPR	0.86 (0.82,0.89)	2.26 (2.20,2.32)	2.92 (2.86,2.99)	3.41 (3.33,3.49)	3.99 (3.89,4.09)
Number at risk	257,969	201,203	156,193	104,465	33,188

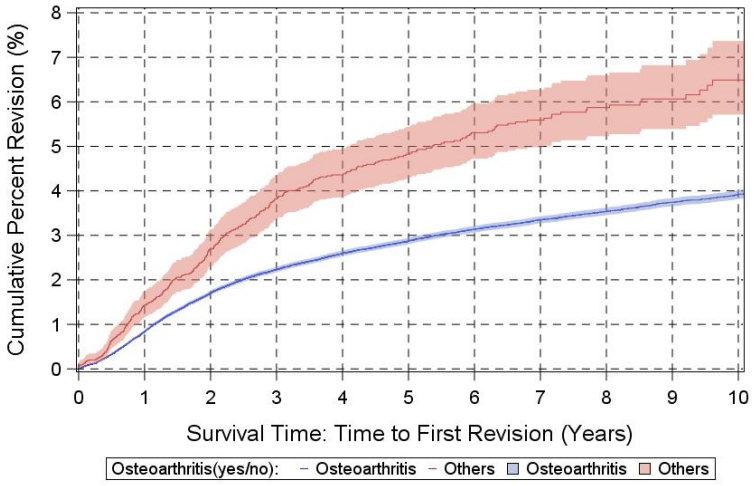


Figure 43. Cumulative Percent Revision for Primary TKA by Diagnosis

Table 61. Cumulative Percent Revision for Primary TKA by Diagnosis (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Osteoarthritis	259,612	0.84 (0.80,0.88)	2.23 (2.17,2.29)	2.87 (2.80,2.95)	3.35 (3.27,3.43)	3.92 (3.82,4.02)
Others	6,494	1.43 (1.17,1.76)	3.82 (3.35,4.35)	4.82 (4.28,5.44)	5.59 (4.98,6.27)	6.49 (5.71,7.37)
Unknown/Missing	22,634					

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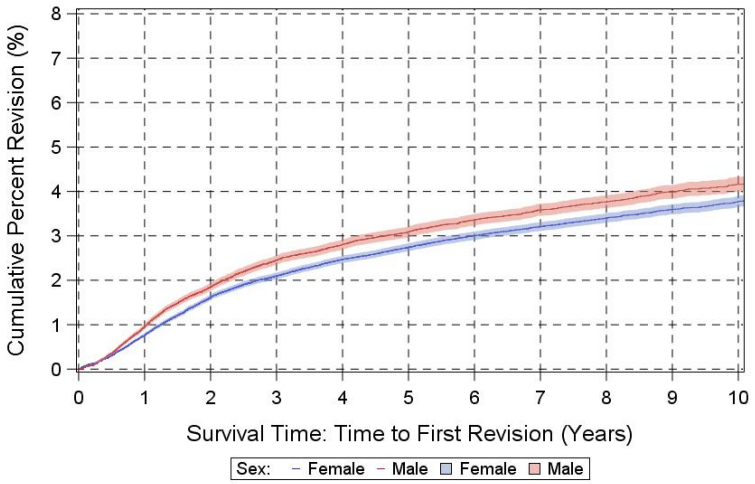


Figure 44. Cumulative Percent Revision for Primary TKA by Sex for Osteoarthritis Diagnosis

Table 62. Cumulative Percent Revision for Primary TKA by Sex for Osteoarthritis Diagnosis (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Female	162,258	0.76 (0.72,0.81)	2.10 (2.03,2.18)	2.74 (2.66,2.83)	3.21 (3.11,3.31)	3.77 (3.65,3.90)
Male	97,315	0.96 (0.90,1.03)	2.45 (2.35,2.56)	3.09 (2.97,3.21)	3.58 (3.45,3.72)	4.16 (4.00,4.34)
Unknown/Missing	39					

2.2.3 Effect of Patella Resurfacing on Revision Risk

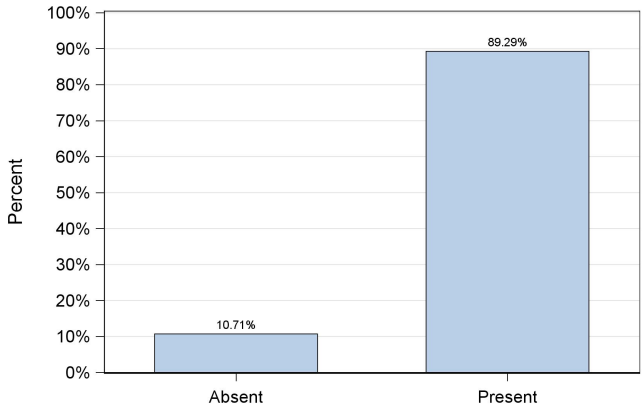


Figure 45. Percent of Primary TKA Cases Performed With (Present) and Without (Absent) Patella Resurfacing

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Table 63. Descriptive Statistics of Primary TKA Cases Having TKA With and Without Patella Resurfacing

Quantity	Resurfaced N	Resurfaced Mean (SD)	Resurfaced Median (IQR)	Without patella resurfaced N	Without patella resurfaced Mean (SD)	Without patella resurfaced Median (IQR)
Female (%)	161,253	62.1		18,210	58.5	
Age (years)	259,500	66.8 (9.3)	67 (12)	31,119	66.8 (9.6)	67 (13)
Height (cm)	258,370	168.6 (10.5)	167.6 (16.5)	31,116	168.8 (10.7)	167.6 (17.8)
Weight (kg)	258,370	94.4 (21.4)	92.7 (28.3)	31,116	94.3 (21.6)	92.8 (28.7)
BMI (kg/m^2)	258,368	33.2 (6.7)	32.5 (9)	31,116	33 (6.7)	32.3 (9)
Smoker - Never (%)	138,662	53.4		16,500	53	
Smoker - Previous (%)	96,716	37.3		11,807	37.9	
Smoker - Current (%)	22,961	8.9		2,758	8.9	
Smoker - Unknown (%)	1,162	0.5		54	0.2	

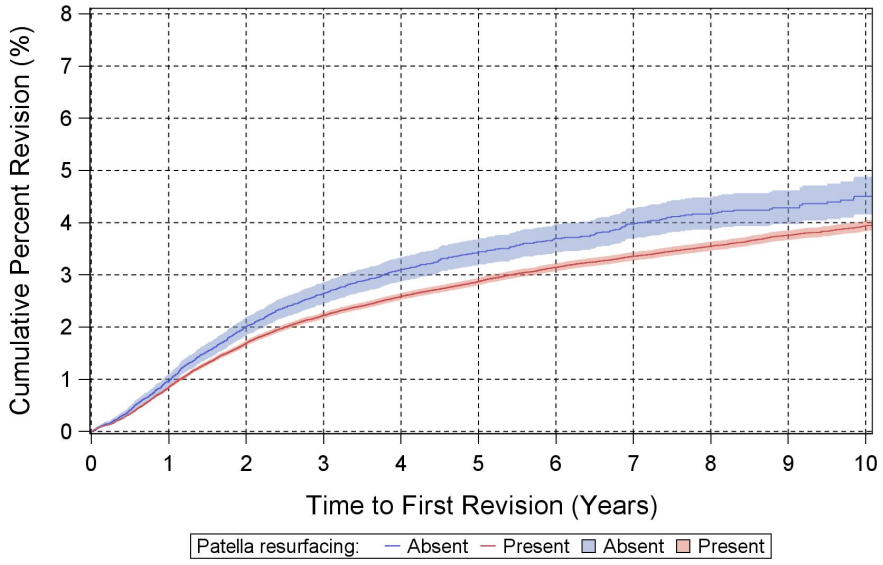


Figure 46. Cumulative Percent Revision Curve for Primary TKA Cases Performed With (Present) and Without (Absent) Patella Resurfacing

Table 64. Cumulative Percent Revision Curve for Primary TKA Cases Performed With and Without Patella Resurfacing (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Patella not resurfaced	30,955	0.97 (0.86,1.09)	2.64 (2.44,2.86)	3.44 (3.20,3.70)	3.97 (3.69, 4.27)	4.50 (4.16, 4.88)
Patella resurfaced	257,778	0.84 (0.81,0.88)	2.22 (2.16,2.28)	2.87 (2.80,2.95)	3.35 (3.27, 3.44)	3.94 (3.84, 4.04)
Unknown/missing	0					

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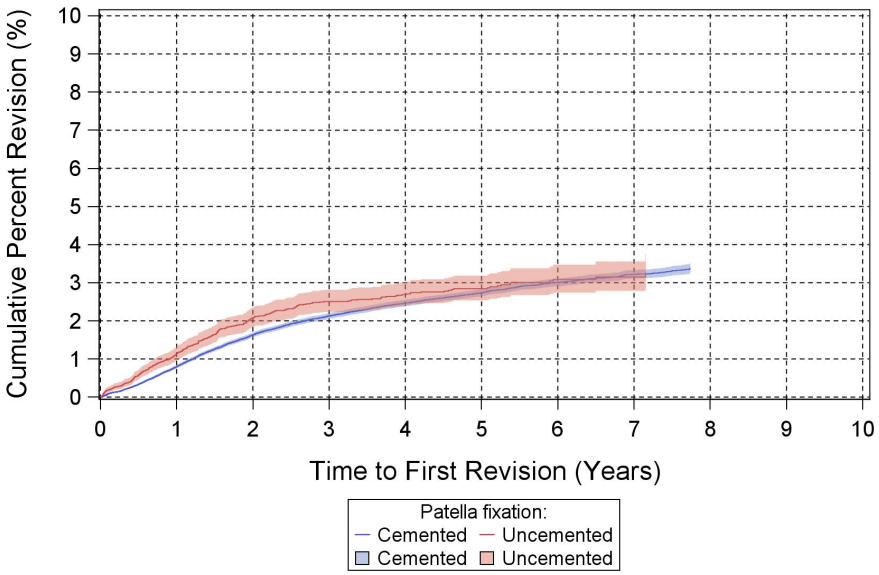


Figure 47. Cumulative Percent Revision Curve for Primary TKA Cases Performed With Patella Resurfacing by Fixation

Table 65. Cumulative Percent Revision Curve for Primary TKA Cases Performed with Patella Resurfacing by Fixation (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Cemented	166,295	0.80 (0.75,0.84)	2.12 (2.05,2.20)	2.74 (2.65,2.83)	3.22 (3.11, 3.33)	N/A
Uncemented	14,495	1.14 (0.97,1.34)	2.51 (2.23,2.81)	2.84 (2.54,3.19)	3.15 (2.78, 3.56)	N/A
Unknown/missing	513					

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2.2.4 Reasons for Revision

The reasons for revision are of central importance to quality improvement because it helps focus attention on specific causes that may be addressed. Therefore, the data are presented in two formats below: tabular and Pareto chart. The tabular format is consistent with how other arthroplasty registries report the cause(s) of revision. The Pareto chart figure presents the same data in a format commonly used in quality improvement. The Pareto chart sorts the reasons for revision by frequency (bar chart on the bottom, from left to right) and presents a cumulative percent using a line graph above.

It is important to note that the time window for the cases reported in the reasons for revision tables and figure differs from the time window used for other figures because the reason for revision was added to the database on 1/1/2015. While these data capture revisions for primaries performed back to 2/15/2012, only revisions occurring on or after 1/1/2015 are included in the reasons for revision figure and tables. Note that for knees, instability/dislocation should be interpreted as instability.

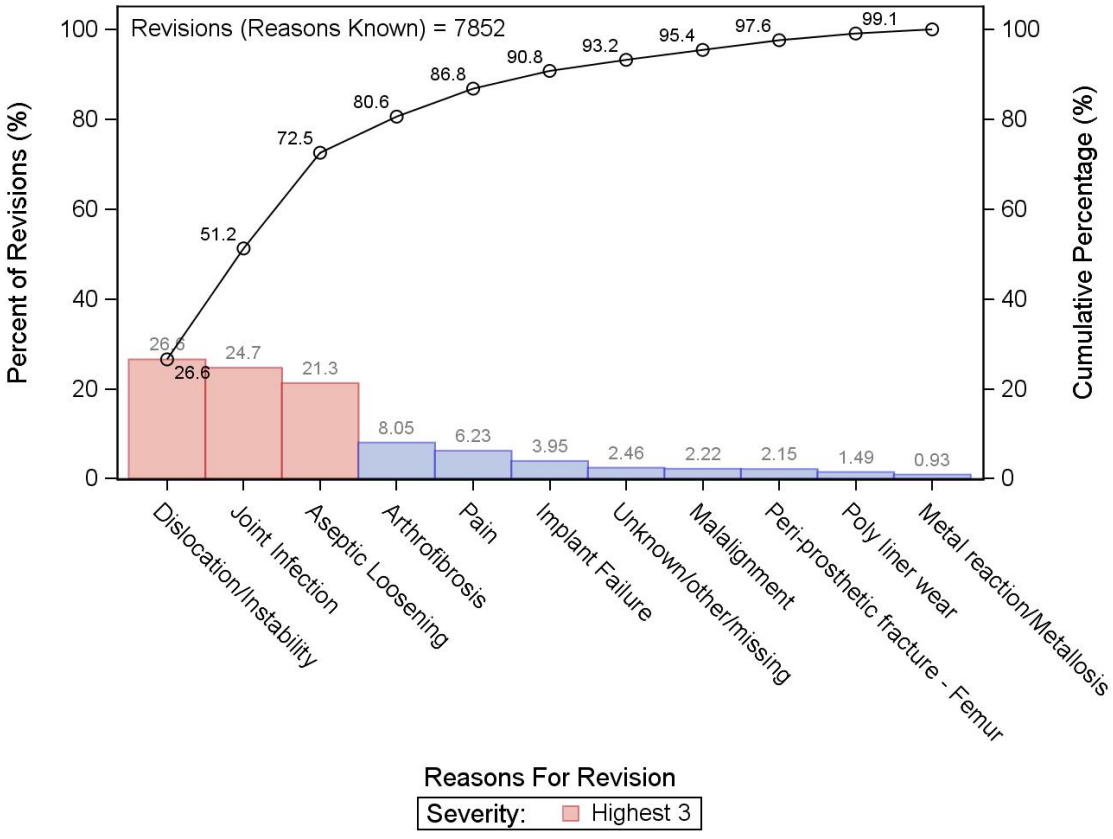


Figure 48. Most Common Reasons for First Revision Following Primary TKA (Pareto Chart)

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Table 66. Reasons for First Revision Following Primary TKA

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	2,085	26.6
2	Joint Infection	1,939	24.7
3	Aseptic Loosening	1,671	21.3
4	Arthrofibrosis	632	8.0
5	Pain	489	6.2
6	Implant Failure	310	3.9
7	Unknown/other/missing	193	2.5
8	Malalignment	174	2.2
9	Peri-prosthetic fracture - Femur	169	2.2
10	Poly liner wear	117	1.5
	Unknown/missing/other	73	0.9

Table 67. Reasons for First Revision Following Primary TKA in First Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Joint Infection	767	34.9
2	Dislocation/Instability	496	22.6
3	Arthrofibrosis	232	10.6
4	Aseptic Loosening	221	10.0
5	Pain	154	7.0
6	Peri-prosthetic fracture - Femur	83	3.8
7	Implant Failure	73	3.3
8	Malalignment	58	2.6
9	Peri-prosthetic fracture - Tibia	36	1.6
10	Extensor mechanism failure	34	1.5
	Unknown/missing/other	13	2.0

Table 68. Reasons for First Revision Following Primary TKA in Second Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	643	30.9
2	Aseptic Loosening	440	21.1
3	Joint Infection	424	20.3
4	Arthrofibrosis	171	8.2
5	Pain	167	8.0
6	Implant Failure	86	4.1
7	Malalignment	47	2.3
8	Poly liner wear	26	1.2
9	Patellofemoral Joint	22	1.1
10	Metal Reaction/Metallosis	20	1.0
	Unknown/missing/other	14	1.8

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Table 69. Reasons for First Revision Following Primary TKA in Third Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	357	30.1
2	Aseptic Loosening	277	23.4
3	Joint Infection	269	22.7
4	Arthrofibrosis	82	6.9
5	Pain	76	6.4
6	Implant Failure	51	4.3
7	Malalignment	26	2.2
8	Metal Reaction/Metallosis	15	1.3
9	Patellofemoral Joint	12	1.0
10	Poly liner wear	10	0.8
	Unknown/missing/other	8	0.9

2.2.5 Most Commonly Used Implants

The following three tables provide utilization data of implants used in primary TKA.

Table 70. Ten Most Commonly Used Femoral Components in Primary TKA

Rank	Component	N	Percent
1	Persona	90,421	31.1
2	Triathlon	88,680	30.5
3	Vanguard	25,707	8.8
4	Attune	19,207	6.6
5	Legion	14,952	5.1
6	Journey II BCS	7,859	2.7
7	Evolution MP	7,433	2.6
8	Sigma PFC	4,995	1.7
9	NK II GS	4,226	1.4
10	Sigma	2,918	1.0
11	Others	24,229	8.3

Table 71. Ten Most Commonly Used Tibial Components in Primary TKA

Rank	Component	N	Percent
1	Persona	88,837	30.6
2	Triathlon	52,466	18.1
3	Triathlon TS	36,484	12.6
4	Maxim	24,016	8.3
5	Attune	19,139	6.6
6	Genesis II	15,872	5.5
7	Journey	9,557	3.3
8	Evolution MP	7,183	2.5
9	Sigma	5,879	2.0
10	NK II	5,195	1.8
11	Others	25,999	8.9

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Table 72. Ten Most Commonly Used Femoral/Tibial Component Combinations in Primary TKA

Rank	Component combination	N	Percent
1	Persona / Persona	88,821	30.6
2	Triathlon / Triathlon	52,440	18.0
3	Triathlon / Triathlon TS	36,075	12.4
4	Vanguard / Maxim	23,989	8.2
5	Attune / Attune	19,137	6.6
6	Legion / Genesis II	14,440	5.0
7	Journey II BCS / Journey	7,736	2.7
8	Evolution MP / Evolution MP	7,135	2.5
9	NK II GS / NK II	4,200	1.4
10	Sigma PFC / Sigma	4,042	1.4
11	Others	32,612	11.1

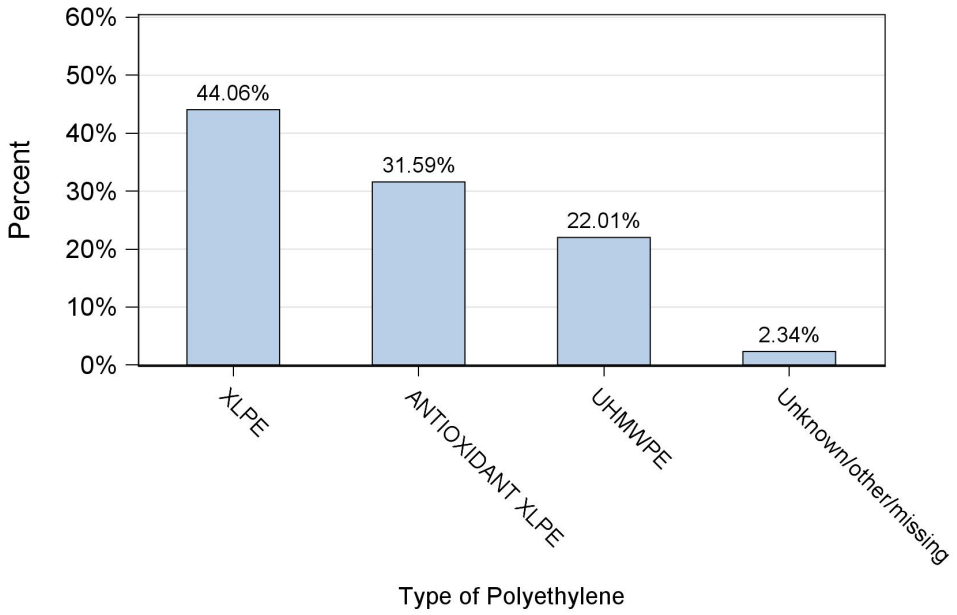


Figure 49. Percent of Polyethylene Inserts by Type of Polyethylene in Primary TKA

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2.2.6 Revision Risk by Implant Summary

As with hip implants, there is substantial variation in revision risk across TKA implants. The same caveats about interpreting CPR data provided in chapter two also apply to the interpretation of CPR data for knees. Specifically, the reader should be cautious in interpreting CPR values when the number at risk is low. While the reader is encouraged to read the details of each femur/tibia implant combination, the following table summarizes the ten-year CPR values.

Table 73. Summary of Cumulative Percent Revision for Femoral/Tibial Combinations in Primary TKA Having at Least 500 Cases, Sorted Alphabetically (A-N)

Femoral/tibial combination	N*	1 year	3 years	5 years	7 years	10 years
Attune CR (Cemented) / Attune	3,664	0.87 (0.62,1.23)	2.37 (1.93,2.92)	3.30 (2.77,3.93)	3.83 (3.25,4.50)	4.50 (3.83,5.28)
Attune CR (Cemented) / Attune S+	5,478	0.61 (0.43,0.88)	1.99 (1.61,2.47)	2.34 (1.90,2.88)	3.01 (2.09,4.33)	N/A
Attune CR/PS (Cemented) / Attune Revision	918	0.55 (0.21,1.46)	0.80 (0.32,1.97)	1.20 (0.49,2.90)	1.20 (0.49,2.90)	N/A
Attune PS (Cemented) / Attune	3,215	0.56 (0.35,0.89)	2.55 (2.06,3.16)	4.05 (3.42,4.79)	4.78 (4.09,5.57)	5.76 (4.90,6.77)
Attune PS (Cemented) / Attune S+	4,736	0.49 (0.32,0.75)	1.95 (1.54,2.45)	2.57 (2.05,3.21)	2.92 (2.23,3.83)	N/A
Evolution MP / Evolution MP	7,113	1.10 (0.87,1.39)	3.37 (2.91,3.89)	4.18 (3.64,4.80)	4.94 (4.29,5.68)	5.37 (4.62,6.24)
Genesis II (CoCr) / Genesis II	712	0.84 (0.38,1.87)	1.83 (1.06,3.12)	2.83 (1.84,4.36)	3.29 (2.20,4.91)	3.29 (2.20,4.91)
Genesis II (Oxinium) / Genesis II	689	1.60 (0.89,2.86)	3.05 (2.00,4.64)	4.51 (3.19,6.35)	5.28 (3.83,7.24)	6.33 (4.71,8.48)
GMK Sphere / GMK Primary	628	0.85 (0.35,2.02)	2.20 (1.25,3.84)	2.90 (1.68,4.99)	3.87 (2.05,7.26)	N/A
iBalance / iBalance	747	2.86 (1.87,4.35)	9.11 (7.13,11.59)	10.75 (8.52,13.53)	12.92 (10.15,16.39)	16.81 (11.37,24.48)
iTotal G2+	733	1.23 (0.64,2.35)	3.00 (1.99,4.52)	4.11 (2.89,5.83)	4.96 (3.58,6.85)	6.67 (4.57,9.68)
Journey II (Oxinium) / Journey	1,754	1.40 (0.92,2.12)	3.55 (2.71,4.64)	4.27 (3.31,5.50)	5.15 (3.97,6.66)	5.84 (4.41,7.71)
Journey II BCS (CoCr) / Journey	1,165	0.47 (0.19,1.12)	1.39 (0.81,2.39)	1.77 (1.05,2.98)	2.29 (1.38,3.82)	N/A
Journey II BCS (Oxinium) / Journey	6,540	1.33 (1.08,1.65)	3.61 (3.17,4.13)	4.54 (4.02,5.12)	5.24 (4.64,5.91)	6.30 (5.30,7.48)
LCS Complete / M.B.T.	1,930	1.04 (0.67,1.60)	3.08 (2.38,3.98)	4.30 (3.43,5.39)	4.41 (3.52,5.52)	5.07 (4.01,6.40)
Legion / Genesis II	14,341	1.04 (0.88,1.22)	2.95 (2.68,3.26)	3.58 (3.27,3.92)	4.20 (3.85,4.59)	5.02 (4.57,5.52)
NexGen GS / NexGen Pegged	675	1.04 (0.50,2.16)	2.07 (1.23,3.48)	2.67 (1.69,4.20)	2.97 (1.93,4.57)	3.37 (2.16,5.25)
NexGen GS / NexGen Precoat	707	0.28 (0.07,1.13)	1.50 (0.81,2.77)	2.01 (1.17,3.45)	2.25 (1.33,3.80)	2.25 (1.33,3.80)
NexGen LPS GS / NexGen Precoat	529	0.38 (0.09,1.50)	1.89 (1.02,3.49)	2.27 (1.30,3.97)	2.85 (1.73,4.69)	3.05 (1.88,4.94)
NexGen LPS Option / NexGen Precoat	726	0.69 (0.29,1.65)	1.52 (0.84,2.72)	2.35 (1.47,3.75)	3.39 (2.29,5.02)	4.14 (2.87,5.96)
NexGen LPS Option / NexGen TM	1,425	0.43 (0.19,0.95)	0.88 (0.50,1.54)	1.21 (0.74,1.97)	1.30 (0.81,2.09)	1.55 (0.98,2.44)
NexGen Option / NexGen Option	1,313	0.30 (0.11,0.81)	0.92 (0.52,1.61)	1.08 (0.64,1.82)	1.27 (0.78,2.07)	1.99 (1.23,3.21)
NexGen Option / NexGen Pegged	616	0.81 (0.34,1.94)	2.44 (1.48,4.01)	2.92 (1.85,4.60)	3.08 (1.98,4.79)	3.28 (2.13,5.04)
NexGen Precoat / NexGen Precoat	671	0.75 (0.31,1.78)	1.75 (0.97,3.14)	2.81 (1.72,4.58)	3.34 (2.09,5.30)	3.34 (2.09,5.30)
NK II / NK II	990	0.20 (0.05,0.81)	1.11 (0.62,2.00)	1.62 (0.99,2.62)	2.02 (1.31,3.12)	2.72 (1.84,4.03)
NK II GS / NK II	4,184	0.43 (0.27,0.68)	0.98 (0.72,1.34)	1.43 (1.10,1.86)	1.84 (1.44,2.35)	2.29 (1.77,2.96)

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Table 74. Summary of Cumulative Percent Revision for Femoral/Tibial Combinations in Primary TKA Having at Least 500 cases, Sorted Alphabetically (O-Z)

Femoral/tibial combination	N*	1 year	3 years	5 years	7 years	10 years
Persona CR (Cemented) / Persona (Cemented)	55,743	0.58 (0.52,0.65)	1.64 (1.53,1.76)	2.13 (1.99,2.28)	2.51 (2.35,2.69)	3.09 (2.85,3.34)
Persona CR (Cementless) / Persona (Cementless)	2,171	1.43 (0.98,2.08)	3.12 (2.37,4.11)	4.12 (3.12,5.42)	4.12 (3.12,5.42)	4.12 (3.12,5.42)
Persona PS (Cemented) / Persona (Cemented)	29,496	0.94 (0.83,1.06)	2.62 (2.43,2.82)	3.45 (3.22,3.69)	4.01 (3.74,4.29)	4.72 (4.39,5.07)
Scorpio / Series 7000	650	1.38 (0.72,2.64)	4.00 (2.74,5.82)	4.92 (3.51,6.89)	5.55 (4.04,7.62)	6.29 (4.61,8.56)
Sigma / M.B.T.	1,049	1.37 (0.81,2.30)	3.51 (2.54,4.86)	4.50 (3.37,6.00)	5.01 (3.79,6.60)	6.57 (5.03,8.56)
Sigma / Sigma	1,803	1.36 (0.91,2.02)	2.85 (2.16,3.75)	3.58 (2.79,4.59)	4.07 (3.21,5.14)	4.59 (3.66,5.75)
Sigma PFC / Sigma	3,955	0.73 (0.50,1.05)	2.08 (1.67,2.59)	2.66 (2.19,3.24)	3.06 (2.54,3.68)	3.46 (2.89,4.14)
Sigma PFC / Sigma PFC All-Poly	547	0.73 (0.28,1.94)	1.28 (0.61,2.67)	1.28 (0.61,2.67)	1.28 (0.61,2.67)	1.28 (0.61,2.67)
Triathlon CR (Cemented) / Triathlon (Cemented)	21,372	0.58 (0.48,0.69)	1.50 (1.34,1.68)	1.96 (1.77,2.18)	2.25 (2.03,2.49)	2.57 (2.31,2.86)
Triathlon CR (Cemented) / Triathlon TS (Cemented)	17,637	0.80 (0.68,0.95)	1.98 (1.77,2.22)	2.46 (2.21,2.74)	2.87 (2.58,3.19)	3.33 (2.96,3.74)
Triathlon CR (Cementless) / Triathlon (Cemented)	521	1.16 (0.52,2.55)	2.34 (1.34,4.09)	3.18 (1.96,5.14)	3.62 (2.29,5.69)	4.46 (2.90,6.82)
Triathlon CR (Cementless) / Triathlon (Cementless)	21,446	1.09 (0.95,1.24)	2.05 (1.84,2.27)	2.41 (2.17,2.68)	2.71 (2.42,3.04)	3.55 (2.67,4.72)
Triathlon CR (Cementless) / Triathlon TS (Cemented)	539	1.70 (0.89,3.24)	3.78 (2.37,6.01)	4.78 (2.99,7.60)	4.78 (2.99,7.60)	4.78 (2.99,7.60)
Triathlon PS (Cemented) / Triathlon (Cemented)	3,780	0.98 (0.71,1.35)	2.65 (2.17,3.23)	3.49 (2.93,4.16)	3.95 (3.34,4.67)	4.80 (4.02,5.71)
Triathlon PS (Cemented) / Triathlon TS (Cemented)	17,594	1.05 (0.91,1.21)	2.52 (2.29,2.77)	3.30 (3.03,3.59)	3.84 (3.54,4.17)	4.49 (4.12,4.88)
Triathlon PS (Cementless) / Triathlon (Cementless)	4,640	1.03 (0.77,1.38)	2.29 (1.87,2.80)	2.95 (2.44,3.55)	3.34 (2.78,4.02)	3.55 (2.93,4.29)
Vanguard CR (Cemented) / Maxim	15,692	0.69 (0.57,0.84)	1.94 (1.73,2.17)	2.41 (2.17,2.67)	2.93 (2.66,3.23)	3.26 (2.95,3.59)
Vanguard CR Porous (Cementless) / Maxim	1,539	0.52 (0.26,1.04)	1.95 (1.37,2.78)	3.08 (2.32,4.07)	3.54 (2.72,4.62)	4.27 (3.24,5.63)
Vanguard/Maxim Mono-Lock	913	0.44 (0.17,1.17)	2.12 (1.36,3.31)	3.09 (2.13,4.47)	3.75 (2.64,5.31)	4.30 (3.01,6.11)
Vanguard PS (Cemented) / Maxim	6,352	1.04 (0.82,1.32)	2.31 (1.96,2.71)	3.03 (2.63,3.48)	3.58 (3.14,4.09)	4.07 (3.57,4.64)
Vanguard XP / Vanguard XP	547	2.56 (1.52,4.28)	9.87 (7.65,12.69)	11.70 (9.28,14.70)	12.26 (9.78,15.31)	12.53 (10.01,15.63)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision

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Table 75. Summary of Cumulative Percent Revision for Femoral/Tibial Combinations in Primary TKA having at Least 500 Cases, Sorted by Five-year CPR (part 1)

Femoral/Tibial Combination	N*	1 year	3 years	5 years	7 years	10 years
NexGen Option / NexGen Option	1,313	0.30 (0.11,0.81)	0.92 (0.52,1.61)	1.08 (0.64,1.82)	1.27 (0.78,2.07)	1.99 (1.23,3.21)
Attune CR/PS (Cemented) / Attune Revision	918	0.55 (0.21,1.46)	0.80 (0.32,1.97)	1.20 (0.49,2.90)	1.20 (0.49,2.90)	N/A
NexGen LPS Option / NexGen TM	1,425	0.43 (0.19,0.95)	0.88 (0.50,1.54)	1.21 (0.74,1.97)	1.30 (0.81,2.09)	1.55 (0.98,2.44)
Sigma PFC / Sigma PFC All-Poly	547	0.73 (0.28,1.94)	1.28 (0.61,2.67)	1.28 (0.61,2.67)	1.28 (0.61,2.67)	1.28 (0.61,2.67)
NK II GS / NK II	4,184	0.43 (0.27,0.68)	0.98 (0.72,1.34)	1.43 (1.10,1.86)	1.84 (1.44,2.35)	2.29 (1.77,2.96)
NK II / NK II	990	0.20 (0.05,0.81)	1.11 (0.62,2.00)	1.62 (0.99,2.62)	2.02 (1.31,3.12)	2.72 (1.84,4.03)
Journey II BCS (CoCr) / Journey	1,165	0.47 (0.19,1.12)	1.39 (0.81,2.39)	1.77 (1.05,2.98)	2.29 (1.38,3.82)	N/A
Triathlon CR (Cemented) / Triathlon (Cemented)	21,372	0.58 (0.48,0.69)	1.50 (1.34,1.68)	1.96 (1.77,2.18)	2.25 (2.03,2.49)	2.57 (2.31,2.86)
NexGen GS / NexGen Precoat	707	0.28 (0.07,1.13)	1.50 (0.81,2.77)	2.01 (1.17,3.45)	2.25 (1.33,3.80)	2.25 (1.33,3.80)
Persona CR (Cemented) / Persona (Cemented)	55,743	0.58 (0.52,0.65)	1.64 (1.53,1.76)	2.13 (1.99,2.28)	2.51 (2.35,2.69)	3.09 (2.85,3.34)
NexGen LPS GS / NexGen Precoat	529	0.38 (0.09,1.50)	1.89 (1.02,3.49)	2.27 (1.30,3.97)	2.85 (1.73,4.69)	3.05 (1.88,4.94)
Attune CR (Cemented) / Attune S+	5,478	0.61 (0.43,0.88)	1.99 (1.61,2.47)	2.34 (1.90,2.88)	3.01 (2.09,4.33)	N/A
NexGen LPS Option / NexGen Precoat	726	0.69 (0.29,1.65)	1.52 (0.84,2.72)	2.35 (1.47,3.75)	3.39 (2.29,5.02)	4.14 (2.87,5.96)
Vanguard CR (Cemented) / Maxim	15,692	0.69 (0.57,0.84)	1.94 (1.73,2.17)	2.41 (2.17,2.67)	2.93 (2.66,3.23)	3.26 (2.95,3.59)
Triathlon CR (Cementless) / Triathlon (Cementless)	21,446	1.09 (0.95,1.24)	2.05 (1.84,2.27)	2.41 (2.17,2.68)	2.71 (2.42,3.04)	3.55 (2.67,4.72)
Triathlon CR (Cemented) / Triathlon TS (Cemented)	17,637	0.80 (0.68,0.95)	1.98 (1.77,2.22)	2.46 (2.21,2.74)	2.87 (2.58,3.19)	3.33 (2.96,3.74)
Attune PS (Cemented) / Attune S+	4,736	0.49 (0.32,0.75)	1.95 (1.54,2.45)	2.57 (2.05,3.21)	2.92 (2.23,3.83)	N/A
Sigma PFC / Sigma	3,955	0.73 (0.50,1.05)	2.08 (1.67,2.59)	2.66 (2.19,3.24)	3.06 (2.54,3.68)	3.46 (2.89,4.14)
NexGen GS / NexGen Pegged	675	1.04 (0.50,2.16)	2.07 (1.23,3.48)	2.67 (1.69,4.20)	2.97 (1.93,4.57)	3.37 (2.16,5.25)
NexGen Precoat / NexGen Precoat	671	0.75 (0.31,1.78)	1.75 (0.97,3.14)	2.81 (1.72,4.58)	3.34 (2.09,5.30)	3.34 (2.09,5.30)
Genesis II (CoCr) / Genesis II	712	0.84 (0.38,1.87)	1.83 (1.06,3.12)	2.83 (1.84,4.36)	3.29 (2.20,4.91)	3.29 (2.20,4.91)
GMK Sphere / GMK Primary	628	0.85 (0.35,2.02)	2.20 (1.25,3.84)	2.90 (1.68,4.99)	3.87 (2.05,7.26)	N/A
NexGen Option / NexGen Pegged	616	0.81 (0.34,1.94)	2.44 (1.48,4.01)	2.92 (1.85,4.60)	3.08 (1.98,4.79)	3.28 (2.13,5.04)
Triathlon PS (Cementless) / Triathlon (Cementless)	4,640	1.03 (0.77,1.38)	2.29 (1.87,2.80)	2.95 (2.44,3.55)	3.34 (2.78,4.02)	3.55 (2.93,4.29)
Vanguard PS (Cemented) / Maxim	6,352	1.04 (0.82,1.32)	2.31 (1.96,2.71)	3.03 (2.63,3.48)	3.58 (3.14,4.09)	4.07 (3.57,4.64)
Vanguard CR Porous (Cementless) / Maxim	1,539	0.52 (0.26,1.04)	1.95 (1.37,2.78)	3.08 (2.32,4.07)	3.54 (2.72,4.62)	4.27 (3.24,5.63)
Vanguard/Maxim Mono-Lock	913	0.44 (0.17,1.17)	2.12 (1.36,3.31)	3.09 (2.13,4.47)	3.75 (2.64,5.31)	4.30 (3.01,6.11)
Triathlon CR (Cementless) / Triathlon (Cemented)	521	1.16 (0.52,2.55)	2.34 (1.34,4.09)	3.18 (1.96,5.14)	3.62 (2.29,5.69)	4.46 (2.90,6.82)
Attune CR (Cemented) / Attune	3,664	0.87 (0.62,1.23)	2.37 (1.93,2.92)	3.30 (2.77,3.93)	3.83 (3.25,4.50)	4.50 (3.83,5.28)

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Table 76. Summary of Cumulative Percent Revision for Femoral/Tibial Combinations in Primary TKA Having at Least 500 Cases, Sorted by Five-year CPR (part 2)

Femoral/Tibial Combination	N*	1 year	3 years	5 years	7 years	10 years
Triathlon PS (Cemented) / Triathlon TS (Cemented)	17,594	1.05 (0.91,1.21)	2.52 (2.29,2.77)	3.30 (3.03,3.59)	3.84 (3.54,4.17)	4.49 (4.12,4.88)
Persona PS (Cemented) / Persona (Cemented)	29,496	0.94 (0.83,1.06)	2.62 (2.43,2.82)	3.45 (3.22,3.69)	4.01 (3.74,4.29)	4.72 (4.39,5.07)
Triathlon PS (Cemented) / Triathlon (Cemented)	3,780	0.98 (0.71,1.35)	2.65 (2.17,3.23)	3.49 (2.93,4.16)	3.95 (3.34,4.67)	4.80 (4.02,5.71)
Sigma / Sigma	1,803	1.36 (0.91,2.02)	2.85 (2.16,3.75)	3.58 (2.79,4.59)	4.07 (3.21,5.14)	4.59 (3.66,5.75)
Legion / Genesis II	14,341	1.04 (0.88,1.22)	2.95 (2.68,3.26)	3.58 (3.27,3.92)	4.20 (3.85,4.59)	5.02 (4.57,5.52)
Attune PS (Cemented) / Attune	3,215	0.56 (0.35,0.89)	2.55 (2.06,3.16)	4.05 (3.42,4.79)	4.78 (4.09,5.57)	5.76 (4.90,6.77)
iTotal G2+	733	1.23 (0.64,2.35)	3.00 (1.99,4.52)	4.11 (2.89,5.83)	4.96 (3.58,6.85)	6.67 (4.57,9.68)
Persona CR (Cementless) / Persona (Cementless)	2,171	1.43 (0.98,2.08)	3.12 (2.37,4.11)	4.12 (3.12,5.42)	4.12 (3.12,5.42)	4.12 (3.12,5.42)
Evolution MP / Evolution MP	7,113	1.10 (0.87,1.39)	3.37 (2.91,3.89)	4.18 (3.64,4.80)	4.94 (4.29,5.68)	5.37 (4.62,6.24)
Journey II (Oxinium) / Journey	1,754	1.40 (0.92,2.12)	3.55 (2.71,4.64)	4.27 (3.31,5.50)	5.15 (3.97,6.66)	5.84 (4.41,7.71)
LCS Complete / M.B.T.	1,930	1.04 (0.67,1.60)	3.08 (2.38,3.98)	4.30 (3.43,5.39)	4.41 (3.52,5.52)	5.07 (4.01,6.40)
Sigma / M.B.T.	1,049	1.37 (0.81,2.30)	3.51 (2.54,4.86)	4.50 (3.37,6.00)	5.01 (3.79,6.60)	6.57 (5.03,8.56)
Genesis II (Oxinium) / Genesis II	689	1.60 (0.89,2.86)	3.05 (2.00,4.64)	4.51 (3.19,6.35)	5.28 (3.83,7.24)	6.33 (4.71,8.48)
Journey II BCS (Oxinium) / Journey	6,540	1.33 (1.08,1.65)	3.61 (3.17,4.13)	4.54 (4.02,5.12)	5.24 (4.64,5.91)	6.30 (5.30,7.48)
Triathlon CR (Cementless) / Triathlon TS (Cemented)	539	1.70 (0.89,3.24)	3.78 (2.37,6.01)	4.78 (2.99,7.60)	4.78 (2.99,7.60)	4.78 (2.99,7.60)
Scorpio / Series 7000	650	1.38 (0.72,2.64)	4.00 (2.74,5.82)	4.92 (3.51,6.89)	5.55 (4.04,7.62)	6.29 (4.61,8.56)
iBalance / iBalance	747	2.86 (1.87,4.35)	9.11 (7.13,11.59)	10.75 (8.52,13.53)	12.92 (10.15,16.39)	16.81 (11.37,24.48)
Vanguard XP / Vanguard XP	547	2.56 (1.52,4.28)	9.87 (7.65,12.69)	11.70 (9.28,14.70)	12.26 (9.78,15.31)	12.53 (10.01,15.63)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision.

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Table 77. Summary of Cumulative Percent Revision for Femoral/Tibial Combinations in Primary TKA Having at Least 500 Cases, Sorted by Ten-year CPR (part 1)

Femoral/Tibial Combination	N*	1 year	3 years	5 years	7 years	10 years
Sigma PFC / Sigma PFC All-Poly	547	0.73 (0.28,1.94)	1.28 (0.61,2.67)	1.28 (0.61,2.67)	1.28 (0.61,2.67)	1.28 (0.61,2.67)
NexGen LPS Option / NexGen TM	1,425	0.43 (0.19,0.95)	0.88 (0.50,1.54)	1.21 (0.74,1.97)	1.30 (0.81,2.09)	1.55 (0.98,2.44)
NexGen Option / NexGen Option	1,313	0.30 (0.11,0.81)	0.92 (0.52,1.61)	1.08 (0.64,1.82)	1.27 (0.78,2.07)	1.99 (1.23,3.21)
NexGen GS / NexGen Precoat	707	0.28 (0.07,1.13)	1.50 (0.81,2.77)	2.01 (1.17,3.45)	2.25 (1.33,3.80)	2.25 (1.33,3.80)
NK II GS / NK II	4,184	0.43 (0.27,0.68)	0.98 (0.72,1.34)	1.43 (1.10,1.86)	1.84 (1.44,2.35)	2.29 (1.77,2.96)
Triathlon CR (Cemented) / Triathlon (Cemented)	21,372	0.58 (0.48,0.69)	1.50 (1.34,1.68)	1.96 (1.77,2.18)	2.25 (2.03,2.49)	2.57 (2.31,2.86)
NK II / NK II	990	0.20 (0.05,0.81)	1.11 (0.62,2.00)	1.62 (0.99,2.62)	2.02 (1.31,3.12)	2.72 (1.84,4.03)
NexGen LPS GS / NexGen Precoat	529	0.38 (0.09,1.50)	1.89 (1.02,3.49)	2.27 (1.30,3.97)	2.85 (1.73,4.69)	3.05 (1.88,4.94)
Persona CR (Cemented) / Persona (Cemented)	55,743	0.58 (0.52,0.65)	1.64 (1.53,1.76)	2.13 (1.99,2.28)	2.51 (2.35,2.69)	3.09 (2.85,3.34)
Vanguard CR (Cemented) / Maxim	15,692	0.69 (0.57,0.84)	1.94 (1.73,2.17)	2.41 (2.17,2.67)	2.93 (2.66,3.23)	3.26 (2.95,3.59)
NexGen Option / NexGen Pegged	616	0.81 (0.34,1.94)	2.44 (1.48,4.01)	2.92 (1.85,4.60)	3.08 (1.98,4.79)	3.28 (2.13,5.04)
Genesis II (CoCr) / Genesis II	712	0.84 (0.38,1.87)	1.83 (1.06,3.12)	2.83 (1.84,4.36)	3.29 (2.20,4.91)	3.29 (2.20,4.91)
Triathlon CR (Cemented) / Triathlon TS (Cemented)	17,637	0.80 (0.68,0.95)	1.98 (1.77,2.22)	2.46 (2.21,2.74)	2.87 (2.58,3.19)	3.33 (2.96,3.74)
NexGen Precoat / NexGen Precoat	671	0.75 (0.31,1.78)	1.75 (0.97,3.14)	2.81 (1.72,4.58)	3.34 (2.09,5.30)	3.34 (2.09,5.30)
NexGen GS / NexGen Pegged	675	1.04 (0.50,2.16)	2.07 (1.23,3.48)	2.67 (1.69,4.20)	2.97 (1.93,4.57)	3.37 (2.16,5.25)
Sigma PFC / Sigma	3,955	0.73 (0.50,1.05)	2.08 (1.67,2.59)	2.66 (2.19,3.24)	3.06 (2.54,3.68)	3.46 (2.89,4.14)
Triathlon CR (Cementless) / Triathlon (Cementless)	21,446	1.09 (0.95,1.24)	2.05 (1.84,2.27)	2.41 (2.17,2.68)	2.71 (2.42,3.04)	3.55 (2.67,4.72)
Triathlon PS (Cementless) / Triathlon (Cementless)	4,640	1.03 (0.77,1.38)	2.29 (1.87,2.80)	2.95 (2.44,3.55)	3.34 (2.78,4.02)	3.55 (2.93,4.29)
Vanguard PS (Cemented) / Maxim	6,352	1.04 (0.82,1.32)	2.31 (1.96,2.71)	3.03 (2.63,3.48)	3.58 (3.14,4.09)	4.07 (3.57,4.64)
Persona CR (Cementless) / Persona (Cementless)	2,171	1.43 (0.98,2.08)	3.12 (2.37,4.11)	4.12 (3.12,5.42)	4.12 (3.12,5.42)	4.12 (3.12,5.42)
NexGen LPS Option / NexGen Precoat	726	0.69 (0.29,1.65)	1.52 (0.84,2.72)	2.35 (1.47,3.75)	3.39 (2.29,5.02)	4.14 (2.87,5.96)
Vanguard CR Porous (Cementless) / Maxim	1,539	0.52 (0.26,1.04)	1.95 (1.37,2.78)	3.08 (2.32,4.07)	3.54 (2.72,4.62)	4.27 (3.24,5.63)
Vanguard/Maxim Mono-Lock	913	0.44 (0.17,1.17)	2.12 (1.36,3.31)	3.09 (2.13,4.47)	3.75 (2.64,5.31)	4.30 (3.01,6.11)
Triathlon CR (Cementless) / Triathlon (Cemented)	521	1.16 (0.52,2.55)	2.34 (1.34,4.09)	3.18 (1.96,5.14)	3.62 (2.29,5.69)	4.46 (2.90,6.82)
Triathlon PS (Cemented) / Triathlon TS (Cemented)	17,594	1.05 (0.91,1.21)	2.52 (2.29,2.77)	3.30 (3.03,3.59)	3.84 (3.54,4.17)	4.49 (4.12,4.88)
Attune CR (Cemented) / Attune	3,664	0.87 (0.62,1.23)	2.37 (1.93,2.92)	3.30 (2.77,3.93)	3.83 (3.25,4.50)	4.50 (3.83,5.28)
Sigma / Sigma	1,803	1.36 (0.91,2.02)	2.85 (2.16,3.75)	3.58 (2.79,4.59)	4.07 (3.21,5.14)	4.59 (3.66,5.75)
Persona PS (Cemented) / Persona (Cemented)	29,496	0.94 (0.83,1.06)	2.62 (2.43,2.82)	3.45 (3.22,3.69)	4.01 (3.74,4.29)	4.72 (4.39,5.07)

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Table 78. Summary of Cumulative Percent Revision for Femoral/Tibial Combinations in Primary TKA Having at Least 500 cases, Sorted by Ten-year CPR (part 2)

Femoral/Tibial Combination	N*	1 year	3 years	5 years	7 years	10 years
Triathlon CR (Cementless) / Triathlon TS (Cemented)	539	1.70 (0.89,3.24)	3.78 (2.37,6.01)	4.78 (2.99,7.60)	4.78 (2.99,7.60)	4.78 (2.99,7.60)
Triathlon PS (Cemented) / Triathlon (Cemented)	3,780	0.98 (0.71,1.35)	2.65 (2.17,3.23)	3.49 (2.93,4.16)	3.95 (3.34,4.67)	4.80 (4.02,5.71)
Legion / Genesis II	14,341	1.04 (0.88,1.22)	2.95 (2.68,3.26)	3.58 (3.27,3.92)	4.20 (3.85,4.59)	5.02 (4.57,5.52)
LCS Complete / M.B.T.	1,930	1.04 (0.67,1.60)	3.08 (2.38,3.98)	4.30 (3.43,5.39)	4.41 (3.52,5.52)	5.07 (4.01,6.40)
Evolution MP / Evolution MP	7,113	1.10 (0.87,1.39)	3.37 (2.91,3.89)	4.18 (3.64,4.80)	4.94 (4.29,5.68)	5.37 (4.62,6.24)
Attune PS (Cemented) / Attune	3,215	0.56 (0.35,0.89)	2.55 (2.06,3.16)	4.05 (3.42,4.79)	4.78 (4.09,5.57)	5.76 (4.90,6.77)
Journey II (Oxinium) / Journey	1,754	1.40 (0.92,2.12)	3.55 (2.71,4.64)	4.27 (3.31,5.50)	5.15 (3.97,6.66)	5.84 (4.41,7.71)
Scorpio / Series 7000	650	1.38 (0.72,2.64)	4.00 (2.74,5.82)	4.92 (3.51,6.89)	5.55 (4.04,7.62)	6.29 (4.61,8.56)
Journey II BCS (Oxinium) / Journey	6,540	1.33 (1.08,1.65)	3.61 (3.17,4.13)	4.54 (4.02,5.12)	5.24 (4.64,5.91)	6.30 (5.30,7.48)
Genesis II (Oxinium) / Genesis II	689	1.60 (0.89,2.86)	3.05 (2.00,4.64)	4.51 (3.19,6.35)	5.28 (3.83,7.24)	6.33 (4.71,8.48)
Sigma / M.B.T.	1,049	1.37 (0.81,2.30)	3.51 (2.54,4.86)	4.50 (3.37,6.00)	5.01 (3.79,6.60)	6.57 (5.03,8.56)
iTotal G2+	733	1.23 (0.64,2.35)	3.00 (1.99,4.52)	4.11 (2.89,5.83)	4.96 (3.58,6.85)	6.67 (4.57,9.68)
Vanguard XP / Vanguard XP	547	2.56 (1.52,4.28)	9.87 (7.65,12.69)	11.70 (9.28,14.70)	12.26 (9.78,15.31)	12.53 (10.01,15.63)
iBalance / iBalance	747	2.86 (1.87,4.35)	9.11 (7.13,11.59)	10.75 (8.52,13.53)	12.92 (10.15,16.39)	16.81 (11.37,24.48)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision

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2.3 Unicompartmental Arthroplasty (UKA)

2.3.1 Descriptive Statistics

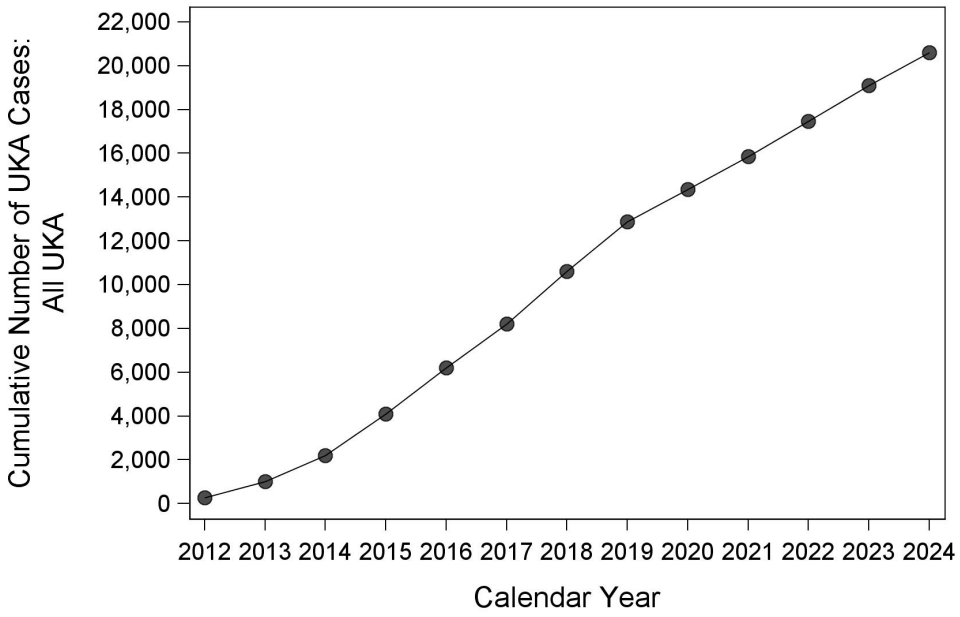


Figure 50. UKA Cases Over Time (in 16,577 Patients)

Table 79. UKA Cases Over Time (Numerical Values)

Year	Annual cases	Cumulative cases
2012	276	276
2013	720	996
2014	1,198	2,194
2015	1,892	4,086
2016	2,117	6,203
2017	2,000	8,203
2018	2,415	10,618
2019	2,247	12,865
2020	1,492	14,357
2021	1,504	15,861
2022	1,615	17,476
2023	1,620	19,096
2024	1,516	20,612

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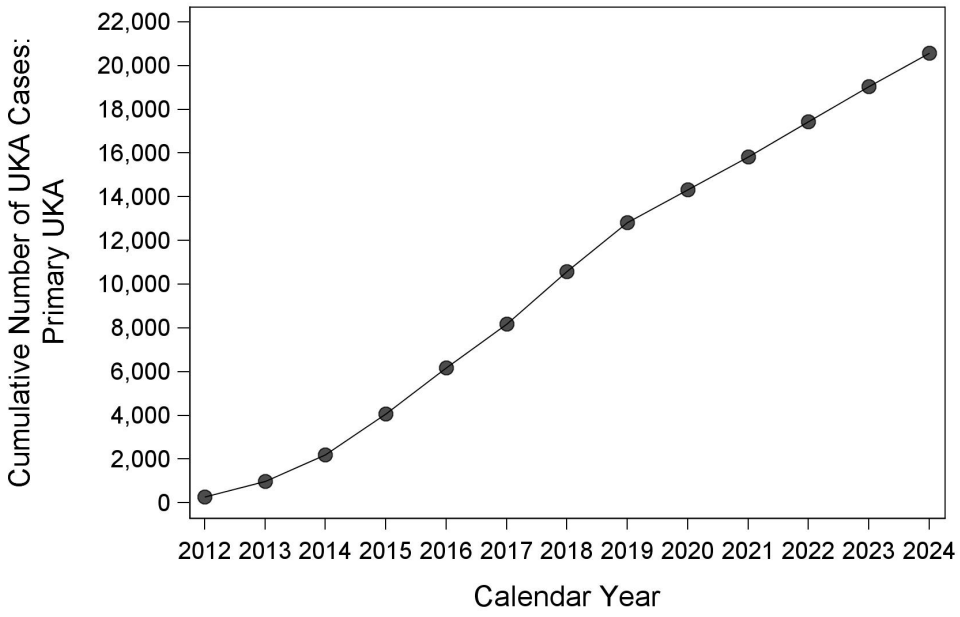


Figure 51. Primary UKA Cases Over Time

Table 80. Primary UKA Cases Over Time (Numerical Values)

Year	Annual cases	Cumulative cases
2012	275	275
2013	717	992
2014	1,193	2,185
2015	1,886	4,071
2016	2,111	6,182
2017	1,995	8,177
2018	2,406	10,583
2019	2,246	12,829
2020	1,491	14,320
2021	1,502	15,822
2022	1,615	17,437
2023	1,616	19,053
2024	1,513	20,566

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Table 81. Descriptive Statistics of Primary UKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	10,277	50	
Age (years)	20,566	64.3 (10.2)	64 (14)
Height (cm)	20,542	170.1 (10.5)	170.2 (15.2)
Weight (kg)	20,542	90.6 (19.6)	88.9 (25.4)
BMI (kg/m^2)	20,541	31.2 (5.8)	30.5 (7.5)
Smoker - Never (%)	10,708	52.1	
Smoker - Previous (%)	7,786	37.9	
Smoker - Current (%)	1,944	9.5	
Smoker - Unknown (%)	128	0.6	

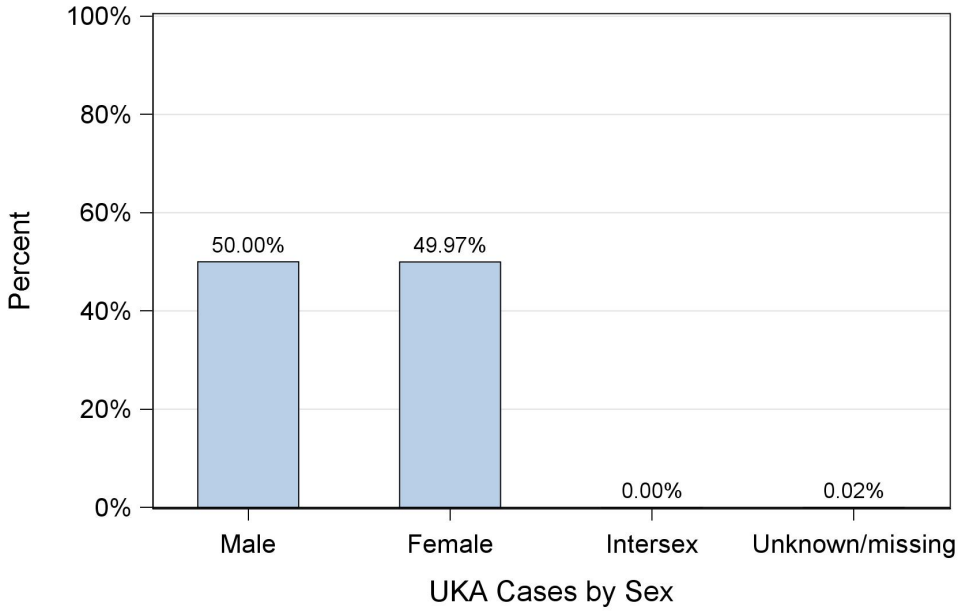


Figure 52. Percent of Primary UKA Cases by Sex

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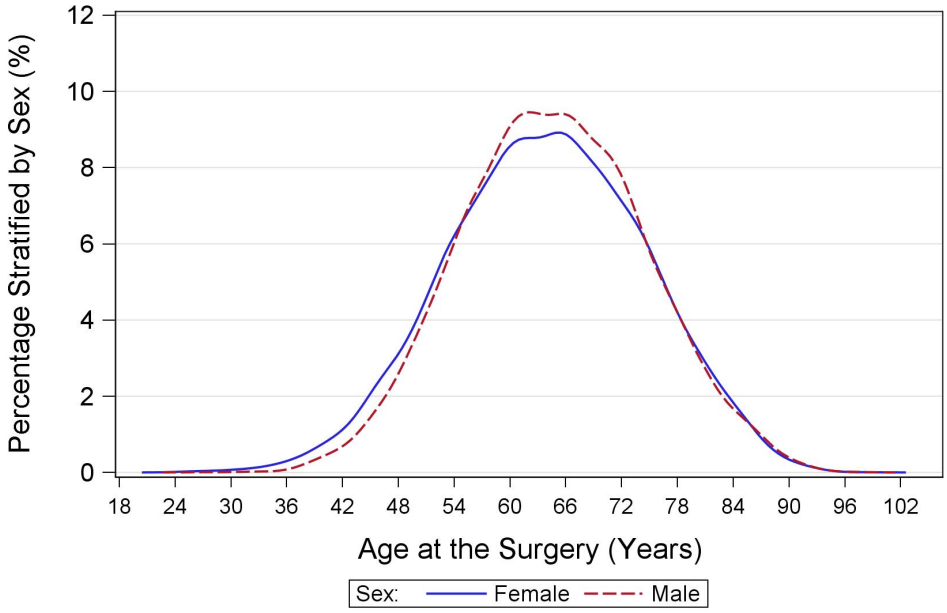


Figure 53. Age Distribution of Primary UKA Cases by Sex

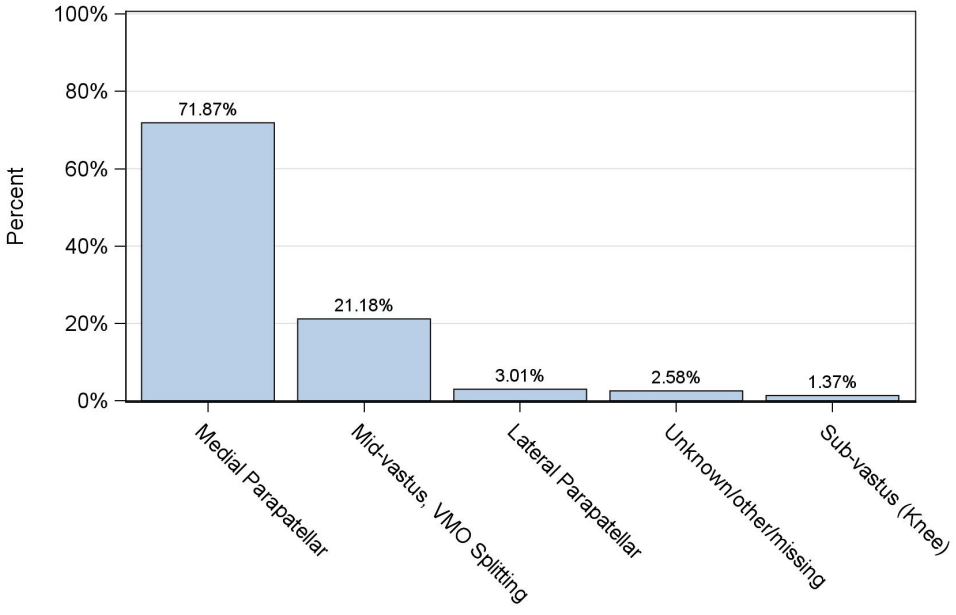


Figure 54. Percent of Primary UKA Cases by Approach

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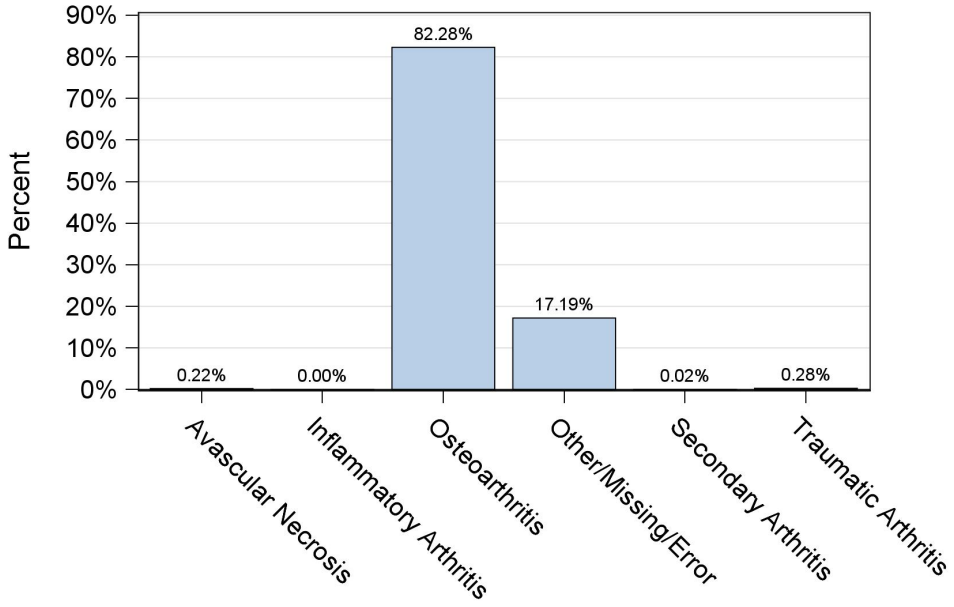


Figure 55. Percent of Primary UKA Cases by Diagnosis

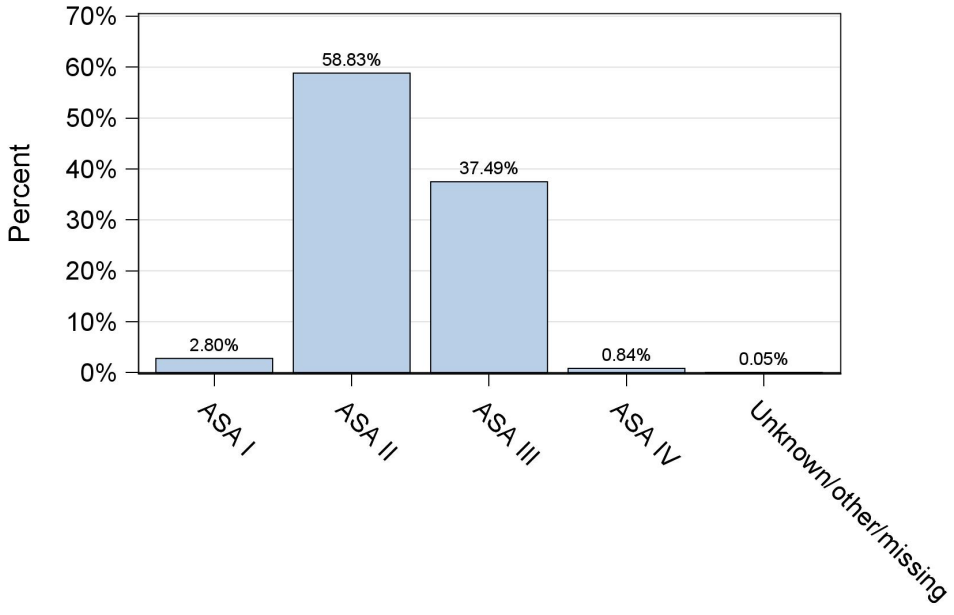


Figure 56. Percent of Primary UKA Cases by ASA Class

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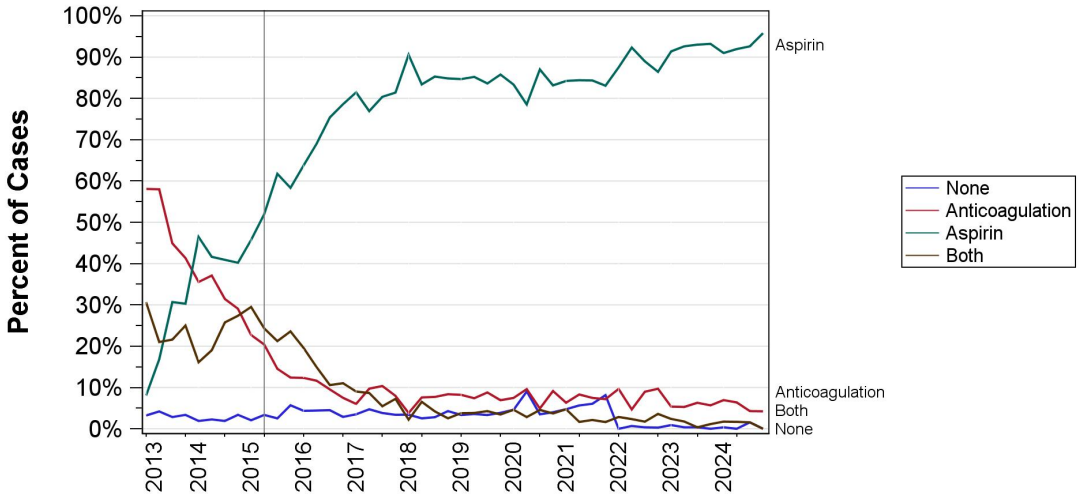


Figure 57. Percent of Primary UKA Patients (First Case) by Thrombosis Prophylaxis

2.3.2 Revision Risk (Overall and by Sex)

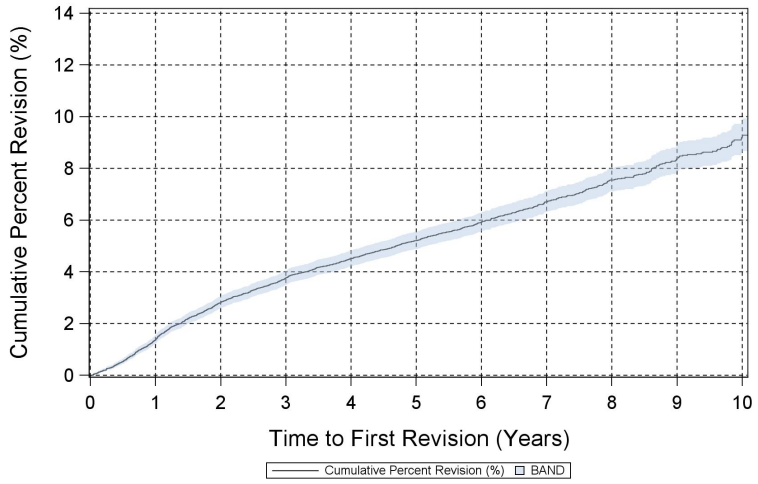


Figure 58. Cumulative Percent Revision for Primary UKA

Table 82. Cumulative Percent Revision for Primary UKA (Numerical Values)

	1 year	3 years	5 years	7 years	10 years
CPR	1.37 (1.22,1.54)	3.76 (3.50,4.05)	5.20 (4.88,5.55)	6.70 (6.31,7.12)	9.24 (8.63,9.88)
Number at risk	18,727	15,159	12,084	7,530	1,956

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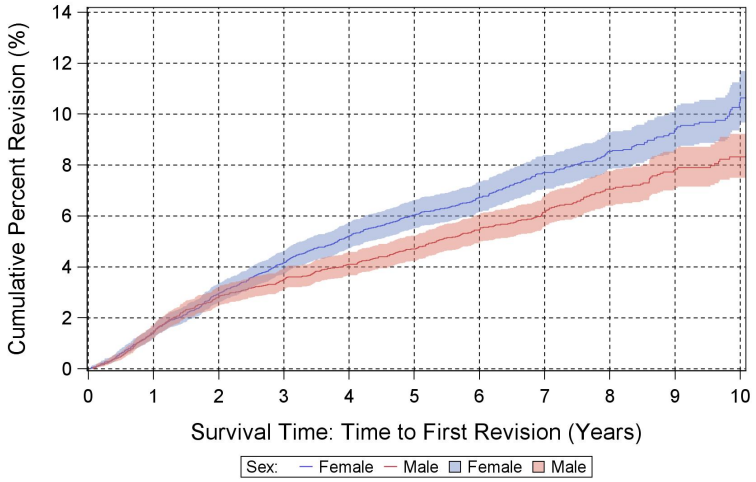


Figure 59. Cumulative Percent Revision for Primary UKA by Sex for Osteoarthritis Diagnosis

Table 83. Cumulative Percent Revision for Primary UKA by Sex for Osteoarthritis Diagnosis (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Female	8,546	1.41 (1.18,1.69)	4.16 (3.73,4.63)	6.04 (5.51,6.61)	7.71 (7.07,8.39)	10.54 (9.59,11.58)
Male	8,314	1.45 (1.21,1.74)	3.51 (3.12,3.96)	4.71 (4.23,5.23)	6.14 (5.57,6.77)	8.32 (7.50,9.22)
Unknown/Missing	4					

2.3.3 Reasons for Revision

The reasons for revision are of central importance to quality improvement because it helps focus attention on specific causes that may be addressed. Therefore, the data are presented in two formats below: tabular and Pareto chart. The tabular format is consistent with how other arthroplasty registries report the cause(s) of revision. The Pareto chart figure presents the same data in a format commonly used in quality improvement. The Pareto chart sorts the reasons for revision by frequency (bar chart on the bottom, from left to right) and presents a cumulative percent using a line graph above.

It is important to note that the time window for the cases reported in the reasons for revision tables and figure differs from the time window used for other figures because the reason for revision was added to the database on 1/1/2015. While these data capture revisions for primaries performed back to 2/15/2012, only revisions occurring on or after 1/1/2015 are included in the reasons for revision figure and tables. Note that for knees, instability/dislocation should be interpreted as instability.

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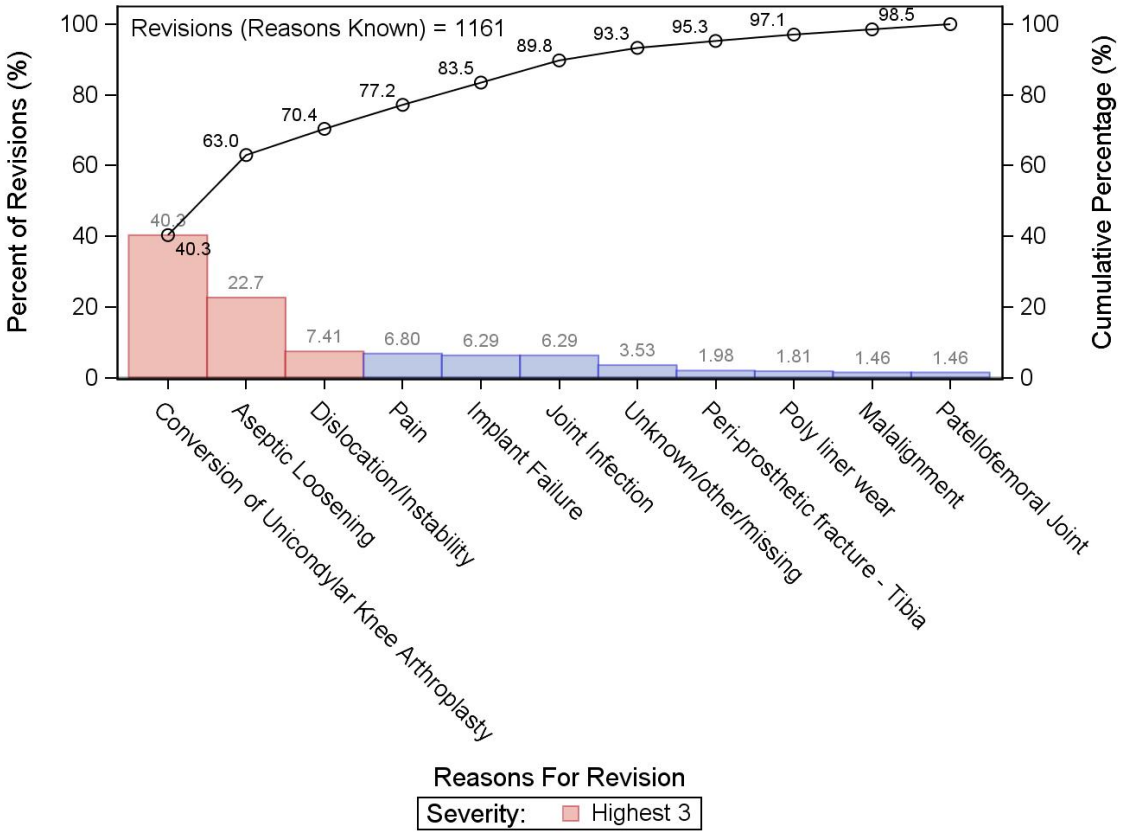


Figure 60. Most Common Reasons for First Revision Following Primary UKA (Pareto Chart)

Table 84. Reasons for First Revision Following Primary UKA

Rank	Reason for Revision	N	Percent
1	Conversion of Unicondylar Knee Arthroplasty	468	40.3
2	Aseptic Loosening	263	22.7
3	Dislocation/Instability	86	7.4
4	Pain	79	6.8
5	Joint Infection	73	6.3
6	Implant Failure	73	6.3
7	Unknown/other/missing	41	3.5
8	Peri-prosthetic fracture - Tibia	23	2.0
9	Poly liner wear	21	1.8
10	Malalignment	17	1.5
	Unknown/missing/other	17	1.5

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Table 85. Reasons for First Revision Following Primary UKA in First Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Conversion of Unicondylar Knee Arthroplasty	63	25.3
2	Joint Infection	44	17.7
3	Aseptic Loosening	41	16.5
4	Implant Failure	20	8.0
5	Peri-prosthetic fracture - Tibia	20	8.0
6	Dislocation/Instability	19	7.6
7	Pain	18	7.2
8	Arthrofibrosis	6	2.4
9	Extensor mechanism failure	5	2.0
10	Metal Reaction/Metallosis	4	1.6
	Unknown/missing/other	3	3.6

Table 86. Reasons for First Revision Following Primary UKA in Second Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Conversion of Unicondylar Knee Arthroplasty	104	40.6
2	Aseptic Loosening	68	26.6
3	Pain	26	10.2
4	Dislocation/Instability	20	7.8
5	Implant Failure	14	5.5
6	Joint Infection	11	4.3
7	Malalignment	5	2.0
8	Osteolysis	2	0.8
9	Arthrofibrosis	2	0.8
10	Patellofemoral Joint	2	0.8
	Unknown/missing/other	1	0.8

Table 87. Reasons for First Revision Following Primary UKA in Third Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Conversion of Unicondylar Knee Arthroplasty	67	42.4
2	Aseptic Loosening	40	25.3
3	Pain	14	8.9
4	Dislocation/Instability	11	7.0
5	Implant Failure	9	5.7
6	Joint Infection	5	3.2
7	Malalignment	5	3.2
8	Patellofemoral Joint	3	1.9
9	Osteolysis	1	0.6
10	Poly liner wear	1	0.6
	Unknown/missing/other	1	1.3

2.3.4 Most Commonly Used Implants

The following three tables provide utilization data of implants used in primary UKA.

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Table 88. Ten Most Commonly Used Femoral Components in Primary UKA

Rank	Component	N	Percent
1	Restoris MCK	7,896	38.4
2	Persona	3,883	18.9
3	Oxford	3,403	16.6
4	ZUK	3,114	15.1
5	Journey II	592	2.9
6	Journey	491	2.4
7	Triathlon PKR	444	2.2
8	Sigma HP	272	1.3
9	iBalance	245	1.2
10	Stride	111	0.5
11	Others	115	0.6

* ZUK (Zimmer Unicondylar Knee) was formerly known as the Zimmer High Flex Knee.

Table 89. Ten Most Commonly Used Tibial Components in Primary UKA

Rank	Component	N	Percent
1	Restoris MCK	7,872	38.3
2	Persona	3,873	18.8
3	ZUK	3,448	16.8
4	Oxford	3,305	16.1
5	Triathlon PKR	438	2.1
6	Journey II	414	2.0
7	Sigma HP	265	1.3
8	iBalance	231	1.1
9	Journey	113	0.6
10	Stride	111	0.5
11	Others	496	2.4

* ZUK (Zimmer Unicondylar Knee) was formerly known as the Zimmer High Flex Knee.

Table 90. Ten Most Commonly Used Femoral/Tibial Component Combinations in Primary UKA

Rank	Component combination	N	Percent
1	Restoris MCK / Restoris MCK	7,871	38.3
2	Persona / Persona	3,871	18.8
3	Oxford / Oxford	3,305	16.1
4	ZUK / ZUK	3,080	15.0
5	Triathlon PKR / Triathlon PKR	438	2.1
6	Journey II / Journey II	407	2.0
7	Journey / ZUK	367	1.8
8	Sigma HP / Sigma HP	265	1.3
9	iBalance / iBalance	231	1.1
10	Journey / Journey	113	0.6
11	Others	618	2.9

* ZUK (Zimmer Unicondylar Knee) was formerly known as the Zimmer High Flex Knee.

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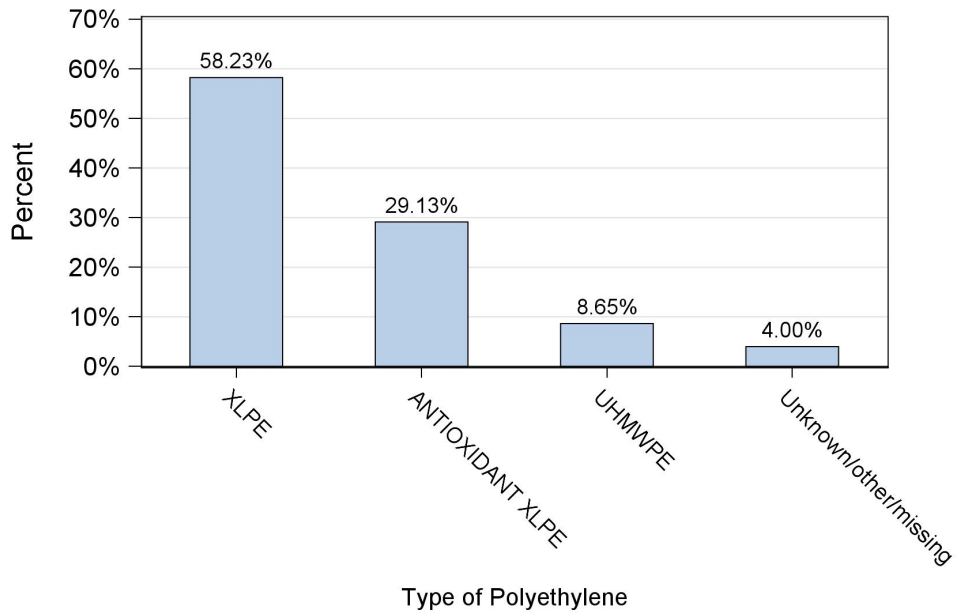


Figure 61. Percentage of Polyethylene Inserts by Type of Polyethylene in Primary UKA

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2.3.5 Revision Risk by Implant Summary

While the reader is encouraged to read the details of each femur/tibia implant combination, the following table summarizes the ten-year CPR values.

Table 91. Cumulative Percent Revision Following Primary UKA for Femoral/Tibial Combinations Having at Least 500 Primary Cases, Sorted Alphabetically

Femoral/Tibial Combination	N*	1 year	3 years	5 years	7 years	10 years
Oxford / Oxford	3,283	1.78 (1.38,2.30)	5.03 (4.32,5.85)	7.10 (6.25,8.07)	9.23 (8.23,10.35)	12.82 (11.40,14.40)
Persona / Persona	3,867	1.29 (0.97,1.72)	3.05 (2.50,3.73)	3.67 (3.02,4.45)	5.20 (4.10,6.58)	N/A
Restoris MCK / Restoris MCK	7,854	1.11 (0.90,1.38)	3.17 (2.78,3.62)	4.65 (4.15,5.21)	5.88 (5.27,6.55)	8.56 (7.27,10.07)
ZUK / ZUK	3,061	1.08 (0.77,1.51)	3.04 (2.49,3.71)	3.94 (3.30,4.69)	4.84 (4.12,5.68)	6.48 (5.55,7.56)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision

** This implant (Zimmer Unicondylar Knee) was formerly known as the Zimmer High Flex Knee

Table 92. Cumulative Percent Revision Following Primary UKA for Femoral/Tibial Combinations Having at Least 500 Primary Cases, Sorted by Ten-year CPR

Femoral/Tibial Combination	N*	1 year	3 years	5 years	7 years	10 years
ZUK / ZUK	3,061	1.08 (0.77,1.51)	3.04 (2.49,3.71)	3.94 (3.30,4.69)	4.84 (4.12,5.68)	6.48 (5.55,7.56)
Restoris MCK / Restoris MCK	7,854	1.11 (0.90,1.38)	3.17 (2.78,3.62)	4.65 (4.15,5.21)	5.88 (5.27,6.55)	8.56 (7.27,10.07)
Oxford / Oxford	3,283	1.78 (1.38,2.30)	5.03 (4.32,5.85)	7.10 (6.25,8.07)	9.23 (8.23,10.35)	12.82 (11.40,14.40)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision

** This implant (Zimmer Unicondylar Knee) was formerly known as the Zimmer High Flex Knee

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2.4 Patellofemoral Joint Arthroplasty (PFJ)

2.4.1 Descriptive Statistics

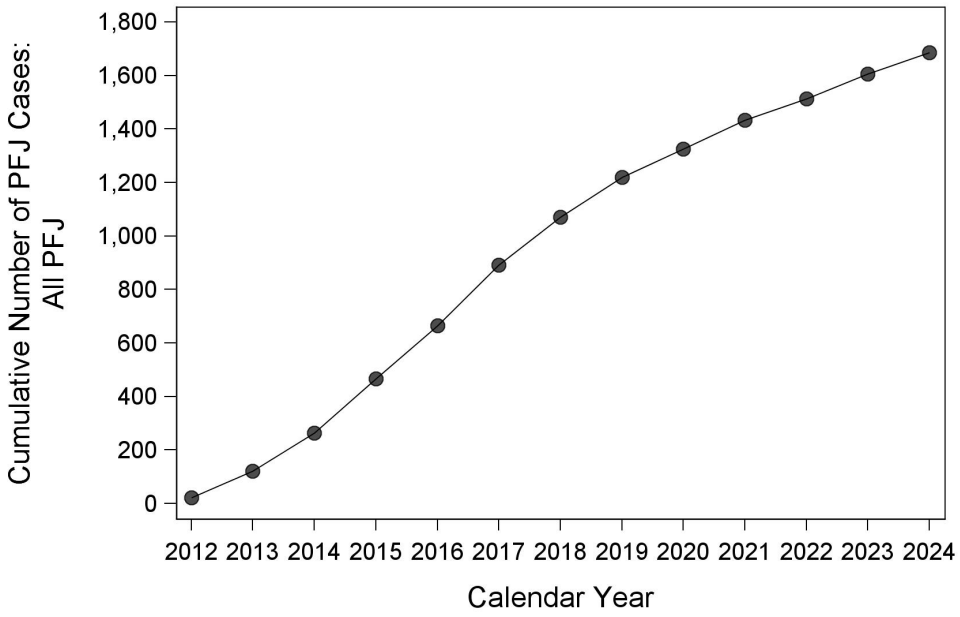


Figure 62. PFJ Cases Over Time (in 1,358 Patients)

Table 93. PFJ Cases Over Time (Numerical Values)

Year	Annual cases	Cumulative cases
2012	23	23
2013	98	121
2014	142	263
2015	204	467
2016	198	665
2017	226	891
2018	180	1,071
2019	149	1,220
2020	105	1,325
2021	109	1,434
2022	80	1,514
2023	92	1,606
2024	80	1,686

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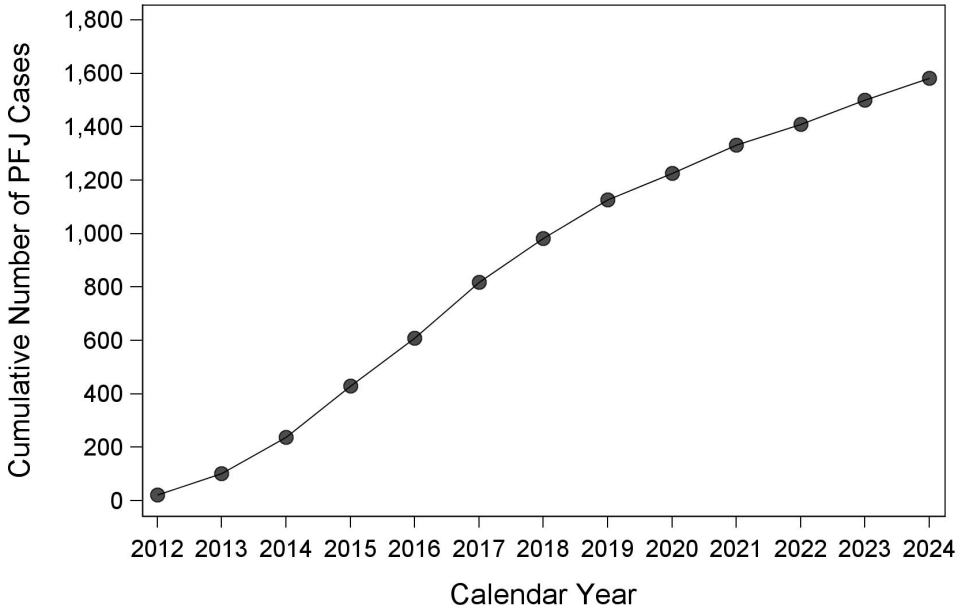


Figure 63. Primary PFJ Cases Over Time

Table 94. Primary PFJ Cases Over Time (Numerical Values)

Year	Annual cases	Cumulative cases
2012	22	22
2013	79	101
2014	136	237
2015	192	429
2016	180	609
2017	210	819
2018	164	983
2019	143	1,126
2020	101	1,227
2021	104	1,331
2022	78	1,409
2023	92	1,501
2024	80	1,581

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Table 95. Descriptive Statistics of Primary PFJ Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,186	75	
Age (years)	1,581	53.7 (12.5)	53 (17)
Height (cm)	1,579	168.6 (10)	167.6 (12.7)
Weight (kg)	1,579	87.5 (20.2)	85.9 (28.1)
BMI (kg/m^2)	1,579	30.7 (6.2)	30.1 (8.3)
Smoker - Never (%)	816	51.6	
Smoker - Previous (%)	471	29.8	
Smoker - Current (%)	236	14.9	
Smoker - Unknown (%)	58	3.7	

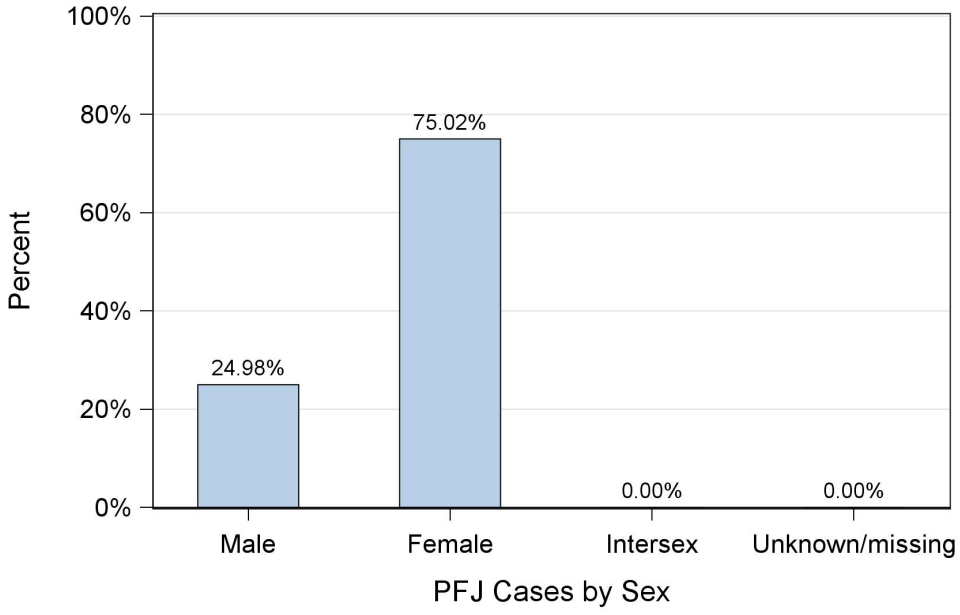


Figure 64. Percent of Primary PFJ Cases by Sex

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Figure 65. Age Distribution of Primary PFJ Cases by Sex

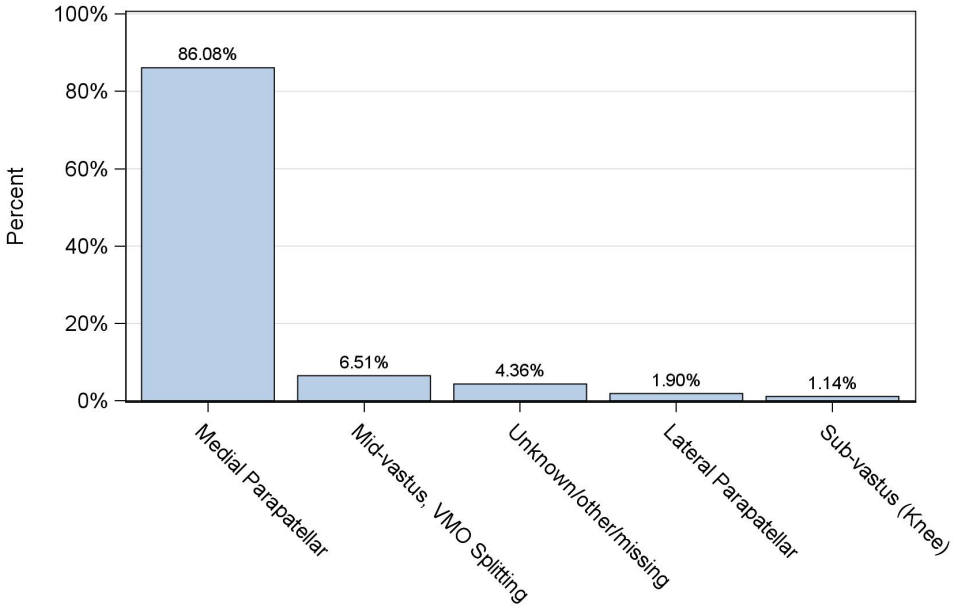


Figure 66. Percent of Primary PFJ Cases by Approach

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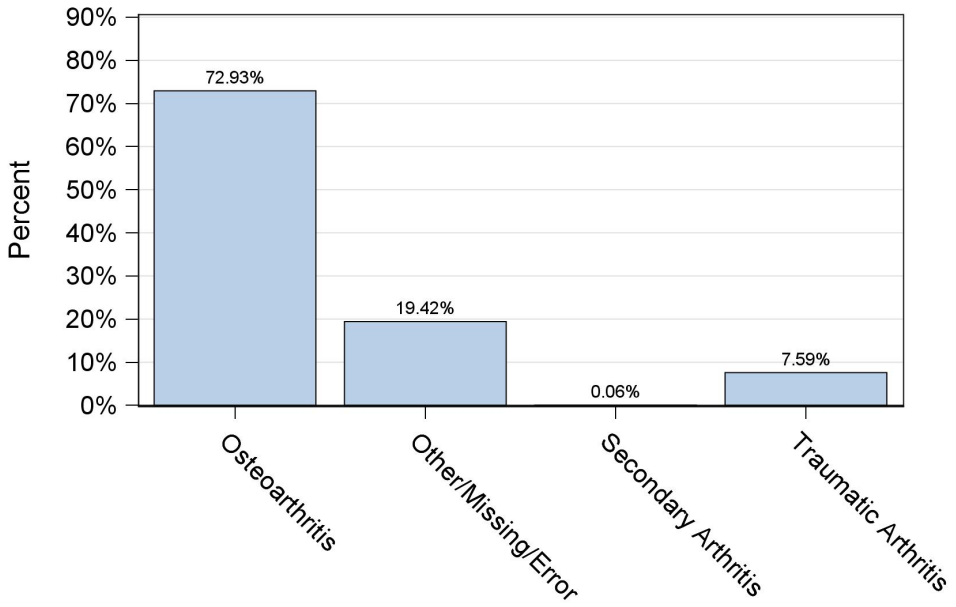


Figure 67. Percent of Primary PFJ Cases by Diagnosis

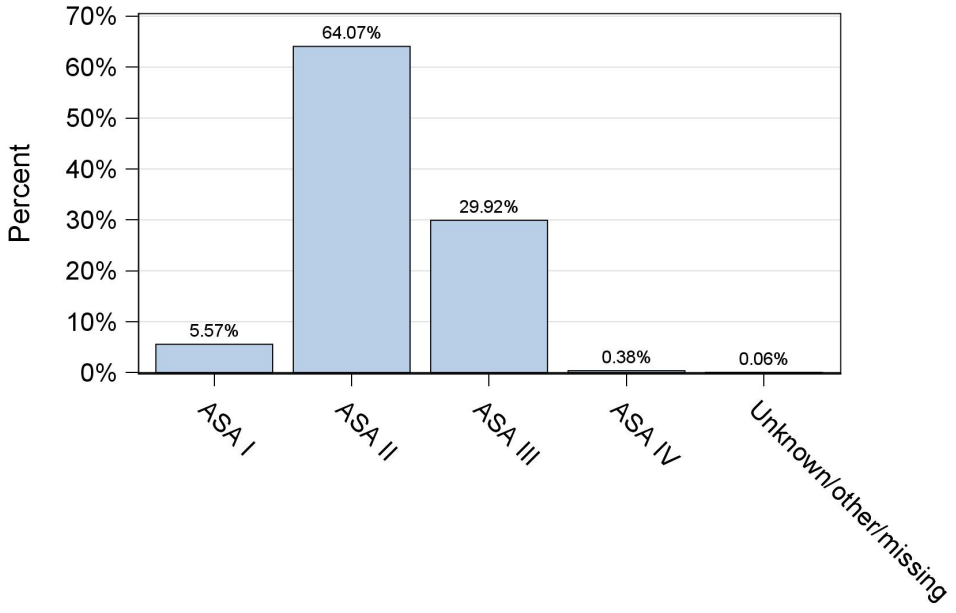


Figure 68. Percent of Primary PFJ Cases by ASA Class

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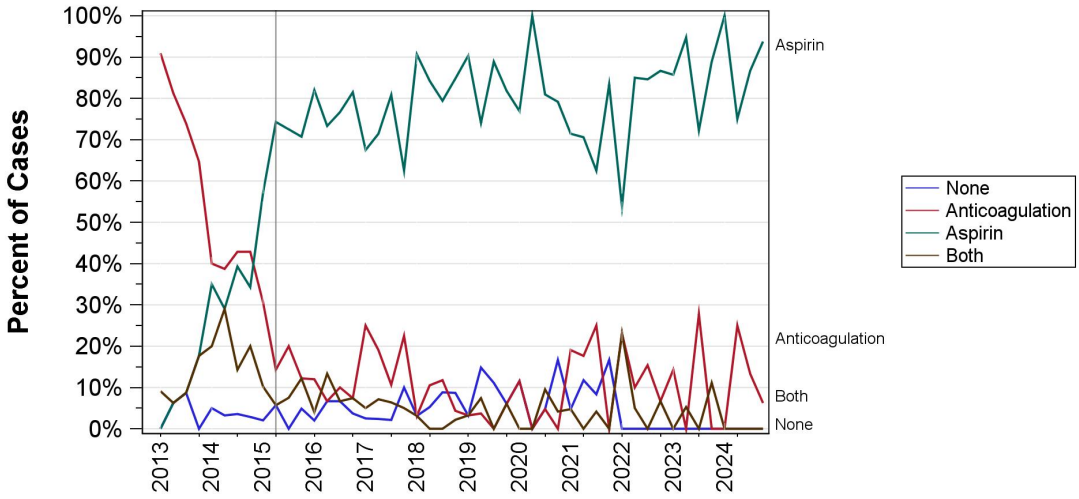


Figure 69. Percent of Primary PFJ Patients (First Case) by Thrombosis Prophylaxis

2.4.2 Revision Risk (Overall and by Sex)

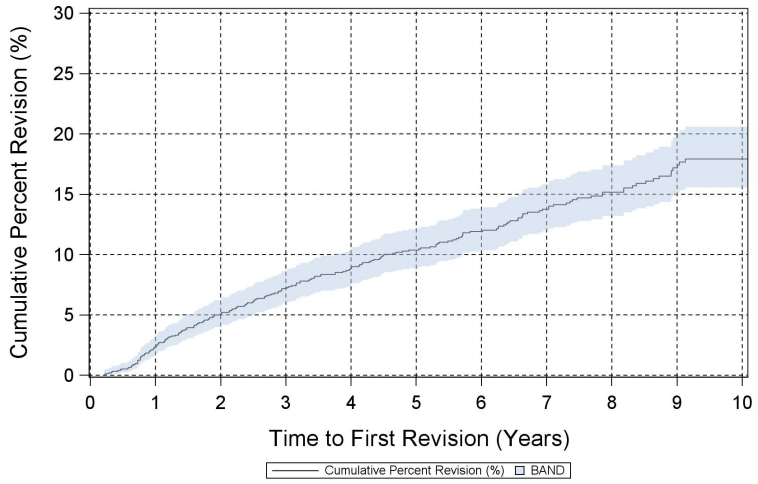


Figure 70. Cumulative Percent Revision for Primary PFJ

Table 96. Cumulative Percent Revision for Primary PFJ (Numerical Values)

	1 year	3 years	5 years	7 years	10 years
CPR	2.30 (1.66,3.20)	7.19 (5.97,8.65)	10.37 (8.87,12.12)	13.76 (11.94,15.83)	17.92 (15.56,20.59)
Number at risk	1,460	1,225	995	686	189

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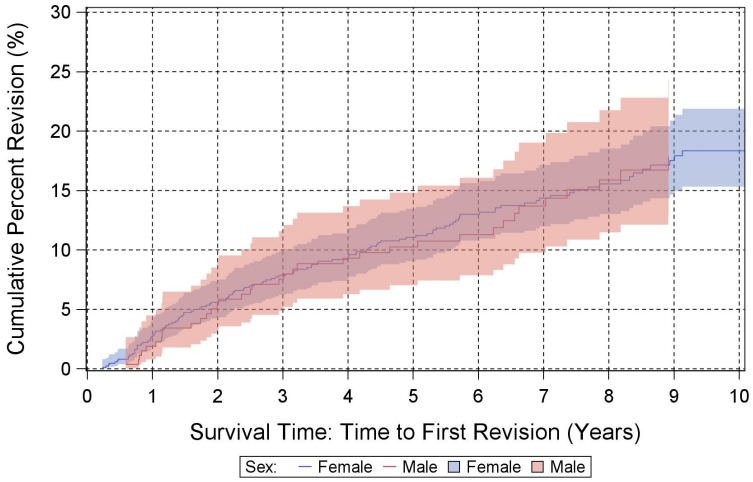


Figure 71. Cumulative Percent Revision for Primary PFJ by Sex for Osteoarthritis Diagnosis

Table 97. Cumulative Percent Revision for Primary PFJ by Sex for Osteoarthritis Diagnosis (Numerical Values)

	N	1 year	3 years	5 years	7 years	10 years
Female	873	2.70 (1.80,4.03)	7.86 (6.22,9.92)	11.06 (9.06,13.46)	14.36 (11.99,17.15)	18.34 (15.32,21.88)
Male	275	1.90 (0.79,4.50)	7.54 (4.87,11.58)	10.25 (7.03,14.82)	13.69 (9.77,19.02)	17.84 (12.93,24.35)
Unknown/Missing	0					

2.4.3 Reasons for Revision

The reasons for revision are of central importance to quality improvement because it helps focus attention on specific causes that may be addressed. Therefore, the data are presented in two formats below: tabular and Pareto chart. The tabular format is consistent with how other arthroplasty registries report the cause(s) of revision. The Pareto chart figure presents the same data in a format commonly used in quality improvement. The Pareto chart sorts the reasons for revision by frequency (bar chart on the bottom, from left to right) and presents a cumulative percent using a line graph above.

It is important to note that the time window for the cases reported in the reasons for revision tables and figure differs from the time window used for other figures because the reason for revision was added to the database on 1/1/2015. While these data capture revisions for primaries performed back to 2/15/2012, only revisions occurring on or after 1/1/2015 are included in the reasons for revision figure and tables. Note that for knees, instability/dislocation should be interpreted as instability.

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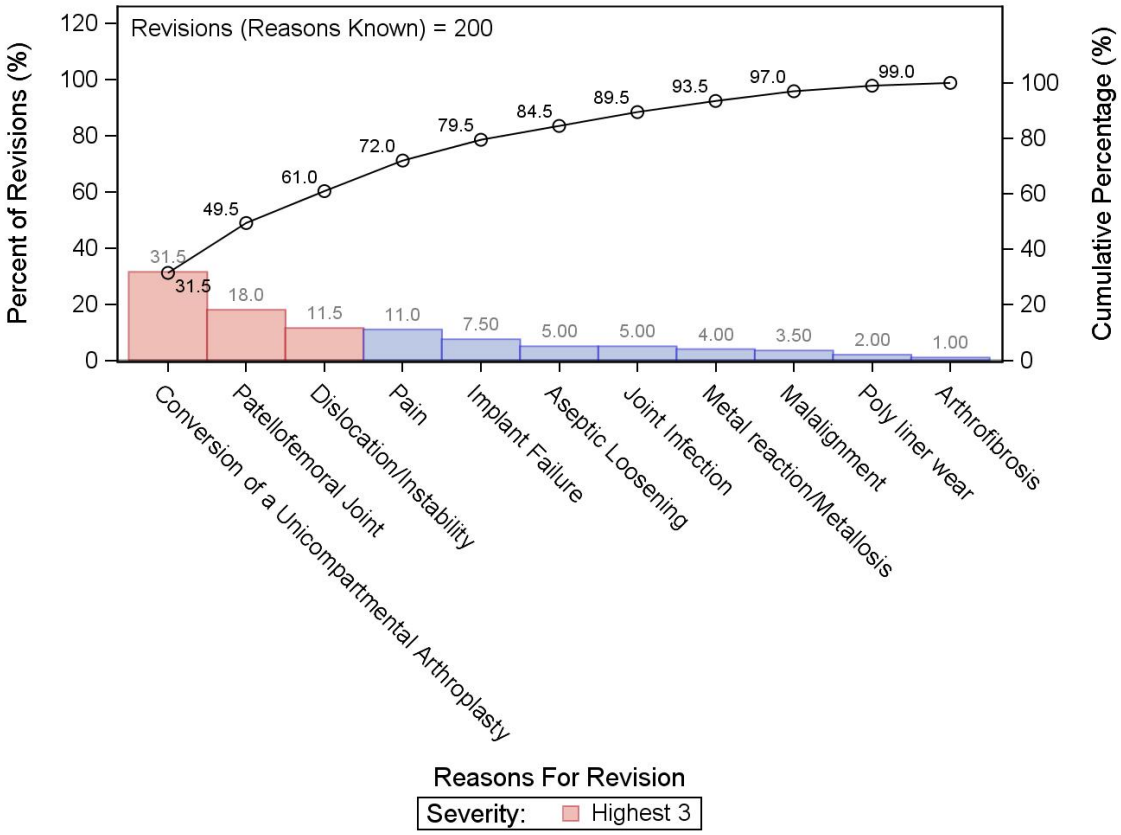


Figure 72. Most Common Reasons for First Revision Following Primary PFJ (Pareto Chart)

Table 98. Reasons for First Revision Following Primary PFJ

Rank	Reason for Revision	N	Percent
1	Conversion of a Unicompartmental Arthroplasty	63	31.5
2	Patellofemoral Joint	36	18.0
3	Dislocation/Instability	23	11.5
4	Pain	22	11.0
5	Implant Failure	15	7.5
6	Aseptic Loosening	10	5.0
7	Joint Infection	10	5.0
8	Metal Reaction/Metallosis	8	4.0
9	Malalignment	7	3.5
10	Poly liner wear	4	2.0
	Unknown/missing/other	2	1.0

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Table 99. Reasons for First Revision Following Primary PFJ in First Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Conversion of a Unicompartmental Arthroplasty	7	20.6
2	Patellofemoral Joint	6	17.6
3	Malalignment	4	11.8
4	Aseptic Loosening	3	8.8
5	Dislocation/Instability	3	8.8
6	Implant Failure	3	8.8
7	Pain	3	8.8
8	Joint Infection	2	5.9
9	Metal Reaction/Metallosis	2	5.9
10	Arthrofibrosis	1	2.9

Table 100. Reasons for First Revision Following Primary PFJ in Second Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Conversion of a Unicompartmental Arthroplasty	10	25.6
2	Pain	8	20.5
3	Patellofemoral Joint	7	17.9
4	Dislocation/Instability	4	10.3
5	Joint Infection	4	10.3
6	Implant Failure	3	7.7
7	Metal Reaction/Metallosis	2	5.1
8	Malalignment	1	2.6

Table 101. Reasons for First Revision Following Primary PFJ in Third Year Post-operatively

Rank	Reason for Revision	N	Percent
1	Conversion of a Unicompartmental Arthroplasty	7	24.1
2	Dislocation/Instability	5	17.2
3	Patellofemoral Joint	4	13.8
4	Implant Failure	3	10.3
5	Metal Reaction/Metallosis	3	10.3
6	Joint Infection	2	6.9
7	Pain	2	6.9
8	Aseptic Loosening	1	3.4
9	Poly liner wear	1	3.4
10	Malalignment	1	3.4

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2.4.4 Most Commonly Used Implants

Table 102. Ten Most Commonly Used Trochlear Components in Primary PFJ

Rank	Component	N	Percent
1	Gender Solutions PFJ	531	33.6
2	Restoris MCK	432	27.3
3	iBalance	289	18.3
4	HemiCAP	119	7.5
5	Competitor PFJ	103	6.5
6	Avon	53	3.4
7	Sigma HP	38	2.4
8	Vanguard PFR	16	1.0

2.4.5 Revision Risk by Implant Summary

Table 103. Cumulative Percent Revision Following Primary PFJ for Implants Having at Least 500 Primary Cases

Implant	N*	1 year	3 years	5 years	7 years	10 years
Gender Solutions PFJ	531	1.36 (0.65,2.84)	6.05 (4.24,8.59)	9.19 (6.83,12.31)	14.07 (10.82,18.20)	17.45 (13.37,22.61)

* Number of patients that contribute to survival analysis used to compute cumulative percent revision.

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Chapter 3

Implant-specific Data

3.1 Conventional THA Stem/Cup Combinations

The discrepancy between the number of cases listed at the beginning of an implant combination and N at year 0 in the table following the CPR figures is due to deaths. The former number is the total number of cases; the latter is the number of cases used to estimate the CPR, considering deaths as censored events.

3.1.1 Accolade C/Trident II

N = 1,190 primary cases were used for this analysis. Distribution of utilization: 67 surgeons across 39 sites used this implant combination in primary THA cases.

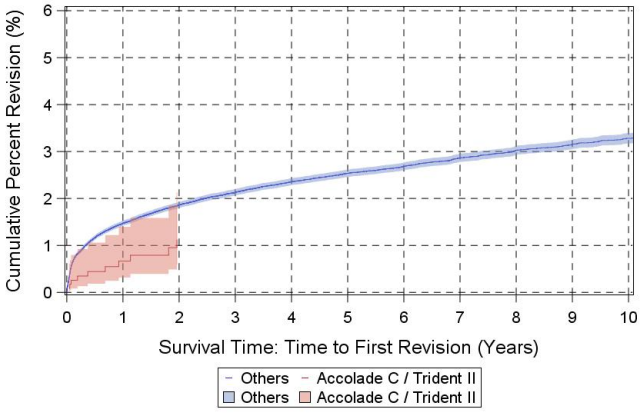


Figure 73. Cumulative Percent Revision Curve for the Accolade C/Trident II Combination, Compared to All Other Implant Combinations in Primary THA Cases

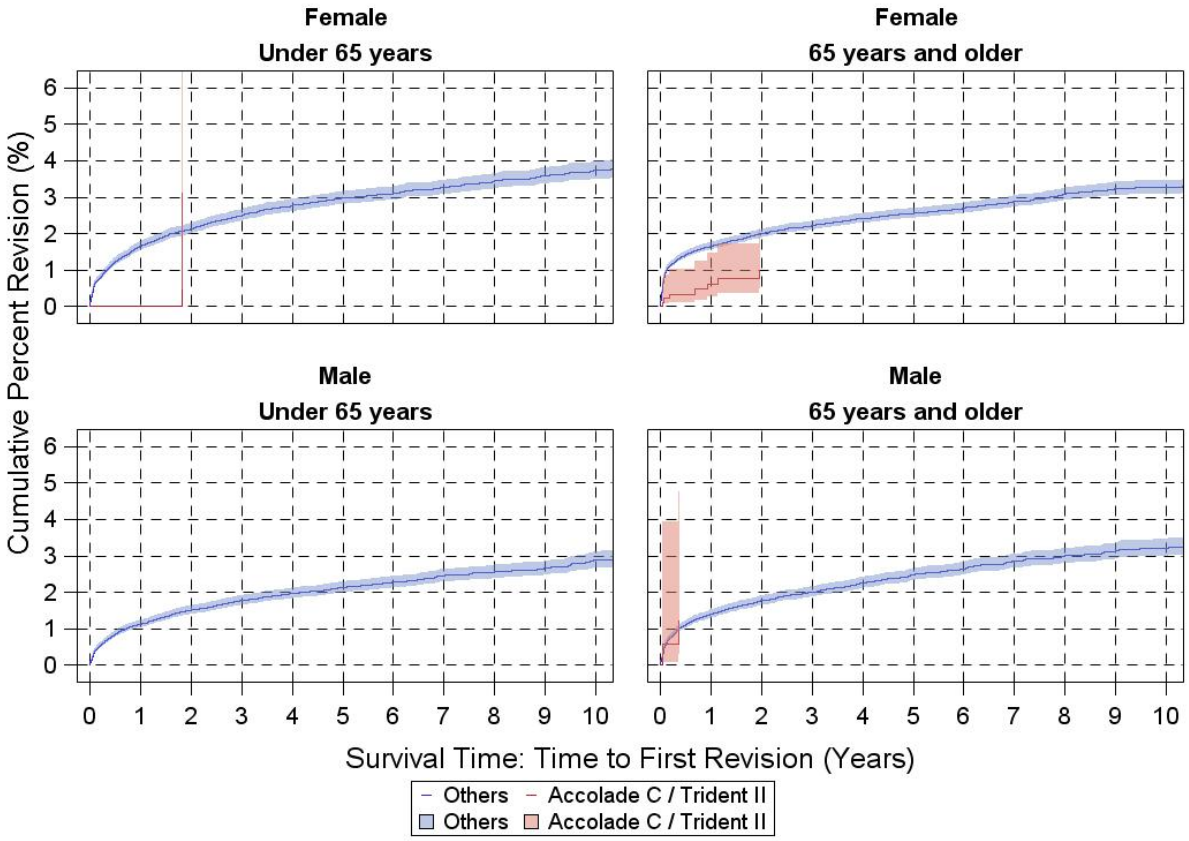


Figure 74. Cumulative Percent Revision Curve for the Accolade C/Trident II Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 104. Cumulative Percent Revision and Number at Risk for the Accolade C/Trident II Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,176	0.00 (0.00,0.00)	61	0.00 (0.00,0.00)	930	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	179	0.00 (0.00,0.00)
1	830	0.67 (0.32,1.40)	39	0.00 (0.00,0.00)	652	0.61 (0.25,1.47)	*	0.00 (0.00,0.00)	135	1.21 (0.30,4.75)
2	562	1.13 (0.59,2.13)	31	3.13 (0.45,20.18)	436	1.00 (0.46,2.14)	*	0.00 (0.00,0.00)	92	1.21 (0.30,4.75)
3	333	1.13 (0.59,2.13)	23	3.13 (0.45,20.18)	255	1.00 (0.46,2.14)	*	0.00 (0.00,0.00)	54	1.21 (0.30,4.75)
4	162	1.13 (0.59,2.13)	11	3.13 (0.45,20.18)	121	1.00 (0.46,2.14)	*	0.00 (0.00,0.00)	29	1.21 (0.30,4.75)
5	56	1.13 (0.59,2.13)	*	3.13 (0.45,20.18)	40	1.00 (0.46,2.14)	0	N/A	11	1.21 (0.30,4.75)
6	15	1.13 (0.59,2.13)	*	3.13 (0.45,20.18)	11	1.00 (0.46,2.14)	0	N/A	*	1.21 (0.30,4.75)
7	*	1.13 (0.59,2.13)	0	N/A	*	1.00 (0.46,2.14)	0	N/A	*	1.21 (0.30,4.75)
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 105. Reasons for First Revision Following Primary THA for Accolade C/Trident II Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	5	50.0
2	Aseptic Loosening	3	30.0
3	Dislocation/Instability	1	10.0
4	Peri-prosthetic fracture - Acetabulum	1	10.0

Table 106. Reasons for First Revision in the First 90 Days Following Primary THA for Accolade C/Trident II Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	25.0
2	Dislocation/Instability	1	25.0
3	Joint Infection	1	25.0
4	Peri-prosthetic fracture - Acetabulum	1	25.0

Table 107. Reasons for First Revision Between 91 and 365 days Following Primary THA for Accolade C/Trident II Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	3	100.0

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Table 108. Descriptive Statistics of Cases Receiving the Accolade C/Trident II Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,001	84.12	
Age (years)	1,190	77.32 (7.85)	78.00 (10.00)
Height (cm)	1,190	163.07 (8.69)	162.56 (10.16)
Weight (kg)	1,190	75.41 (17.54)	73.02 (23.80)
BMI(kg/m^2)	1,190	28.33 (6.16)	27.45 (8.11)
Smoker - Never (%)	668	56.13	
Smoker - Previous (%)	432	36.3	
Smoker - Current (%)	79	6.64	
Smoker - Unknown (%)	11	0.92	

Table 109. Distribution of Approach Used for Accolade C/Trident II Combination in Primary THA Cases

Approach	N	Percent
Anterior	308	25.9
Anterolateral	152	12.8
Posterior	726	61.0
Transtrochanteric	1	0.1
Missing/unknown/other	3	0.2

Table 110. Distribution of Head Size for Accolade C/Trident II Combination in Primary THA Cases

Size (mm)	N	Percent
22	1	0.1
28	1	0.1
32	45	5.0
36	763	85.5
40	73	8.2
44	4	0.5
Missing/unknown/other	5	0.6

Table 111. Distribution of Bearing Surface for Accolade C/Trident II Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	86	7.2
Ceramic-on-plastic	801	67.3
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	278	23.4
Missing/unknown/other	25	2.1

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Table 112. Distribution of Polyethylene Used for Accolade C/Trident II Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,142	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 113. Volume of Cases by Surgeon and Site for the Accolade C/Trident II Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	17 (23)	6 (21)
Cases per site	30 (36)	11 (40)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

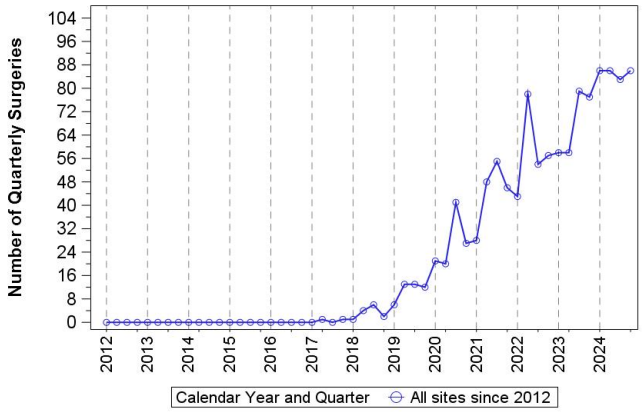


Figure 75. Utilization of the Accolade C/Trident II Combination in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

60570435D	60570637D	60580740D
60570537D	60570740D	60580230D
60570335D	60580637D	
60580435D	60580335D	
60580537D	60570230D	

Catalog numbers of Acetabular Cups Used in the Analysis

7020452E	7020456F	7020458F
7020450D	7021152E	7020446C
7020448D	7021150D	7000452E
7020454E	7021148D	7000450D

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7090448D	7021158F	7020444B
7021154E	7090454E	7021160G
7021156F	7000458F	7090446C
7020460G	7021146C	7090468I
7090450D	7090456F	7090470I
7090452E	7090458F	7421152E
7000448D	7000446C	
7000456F	7020462G	
7000454E	7090462G	

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3.1.2 Accolade II/Trident

N = 21,227 primary cases were used for this analysis. Distribution of utilization: 128 surgeons across 50 sites used this implant combination in primary THA cases.

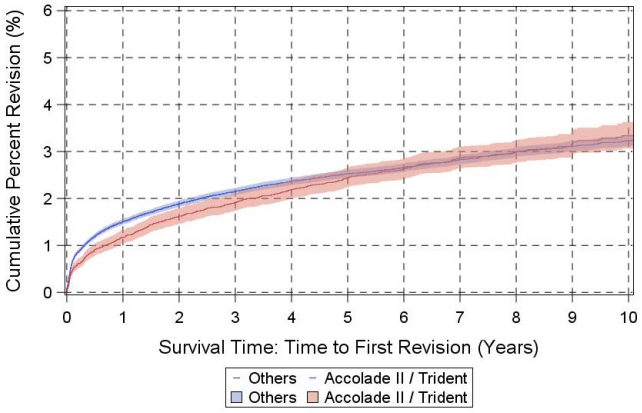


Figure 76. Cumulative Percent Revision Curve for the Accolade II/Trident Combination, Compared to All Other Implant Combinations in Primary THA Cases

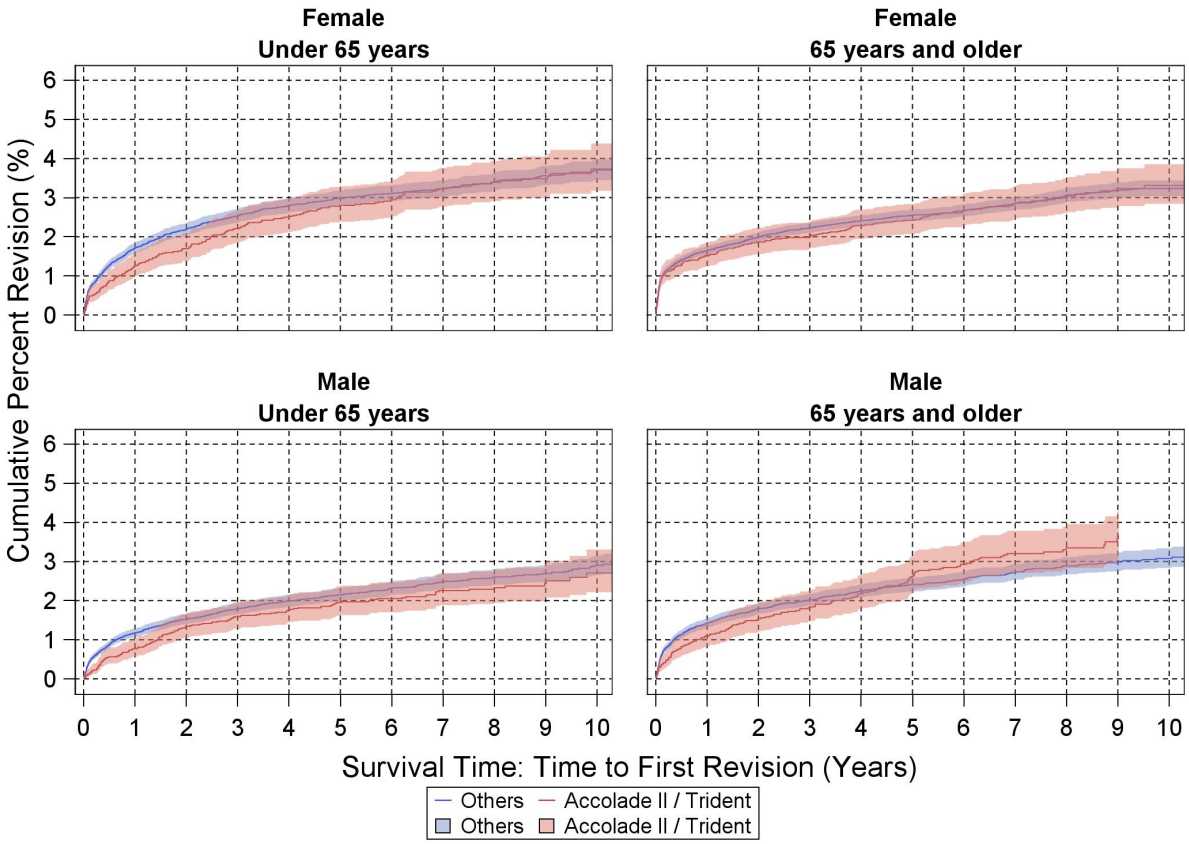


Figure 77. Cumulative Percent Revision Curve for the Accolade II/Trident Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 114. Cumulative Percent Revision and Number at Risk for the Accolade II/Trident Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	21,076	0.00 (0.00,0.00)	5,133	0.00 (0.00,0.00)	6,273	0.00 (0.00,0.00)	5,305	0.00 (0.00,0.00)	4,359	0.00 (0.00,0.00)
1	20,820	1.18 (1.04,1.33)	5,065	1.25 (0.98,1.59)	6,174	1.51 (1.24,1.85)	5,264	0.77 (0.57,1.05)	4,311	1.10 (0.83,1.46)
2	20,632	1.62 (1.46,1.80)	5,028	1.70 (1.38,2.09)	6,112	1.87 (1.56,2.23)	5,216	1.34 (1.06,1.69)	4,270	1.54 (1.21,1.95)
3	20,399	1.92 (1.74,2.11)	4,977	2.21 (1.84,2.65)	6,033	2.01 (1.69,2.39)	5,170	1.59 (1.28,1.96)	4,213	1.84 (1.48,2.28)
4	20,106	2.19 (2.00,2.39)	4,908	2.52 (2.13,2.99)	5,934	2.29 (1.95,2.69)	5,132	1.76 (1.44,2.15)	4,126	2.17 (1.77,2.65)
5	19,601	2.44 (2.24,2.66)	4,778	2.80 (2.38,3.29)	5,780	2.42 (2.07,2.84)	5,026	1.95 (1.61,2.36)	4,011	2.62 (2.19,3.15)
6	17,319	2.64 (2.43,2.86)	4,258	2.95 (2.52,3.46)	5,118	2.67 (2.30,3.10)	4,443	2.05 (1.70,2.47)	3,494	2.93 (2.46,3.48)
7	13,686	2.86 (2.64,3.10)	3,431	3.22 (2.77,3.75)	4,059	2.84 (2.45,3.29)	3,486	2.26 (1.88,2.70)	2,705	3.20 (2.71,3.78)
8	9,570	3.00 (2.77,3.25)	2,423	3.39 (2.91,3.94)	2,776	3.01 (2.60,3.48)	2,499	2.33 (1.94,2.79)	1,867	3.35 (2.83,3.96)
9	5,679	3.16 (2.92,3.43)	1,479	3.48 (2.99,4.05)	1,648	3.23 (2.78,3.75)	1,452	2.44 (2.03,2.93)	1,095	3.59 (3.02,4.27)
10	2,942	3.34 (3.06,3.63)	765	3.73 (3.18,4.38)	848	3.31 (2.84,3.86)	752	2.71 (2.22,3.31)	573	3.68 (3.09,4.38)

Table 115. Reasons for First Revision Following Primary THA for Accolade II/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	178	29.2
2	Peri-prosthetic fracture - Femur	124	20.3
3	Joint Infection	114	18.7
4	Dislocation/Instability	82	13.4
5	Pain	32	5.2
6	Metal Reaction/Metallosis	29	4.8
7	Implant Failure	19	3.1
8	Malalignment	18	3.0
9	Peri-prosthetic fracture - Acetabulum	12	2.0
10	Osteolysis	2	0.3

Table 116. Reasons for First Revision in the First 90 Days Following Primary THA for Accolade II/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	72	55.4
2	Dislocation/Instability	16	12.3
3	Joint Infection	13	10.0
4	Aseptic Loosening	11	8.5
5	Implant Failure	8	6.2
6	Peri-prosthetic fracture - Acetabulum	4	3.1
7	Pain	3	2.3
8	Malalignment	3	2.3

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Table 117. Reasons for First Revision Between 91 and 365 days Following Primary THA for Accolade II/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	32	30.2
2	Dislocation/Instability	23	21.7
3	Aseptic Loosening	21	19.8
4	Pain	13	12.3
5	Peri-prosthetic fracture - Femur	12	11.3
6	Implant Failure	2	1.9
7	Peri-prosthetic fracture - Acetabulum	2	1.9
8	Malalignment	1	0.9

Table 118. Descriptive Statistics of Cases Receiving the Accolade II/Trident Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	11,472	54.04	
Age (years)	21,227	64.28 (11.02)	65.00 (14.00)
Height (cm)	21,227	170.07 (10.32)	170.00 (15.24)
Weight (kg)	21,227	88.56 (21.07)	86.60 (28.32)
BMI(kg/m^2)	21,227	30.51 (6.37)	29.74 (8.30)
Smoker - Never (%)	10,227	48.18	
Smoker - Previous (%)	8,058	37.96	
Smoker - Current (%)	2,847	13.41	
Smoker - Unknown (%)	95	0.45	

Table 119. Distribution of Approach Used for Accolade II/Trident Combination in Primary THA Cases

Approach	N	Percent
Anterior	6,474	30.5
Anterolateral	3320	15.6
Posterior	11,369	53.6
Transtrochanteric	18	0.1
Missing/unknown/other	46	0.2

Table 120. Distribution of Head Size for Accolade II/Trident Combination in Primary THA Cases

Size (mm)	N	Percent
22	10	0.1
28	34	0.2
32	3,672	18.9
36	14,435	74.3
40	1,123	5.8
44	108	0.6
Missing/unknown/other	54	0.3

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Table 121. Distribution of Bearing Surface for Accolade II/Trident Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	3,485	16.4
Ceramic-on-plastic	15,883	74.8
Ceramic-on-ceramic	16	0.1
Metal-on-metal	0	0.0
Dual mobility	1,748	8.2
Missing/unknown/other	95	0.5

Table 122. Distribution of Polyethylene Used for Accolade II/Trident Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	21,152	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	2	0.0

Table 123. Volume of Cases by Surgeon and Site for the Accolade II/Trident Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	165 (292)	21 (191)
Cases per site	424 (667)	119 (589)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

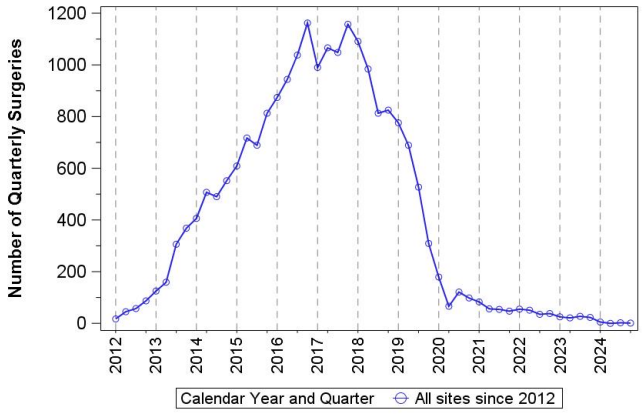


Figure 78. Utilization of the Accolade II/Trident Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

67210535	67210837	67200127
67210635	67200737	67201040
67210435	67210937	67211140
67210737	67200837	67210027
67200535	67210230	67201140
67200435	67200230	67200027
67210330	67200937	
67200635	67211040	
67200330	67210127	

Catalog numbers of Acetabular Cups Used in the Analysis

5020354E	5000352D	5421162H
5021152E	5000350D	5000348C
5021154E	5020156F	5021144B
5421150E	5090254E	5081158F
5020350D	5000152E	5000364G
5021156F	5021146C	5021166H
5020352D	5001152E	5401146D
5020356E	5020364G	5401162H
5021150D	5421160G	5081160G
5020358F	5401160G	5020154E
5021158F	5090256E	5090268H
5421154F	5000154E	5001148D
5021148D	5021164H	5090266H
5020360F	5081152E	5421164H
5421146D	5020158F	5020162G
5021160G	5401148D	5401164H
5421152E	5000148D	5421142B
5421148D	5020148D	5081146C
5421156F	5090258F	5081162G
5000354E	5000150D	5090270I
5401150E	5081150D	5021168I
5020348C	5000362G	5090272I
5020362G	5000156F	5000146C
5421158G	5020346B	5000160G
5401152E	5081148D	5000164H
5021162G	5020160G	5001158F
5401154F	5090262G	5020344A
5421144C	5081154E	5401144C
5000356E	5090264G	5401166I
5000358F	5081156F	5421168I
5401156F	5090260F	65C3248
5020152E	5020366H	65C3252
5401158G	5020150D	
5000360F	5000158F	

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3.1.3 Accolade II/Trident II

N = 21,931 primary cases were used for this analysis. Distribution of utilization: 126 surgeons across 62 sites used this implant combination in primary THA cases.

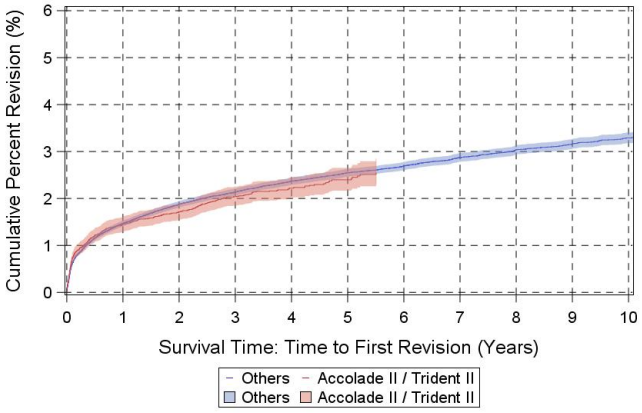


Figure 79. Cumulative Percent Revision Curve for the Accolade II/Trident II Combination, Compared to All Other Implant Combinations in Primary THA Cases

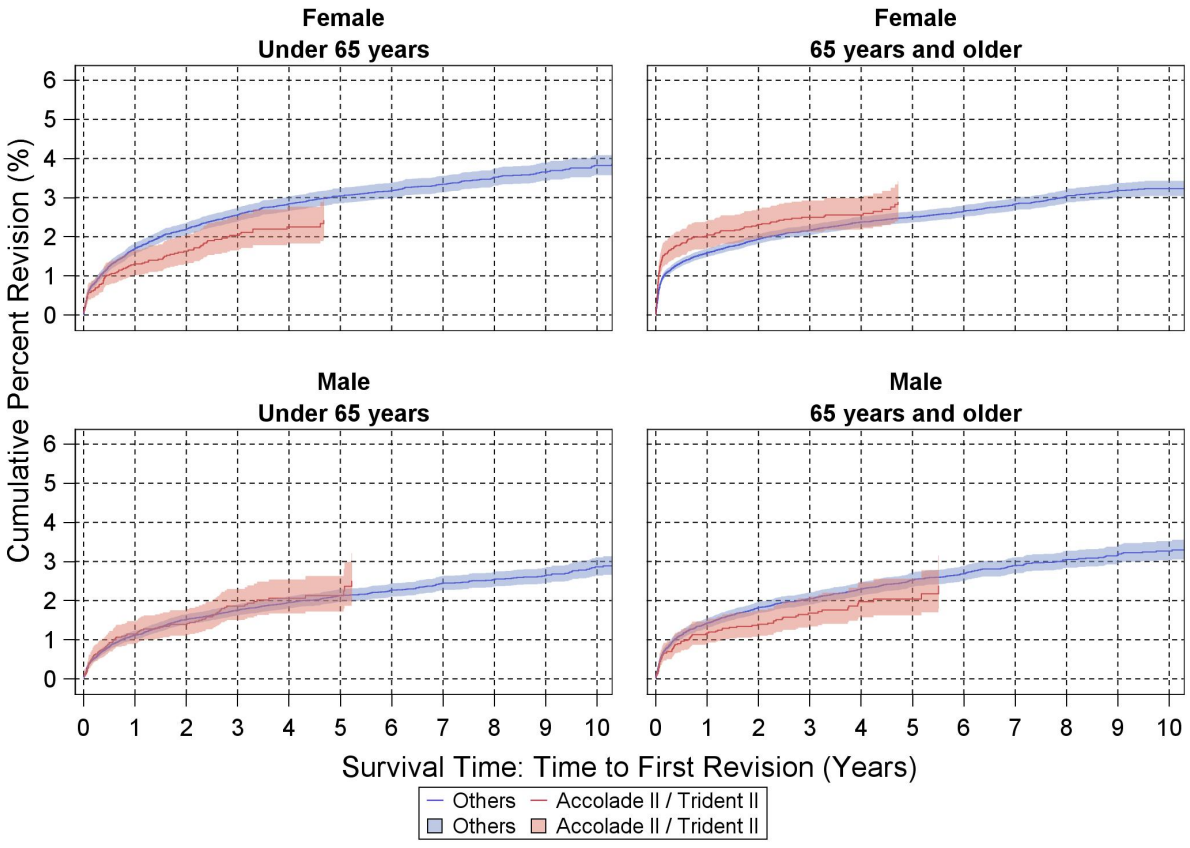


Figure 80. Cumulative Percent Revision Curve for the Accolade II/Trident II Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 124. Cumulative Percent Revision and Number at Risk for the Accolade II/Trident II Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	21,869	0.00 (0.00,0.00)	4,913	0.00 (0.00,0.00)	6,342	0.00 (0.00,0.00)	5,407	0.00 (0.00,0.00)	5,203	0.00 (0.00,0.00)
1	19,010	1.45 (1.30,1.62)	4,313	1.30 (1.02,1.67)	5,599	2.05 (1.72,2.43)	4,678	1.15 (0.89,1.48)	4,418	1.18 (0.91,1.51)
2	15,684	1.71 (1.55,1.90)	3,542	1.63 (1.30,2.04)	4,710	2.31 (1.96,2.72)	3,845	1.39 (1.10,1.75)	3,585	1.40 (1.10,1.77)
3	11,675	2.04 (1.85,2.25)	2,632	2.04 (1.65,2.51)	3,615	2.50 (2.13,2.93)	2,786	1.86 (1.50,2.30)	2,641	1.68 (1.34,2.11)
4	7,539	2.22 (2.01,2.45)	1,715	2.25 (1.83,2.77)	2,329	2.56 (2.18,3.00)	1,777	2.06 (1.67,2.54)	1,718	1.97 (1.57,2.47)
5	3,948	2.40 (2.17,2.65)	925	2.43 (1.95,3.01)	1,233	2.89 (2.44,3.42)	920	2.13 (1.72,2.63)	870	2.04 (1.62,2.56)
6	1,206	2.56 (2.29,2.85)	269	2.43 (1.95,3.01)	384	2.89 (2.44,3.42)	288	2.51 (1.96,3.21)	265	2.38 (1.80,3.15)
7	176	2.56 (2.29,2.85)	45	2.43 (1.95,3.01)	53	2.89 (2.44,3.42)	39	2.51 (1.96,3.21)	39	2.38 (1.80,3.15)
8	13	2.56 (2.29,2.85)	*	2.43 (1.95,3.01)	*	2.89 (2.44,3.42)	*	2.51 (1.96,3.21)	*	2.38 (1.80,3.15)
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 125. Reasons for First Revision Following Primary THA for Accolade II/Trident II Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	135	31.0
2	Joint Infection	111	25.5
3	Aseptic Loosening	66	15.2
4	Dislocation/Instability	65	14.9
5	Malalignment	17	3.9
6	Implant Failure	14	3.2
7	Pain	11	2.5
8	Peri-prosthetic fracture - Acetabulum	8	1.8
9	Metal Reaction/Metallosis	4	0.9
10	Osteolysis	2	0.5
	Unknown/missing/other	2	0.5

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Table 126. Reasons for First Revision in the First 90 Days Following Primary THA for Accolade II/Trident II Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	112	54.1
2	Joint Infection	39	18.8
3	Dislocation/Instability	26	12.6
4	Aseptic Loosening	9	4.4
5	Implant Failure	7	3.4
6	Malalignment	6	2.9
7	Peri-prosthetic fracture - Acetabulum	5	2.4
8	Pain	2	1.0
9	Metal Reaction/Metallosis	1	0.5

Table 127. Reasons for First Revision Between 91 and 365 days Following Primary THA for Accolade II/Trident II Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	36	35.3
2	Dislocation/Instability	22	21.6
3	Aseptic Loosening	18	17.6
4	Peri-prosthetic fracture - Femur	14	13.7
5	Malalignment	5	4.9
6	Pain	3	2.9
7	Osteolysis	1	1.0
8	Poly liner wear	1	1.0
9	Implant Failure	1	1.0
10	Peri-prosthetic fracture - Acetabulum	1	1.0

Table 128. Descriptive Statistics of Cases Receiving the Accolade II/Trident II Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	11,280	51.43	
Age (years)	21,931	64.44 (10.56)	65.00 (14.00)
Height (cm)	21,931	170.73 (10.42)	170.18 (15.20)
Weight (kg)	21,931	89.59 (20.71)	88.00 (27.60)
BMI(kg/m^2)	21,931	30.62 (6.07)	29.91 (8.11)
Smoker - Never (%)	10,982	50.08	
Smoker - Previous (%)	7,560	34.47	
Smoker - Current (%)	3,344	15.25	
Smoker - Unknown (%)	45	0.21	

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Table 129. Distribution of Approach Used for Accolade II/Trident II Combination in Primary THA Cases

Approach	N	Percent
Anterior	7,593	34.6
Anterolateral	1612	7.3
Posterior	12,667	57.8
Transtrochanteric	13	0.1
Missing/unknown/other	46	0.2

Table 130. Distribution of Head Size for Accolade II/Trident II Combination in Primary THA Cases

Size (mm)	N	Percent
22	9	0.1
28	22	0.1
32	1,792	9.7
36	14,798	79.9
40	1,730	9.3
44	123	0.7
Missing/unknown/other	57	0.3

Table 131. Distribution of Bearing Surface for Accolade II/Trident II Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	811	3.7
Ceramic-on-plastic	17,663	80.5
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	3,046	13.9
Missing/unknown/other	411	1.9

Table 132. Distribution of Polyethylene Used for Accolade II/Trident II Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	21,521	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 133. Volume of Cases by Surgeon and Site for the Accolade II/Trident II Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	174 (248)	74 (201)
Cases per site	353 (498)	136 (446)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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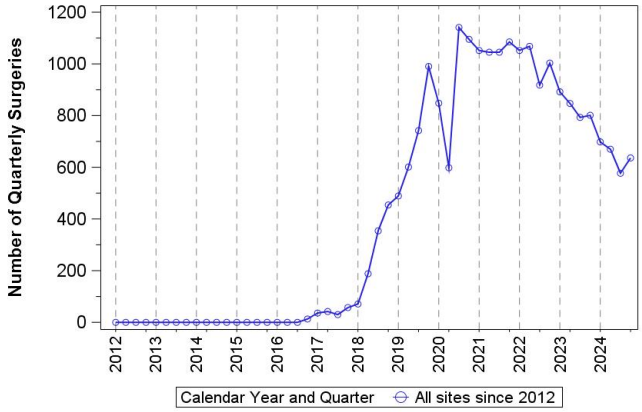


Figure 81. Utilization of the Accolade II/Trident II Combination in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

67210535	67200330	67201040
67210435	67200737	67211140
67210635	67210937	67200127
67210737	67210230	67210027
67210330	67200837	67201140
67200535	67200230	67200027
67200435	67211040	
67210837	67200937	
67200635	67210127	

Catalog numbers of Acetabular Cups Used in the Analysis

7020452E	7021160G	7421156F
7020454E	7090452E	7000446C
7020456F	7000450D	7000462G
7020450D	7000448D	7090462G
7020448D	7090454E	7020466H
7020458F	7090456F	7090464H
7021152E	7090448D	7021164H
7021150D	7021146C	7090446C
7021154E	7000460G	7421146C
7020460G	7020444B	7090468I
7021156F	7090450D	7421162G
7000452E	7021162G	7021144B
7021148D	7421152E	7021166H
7021158F	7020464H	7090466H
7020446C	7090458F	7421158F
7000454E	7421148D	7090470I
7000456F	7090460G	7421160G
7020462G	7421154E	7090472J
7000458F	7421150D	

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3.1.4 Accolade TMZF/Trident

N = 915 primary cases were used for this analysis. Distribution of utilization: 16 surgeons across 13 sites used this implant combination in primary THA cases.

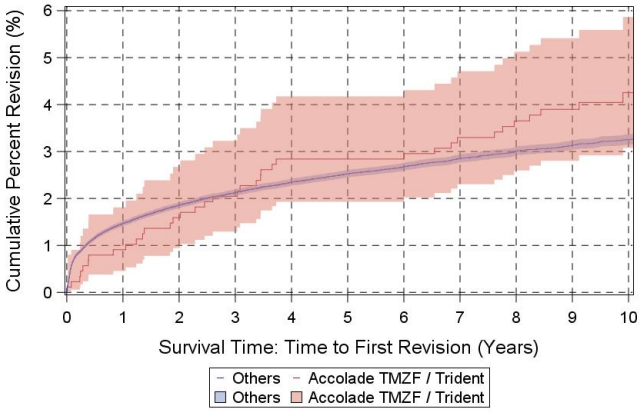


Figure 82. Cumulative Percent Revision Curve for the Accolade TMZF/Trident Combination, Compared to All Other Implant Combinations in Primary THA Cases

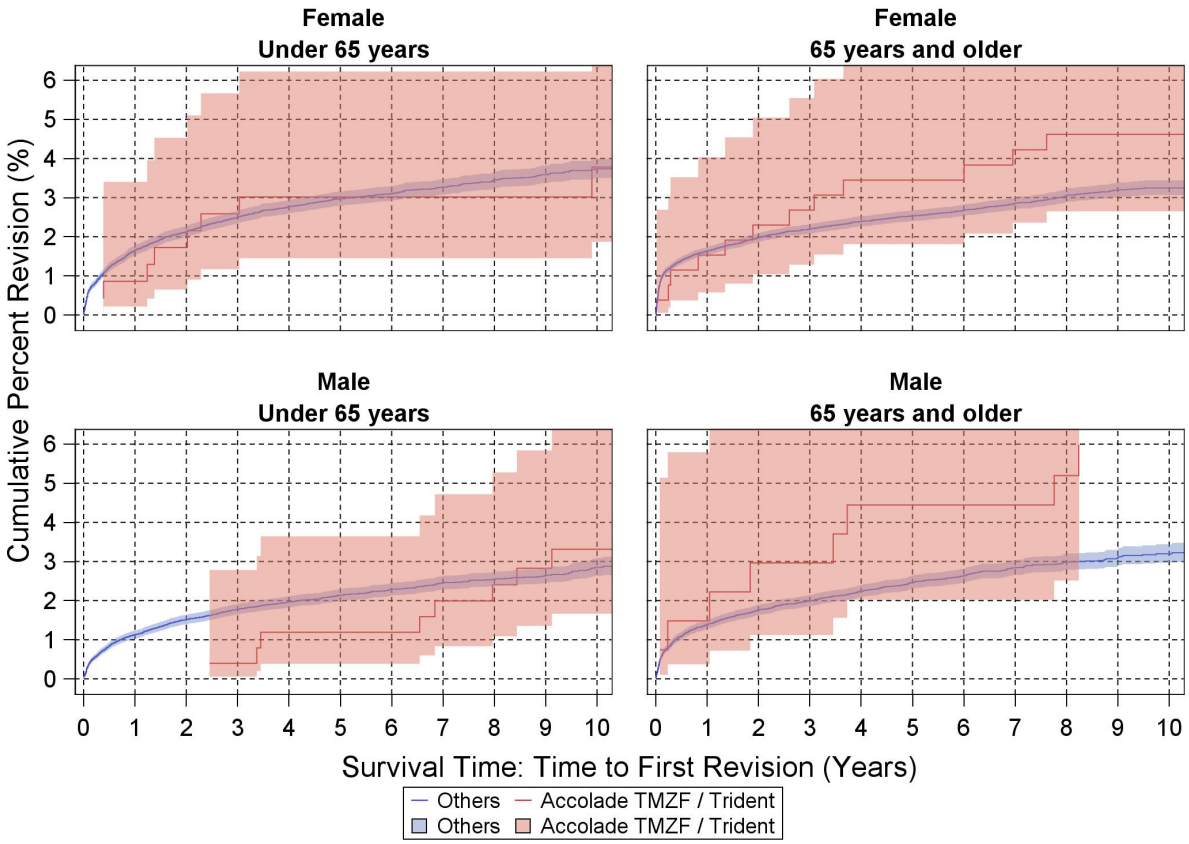


Figure 83. Cumulative Percent Revision Curve for the Accolade TMZF/Trident Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 134. Cumulative Percent Revision and Number at Risk for the Accolade TMZF/Trident Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	880	0.00 (0.00,0.00)	232	0.00 (0.00,0.00)	261	0.00 (0.00,0.00)	252	0.00 (0.00,0.00)	135	0.00 (0.00,0.00)
1	872	0.91 (0.46,1.81)	230	0.86 (0.22,3.40)	257	1.53 (0.58,4.03)	252	0.00 (0.00,0.00)	133	1.48 (0.37,5.79)
2	866	1.59 (0.95,2.67)	228	1.72 (0.65,4.53)	255	2.30 (1.04,5.05)	252	0.00 (0.00,0.00)	131	2.96 (1.12,7.70)
3	862	2.05 (1.29,3.23)	226	2.59 (1.17,5.67)	254	2.68 (1.29,5.54)	251	0.40 (0.06,2.78)	131	2.96 (1.12,7.70)
4	855	2.84 (1.93,4.18)	225	3.02 (1.45,6.22)	252	3.45 (1.81,6.52)	249	1.19 (0.39,3.65)	129	4.44 (2.02,9.62)
5	855	2.84 (1.93,4.18)	225	3.02 (1.45,6.22)	252	3.45 (1.81,6.52)	249	1.19 (0.39,3.65)	129	4.44 (2.02,9.62)
6	854	2.84 (1.93,4.18)	225	3.02 (1.45,6.22)	251	3.45 (1.81,6.52)	249	1.19 (0.39,3.65)	129	4.44 (2.02,9.62)
7	839	3.30 (2.30,4.71)	221	3.02 (1.45,6.22)	246	4.22 (2.36,7.49)	243	1.99 (0.83,4.72)	129	4.44 (2.02,9.62)
8	804	3.65 (2.60,5.13)	214	3.02 (1.45,6.22)	232	4.62 (2.65,7.99)	236	2.41 (1.09,5.28)	122	5.20 (2.51,10.59)
9	689	3.90 (2.80,5.41)	185	3.02 (1.45,6.22)	190	4.62 (2.65,7.99)	210	2.83 (1.36,5.84)	104	5.98 (3.04,11.61)
10	430	4.25 (3.08,5.87)	120	3.78 (1.87,7.56)	123	4.62 (2.65,7.99)	127	3.31 (1.67,6.53)	60	5.98 (3.04,11.61)

Table 135. Reasons for First Revision Following Primary THA for Accolade TMZF/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	11	33.3
2	Metal Reaction/Metallosis	8	24.2
3	Joint Infection	6	18.2
4	Dislocation/Instability	4	12.1
5	Peri-prosthetic fracture - Femur	3	9.1
6	Malalignment	1	3.0

Table 136. Reasons for First Revision in the First 90 Days Following Primary THA for Accolade TMZF/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	50.0
2	Peri-prosthetic fracture - Femur	1	50.0

Table 137. Reasons for First Revision Between 91 and 365 days Following Primary THA for Accolade TMZF/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	1	100.0

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Table 138. Descriptive Statistics of Cases Receiving the Accolade TMZF/Trident Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	508	55.52	
Age (years)	915	63.29 (11.20)	63.00 (16.00)
Height (cm)	915	169.96 (10.57)	170.00 (15.24)
Weight (kg)	915	90.26 (21.34)	89.40 (29.33)
BMI(kg/m^2)	915	31.09 (6.17)	30.49 (8.32)
Smoker - Never (%)	418	45.68	
Smoker - Previous (%)	353	38.58	
Smoker - Current (%)	128	13.99	
Smoker - Unknown (%)	16	1.75	

Table 139. Distribution of Approach Used for Accolade TMZF/Trident Combination in Primary THA Cases

Approach	N	Percent
Anterior	8	0.9
Anterolateral	138	15.1
Posterior	759	83.0
Transtrochanteric	3	0.3
Missing/unknown/other	7	0.8

Table 140. Distribution of Head Size for Accolade TMZF/Trident Combination in Primary THA Cases

Size (mm)	N	Percent
28	1	0.1
32	98	10.9
36	694	77.5
40	96	10.7
Missing/unknown/other	7	0.8

Table 141. Distribution of Bearing Surface for Accolade TMZF/Trident Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	497	54.3
Ceramic-on-plastic	389	42.5
Ceramic-on-ceramic	3	0.3
Metal-on-metal	0	0.0
Dual mobility	18	2.0
Missing/unknown/other	8	0.9

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Table 142. Distribution of Polyethylene Used for Accolade TMZF/Trident Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	908	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 143. Volume of Cases by Surgeon and Site for the Accolade TMZF/Trident Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	57 (134)	5 (14)
Cases per site	70 (104)	11 (122)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

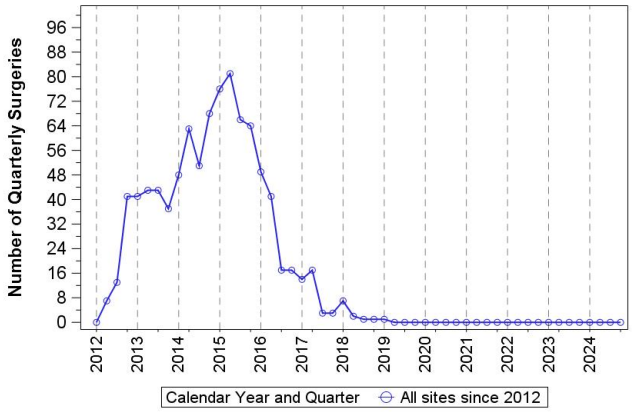


Figure 84. Utilization of the Accolade TMZF/Trident Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

60200335	60212530	60215537
60202530	60214535	60210130
60203535	60210435	60200637
60210335	60200537	60210637
60200230	60210537	60210740
60200435	60210230	60200030
60204535	60205537	60210030
60213535	60200130	

Catalog numbers of Acetabular Cups Used in the Analysis

5021152E	5421158G	5020350D
5021150D	5020158F	5020358F
5021154E	5421148D	5020362G
5021156F	5021162G	5090256E
5421150E	5020352D	5421160G
5421154F	5020356E	5000350D
5021158F	5421146D	5000360F
5020152E	5020154E	5020150D
5021160G	5020360F	5020160G
5021148D	5020148D	5020364G
5020156F	5021164H	5021146C
5421152E	5000352D	5421144C
5020354E	5000354E	
5421156F	5020348C	

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3.1.5 Actis DuoFix/Pinnacle

All Actis DuoFix implants included in this analysis are collared version. N = 10,119 primary cases were used for this analysis. Distribution of utilization: 67 surgeons across 41 sites used this implant combination in primary THA cases.

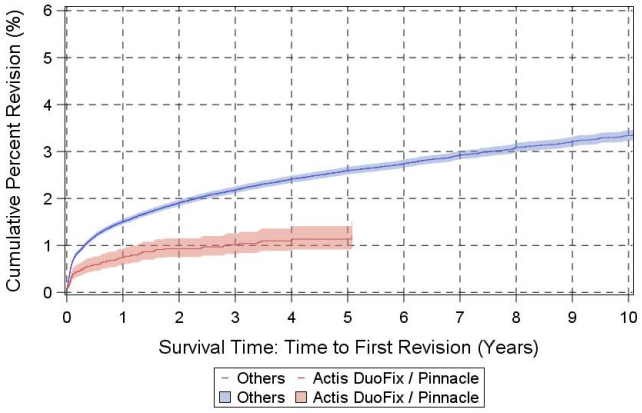


Figure 85. Cumulative Percent Revision Curve for the Actis DuoFix/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases

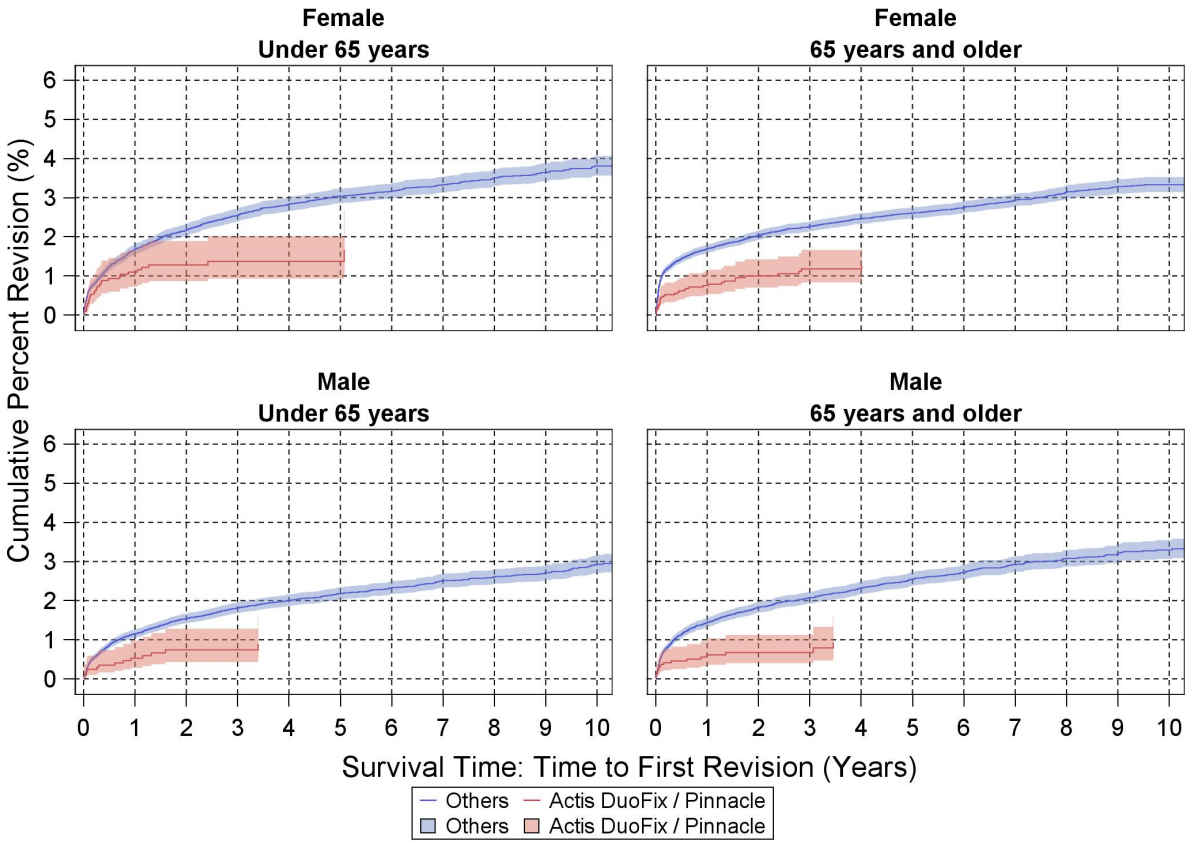


Figure 86. Cumulative Percent Revision Curve for the Actis DuoFix/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 144. Cumulative Percent Revision and Number at Risk for the Actis DuoFix/Pinnacle Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	10,090	0.00 (0.00,0.00)	2,117	0.00 (0.00,0.00)	3,487	0.00 (0.00,0.00)	2,040	0.00 (0.00,0.00)	2,446	0.00 (0.00,0.00)
1	7,779	0.75 (0.59,0.94)	1,695	1.10 (0.72,1.66)	2,685	0.75 (0.51,1.11)	1,592	0.53 (0.28,0.98)	1,807	0.61 (0.36,1.03)
2	5,577	0.93 (0.75,1.15)	1,257	1.28 (0.86,1.89)	1,999	1.00 (0.70,1.42)	1,084	0.74 (0.43,1.28)	1,237	0.67 (0.40,1.12)
3	4,037	1.02 (0.82,1.26)	897	1.37 (0.93,2.02)	1,518	1.18 (0.83,1.66)	755	0.74 (0.43,1.28)	867	0.67 (0.40,1.12)
4	2,678	1.10 (0.89,1.36)	599	1.37 (0.93,2.02)	1,081	1.18 (0.83,1.66)	468	0.89 (0.51,1.57)	530	0.93 (0.55,1.59)
5	1,606	1.13 (0.91,1.41)	349	1.37 (0.93,2.02)	690	1.27 (0.89,1.80)	280	0.89 (0.51,1.57)	287	0.93 (0.55,1.59)
6	607	1.20 (0.95,1.51)	119	1.67 (1.04,2.68)	285	1.27 (0.89,1.80)	98	0.89 (0.51,1.57)	105	0.93 (0.55,1.59)
7	40	1.20 (0.95,1.51)	*	1.67 (1.04,2.68)	20	1.27 (0.89,1.80)	*	0.89 (0.51,1.57)	*	0.93 (0.55,1.59)
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 145. Reasons for First Revision Following Primary THA for Actis DuoFix/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	33	35.5
2	Dislocation/Instability	19	20.4
3	Peri-prosthetic fracture - Femur	12	12.9
4	Aseptic Loosening	8	8.6
5	Pain	7	7.5
6	Metal Reaction/Metallosis	5	5.4
7	Implant Failure	3	3.2
8	Malalignment	3	3.2
9	Peri-prosthetic fracture - Acetabulum	2	2.2
10	Poly liner wear	1	1.1

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Table 146. Reasons for First Revision in the First 90 Days Following Primary THA for Actis DuoFix/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	16	34.8
2	Dislocation/Instability	12	26.1
3	Peri-prosthetic fracture - Femur	9	19.6
4	Aseptic Loosening	2	4.4
5	Peri-prosthetic fracture - Acetabulum	2	4.4
6	Pain	2	4.4
7	Implant Failure	1	2.2
8	Metal Reaction/Metallosis	1	2.2
9	Malalignment	1	2.2

Table 147. Reasons for First Revision Between 91 and 365 days Following Primary THA for Actis DuoFix/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	9	36.0
2	Dislocation/Instability	5	20.0
3	Pain	4	16.0
4	Aseptic Loosening	2	8.0
5	Peri-prosthetic fracture - Femur	2	8.0
6	Implant Failure	1	4.0
7	Metal Reaction/Metallosis	1	4.0
8	Malalignment	1	4.0

Table 148. Descriptive Statistics of Cases Receiving the Actis DuoFix/Pinnacle Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	5,618	55.52	
Age (years)	10,119	66.05 (10.00)	67.00 (13.00)
Height (cm)	10,119	169.92 (10.35)	170.00 (15.24)
Weight (kg)	10,119	89.63 (21.05)	88.00 (28.40)
BMI(kg/m^2)	10,119	30.92 (6.25)	30.17 (8.43)
Smoker - Never (%)	5,099	50.39	
Smoker - Previous (%)	3,670	36.27	
Smoker - Current (%)	1,338	13.22	
Smoker - Unknown (%)	12	0.12	

Table 149. Distribution of Approach Used for Actis DuoFix/Pinnacle Combination in Primary THA Cases

Approach	N	Percent
Anterior	5,975	59.0
Anterolateral	1404	13.9
Posterior	2,739	27.1
Transtrochanteric	0	0.0
Missing/unknown/other	1	0.0

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Table 150. Distribution of Head Size for Actis DuoFix/Pinnacle Combination in Primary THA Cases

Size (mm)	N	Percent
28	72	0.7
32	2,202	22.3
36	6,475	65.6
40	1,094	11.1
Missing/unknown/other	25	0.2

Table 151. Distribution of Bearing Surface for Actis DuoFix/Pinnacle Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	905	8.9
Ceramic-on-plastic	8,931	88.3
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	65	0.6
Missing/unknown/other	218	2.1

Table 152. Distribution of Polyethylene Used for Actis DuoFix/Pinnacle Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	65	0.7
XLPE	9,861	99.3
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 153. Volume of Cases by Surgeon and Site for the Actis DuoFix/Pinnacle Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	151 (262)	24 (172)
Cases per site	246 (397)	77 (280)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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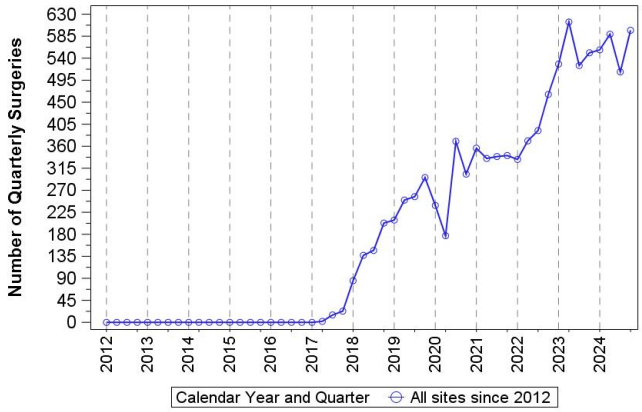


Figure 87. Utilization of the Actis DuoFix/Pinnacle Combination in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

101011060	101012040	101011010
101011050	101012080	101012010
101011040	101012030	101011110
101011070	101011090	101012110
101012060	101012090	101012120
101011030	101011020	101011120
101012070	101012020	101012005
101011080	101011100	
101012050	101012100	

Catalog numbers of Acetabular Cups Used in the Analysis

121732052	121731058	121701054
121732054	121722048	121703058
121732056	121731048	121730062
121732058	121703054	121732066
121732050	121730052	121730066
121732048	121730056	121701056
121722052	121703056	121701058
121732060	121730054	121703060
121722054	121703048	121720044
121722050	121731060	121722064
121732062	121730050	121701060
121722056	121701052	121703062
121731052	121730058	121703064
121731054	121703050	121716068
121722058	121720046	121716074
121731056	121730048	121730064
121730046	121701048	121730068
121703052	121730044	121731046
121731050	121730060	
121722060	121701050	
121732064	121722062	

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3.1.6 AML/Pinnacle

N = 808 primary cases were used for this analysis. Distribution of utilization: 17 surgeons across 14 sites used this implant combination in primary THA cases.

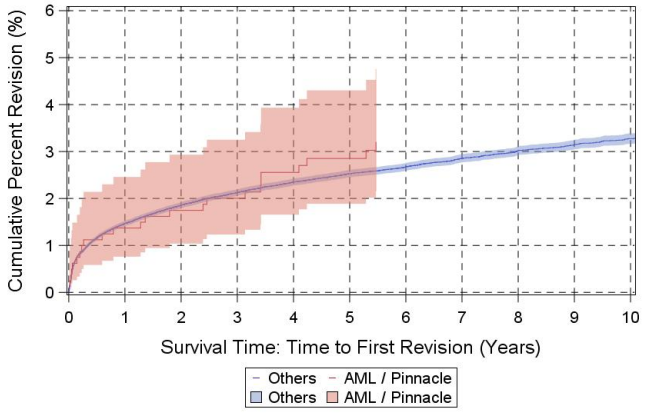


Figure 88. Cumulative Percent Revision Curve for the AML/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases

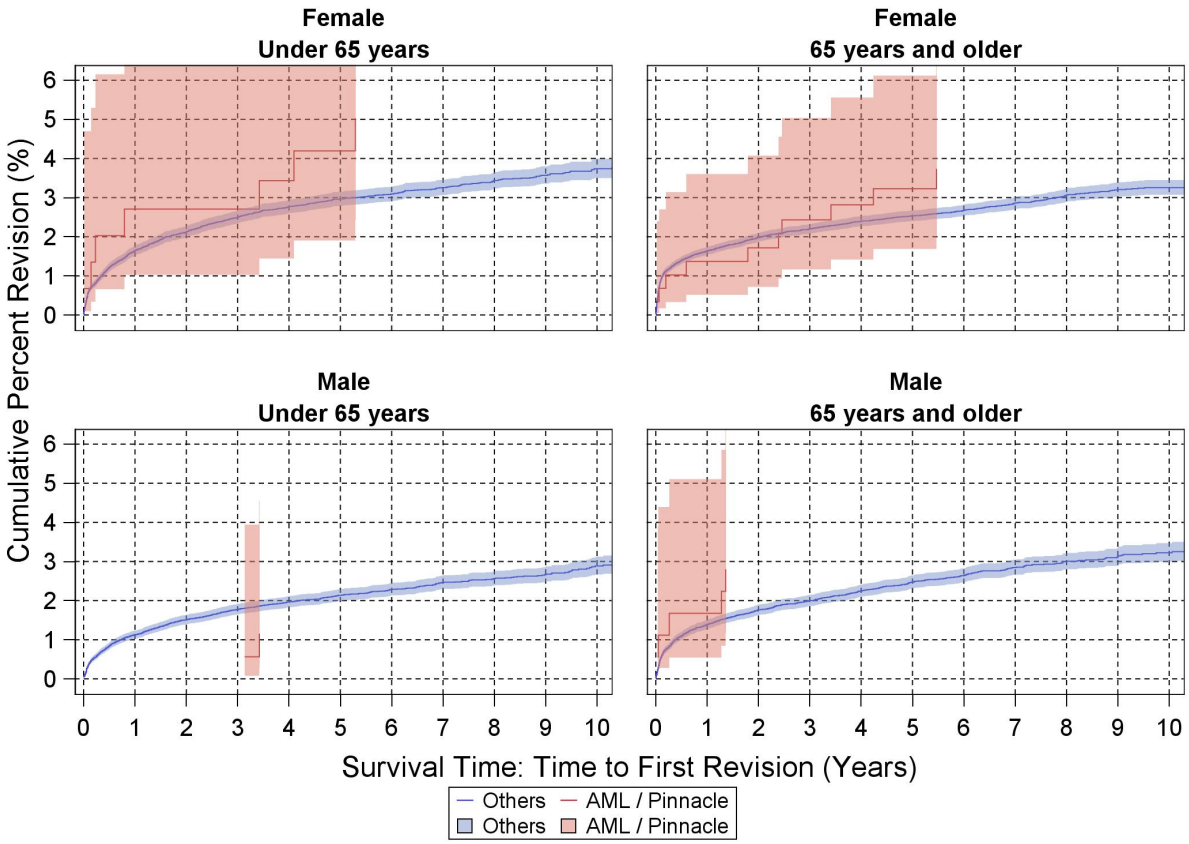


Figure 89. Cumulative Percent Revision Curve for the AML/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 154. Cumulative Percent Revision and Number at Risk for the AML/Pinnacle Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	804	0.00 (0.00,0.00)	148	0.00 (0.00,0.00)	293	0.00 (0.00,0.00)	184	0.00 (0.00,0.00)	179	0.00 (0.00,0.00)
1	789	1.37 (0.76,2.46)	143	2.71 (1.02,7.05)	287	1.37 (0.52,3.60)	184	0.00 (0.00,0.00)	175	1.68 (0.54,5.11)
2	772	1.75 (1.04,2.93)	141	2.71 (1.02,7.05)	280	1.72 (0.72,4.07)	182	0.00 (0.00,0.00)	169	2.80 (1.18,6.60)
3	743	2.01 (1.23,3.25)	139	2.71 (1.02,7.05)	265	2.43 (1.17,5.03)	178	0.00 (0.00,0.00)	161	2.80 (1.18,6.60)
4	664	2.56 (1.66,3.93)	128	3.43 (1.44,8.06)	240	2.82 (1.42,5.56)	158	1.16 (0.29,4.55)	138	2.80 (1.18,6.60)
5	596	2.85 (1.89,4.30)	119	4.19 (1.90,9.11)	219	3.23 (1.69,6.12)	143	1.16 (0.29,4.55)	115	2.80 (1.18,6.60)
6	504	3.21 (2.15,4.76)	100	5.03 (2.42,10.28)	181	3.74 (2.01,6.87)	122	1.16 (0.29,4.55)	101	2.80 (1.18,6.60)
7	372	3.21 (2.15,4.76)	78	5.03 (2.42,10.28)	129	3.74 (2.01,6.87)	89	1.16 (0.29,4.55)	76	2.80 (1.18,6.60)
8	269	3.21 (2.15,4.76)	58	5.03 (2.42,10.28)	99	3.74 (2.01,6.87)	57	1.16 (0.29,4.55)	55	2.80 (1.18,6.60)
9	171	3.21 (2.15,4.76)	39	5.03 (2.42,10.28)	64	3.74 (2.01,6.87)	32	1.16 (0.29,4.55)	36	2.80 (1.18,6.60)
10	90	3.21 (2.15,4.76)	18	5.03 (2.42,10.28)	32	3.74 (2.01,6.87)	19	1.16 (0.29,4.55)	21	2.80 (1.18,6.60)

Table 155. Reasons for First Revision Following Primary THA for AML/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	9	37.5
2	Dislocation/Instability	7	29.2
3	Aseptic Loosening	3	12.5
4	Pain	2	8.3
5	Poly liner wear	1	4.2
6	Peri-prosthetic fracture - Acetabulum	1	4.2
7	Malalignment	1	4.2

Table 156. Reasons for First Revision in the First 90 Days Following Primary THA for AML/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	4	50.0
2	Joint Infection	2	25.0
3	Peri-prosthetic fracture - Acetabulum	1	12.5
4	Malalignment	1	12.5

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Table 157. Reasons for First Revision Between 91 and 365 days Following Primary THA for AML/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	2	66.7
2	Dislocation/Instability	1	33.3

Table 158. Descriptive Statistics of Cases Receiving the AML/Pinnacle Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	444	54.95	
Age (years)	808	66.89 (10.62)	67.00 (15.00)
Height (cm)	808	169.84 (10.47)	170.00 (15.24)
Weight (kg)	808	89.76 (21.14)	87.75 (28.15)
BMI(kg/m^2)	808	31.03 (6.45)	30.40 (8.45)
Smoker - Never (%)	376	46.53	
Smoker - Previous (%)	296	36.63	
Smoker - Current (%)	136	16.83	
Smoker - Unknown (%)	0	0.0	

Table 159. Distribution of Approach Used for AML/Pinnacle Combination in Primary THA Cases

Approach	N	Percent
Anterior	9	1.1
Anterolateral	636	78.7
Posterior	161	19.9
Transtrochanteric	0	0.0
Missing/unknown/other	2	0.2

Table 160. Distribution of Head Size for AML/Pinnacle Combination in Primary THA Cases

Size (mm)	N	Percent
28	5	0.6
32	185	23.1
36	504	62.8
40	106	13.2
44	1	0.1
Missing/unknown/other	1	0.1

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Table 161. Distribution of Bearing Surface for AML/Pinnacle Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	698	86.4
Ceramic-on-plastic	103	12.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	1	0.1
Missing/unknown/other	6	0.7

Table 162. Distribution of Polyethylene Used for AML/Pinnacle Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.1
XLPE	802	99.9
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 163. Volume of Cases by Surgeon and Site for the AML/Pinnacle Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	47 (110)	6 (17)
Cases per site	57 (138)	8 (55)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

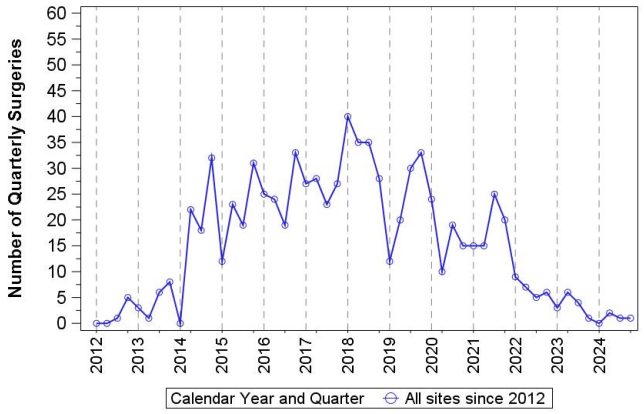


Figure 90. Utilization of the AML/Pinnacle Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

155402135	155401150	155401195
155402121	155401165	155401210
155401121	155402106	155403150
155402150	155402180	155403165
155401135	155401180	155403180
155402165	155403135	
155401106	155402195	

Catalog numbers of Acetabular Cups Used in the Analysis

121701052	121732062	121731050
121701054	121703048	121703060
121732054	121701060	121722058
121701050	121703056	121722060
121732052	121703050	121730048
121701056	121730050	121731048
121701048	121732064	121720046
121732058	121701062	121720052
121732056	121703058	121722062
121732050	121722048	121730052
121701058	121722050	121730056
121732060	121731052	121730064
121732048	121731054	121731056
121703052	121720044	121731058
121703054	121722054	
121722052	121730054	

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3.1.7 Anthology/PolarCup

N = 560 primary cases were used for this analysis. Fewer than ten surgeons used this implant combination at fewer than ten sites in primary THA cases.

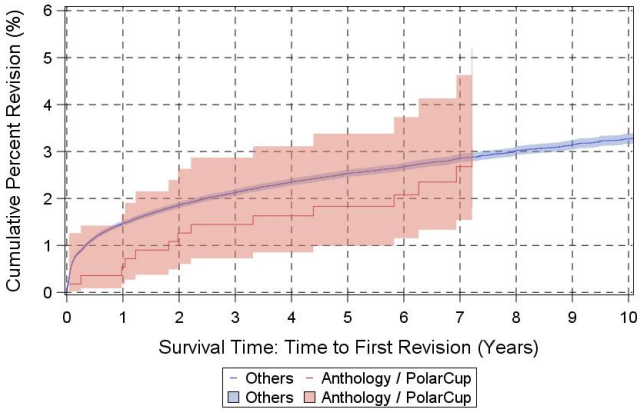


Figure 91. Cumulative Percent Revision Curve for the Anthology/PolarCup Combination, Compared to All Other Implant Combinations in Primary THA Cases

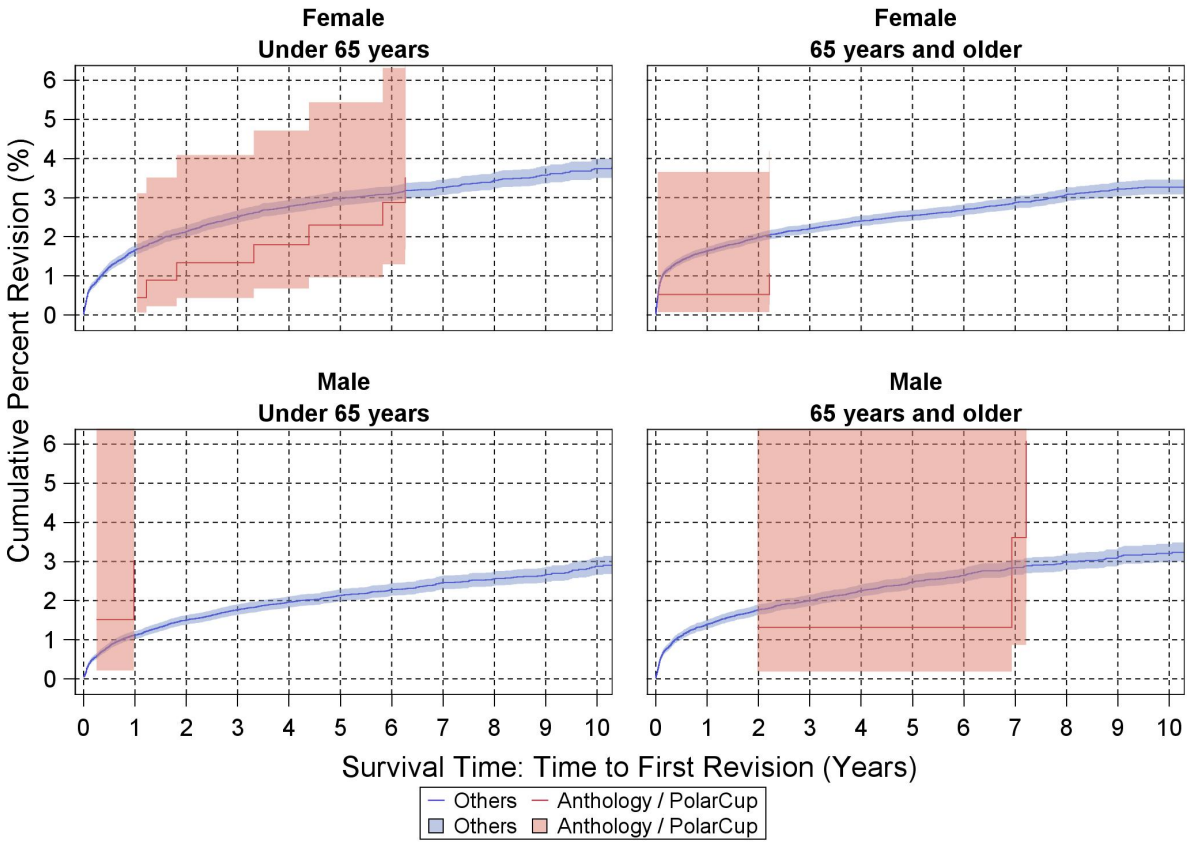


Figure 92. Cumulative Percent Revision Curve for the Anthology/PolarCup Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 164. Cumulative Percent Revision and Number at Risk for the Anthology/PolarCup Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	560	0.00 (0.00,0.00)	227	0.00 (0.00,0.00)	191	0.00 (0.00,0.00)	66	0.00 (0.00,0.00)	76	0.00 (0.00,0.00)
1	549	0.54 (0.17,1.66)	225	0.00 (0.00,0.00)	184	0.52 (0.07,3.66)	64	3.03 (0.77,11.58)	76	0.00 (0.00,0.00)
2	544	1.26 (0.60,2.63)	221	1.34 (0.43,4.09)	184	0.52 (0.07,3.66)	64	3.03 (0.77,11.58)	75	1.32 (0.19,8.97)
3	534	1.45 (0.73,2.87)	216	1.34 (0.43,4.09)	179	1.06 (0.27,4.19)	64	3.03 (0.77,11.58)	75	1.32 (0.19,8.97)
4	519	1.63 (0.85,3.11)	207	1.80 (0.68,4.72)	176	1.06 (0.27,4.19)	63	3.03 (0.77,11.58)	73	1.32 (0.19,8.97)
5	458	1.83 (0.99,3.38)	189	2.30 (0.96,5.44)	141	1.06 (0.27,4.19)	60	3.03 (0.77,11.58)	68	1.32 (0.19,8.97)
6	384	2.08 (1.15,3.73)	163	2.88 (1.30,6.32)	116	1.06 (0.27,4.19)	51	3.03 (0.77,11.58)	54	1.32 (0.19,8.97)
7	292	2.68 (1.54,4.63)	130	3.52 (1.68,7.30)	87	1.06 (0.27,4.19)	34	3.03 (0.77,11.58)	41	3.61 (0.87,14.37)
8	183	3.05 (1.78,5.20)	84	3.52 (1.68,7.30)	55	1.06 (0.27,4.19)	18	3.03 (0.77,11.58)	26	6.08 (1.93,18.31)
9	71	3.05 (1.78,5.20)	37	3.52 (1.68,7.30)	17	1.06 (0.27,4.19)	*	3.03 (0.77,11.58)	*	6.08 (1.93,18.31)
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 165. Reasons for First Revision Following Primary THA for Anthology/PolarCup Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	7	50.0
2	Malalignment	3	21.4
3	Joint Infection	1	7.1
4	Peri-prosthetic fracture - Acetabulum	1	7.1
5	Peri-prosthetic fracture - Femur	1	7.1
6	Metal Reaction/Metallosis	1	7.1

Table 166. Reasons for First Revision in the First 90 Days Following Primary THA for Anthology/PolarCup Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Acetabulum	1	100.0

Table 167. Reasons for First Revision Between 91 and 365 days Following Primary THA for Anthology/PolarCup Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	50.0
2	Joint Infection	1	50.0

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Table 168. Descriptive Statistics of Cases Receiving the Anthology/PolarCup Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	418	74.64	
Age (years)	560	62.78 (11.60)	64.00 (14.00)
Height (cm)	560	166.78 (8.88)	167.00 (13.00)
Weight (kg)	560	88.05 (24.00)	84.00 (29.10)
BMI(kg/m^2)	560	31.62 (8.16)	29.97 (9.11)
Smoker - Never (%)	288	51.43	
Smoker - Previous (%)	214	38.21	
Smoker - Current (%)	58	10.36	
Smoker - Unknown (%)	0	0.0	

Table 169. Distribution of Approach Used for Anthology/PolarCup Combination in Primary THA Cases

Approach	N	Percent
Anterior	4	0.7
Anterolateral	489	87.3
Posterior	0	0.0
Transtrochanteric	67	12.0
Missing/unknown/other	0	0.0

Table 170. Distribution of Bearing Surface for Anthology/PolarCup Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	0	0.0
Ceramic-on-plastic	0	0.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	554	98.9
Missing/unknown/other	6	1.1

Table 171. Distribution of Polyethylene Used for Anthology/PolarCup Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	554	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 172. Volume of Cases by Surgeon and Site for the Anthology/PolarCup Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	140 (257)	17 (276)
Cases per site	186 (293)	34 (524)

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The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

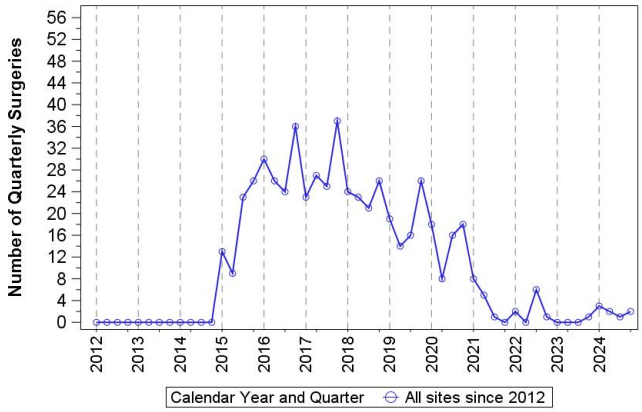


Figure 93. Utilization of the Anthology/PolarCup Combination in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

71356004	71356009	71356107
71356005	71356010	71356011
71356003	71356109	71356101
71356006	71356106	71356102
71356007	71356012	71356112
71356002	71356103	71357004
71356008	71356104	71357007
71356001	71356105	

Catalog numbers of Acetabular Cups Used in the Analysis

75100409	75100413	75100451
75100410	75100414	75100453
75100411	75100407	75100457
75100408	75100406	
75100412	75100415	

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3.1.8 Anthology/Reflection 3

N = 6,243 primary cases were used for this analysis. Distribution of utilization: 61 surgeons across 39 sites used this implant combination in primary THA cases.

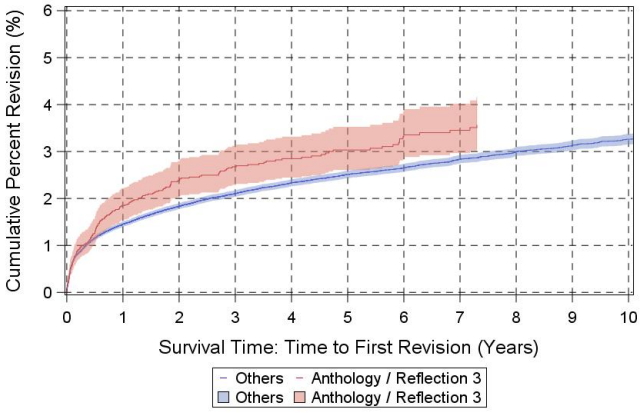


Figure 94. Cumulative Percent Revision Curve for the Anthology/Reflection 3 Combination, Compared to All Other Implant Combinations in Primary THA Cases

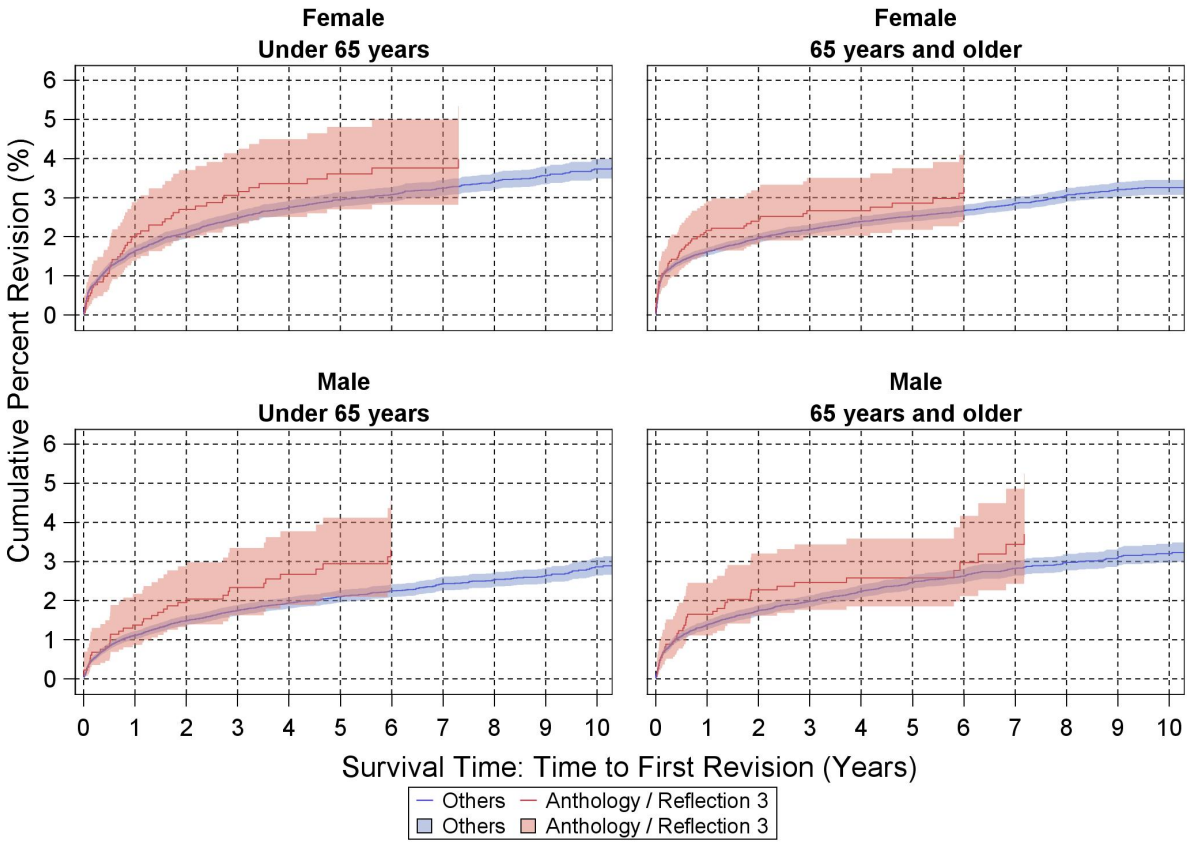


Figure 95. Cumulative Percent Revision Curve for the Anthology/Reflection 3 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 173. Cumulative Percent Revision and Number at Risk for the Anthology/Reflection 3 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	6,211	0.00 (0.00,0.00)	1,422	0.00 (0.00,0.00)	1,978	0.00 (0.00,0.00)	1,327	0.00 (0.00,0.00)	1,480	0.00 (0.00,0.00)
1	5,740	1.85 (1.54,2.22)	1,331	2.00 (1.39,2.88)	1,801	2.16 (1.60,2.91)	1,252	1.38 (0.87,2.17)	1,353	1.65 (1.11,2.46)
2	5,044	2.38 (2.02,2.80)	1,172	2.70 (1.96,3.71)	1,585	2.40 (1.80,3.19)	1,122	1.95 (1.32,2.88)	1,163	2.28 (1.61,3.21)
3	4,221	2.67 (2.29,3.12)	1,002	3.06 (2.26,4.13)	1,312	2.66 (2.02,3.50)	953	2.33 (1.63,3.35)	953	2.46 (1.76,3.44)
4	3,561	2.85 (2.44,3.32)	855	3.36 (2.50,4.49)	1,105	2.66 (2.02,3.50)	804	2.67 (1.89,3.77)	797	2.58 (1.85,3.59)
5	2,892	3.03 (2.61,3.53)	715	3.61 (2.70,4.81)	884	2.86 (2.18,3.75)	667	2.94 (2.10,4.12)	626	2.58 (1.85,3.59)
6	2,292	3.36 (2.88,3.90)	588	3.76 (2.82,5.00)	698	3.25 (2.47,4.28)	531	3.30 (2.36,4.62)	475	2.97 (2.12,4.17)
7	1,779	3.45 (2.96,4.02)	440	3.76 (2.82,5.00)	525	3.25 (2.47,4.28)	432	3.30 (2.36,4.62)	382	3.44 (2.43,4.86)
8	1,378	3.57 (3.06,4.16)	343	3.99 (2.97,5.34)	397	3.25 (2.47,4.28)	348	3.30 (2.36,4.62)	290	3.70 (2.60,5.24)
9	883	3.57 (3.06,4.16)	213	3.99 (2.97,5.34)	229	3.25 (2.47,4.28)	249	3.30 (2.36,4.62)	192	3.70 (2.60,5.24)
10	456	3.57 (3.06,4.16)	118	3.99 (2.97,5.34)	117	3.25 (2.47,4.28)	139	3.30 (2.36,4.62)	82	3.70 (2.60,5.24)

Table 174. Reasons for First Revision Following Primary THA for Anthology/Reflection 3 Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	40	22.7
2	Dislocation/Instability	40	22.7
3	Joint Infection	35	19.9
4	Peri-prosthetic fracture - Femur	29	16.5
5	Malalignment	11	6.3
6	Implant Failure	10	5.7
7	Pain	7	4.0
8	Peri-prosthetic fracture - Acetabulum	3	1.7
9	Metal Reaction/Metallosis	1	0.6

Table 175. Reasons for First Revision in the First 90 Days Following Primary THA for Anthology/Reflection 3 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	23	39.7
2	Dislocation/Instability	11	19.0
3	Joint Infection	10	17.2
4	Aseptic Loosening	4	6.9
5	Implant Failure	4	6.9
6	Peri-prosthetic fracture - Acetabulum	3	5.2
7	Malalignment	3	5.2

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Table 176. Reasons for First Revision Between 91 and 365 days Following Primary THA for Anthology/Reflection 3 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	16	32.0
2	Joint Infection	12	24.0
3	Aseptic Loosening	11	22.0
4	Pain	5	10.0
5	Peri-prosthetic fracture - Femur	3	6.0
6	Malalignment	2	4.0
7	Implant Failure	1	2.0

Table 177. Descriptive Statistics of Cases Receiving the Anthology/Reflection 3 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	3,416	54.72	
Age (years)	6,243	65.36 (10.40)	66.00 (13.00)
Height (cm)	6,243	169.80 (10.18)	170.00 (15.24)
Weight (kg)	6,243	90.52 (21.88)	88.50 (28.72)
BMI(kg/m^2)	6,243	31.29 (6.65)	30.49 (8.79)
Smoker - Never (%)	3,055	48.93	
Smoker - Previous (%)	2,350	37.64	
Smoker - Current (%)	826	13.23	
Smoker - Unknown (%)	12	0.19	

Table 178. Distribution of Approach Used for Anthology/Reflection 3 Combination in Primary THA Cases

Approach	N	Percent
Anterior	3,455	55.3
Anterolateral	2017	32.3
Posterior	752	12.1
Transtrochanteric	15	0.2
Missing/unknown/other	4	0.1

Table 179. Distribution of Head Size for Anthology/Reflection 3 Combination in Primary THA Cases

Size (mm)	N	Percent
22	3	0.1
28	28	0.5
32	1,336	22.2
36	4,213	70.1
40	392	6.5
44	16	0.3
Missing/unknown/other	23	0.4

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Table 180. Distribution of Bearing Surface for Anthology/Reflection 3 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,188	19.0
Ceramic-on-plastic	4,799	76.9
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	222	3.6
Missing/unknown/other	34	0.5

Table 181. Distribution of Polyethylene Used for Anthology/Reflection 3 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.0
XLPE	6,213	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 182. Volume of Cases by Surgeon and Site for the Anthology/Reflection 3 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	102 (217)	14 (69)
Cases per site	160 (253)	48 (225)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

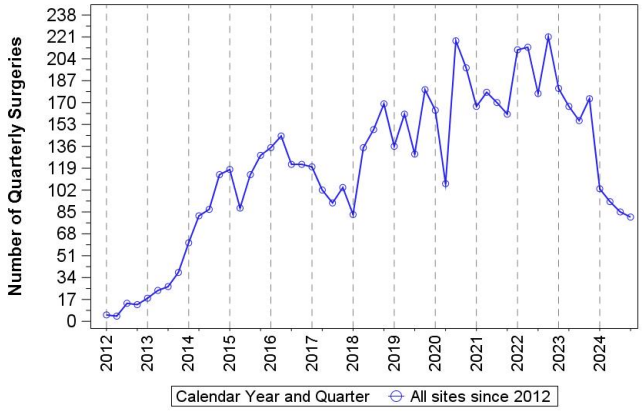


Figure 96. Utilization of the Anthology/Reflection 3 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

71356006	71357008	71356102
71356106	71356111	71357104
71356007	71357108	71357103
71356108	71356103	71356001
71356008	71357106	71357112
71356107	71357005	71357011
71356005	71356011	71357002
71356105	71357109	71356113
71356009	71357004	71357012
71356010	71357105	71356013
71356109	71357009	71356101
71356004	71357110	71356114
71356110	71356002	71357102
71356104	71357003	71357001
71356003	71356112	71357101
71357006	71357010	71356014
71357007	71357111	
71357107	71356012	

Catalog numbers of Acetabular Cups Used in the Analysis

71335552	71331850	71331846
71335554	71331858	71338664
71335556	71331860	71338663
71335550	71331848	71331862
71335558	71335564	71331864
71335560	71338667	71335544
71335548	71338665	71335566
71331854	71335546	71335568
71331852	71338666	71338671
71331856	71338668	
71335562	71338669	

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3.1.9 Avenir (Cemented)/G7

N = 2,071 primary cases were used for this analysis. Distribution of utilization: 63 surgeons across 44 sites used this implant combination in primary THA cases.

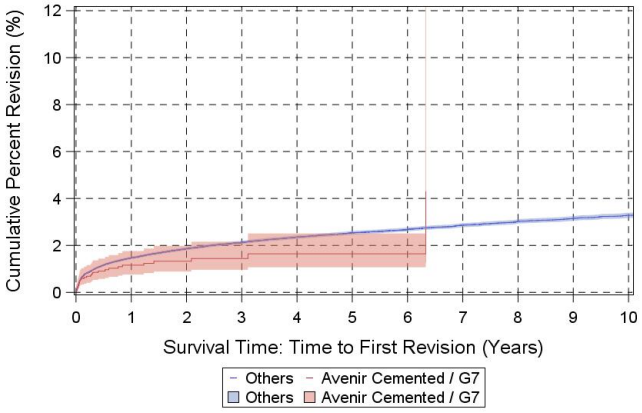


Figure 97. Cumulative Percent Revision Curve for the Avenir (Cemented)/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases

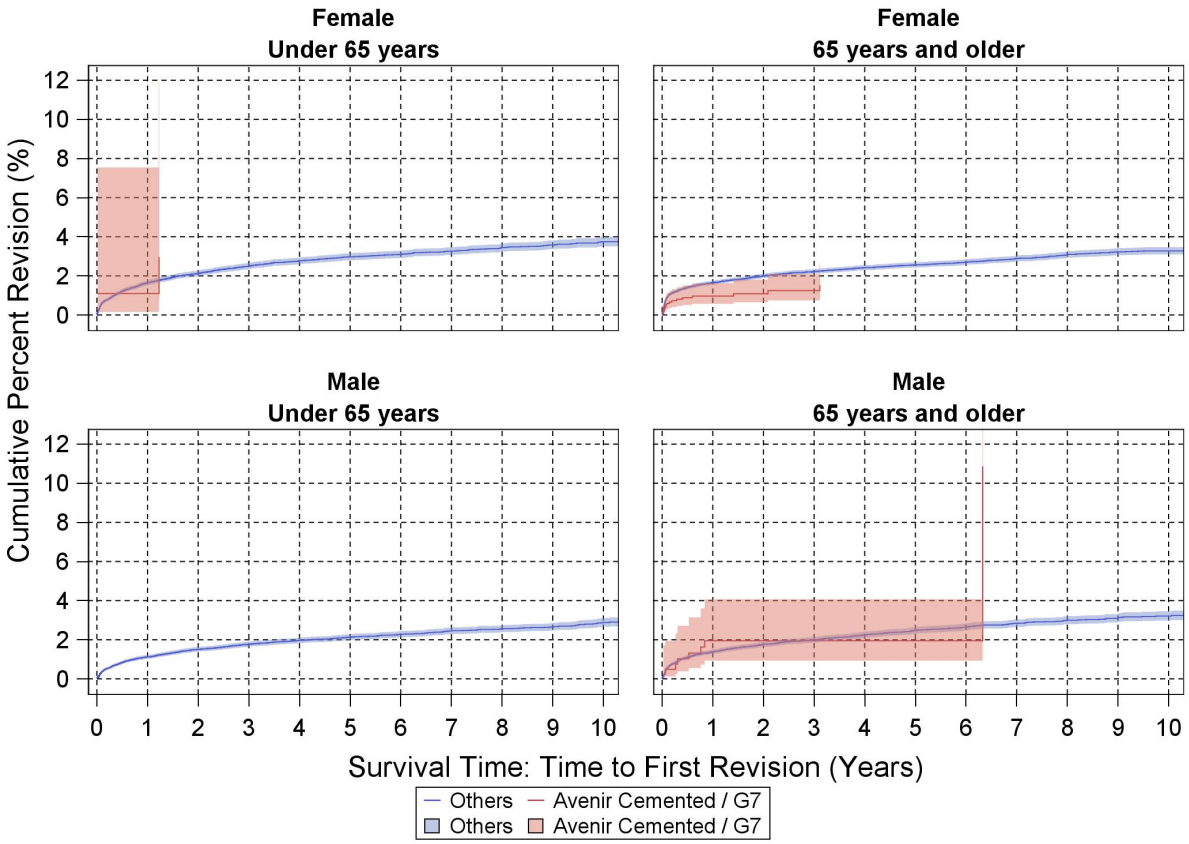


Figure 98. Cumulative Percent Revision Curve for the Avenir (Cemented)/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 183. Cumulative Percent Revision and Number at Risk for the Avenir (Cemented)/G7 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	2,060	0.00 (0.00,0.00)	92	0.00 (0.00,0.00)	1,526	0.00 (0.00,0.00)	27	0.00 (0.00,0.00)	414	0.00 (0.00,0.00)
1	1,359	1.16 (0.76,1.76)	57	1.10 (0.16,7.54)	991	0.97 (0.57,1.63)	22	0.00 (0.00,0.00)	288	1.95 (0.93,4.07)
2	872	1.33 (0.88,1.98)	37	2.96 (0.71,11.86)	623	1.08 (0.65,1.81)	14	0.00 (0.00,0.00)	197	1.95 (0.93,4.07)
3	513	1.44 (0.96,2.16)	14	2.96 (0.71,11.86)	371	1.25 (0.75,2.09)	*	0.00 (0.00,0.00)	119	1.95 (0.93,4.07)
4	278	1.64 (1.07,2.51)	*	2.96 (0.71,11.86)	200	1.52 (0.88,2.63)	*	0.00 (0.00,0.00)	67	1.95 (0.93,4.07)
5	164	1.64 (1.07,2.51)	*	2.96 (0.71,11.86)	114	1.52 (0.88,2.63)	*	0.00 (0.00,0.00)	41	1.95 (0.93,4.07)
6	60	1.64 (1.07,2.51)	0	N/A	43	1.52 (0.88,2.63)	*	0.00 (0.00,0.00)	16	1.95 (0.93,4.07)
7	19	4.30 (1.27,13.99)	0	N/A	14	1.52 (0.88,2.63)	0	N/A	*	10.86 (2.23,44.40)
8	*	4.30 (1.27,13.99)	0	N/A	*	1.52 (0.88,2.63)	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 184. Reasons for First Revision Following Primary THA for Avenir (Cemented)/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	11	40.7
2	Dislocation/Instability	8	29.6
3	Peri-prosthetic fracture - Femur	3	11.1
4	Aseptic Loosening	2	7.4
5	Peri-prosthetic fracture - Acetabulum	2	7.4
6	Implant Failure	1	3.7

Table 185. Reasons for First Revision in the First 90 Days Following Primary THA for Avenir (Cemented)/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	7	50.0
2	Dislocation/Instability	4	28.6
3	Peri-prosthetic fracture - Acetabulum	2	14.3
4	Peri-prosthetic fracture - Femur	1	7.1

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Table 186. Reasons for First Revision Between 91 and 365 days Following Primary THA for Avenir (Cemented)/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	4	50.0
2	Aseptic Loosening	2	25.0
3	Dislocation/Instability	2	25.0

Table 187. Descriptive Statistics of Cases Receiving the Avenir (Cemented)/G7 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,626	78.51	
Age (years)	2,071	76.61 (7.60)	77.00 (10.00)
Height (cm)	2,061	164.87 (9.54)	163.83 (12.70)
Weight (kg)	2,061	77.60 (17.52)	75.90 (25.30)
BMI(kg/m^2)	2,061	28.48 (5.64)	27.96 (7.45)
Smoker - Never (%)	1,102	53.21	
Smoker - Previous (%)	850	41.04	
Smoker - Current (%)	107	5.17	
Smoker - Unknown (%)	12	0.58	

Table 188. Distribution of Approach Used for Avenir (Cemented)/G7 Combination in Primary THA Cases

Approach	N	Percent
Anterior	1,222	59.0
Anterolateral	141	6.8
Posterior	690	33.3
Transtrochanteric	4	0.2
Missing/unknown/other	14	0.7

Table 189. Distribution of Head Size for Avenir (Cemented)/G7 Combination in Primary THA Cases

Size (mm)	N	Percent
28	3	0.2
32	210	13.8
36	1,134	74.7
40	139	9.2
Missing/unknown/other	33	2.2

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Table 190. Distribution of Bearing Surface for Avenir (Cemented)/G7 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	232	11.2
Ceramic-on-plastic	1,254	60.5
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	507	24.5
Missing/unknown/other	78	3.8

Table 191. Distribution of Polyethylene Used for Avenir (Cemented)/G7 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,224	61.1
Antioxidant XLPE	779	38.9
Missing/unknown/other	0	0.0

Table 192. Volume of Cases by Surgeon and Site for the Avenir (Cemented)/G7 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	32 (54)	13 (35)
Cases per site	47 (73)	13 (53)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

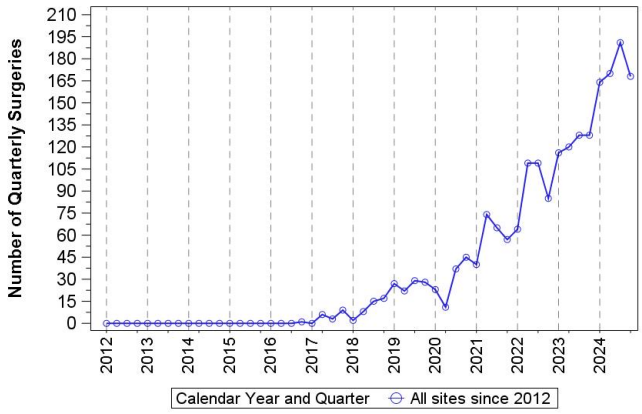


Figure 99. Utilization of the Avenir (Cemented)/G7 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

106010204	106010201	106010307
106010203	106010206	106010207
106010205	106010306	106010308
106010202	106010303	106010208
106010304	106010302	
106010305	106010301	

Catalog numbers of Acetabular Cups Used in the Analysis

10000663	110017103	10000668
10000662	110010248	110017107
110010244	110010263	110010267
110010243	110017101	110010268
110010245	10000667	110010269
10000664	110010264	10000669
110010246	110017104	110010240
10000661	110010249	110010250
10000665	110010266	110010251
110010242	110010262	110010261
110010247	110010265	110010271
110017102	110017105	110017100
10000666	110010241	
10000660	110017106	

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3.1.10 Avenir (Cementless)/Continuum

N = 525 primary cases were used for this analysis. Distribution of utilization: 17 surgeons across 14 sites used this implant combination in primary THA cases.

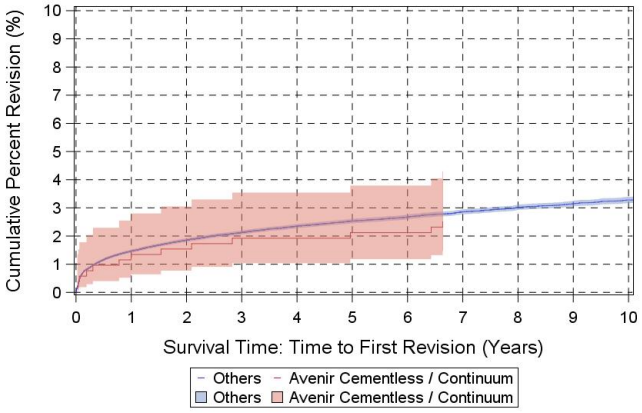


Figure 100. Cumulative Percent Revision Curve for the Avenir (Cementless)/Continuum Combination, Compared to All Other Implant Combinations in Primary THA Cases

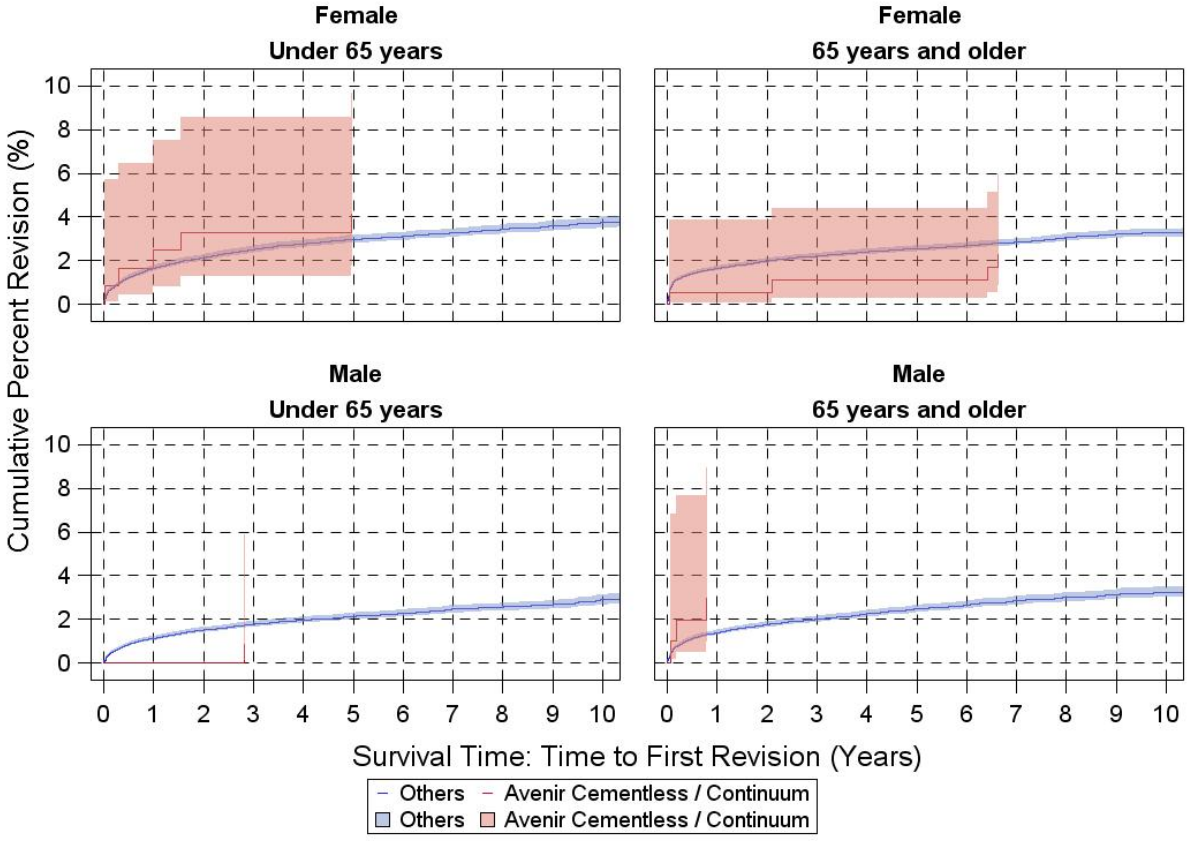


Figure 101. Cumulative Percent Revision Curve for the Avenir (Cementless)/Continuum Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 193. Cumulative Percent Revision and Number at Risk for the Avenir (Cementless)/Continuum Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	520	0.00 (0.00,0.00)	121	0.00 (0.00,0.00)	180	0.00 (0.00,0.00)	118	0.00 (0.00,0.00)	101	0.00 (0.00,0.00)
1	513	1.35 (0.64,2.80)	118	2.48 (0.81,7.49)	179	0.56 (0.08,3.88)	118	0.00 (0.00,0.00)	98	2.97 (0.97,8.93)
2	512	1.54 (0.77,3.05)	117	3.31 (1.25,8.57)	179	0.56 (0.08,3.88)	118	0.00 (0.00,0.00)	98	2.97 (0.97,8.93)
3	510	1.92 (1.04,3.54)	117	3.31 (1.25,8.57)	178	1.11 (0.28,4.37)	117	0.85 (0.12,5.86)	98	2.97 (0.97,8.93)
4	504	1.92 (1.04,3.54)	117	3.31 (1.25,8.57)	176	1.11 (0.28,4.37)	115	0.85 (0.12,5.86)	96	2.97 (0.97,8.93)
5	501	2.12 (1.18,3.79)	114	4.15 (1.75,9.68)	176	1.11 (0.28,4.37)	115	0.85 (0.12,5.86)	96	2.97 (0.97,8.93)
6	495	2.12 (1.18,3.79)	111	4.15 (1.75,9.68)	176	1.11 (0.28,4.37)	113	0.85 (0.12,5.86)	95	2.97 (0.97,8.93)
7	478	2.52 (1.47,4.30)	110	4.15 (1.75,9.68)	164	2.27 (0.86,5.95)	110	0.85 (0.12,5.86)	94	2.97 (0.97,8.93)
8	411	2.52 (1.47,4.30)	94	4.15 (1.75,9.68)	135	2.27 (0.86,5.95)	97	0.85 (0.12,5.86)	85	2.97 (0.97,8.93)
9	317	2.52 (1.47,4.30)	76	4.15 (1.75,9.68)	110	2.27 (0.86,5.95)	74	0.85 (0.12,5.86)	57	2.97 (0.97,8.93)
10	189	2.52 (1.47,4.30)	43	4.15 (1.75,9.68)	59	2.27 (0.86,5.95)	51	0.85 (0.12,5.86)	36	2.97 (0.97,8.93)

Table 194. Reasons for First Revision Following Primary THA for Avenir (Cementless)/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	4	33.3
2	Dislocation/Instability	3	25.0
3	Aseptic Loosening	2	16.7
4	Pain	2	16.7
5	Joint Infection	1	8.3

Table 195. Reasons for First Revision in the First 90 Days Following Primary THA for Avenir (Cementless)/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	2	50.0
2	Aseptic Loosening	1	25.0
3	Dislocation/Instability	1	25.0

Table 196. Reasons for First Revision Between 91 and 365 days Following Primary THA for Avenir (Cementless)/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	1	50.0
2	Pain	1	50.0

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Table 197. Descriptive Statistics of Cases Receiving the Avenir (Cementless)/Continuum Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	303	57.71	
Age (years)	525	65.68 (10.89)	66.00 (14.00)
Height (cm)	513	169.30 (10.49)	168.00 (16.51)
Weight (kg)	513	86.19 (20.68)	84.00 (27.43)
BMI(kg/m^2)	513	29.87 (5.72)	29.30 (7.37)
Smoker - Never (%)	261	49.71	
Smoker - Previous (%)	192	36.57	
Smoker - Current (%)	72	13.71	
Smoker - Unknown (%)	0	0.0	

Table 198. Distribution of Approach Used for Avenir (Cementless)/Continuum Combination in Primary THA Cases

Approach	N	Percent
Anterior	124	23.6
Anterolateral	132	25.1
Posterior	257	49.0
Transtrochanteric	0	0.0
Missing/unknown/other	12	2.3

Table 199. Distribution of Head Size for Avenir (Cementless)/Continuum Combination in Primary THA Cases

Size (mm)	N	Percent
28	3	0.6
32	111	21.2
36	359	68.6
40	46	8.8
Missing/unknown/other	4	0.8

Table 200. Distribution of Bearing Surface for Avenir (Cementless)/Continuum Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	286	54.5
Ceramic-on-plastic	233	44.4
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	6	1.1

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Table 201. Distribution of Polyethylene Used for Avenir (Cementless)/Continuum Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	323	61.8
Antioxidant XLPE	200	38.2
Missing/unknown/other	0	0.0

Table 202. Volume of Cases by Surgeon and Site for the Avenir (Cementless)/Continuum Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	30 (52)	8 (16)
Cases per site	37 (61)	6 (30)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

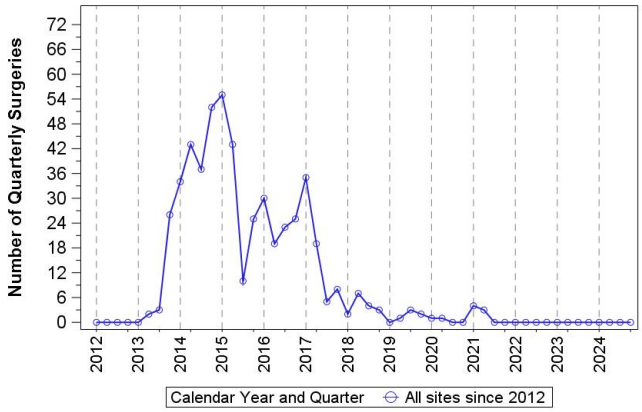


Figure 102. Utilization of the Avenir (Cementless)/Continuum Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

106010004	106010106	106010008
106010003	106010105	106010108
106010005	106010001	106010101
106010002	106010007	106010102
106010006	106010103	106010009
106010104	106010107	

Catalog numbers of Acetabular Cups Used in the Analysis

875705201	875706201	875705402
875705601	875705202	875705602
875705401	875704601	875705802
875705801	875705002	875706002
875705001	875706401	875706402
875704801	875704401	
875706001	875704802	

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3.1.11 Avenir (Cementless)/G7

N = 836 primary cases were used for this analysis. Distribution of utilization: 31 surgeons across 20 sites used this implant combination in primary THA cases.

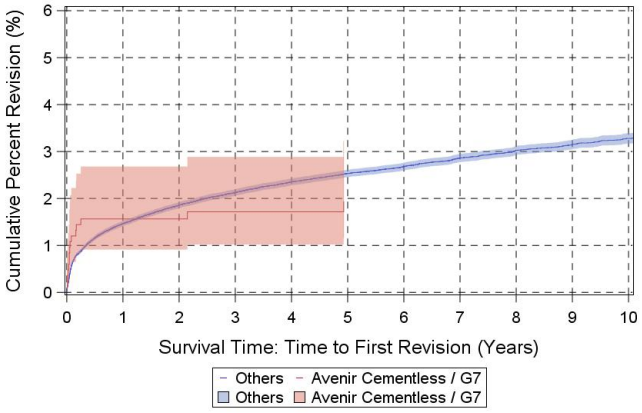


Figure 103. Cumulative Percent Revision Curve for the Avenir (Cementless)/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases

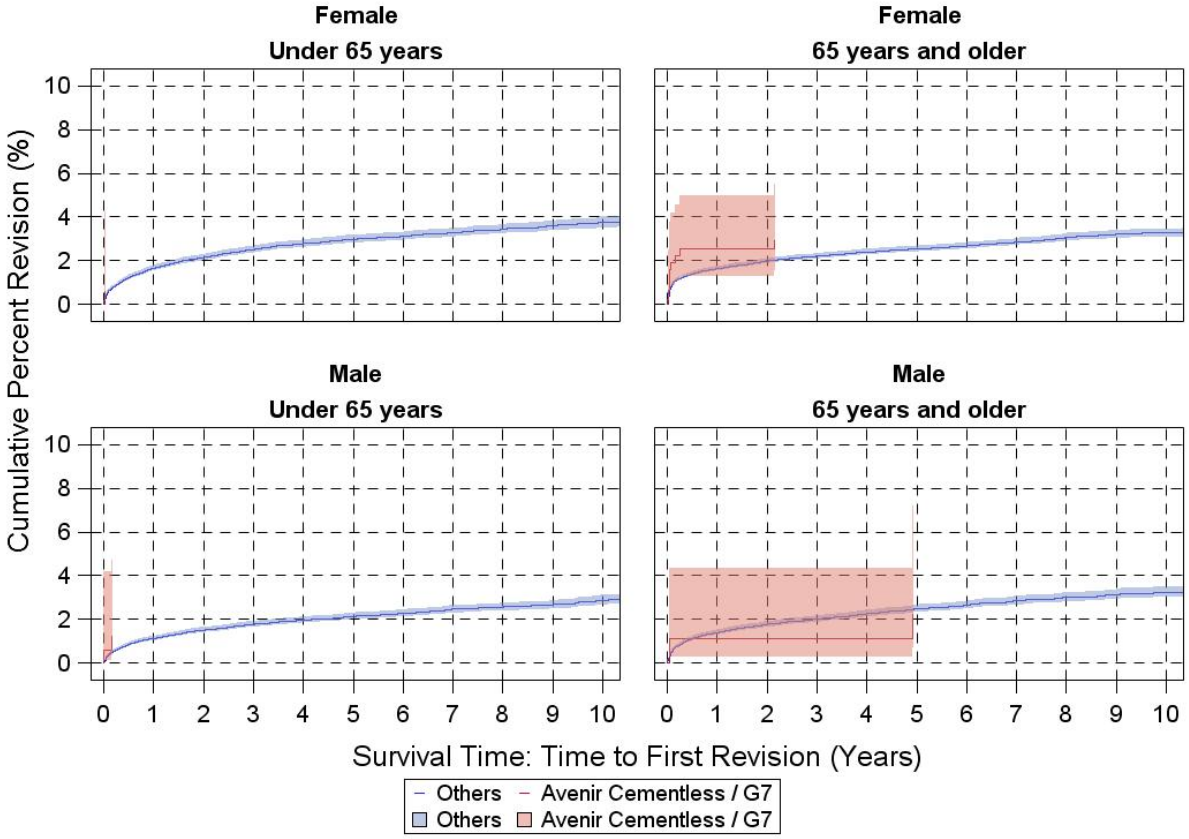


Figure 104. Cumulative Percent Revision Curve for the Avenir (Cementless)/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 203. Cumulative Percent Revision and Number at Risk for the Avenir (Cementless)/G7 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	833	0.00 (0.00,0.00)	165	0.00 (0.00,0.00)	318	0.00 (0.00,0.00)	166	0.00 (0.00,0.00)	182	0.00 (0.00,0.00)
1	749	1.57 (0.91,2.68)	148	0.61 (0.09,4.22)	294	2.52 (1.27,4.98)	148	1.20 (0.30,4.73)	157	1.10 (0.28,4.35)
2	665	1.57 (0.91,2.68)	126	0.61 (0.09,4.22)	261	2.52 (1.27,4.98)	137	1.20 (0.30,4.73)	139	1.10 (0.28,4.35)
3	571	1.72 (1.02,2.88)	107	0.61 (0.09,4.22)	227	2.90 (1.52,5.51)	117	1.20 (0.30,4.73)	118	1.10 (0.28,4.35)
4	501	1.72 (1.02,2.88)	93	0.61 (0.09,4.22)	197	2.90 (1.52,5.51)	107	1.20 (0.30,4.73)	102	1.10 (0.28,4.35)
5	440	1.94 (1.16,3.22)	86	0.61 (0.09,4.22)	171	2.90 (1.52,5.51)	93	1.20 (0.30,4.73)	88	2.22 (0.67,7.20)
6	302	1.94 (1.16,3.22)	64	0.61 (0.09,4.22)	106	2.90 (1.52,5.51)	67	1.20 (0.30,4.73)	65	2.22 (0.67,7.20)
7	186	1.94 (1.16,3.22)	39	0.61 (0.09,4.22)	64	2.90 (1.52,5.51)	39	1.20 (0.30,4.73)	44	2.22 (0.67,7.20)
8	82	1.94 (1.16,3.22)	16	0.61 (0.09,4.22)	34	2.90 (1.52,5.51)	13	1.20 (0.30,4.73)	19	2.22 (0.67,7.20)
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

Table 204. Reasons for First Revision Following Primary THA for Avenir (Cementless)/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	6	40.0
2	Aseptic Loosening	4	26.7
3	Dislocation/Instability	4	26.7
4	Joint Infection	1	6.7

Table 205. Reasons for First Revision in the First 90 Days Following Primary THA for Avenir (Cementless)/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	5	41.7
2	Aseptic Loosening	4	33.3
3	Dislocation/Instability	2	16.7
4	Joint Infection	1	8.3

Table 206. Reasons for First Revision Between 91 and 365 days Following Primary THA for Avenir (Cementless)/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	100.0

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Table 207. Descriptive Statistics of Cases Receiving the Avenir (Cementless)/G7 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	485	58.01	
Age (years)	836	66.26 (10.58)	67.00 (13.00)
Height (cm)	672	169.07 (9.79)	167.64 (12.74)
Weight (kg)	672	84.84 (18.44)	83.17 (25.97)
BMI(kg/m^2)	672	29.54 (5.27)	29.07 (7.19)
Smoker - Never (%)	406	48.56	
Smoker - Previous (%)	351	41.99	
Smoker - Current (%)	79	9.45	
Smoker - Unknown (%)	0	0.0	

Table 208. Distribution of Approach Used for Avenir (Cementless)/G7 Combination in Primary THA Cases

Approach	N	Percent
Anterior	348	41.6
Anterolateral	34	4.1
Posterior	290	34.7
Transtrochanteric	0	0.0
Missing/unknown/other	164	19.6

Table 209. Distribution of Head Size for Avenir (Cementless)/G7 Combination in Primary THA Cases

Size (mm)	N	Percent
32	49	7.5
36	540	83.2
40	59	9.1
Missing/unknown/other	1	0.1

Table 210. Distribution of Bearing Surface for Avenir (Cementless)/G7 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	103	12.3
Ceramic-on-plastic	545	65.2
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	183	21.9
Missing/unknown/other	5	0.6

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Table 211. Distribution of Polyethylene Used for Avenir (Cementless)/G7 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	627	75.6
Antioxidant XLPE	202	24.4
Missing/unknown/other	0	0.0

Table 212. Volume of Cases by Surgeon and Site for the Avenir (Cementless)/G7 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	27 (69)	1 (24)
Cases per site	41 (87)	4 (52)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

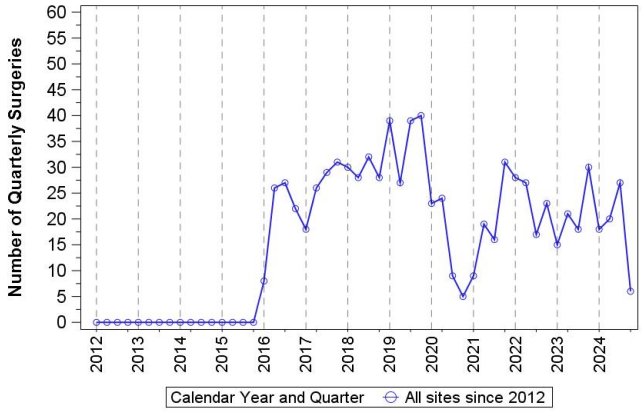


Figure 105. Utilization of the Avenir (Cementless)/G7 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

106010004	106010006	106010007
106010005	106010106	106010101
106010002	106010103	106010008
106010105	106010107	106010108
106010003	106010102	106010109
106010104	106010001	

Catalog numbers of Acetabular Cups Used in the Analysis

10000664	110010242	110010269
10000663	110010248	10000660
10000665	10000661	10000669
110010244	10000668	110010267
110010243	110010249	110010270
110010245	110010263	110017103
10000666	110010266	110017104
10000662	110010241	110017105
110010246	110010250	
110010247	110010264	
10000667	110010265	

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3.1.12 Avenir Complete/G7

N = 9,013 primary cases were used for this analysis. Distribution of utilization: 88 surgeons across 53 sites used this implant combination in primary THA cases.

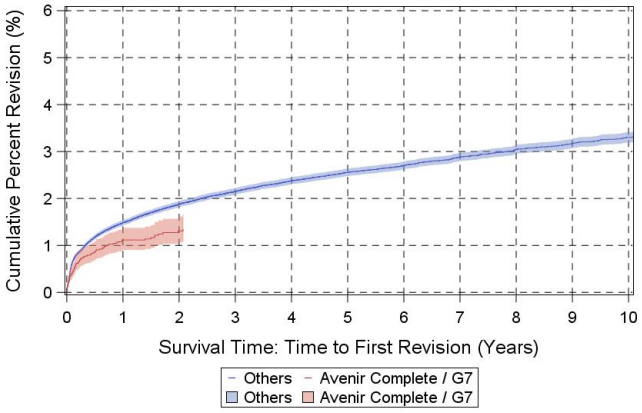


Figure 106. Cumulative Percent Revision Curve for the Avenir Complete/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases

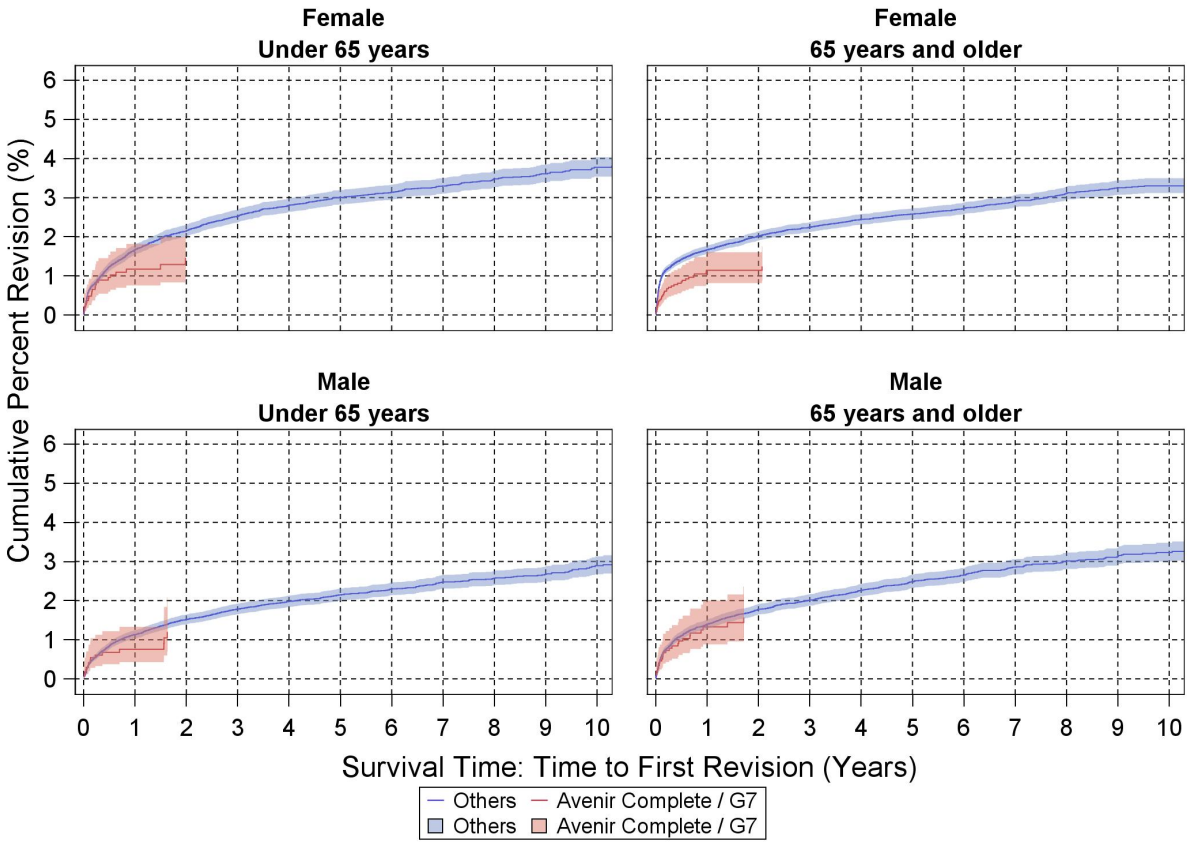


Figure 107. Cumulative Percent Revision Curve for the Avenir Complete/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 213. Cumulative Percent Revision and Number at Risk for the Avenir Complete/G7 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	8,993	0.00 (0.00,0.00)	1,907	0.00 (0.00,0.00)	3,366	0.00 (0.00,0.00)	1,720	0.00 (0.00,0.00)	1,997	0.00 (0.00,0.00)
1	5,393	1.12 (0.91,1.38)	1,142	1.17 (0.76,1.82)	2,061	1.14 (0.82,1.60)	1,019	0.76 (0.43,1.33)	1,169	1.33 (0.88,2.00)
2	2,670	1.31 (1.06,1.61)	562	1.46 (0.93,2.29)	1,062	1.14 (0.82,1.60)	470	1.20 (0.69,2.08)	575	1.57 (1.04,2.36)
3	949	1.35 (1.09,1.66)	212	1.46 (0.93,2.29)	404	1.24 (0.88,1.75)	148	1.20 (0.69,2.08)	184	1.57 (1.04,2.36)
4	174	1.35 (1.09,1.66)	41	1.46 (0.93,2.29)	84	1.24 (0.88,1.75)	24	1.20 (0.69,2.08)	25	1.57 (1.04,2.36)
5	11	1.35 (1.09,1.66)	*	1.46 (0.93,2.29)	*	1.24 (0.88,1.75)	*	1.20 (0.69,2.08)	*	1.57 (1.04,2.36)
6	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
7	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 214. Reasons for First Revision Following Primary THA for Avenir Complete/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	28	28.9
2	Peri-prosthetic fracture - Femur	26	26.8
3	Dislocation/Instability	19	19.6
4	Aseptic Loosening	18	18.6
5	Poly liner wear	2	2.1
6	Malalignment	2	2.1
7	Implant Failure	1	1.0
8	Pain	1	1.0

Table 215. Reasons for First Revision in the First 90 Days Following Primary THA for Avenir Complete/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	24	38.7
2	Joint Infection	13	21.0
3	Dislocation/Instability	12	19.4
4	Aseptic Loosening	9	14.5
5	Malalignment	2	3.2
6	Poly liner wear	1	1.6
7	Implant Failure	1	1.6

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Table 216. Reasons for First Revision Between 91 and 365 days Following Primary THA for Avenir Complete/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	11	40.7
2	Aseptic Loosening	7	25.9
3	Dislocation/Instability	6	22.2
4	Peri-prosthetic fracture - Femur	2	7.4
5	Poly liner wear	1	3.7

Table 217. Descriptive Statistics of Cases Receiving the Avenir Complete/G7 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	5,283	58.62	
Age (years)	9,013	66.05 (10.88)	67.00 (14.00)
Height (cm)	9,013	169.34 (10.26)	167.64 (15.24)
Weight (kg)	9,013	86.46 (20.44)	84.37 (28.09)
BMI(kg/m^2)	9,013	30.02 (6.05)	29.34 (8.10)
Smoker - Never (%)	4,628	51.35	
Smoker - Previous (%)	3,177	35.25	
Smoker - Current (%)	1,190	13.2	
Smoker - Unknown (%)	18	0.2	

Table 218. Distribution of Approach Used for Avenir Complete/G7 Combination in Primary THA Cases

Approach	N	Percent
Anterior	7,149	79.3
Anterolateral	332	3.7
Posterior	1,512	16.8
Transtrochanteric	8	0.1
Missing/unknown/other	12	0.1

Table 219. Distribution of Head Size for Avenir Complete/G7 Combination in Primary THA Cases

Size (mm)	N	Percent
28	4	0.1
32	1,048	12.6
36	6,012	72.2
40	1,214	14.6
Missing/unknown/other	53	0.6

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Table 220. Distribution of Bearing Surface for Avenir Complete/G7 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	518	5.8
Ceramic-on-plastic	7,760	86.1
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	598	6.6
Missing/unknown/other	137	1.5

Table 221. Distribution of Polyethylene Used for Avenir Complete/G7 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	3,377	38.0
Antioxidant XLPE	5,515	62.0
Missing/unknown/other	0	0.0

Table 222. Volume of Cases by Surgeon and Site for the Avenir Complete/G7 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	102 (215)	29 (76)
Cases per site	170 (236)	96 (162)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

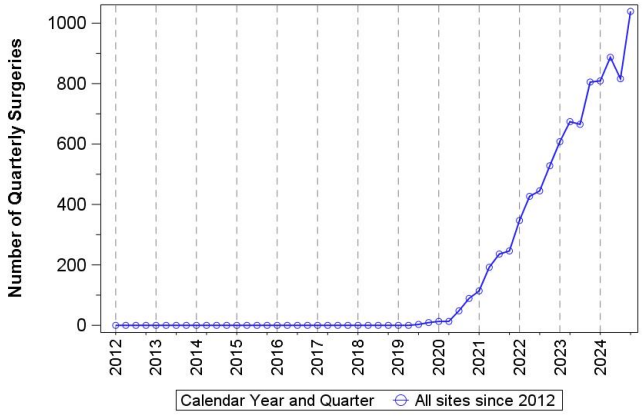


Figure 108. Utilization of the Avenir Complete/G7 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

574202050	574201010	574201075
574202040	574203060	574203000
574202060	574102030	574101010
574202030	574101040	574103030
574201040	574101020	574102075
574201050	574101030	574203070
574201030	574202010	574103020
574201020	574101050	574102010
574202065	574201065	574101065
574202020	574102065	574101000
574201060	574102020	574101070
574203050	574202080	574201080
574202070	574203010	574102000
574203040	574101060	574102080
574203030	574103040	574101075
574203020	574102070	574101085
574102050	574201070	574102085
574102060	574201000	574101080
574102040	574103050	574101090
574202075	574203065	

Catalog numbers of Acetabular Cups Used in the Analysis

110010244	110017102	110010268
110010243	110017105	110010269
110010245	110010264	10000668
110010246	110010263	110017100
110010247	110010265	110010271
110010242	10000667	110017108
110010248	110010266	10000669
110010241	110017106	110010251
10000662	10000661	110010261
10000663	110010267	110010270
10000664	110010250	110017099
10000665	110017101	110010272
110010249	110017107	110010274
10000666	110010262	110017109
110017104	110010240	
110017103	10000660	

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3.1.13 Corail/Pinnacle

N = 4,192 primary cases were used for this analysis. Distribution of utilization: 49 surgeons across 32 sites used this implant combination in primary THA cases.

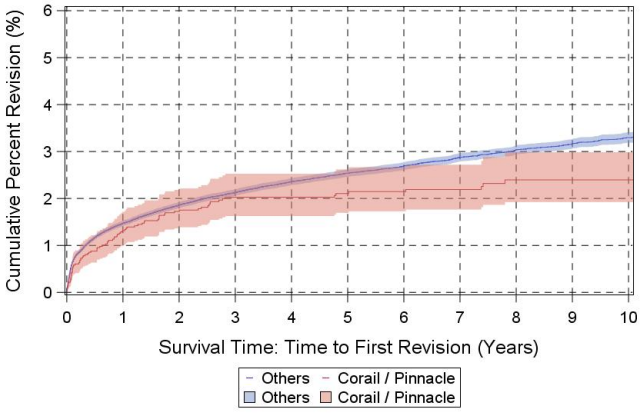


Figure 109. Cumulative Percent Revision Curve for the Corail/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases

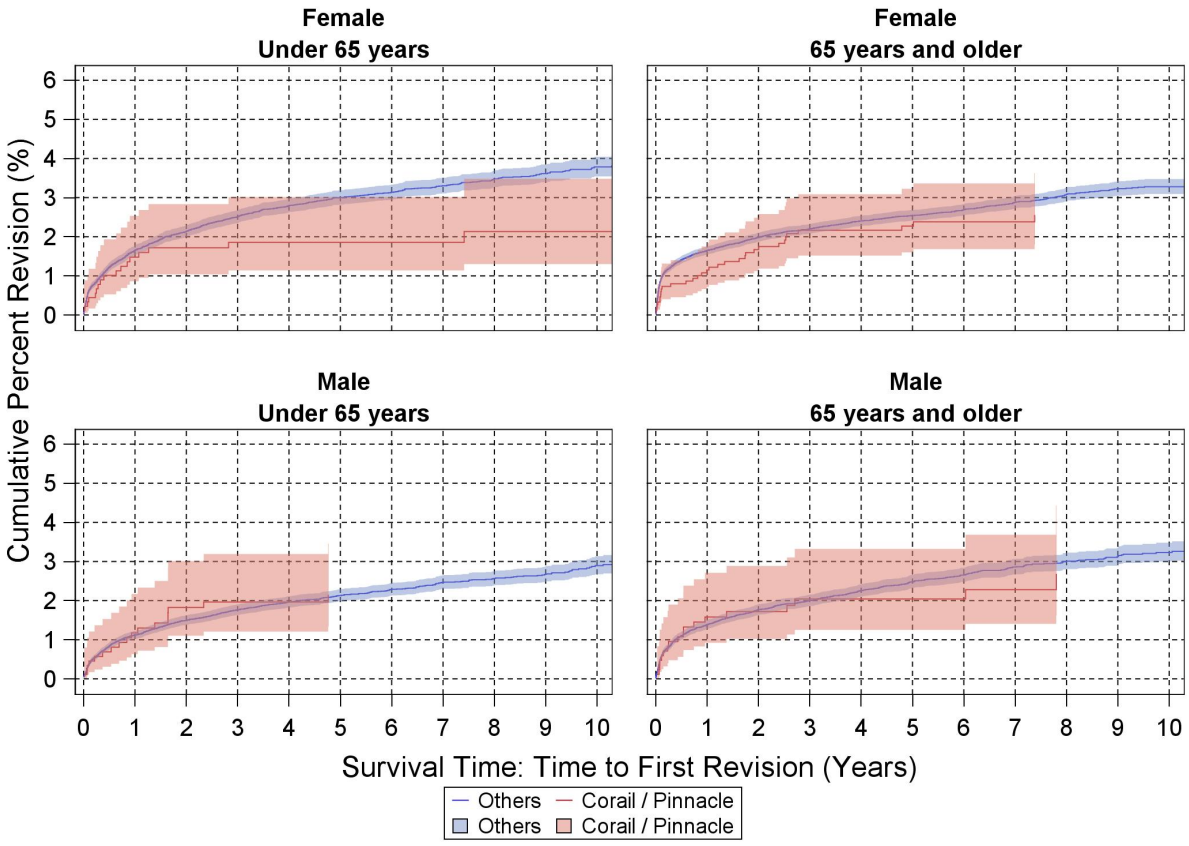


Figure 110. Cumulative Percent Revision Curve for the Corail/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 223. Cumulative Percent Revision and Number at Risk for the Corail/Pinnacle Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	4,141	0.00 (0.00,0.00)	901	0.00 (0.00,0.00)	1,511	0.00 (0.00,0.00)	881	0.00 (0.00,0.00)	848	0.00 (0.00,0.00)
1	3,780	1.31 (1.01,1.72)	833	1.48 (0.86,2.53)	1,391	1.15 (0.72,1.84)	797	1.17 (0.63,2.17)	759	1.58 (0.92,2.71)
2	3,440	1.72 (1.36,2.18)	775	1.72 (1.04,2.83)	1,266	1.67 (1.12,2.49)	726	1.82 (1.10,3.01)	673	1.72 (1.02,2.89)
3	3,048	2.03 (1.63,2.53)	698	1.86 (1.14,3.01)	1,123	2.17 (1.52,3.09)	644	1.97 (1.21,3.19)	583	2.04 (1.25,3.32)
4	2,678	2.03 (1.63,2.53)	634	1.86 (1.14,3.01)	981	2.17 (1.52,3.09)	561	1.97 (1.21,3.19)	502	2.04 (1.25,3.32)
5	2,448	2.11 (1.69,2.62)	578	1.86 (1.14,3.01)	898	2.27 (1.60,3.22)	513	2.15 (1.34,3.46)	459	2.04 (1.25,3.32)
6	2,181	2.15 (1.73,2.67)	517	1.86 (1.14,3.01)	790	2.38 (1.68,3.36)	462	2.15 (1.34,3.46)	412	2.04 (1.25,3.32)
7	1,752	2.19 (1.76,2.72)	412	1.86 (1.14,3.01)	636	2.38 (1.68,3.36)	371	2.15 (1.34,3.46)	333	2.28 (1.41,3.68)
8	1,155	2.40 (1.92,2.99)	274	2.13 (1.30,3.48)	407	2.56 (1.80,3.62)	256	2.15 (1.34,3.46)	218	2.69 (1.62,4.43)
9	683	2.40 (1.92,2.99)	171	2.13 (1.30,3.48)	223	2.56 (1.80,3.62)	158	2.15 (1.34,3.46)	131	2.69 (1.62,4.43)
10	347	2.40 (1.92,2.99)	93	2.13 (1.30,3.48)	111	2.56 (1.80,3.62)	77	2.15 (1.34,3.46)	66	2.69 (1.62,4.43)

Table 224. Reasons for First Revision Following Primary THA for Corail/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	23	26.7
2	Aseptic Loosening	21	24.4
3	Dislocation/Instability	18	20.9
4	Peri-prosthetic fracture - Femur	10	11.6
5	Implant Failure	5	5.8
6	Pain	4	4.7
7	Malalignment	4	4.7
8	Peri-prosthetic fracture - Acetabulum	1	1.2

Table 225. Reasons for First Revision in the First 90 Days Following Primary THA for Corail/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	8	27.6
2	Dislocation/Instability	7	24.1
3	Aseptic Loosening	6	20.7
4	Joint Infection	4	13.8
5	Implant Failure	2	6.9
6	Peri-prosthetic fracture - Acetabulum	1	3.4
7	Pain	1	3.4

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Table 226. Reasons for First Revision Between 91 and 365 days Following Primary THA for Corail/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	8	33.3
2	Joint Infection	7	29.2
3	Aseptic Loosening	4	16.7
4	Pain	2	8.3
5	Malalignment	2	8.3
6	Implant Failure	1	4.2

Table 227. Descriptive Statistics of Cases Receiving the Corail/Pinnacle Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,441	58.23	
Age (years)	4,192	65.87 (10.25)	66.00 (14.00)
Height (cm)	4,036	169.43 (10.45)	168.00 (15.24)
Weight (kg)	4,036	88.55 (20.57)	86.40 (28.12)
BMI(kg/m^2)	4,036	30.77 (6.73)	29.91 (8.17)
Smoker - Never (%)	1,965	46.88	
Smoker - Previous (%)	1,605	38.29	
Smoker - Current (%)	616	14.69	
Smoker - Unknown (%)	6	0.14	

Table 228. Distribution of Approach Used for Corail/Pinnacle Combination in Primary THA Cases

Approach	N	Percent
Anterior	2,335	55.7
Anterolateral	929	22.2
Posterior	759	18.1
Transtrochanteric	7	0.2
Missing/unknown/other	162	3.9

Table 229. Distribution of Head Size for Corail/Pinnacle Combination in Primary THA Cases

Size (mm)	N	Percent
28	11	0.3
32	829	20.0
36	2,888	69.6
40	390	9.4
44	16	0.4
Missing/unknown/other	13	0.3

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Table 230. Distribution of Bearing Surface for Corail/Pinnacle Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,307	31.2
Ceramic-on-plastic	2,820	67.3
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	10	0.2
Missing/unknown/other	55	1.3

Table 231. Distribution of Polyethylene Used for Corail/Pinnacle Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	10	0.2
XLPE	4,139	99.8
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 232. Volume of Cases by Surgeon and Site for the Corail/Pinnacle Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	85 (136)	8 (111)
Cases per site	131 (231)	24 (147)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

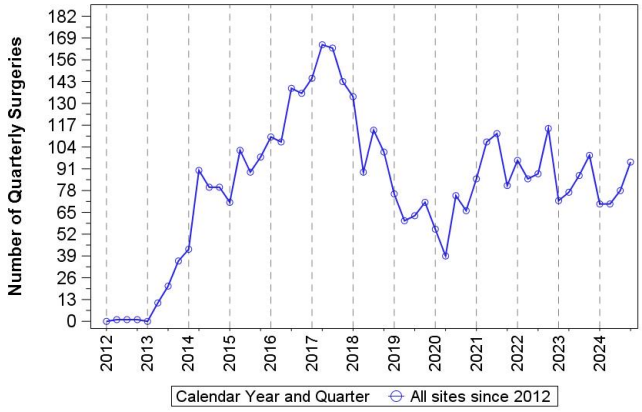


Figure 111. Utilization of the Corail/Pinnacle Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

3L92502	L971115	L98011
3L92501	L20311	L971208
3L92503	3L92510	L971310
3L92500	L20315	L98012
3L92504	3L92514	L20309
3L92505	L971109	L971308
L971112	L971210	L98112
3L92499	L971116	L98115
L971111	3L92515	L98120
3L92512	L20316	L98015
3L92511	3L92508	3L92521
L971113	3L92509	L20320
3L92513	L20310	L98010
L971110	L971209	L98016
L20312	3L92507	L98018
3L92498	3L92516	L98020
L971114	L971118	L98113
L20313	L20318	L98114
3L92506	L98013	L98116
L20314	L98014	

Catalog numbers of Acetabular Cups Used in the Analysis

121732052	121730050	121732066
121732054	121732064	121703062
121732056	121730060	121730046
121732058	121731052	121730064
121732050	121731054	121731060
121732048	121703058	121730068
121732060	121722054	121722056
121730052	121731056	121722060
121730054	121703050	121730066
121722052	121703048	121722058
121730056	121722048	121722064
121732062	121730048	121701052
121703052	121730062	121703064
121730058	121731048	121720046
121722050	121703060	121722062
121703054	121731050	
121703056	121731058	

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3.1.14 Corail Coxa Vara/Pinnacle

N = 885 primary cases were used for this analysis. Distribution of utilization: 30 surgeons across 25 sites used this implant combination in primary THA cases.

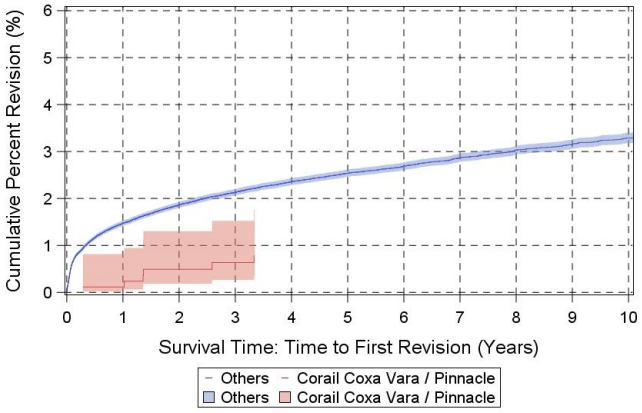


Figure 112. Cumulative Percent Revision Curve for the Corail Coxa Vara/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases

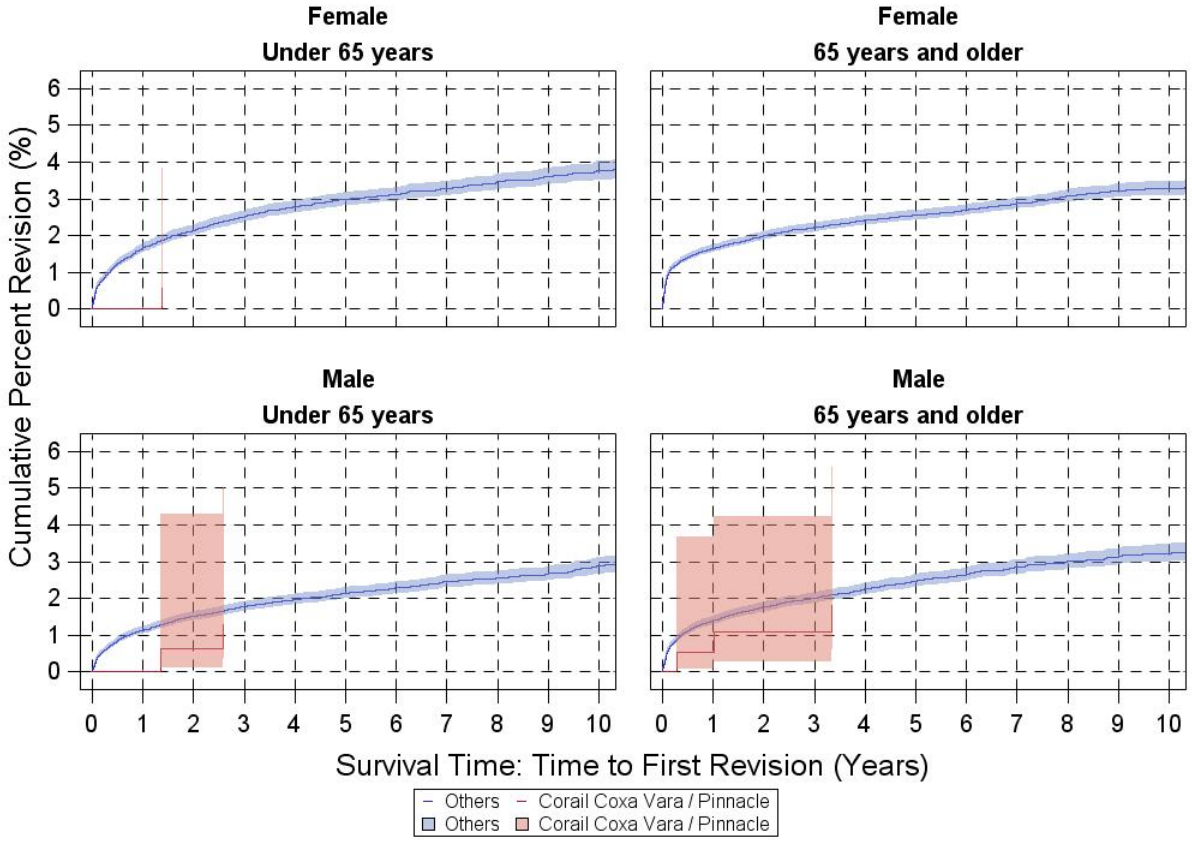


Figure 113. Cumulative Percent Revision Curve for the Corail Coxa Vara/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 233. Cumulative Percent Revision and Number at Risk for the Corail Coxa Vara/Pinnacle Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	881	0.00 (0.00,0.00)	202	0.00 (0.00,0.00)	306	0.00 (0.00,0.00)	179	0.00 (0.00,0.00)	194	0.00 (0.00,0.00)
1	819	0.12 (0.02,0.82)	190	0.00 (0.00,0.00)	281	0.00 (0.00,0.00)	168	0.00 (0.00,0.00)	180	0.52 (0.07,3.66)
2	749	0.49 (0.18,1.31)	174	0.55 (0.08,3.84)	261	0.00 (0.00,0.00)	154	0.62 (0.09,4.30)	160	1.08 (0.27,4.24)
3	657	0.64 (0.26,1.52)	155	0.55 (0.08,3.84)	219	0.00 (0.00,0.00)	142	1.28 (0.32,5.03)	141	1.08 (0.27,4.24)
4	585	0.79 (0.36,1.76)	138	0.55 (0.08,3.84)	196	0.00 (0.00,0.00)	126	1.28 (0.32,5.03)	125	1.80 (0.58,5.56)
5	525	0.79 (0.36,1.76)	127	0.55 (0.08,3.84)	170	0.00 (0.00,0.00)	115	1.28 (0.32,5.03)	113	1.80 (0.58,5.56)
6	434	0.79 (0.36,1.76)	109	0.55 (0.08,3.84)	136	0.00 (0.00,0.00)	99	1.28 (0.32,5.03)	90	1.80 (0.58,5.56)
7	344	0.79 (0.36,1.76)	83	0.55 (0.08,3.84)	102	0.00 (0.00,0.00)	84	1.28 (0.32,5.03)	75	1.80 (0.58,5.56)
8	225	0.79 (0.36,1.76)	54	0.55 (0.08,3.84)	53	0.00 (0.00,0.00)	67	1.28 (0.32,5.03)	51	1.80 (0.58,5.56)
9	134	0.79 (0.36,1.76)	32	0.55 (0.08,3.84)	31	0.00 (0.00,0.00)	42	1.28 (0.32,5.03)	29	1.80 (0.58,5.56)
10	63	0.79 (0.36,1.76)	16	0.55 (0.08,3.84)	18	0.00 (0.00,0.00)	14	1.28 (0.32,5.03)	15	1.80 (0.58,5.56)

Table 234. Reasons for First Revision Following Primary THA for Corail Coxa Vara/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	5	83.3
2	Dislocation/Instability	1	16.7

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 235. Reasons for First Revision Between 91 and 365 days Following Primary THA for Corail Coxa Vara/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	100.0

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Table 236. Descriptive Statistics of Cases Receiving the Corail Coxa Vara/Pinnacle Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	510	57.63	
Age (years)	885	65.44 (9.95)	66.00 (13.00)
Height (cm)	882	169.81 (10.17)	170.00 (15.24)
Weight (kg)	882	88.19 (19.61)	86.81 (25.15)
BMI(kg/m^2)	882	30.48 (5.73)	29.71 (7.85)
Smoker - Never (%)	410	46.33	
Smoker - Previous (%)	351	39.66	
Smoker - Current (%)	123	13.9	
Smoker - Unknown (%)	1	0.11	

Table 237. Distribution of Approach Used for Corail Coxa Vara/Pinnacle Combination in Primary THA Cases

Approach	N	Percent
Anterior	552	62.4
Anterolateral	183	20.7
Posterior	145	16.4
Transtrochanteric	0	0.0
Missing/unknown/other	5	0.6

Table 238. Distribution of Head Size for Corail Coxa Vara/Pinnacle Combination in Primary THA Cases

Size (mm)	N	Percent
28	11	1.3
32	219	25.1
36	606	69.3
40	31	3.5
44	1	0.1
Missing/unknown/other	6	0.7

Table 239. Distribution of Bearing Surface for Corail Coxa Vara/Pinnacle Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	222	25.1
Ceramic-on-plastic	643	72.7
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	2	0.2
Missing/unknown/other	18	2.0

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Table 240. Distribution of Polyethylene Used for Corail Coxa Vara/Pinnacle Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	2	0.2
XLPE	871	99.8
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 241. Volume of Cases by Surgeon and Site for the Corail Coxa Vara/Pinnacle Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	29 (37)	12 (45)
Cases per site	35 (49)	10 (45)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

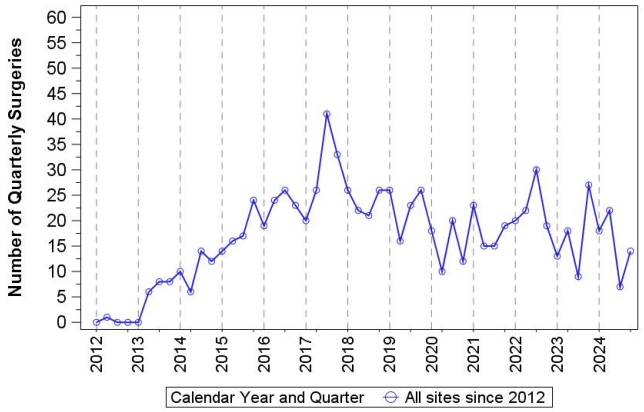


Figure 114. Utilization of the Corail Coxa Vara/Pinnacle Combination in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

3L93712	3L93714	3L93718
3L93711	3L93715	
3L93713	3L93709	
3L93710	3L93716	

Catalog numbers of Acetabular Cups Used in the Analysis

121732052	121730052	121732048
121732054	121732058	121732060
121732056	121722052	121730054
121732050	121722050	121703052

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121730050	121730048	121722060
121732062	121703048	121730044
121703054	121703060	121730046
121722054	121722056	121731050
121730056	121703050	121731052
121703056	121730060	121731054
121703058	121731048	121731056
121730058	121730062	121731058
121722048	121731060	

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3.1.15 C-Stem AMT/Pinnacle

N = 555 primary cases were used for this analysis. Fewer than ten surgeons used this implant combination at fewer than ten sites in primary THA cases.

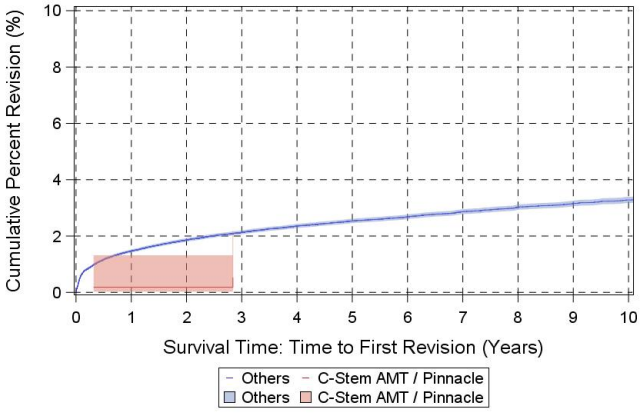


Figure 115. Cumulative Percent Revision Curve for the C-Stem AMT/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases

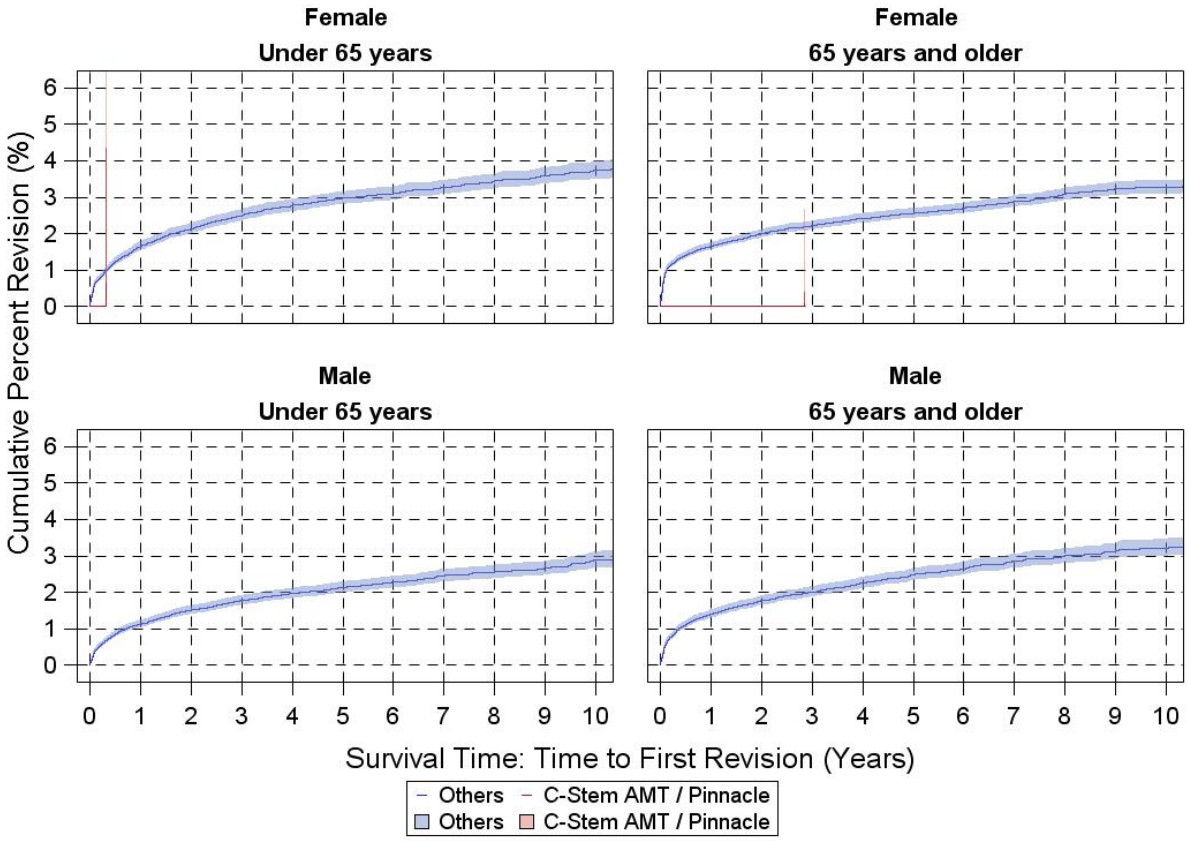


Figure 116. Cumulative Percent Revision Curve for the C-Stem AMT/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 242. Cumulative Percent Revision and Number at Risk for the C-Stem AMT/Pinnacle Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	549	0.00 (0.00,0.00)	23	0.00 (0.00,0.00)	482	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	38	0.00 (0.00,0.00)
1	475	0.19 (0.03,1.32)	17	4.35 (0.62,27.07)	421	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	34	0.00 (0.00,0.00)
2	383	0.19 (0.03,1.32)	11	4.35 (0.62,27.07)	338	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	32	0.00 (0.00,0.00)
3	289	0.52 (0.12,2.19)	*	4.35 (0.62,27.07)	256	0.38 (0.05,2.66)	0	N/A	26	0.00 (0.00,0.00)
4	219	0.52 (0.12,2.19)	*	4.35 (0.62,27.07)	191	0.38 (0.05,2.66)	0	N/A	21	0.00 (0.00,0.00)
5	173	0.52 (0.12,2.19)	*	4.35 (0.62,27.07)	153	0.38 (0.05,2.66)	0	N/A	15	0.00 (0.00,0.00)
6	131	0.52 (0.12,2.19)	*	4.35 (0.62,27.07)	117	0.38 (0.05,2.66)	0	N/A	*	0.00 (0.00,0.00)
7	98	0.52 (0.12,2.19)	*	4.35 (0.62,27.07)	87	0.38 (0.05,2.66)	0	N/A	*	0.00 (0.00,0.00)
8	63	0.52 (0.12,2.19)	*	4.35 (0.62,27.07)	52	0.38 (0.05,2.66)	0	N/A	*	0.00 (0.00,0.00)
9	30	0.52 (0.12,2.19)	*	4.35 (0.62,27.07)	25	0.38 (0.05,2.66)	0	N/A	*	0.00 (0.00,0.00)
10	*	0.52 (0.12,2.19)	*	4.35 (0.62,27.07)	*	0.38 (0.05,2.66)	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 243. Reasons for First Revision Following Primary THA for C-Stem AMT/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	50.0
2	Peri-prosthetic fracture - Femur	1	50.0

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 244. Reasons for First Revision Between 91 and 365 days Following Primary THA for C-Stem AMT/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	100.0

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Table 245. Descriptive Statistics of Cases Receiving the C-Stem AMT/Pinnacle Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	508	91.53	
Age (years)	555	77.83 (7.62)	78.00 (10.00)
Height (cm)	555	162.44 (7.76)	162.60 (11.00)
Weight (kg)	555	72.56 (15.36)	70.00 (21.50)
BMI(kg/m^2)	555	27.44 (5.17)	27.08 (7.41)
Smoker - Never (%)	282	50.81	
Smoker - Previous (%)	234	42.16	
Smoker - Current (%)	38	6.85	
Smoker - Unknown (%)	1	0.18	

Table 246. Distribution of Approach Used for C-Stem AMT/Pinnacle Combination in Primary THA Cases

Approach	N	Percent
Anterior	299	53.9
Anterolateral	125	22.5
Posterior	131	23.6
Transtrochanteric	0	0.0
Missing/unknown/other	0	0.0

Table 247. Distribution of Head Size for C-Stem AMT/Pinnacle Combination in Primary THA Cases

Size (mm)	N	Percent
28	8	1.5
32	289	53.5
36	230	42.6
40	11	2.0
Missing/unknown/other	2	0.4

Table 248. Distribution of Bearing Surface for C-Stem AMT/Pinnacle Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	379	68.3
Ceramic-on-plastic	159	28.6
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	11	2.0
Missing/unknown/other	6	1.1

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Table 249. Distribution of Polyethylene Used for C-Stem AMT/Pinnacle Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	11	2.0
XLPE	540	98.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 250. Volume of Cases by Surgeon and Site for the C-Stem AMT/Pinnacle Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	79 (98)	34 (125)
Cases per site	79 (157)	5 (99)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

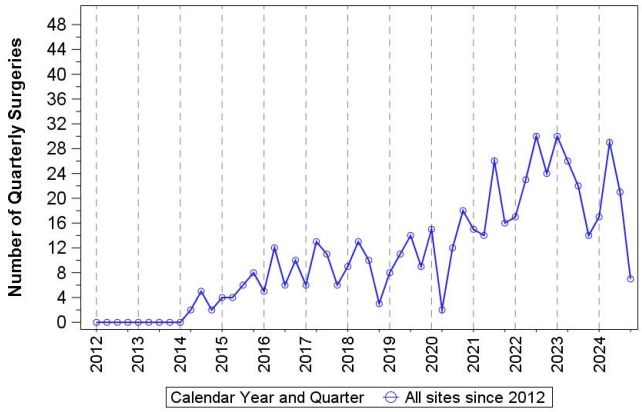


Figure 117. Utilization of the C-Stem AMT/Pinnacle Combination in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

157004085	157014090	157014110
157004070	157004100	157004110
157004090	157014070	157004120
157014085	157014100	

Catalog numbers of Acetabular Cups Used in the Analysis

121732052	121722052	121730054
121732050	121732056	121730050
121732054	121722048	121720046
121732048	121722054	121722058
121722050	121732058	121730052

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121722056	121732060	121730060
121732062	121720044	
121722060	121730048	
121730046	121730056	

3.1.16 Echo Bi-Metric/G7

N = 1,676 primary cases were used for this analysis. Distribution of utilization: 37 surgeons across 32 sites used this implant combination in primary THA cases.

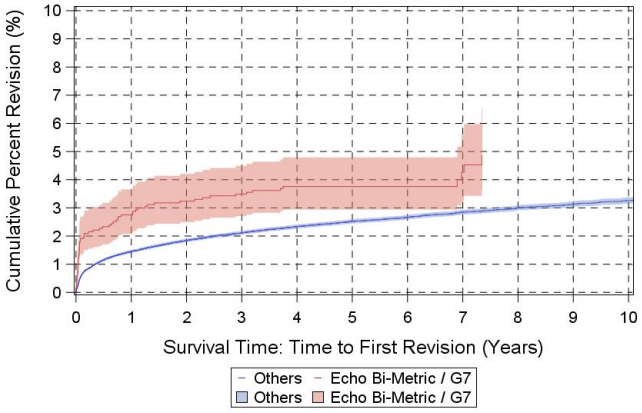


Figure 118. Cumulative Percent Revision Curve for the Echo Bi-Metric/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases

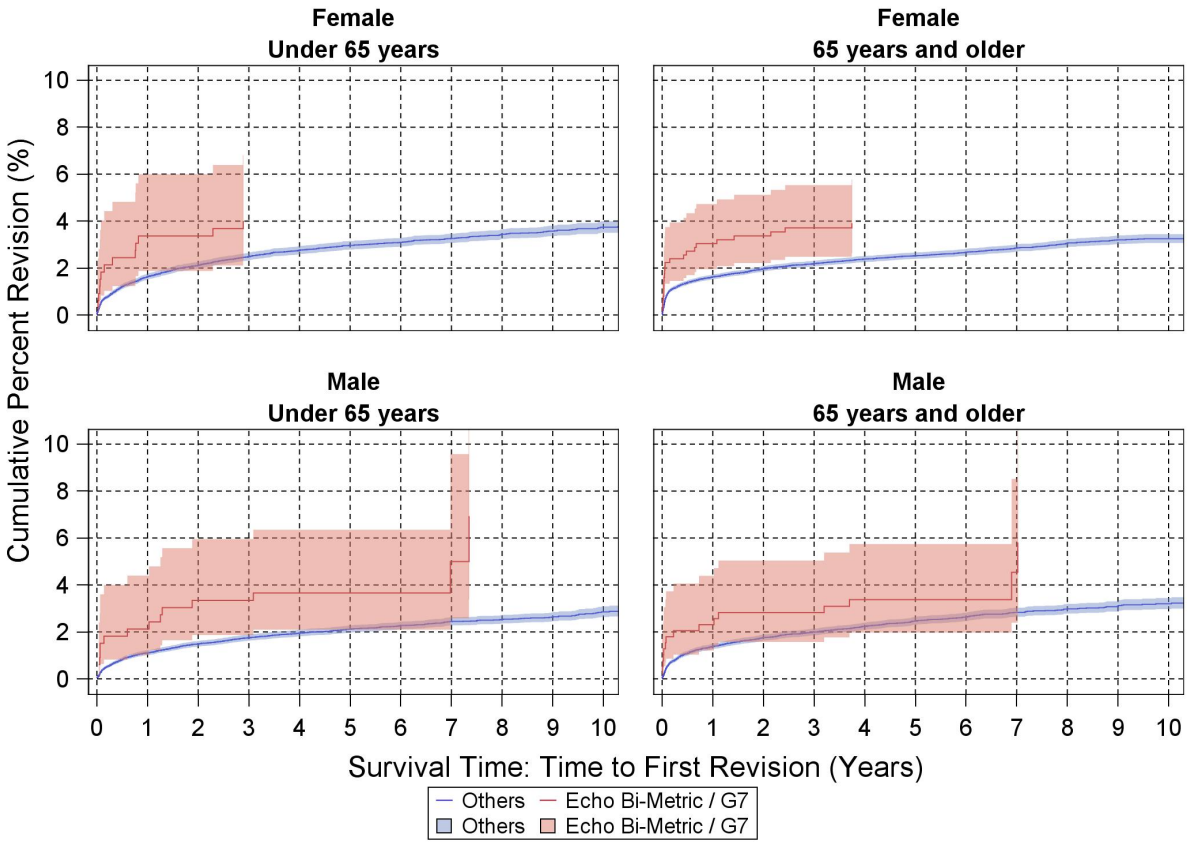


Figure 119. Cumulative Percent Revision Curve for the Echo Bi-Metric/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 251. Cumulative Percent Revision and Number at Risk for the Echo Bi-Metric/G7 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,674	0.00 (0.00,0.00)	328	0.00 (0.00,0.00)	626	0.00 (0.00,0.00)	330	0.00 (0.00,0.00)	390	0.00 (0.00,0.00)
1	1,606	2.75 (2.07,3.66)	311	3.37 (1.88,5.99)	594	3.04 (1.95,4.73)	322	2.12 (1.02,4.40)	379	2.31 (1.21,4.39)
2	1,573	3.24 (2.49,4.21)	307	3.37 (1.88,5.99)	576	3.37 (2.21,5.12)	315	3.34 (1.87,5.95)	375	2.82 (1.57,5.04)
3	1,494	3.49 (2.71,4.49)	290	4.01 (2.35,6.81)	531	3.71 (2.48,5.53)	307	3.34 (1.87,5.95)	366	2.82 (1.57,5.04)
4	1,353	3.76 (2.94,4.79)	266	4.01 (2.35,6.81)	481	3.91 (2.63,5.77)	283	3.66 (2.09,6.35)	323	3.37 (1.97,5.74)
5	1,136	3.76 (2.94,4.79)	225	4.01 (2.35,6.81)	410	3.91 (2.63,5.77)	246	3.66 (2.09,6.35)	255	3.37 (1.97,5.74)
6	749	3.76 (2.94,4.79)	153	4.01 (2.35,6.81)	276	3.91 (2.63,5.77)	160	3.66 (2.09,6.35)	160	3.37 (1.97,5.74)
7	364	4.26 (3.25,5.58)	67	4.01 (2.35,6.81)	152	3.91 (2.63,5.77)	70	5.00 (2.58,9.58)	75	4.54 (2.39,8.52)
8	150	4.87 (3.63,6.52)	19	4.01 (2.35,6.81)	81	3.91 (2.63,5.77)	24	6.94 (3.37,13.99)	26	5.81 (3.02,11.03)
9	44	4.87 (3.63,6.52)	*	4.01 (2.35,6.81)	26	3.91 (2.63,5.77)	*	6.94 (3.37,13.99)	*	5.81 (3.02,11.03)
10	*	4.87 (3.63,6.52)	0	N/A	*	3.91 (2.63,5.77)	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 252. Reasons for First Revision Following Primary THA for Echo Bi-Metric/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	23	34.8
2	Joint Infection	17	25.8
3	Dislocation/Instability	12	18.2
4	Aseptic Loosening	7	10.6
5	Implant Failure	3	4.5
6	Malalignment	2	3.0
7	Peri-prosthetic fracture - Acetabulum	1	1.5
8	Pain	1	1.5

Table 253. Reasons for First Revision in the First 90 Days Following Primary THA for Echo Bi-Metric/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	19	52.8
2	Aseptic Loosening	5	13.9
3	Dislocation/Instability	4	11.1
4	Joint Infection	4	11.1
5	Malalignment	2	5.6
6	Implant Failure	1	2.8
7	Peri-prosthetic fracture - Acetabulum	1	2.8

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Table 254. Reasons for First Revision Between 91 and 365 days Following Primary THA for Echo Bi-Metric/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	3	30.0
2	Aseptic Loosening	2	20.0
3	Joint Infection	2	20.0
4	Implant Failure	2	20.0
5	Peri-prosthetic fracture - Femur	1	10.0

Table 255. Descriptive Statistics of Cases Receiving the Echo Bi-Metric/G7 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	954	56.92	
Age (years)	1,676	66.69 (10.96)	67.00 (14.00)
Height (cm)	1,676	169.58 (10.40)	168.90 (15.24)
Weight (kg)	1,676	89.17 (22.32)	86.93 (29.66)
BMI(kg/m^2)	1,676	30.87 (6.67)	29.89 (8.77)
Smoker - Never (%)	822	49.05	
Smoker - Previous (%)	608	36.28	
Smoker - Current (%)	243	14.5	
Smoker - Unknown (%)	3	0.18	

Table 256. Distribution of Approach Used for Echo Bi-Metric/G7 Combination in Primary THA Cases

Approach	N	Percent
Anterior	135	8.1
Anterolateral	54	3.2
Posterior	1,484	88.5
Transtrochanteric	1	0.1
Missing/unknown/other	2	0.1

Table 257. Distribution of Head Size for Echo Bi-Metric/G7 Combination in Primary THA Cases

Size (mm)	N	Percent
28	4	0.3
32	252	17.3
36	767	52.7
40	425	29.2
Missing/unknown/other	8	0.6

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Table 258. Distribution of Bearing Surface for Echo Bi-Metric/G7 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	113	6.7
Ceramic-on-plastic	1,335	79.7
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	216	12.9
Missing/unknown/other	12	0.7

Table 259. Distribution of Polyethylene Used for Echo Bi-Metric/G7 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,259	75.4
Antioxidant XLPE	410	24.6
Missing/unknown/other	0	0.0

Table 260. Volume of Cases by Surgeon and Site for the Echo Bi-Metric/G7 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	45 (130)	4 (34)
Cases per site	52 (147)	10 (35)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

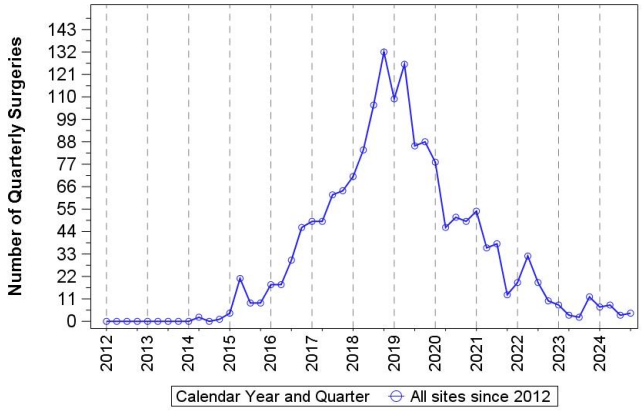


Figure 120. Utilization of the Echo Bi-Metric/G7 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

192113	192412	192514
192112	192509	192017
192111	192512	192007
192012	192413	192107
192110	192510	192118
192114	192116	192416
192011	192016	192515
192010	192108	192018
192013	192414	192417
192014	192513	192516
192411	192511	192019
192109	192408	192020
192115	192508	192119
192009	192407	192517
192015	192008	
192410	192415	
192409	192117	

Catalog numbers of Acetabular Cups Used in the Analysis

110010243	110010265	110010262
110010244	110010263	110010269
110010245	110010264	110017101
110010246	110017102	10000668
110010242	110010266	110010240
110010247	10000667	110010250
10000663	110017103	110010268
110010241	110017104	10000660
10000664	110010249	10000671
110010248	110017105	110010270
10000662	110010267	110017108
10000665	110017106	
10000666	10000661	

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3.1.17 Echo Bi-Metric Microplasty/G7

N = 2,303 primary cases were used for this analysis. Distribution of utilization: 26 surgeons across 28 sites used this implant combination in primary THA cases.

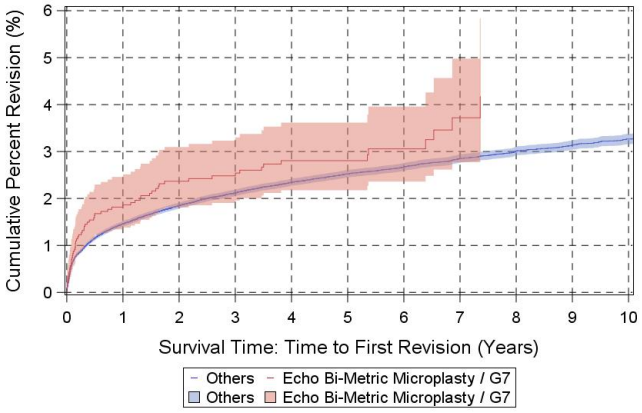


Figure 121. Cumulative Percent Revision Curve for the Echo Bi-Metric Microplasty/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases

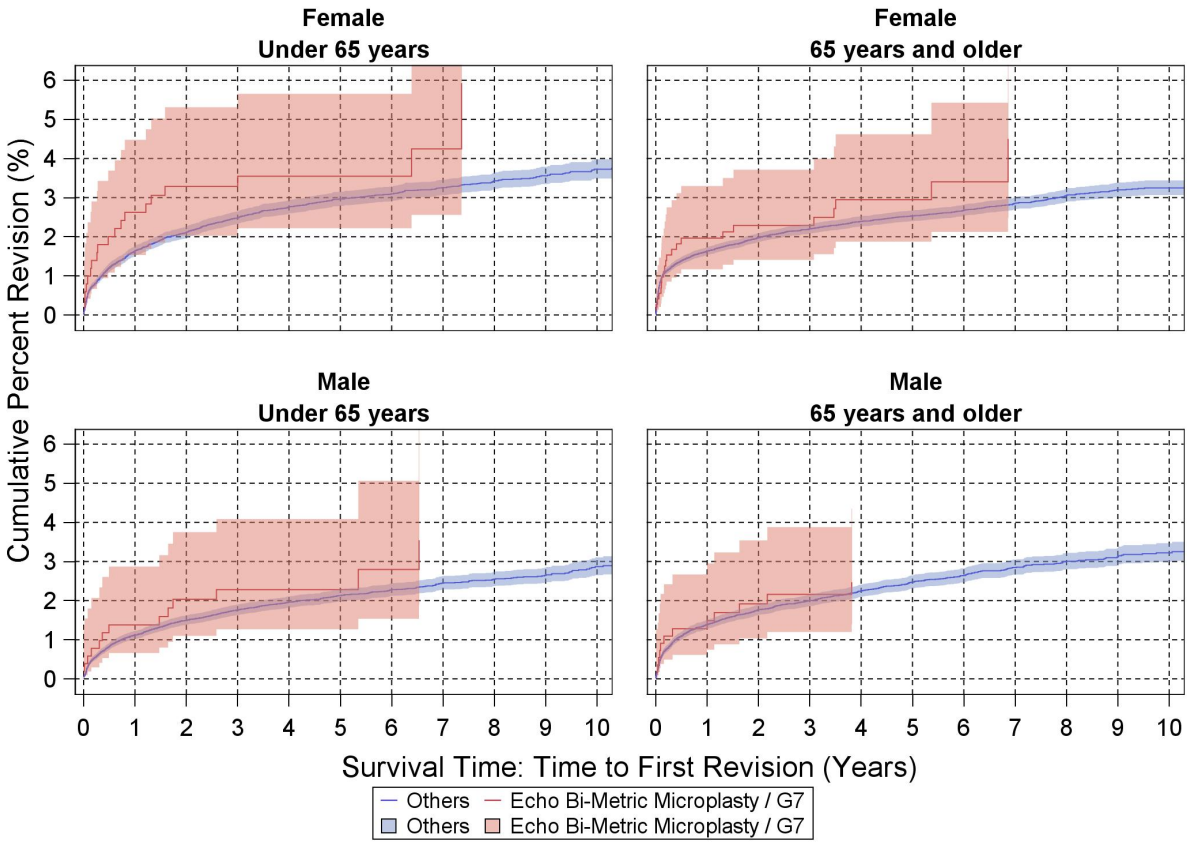


Figure 122. Cumulative Percent Revision Curve for the Echo Bi-Metric Microplasty/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 261. Cumulative Percent Revision and Number at Risk for the Echo Bi-Metric Microplasty/G7 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	2,298	0.00 (0.00,0.00)	504	0.00 (0.00,0.00)	725	0.00 (0.00,0.00)	515	0.00 (0.00,0.00)	553	0.00 (0.00,0.00)
1	2,060	1.86 (1.38,2.51)	463	2.62 (1.53,4.48)	635	1.97 (1.17,3.30)	478	1.38 (0.66,2.87)	483	1.49 (0.75,2.95)
2	1,796	2.37 (1.81,3.10)	402	3.29 (2.02,5.31)	551	2.29 (1.41,3.71)	428	2.03 (1.10,3.75)	414	1.92 (1.03,3.54)
3	1,610	2.48 (1.90,3.23)	370	3.29 (2.02,5.31)	479	2.29 (1.41,3.71)	390	2.28 (1.27,4.08)	370	2.16 (1.20,3.88)
4	1,303	2.81 (2.18,3.62)	305	3.55 (2.22,5.65)	360	2.95 (1.87,4.62)	336	2.28 (1.27,4.08)	302	2.47 (1.40,4.35)
5	919	2.81 (2.18,3.62)	222	3.55 (2.22,5.65)	254	2.95 (1.87,4.62)	227	2.28 (1.27,4.08)	216	2.47 (1.40,4.35)
6	579	3.06 (2.36,3.96)	159	3.55 (2.22,5.65)	152	3.40 (2.13,5.43)	151	2.80 (1.54,5.06)	117	2.47 (1.40,4.35)
7	323	3.72 (2.77,4.98)	96	4.25 (2.56,7.01)	79	4.50 (2.48,8.08)	81	3.54 (1.89,6.58)	67	2.47 (1.40,4.35)
8	83	4.17 (2.98,5.83)	26	5.93 (3.06,11.31)	16	4.50 (2.48,8.08)	26	3.54 (1.89,6.58)	15	2.47 (1.40,4.35)
9	*	4.17 (2.98,5.83)	0	N/A	*	4.50 (2.48,8.08)	*	3.54 (1.89,6.58)	*	2.47 (1.40,4.35)
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 262. Reasons for First Revision Following Primary THA for Echo Bi-Metric Microplasty/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	25	38.5
2	Aseptic Loosening	11	16.9
3	Dislocation/Instability	11	16.9
4	Joint Infection	8	12.3
5	Pain	4	6.2
6	Malalignment	4	6.2
7	Implant Failure	2	3.1

Table 263. Reasons for First Revision in the First 90 Days Following Primary THA for Echo Bi-Metric Microplasty/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	20	71.4
2	Aseptic Loosening	3	10.7
3	Dislocation/Instability	3	10.7
4	Pain	1	3.6
5	Malalignment	1	3.6

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Table 264. Reasons for First Revision Between 91 and 365 days Following Primary THA for Echo Bi-Metric Microplasty/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	4	28.6
2	Aseptic Loosening	3	21.4
3	Joint Infection	3	21.4
4	Implant Failure	2	14.3
5	Pain	1	7.1
6	Malalignment	1	7.1

Table 265. Descriptive Statistics of Cases Receiving the Echo Bi-Metric Microplasty/G7 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,230	53.41	
Age (years)	2,303	65.55 (10.31)	66.00 (14.00)
Height (cm)	2,303	169.96 (10.63)	170.18 (15.24)
Weight (kg)	2,303	88.20 (19.89)	87.77 (26.00)
BMI(kg/m^2)	2,303	30.51 (7.24)	29.99 (7.94)
Smoker - Never (%)	1,153	50.07	
Smoker - Previous (%)	807	35.04	
Smoker - Current (%)	338	14.68	
Smoker - Unknown (%)	5	0.22	

Table 266. Distribution of Approach Used for Echo Bi-Metric Microplasty/G7 Combination in Primary THA Cases

Approach	N	Percent
Anterior	1,696	73.6
Anterolateral	102	4.4
Posterior	501	21.8
Transtrochanteric	3	0.1
Missing/unknown/other	1	0.0

Table 267. Distribution of Head Size for Echo Bi-Metric Microplasty/G7 Combination in Primary THA Cases

Size (mm)	N	Percent
28	1	0.1
32	301	14.4
36	1,457	69.7
40	323	15.4
Missing/unknown/other	10	0.5

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Table 268. Distribution of Bearing Surface for Echo Bi-Metric Microplasty/G7 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	290	12.6
Ceramic-on-plastic	1,792	77.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	180	7.8
Missing/unknown/other	41	1.8

Table 269. Distribution of Polyethylene Used for Echo Bi-Metric Microplasty/G7 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,501	66.1
Antioxidant XLPE	770	33.9
Missing/unknown/other	0	0.0

Table 270. Volume of Cases by Surgeon and Site for the Echo Bi-Metric Microplasty/G7 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	88 (132)	7 (163)
Cases per site	82 (122)	15 (113)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

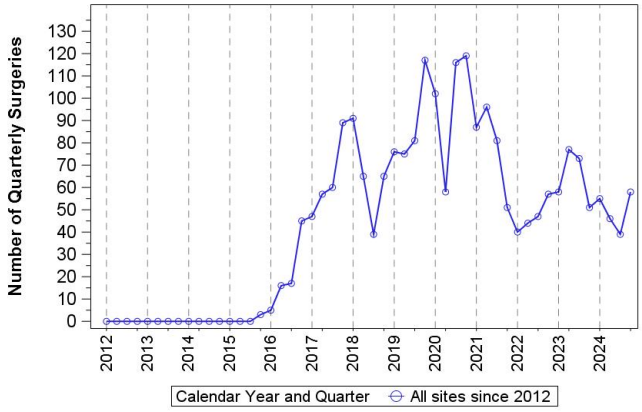


Figure 123. Utilization of the Echo Bi-Metric Microplasty/G7 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

193012	193009	192807
193112	193109	193007
193111	193115	193118
193113	193015	193018
193010	193108	193107
193013	193008	192907
193011	193116	192908
193014	193016	193019
193110	193117	193119
193114	193017	

Catalog numbers of Acetabular Cups Used in the Analysis

110017102	110017101	110010249
110017103	10000662	110010266
110010243	110010242	110010267
110017104	10000667	110017108
110010246	110017107	10000669
110010245	110010263	110010268
110017105	110010248	10000660
110010244	10000661	10000671
10000664	110010264	110010250
10000665	110017100	110010272
110017106	110010265	110017099
110010247	110010241	110017109
10000663	110010262	
10000666	10000668	

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3.1.18 Echo FX/G7

N = 504 primary cases were used for this analysis. Distribution of utilization: 35 surgeons across 23 sites used this implant combination in primary THA cases.

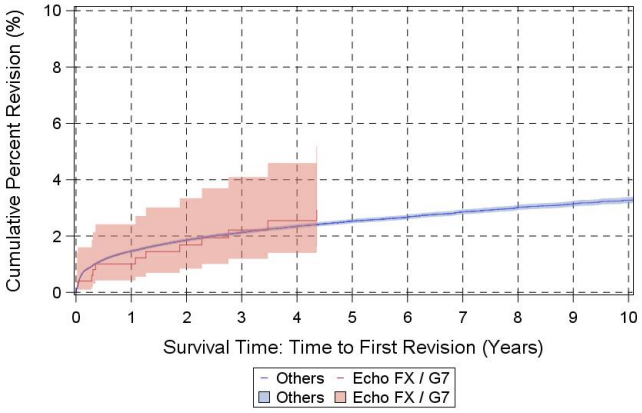


Figure 124. Cumulative Percent Revision Curve for the Echo FX/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases

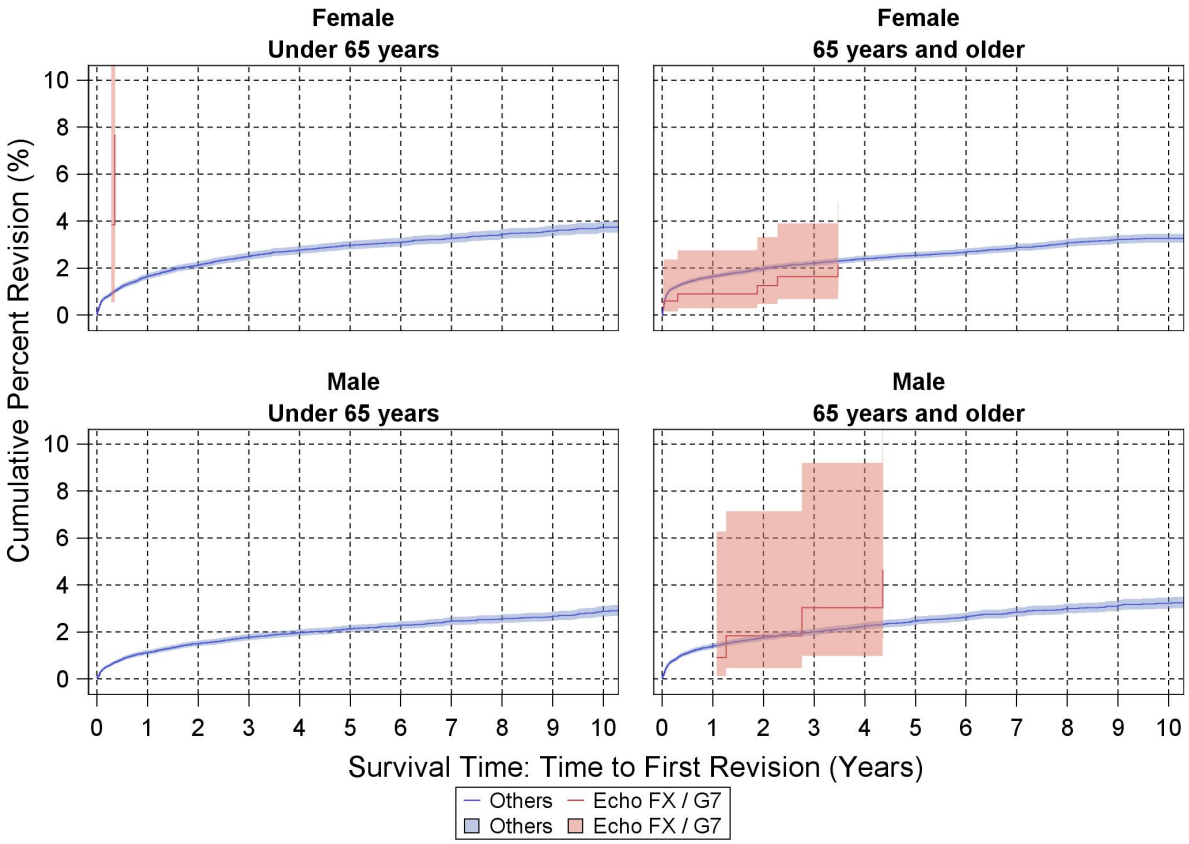


Figure 125. Cumulative Percent Revision Curve for the Echo FX/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 271. Cumulative Percent Revision and Number at Risk for the Echo FX/G7 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	497	0.00 (0.00,0.00)	26	0.00 (0.00,0.00)	335	0.00 (0.00,0.00)	18	0.00 (0.00,0.00)	118	0.00 (0.00,0.00)
1	463	1.01 (0.42,2.42)	24	7.69 (1.98,27.40)	311	0.90 (0.29,2.76)	18	0.00 (0.00,0.00)	110	0.00 (0.00,0.00)
2	408	1.68 (0.84,3.34)	23	7.69 (1.98,27.40)	269	1.26 (0.47,3.32)	18	0.00 (0.00,0.00)	98	1.84 (0.46,7.14)
3	327	2.21 (1.19,4.09)	19	7.69 (1.98,27.40)	219	1.63 (0.68,3.90)	18	0.00 (0.00,0.00)	71	3.03 (0.98,9.20)
4	267	2.54 (1.40,4.59)	17	7.69 (1.98,27.40)	170	2.15 (0.95,4.80)	16	0.00 (0.00,0.00)	64	3.03 (0.98,9.20)
5	228	2.93 (1.65,5.19)	16	7.69 (1.98,27.40)	145	2.15 (0.95,4.80)	16	0.00 (0.00,0.00)	51	4.65 (1.71,12.28)
6	175	2.93 (1.65,5.19)	13	7.69 (1.98,27.40)	104	2.15 (0.95,4.80)	13	0.00 (0.00,0.00)	45	4.65 (1.71,12.28)
7	104	2.93 (1.65,5.19)	*	7.69 (1.98,27.40)	59	2.15 (0.95,4.80)	11	0.00 (0.00,0.00)	26	4.65 (1.71,12.28)
8	57	2.93 (1.65,5.19)	*	7.69 (1.98,27.40)	32	2.15 (0.95,4.80)	*	0.00 (0.00,0.00)	13	4.65 (1.71,12.28)
9	19	2.93 (1.65,5.19)	0	N/A	*	2.15 (0.95,4.80)	*	0.00 (0.00,0.00)	*	4.65 (1.71,12.28)
10	*	2.93 (1.65,5.19)	0	N/A	*	2.15 (0.95,4.80)	0	N/A	*	4.65 (1.71,12.28)

* Denotes that the number of cases is between 1 and 10.

Table 272. Reasons for First Revision Following Primary THA for Echo FX/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	5	41.7
2	Dislocation/Instability	3	25.0
3	Joint Infection	1	8.3
4	Implant Failure	1	8.3
5	Peri-prosthetic fracture - Femur	1	8.3
6	Pain	1	8.3

Table 273. Reasons for First Revision in the First 90 Days Following Primary THA for Echo FX/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	50.0
2	Peri-prosthetic fracture - Femur	1	50.0

Table 274. Reasons for First Revision Between 91 and 365 days Following Primary THA for Echo FX/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	2	66.7
2	Implant Failure	1	33.3

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Table 275. Descriptive Statistics of Cases Receiving the Echo FX/G7 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	366	72.62	
Age (years)	504	76.27 (8.87)	77.00 (12.00)
Height (cm)	504	164.28 (9.86)	162.60 (12.72)
Weight (kg)	504	80.17 (20.42)	78.00 (28.15)
BMI(kg/m^2)	504	29.60 (6.65)	28.74 (8.98)
Smoker - Never (%)	257	50.99	
Smoker - Previous (%)	185	36.71	
Smoker - Current (%)	62	12.3	
Smoker - Unknown (%)	0	0.0	

Table 276. Distribution of Approach Used for Echo FX/G7 Combination in Primary THA Cases

Approach	N	Percent
Anterior	27	5.4
Anterolateral	346	68.7
Posterior	128	25.4
Transtrochanteric	0	0.0
Missing/unknown/other	3	0.6

Table 277. Distribution of Head Size for Echo FX/G7 Combination in Primary THA Cases

Size (mm)	N	Percent
32	12	2.6
36	363	80.3
40	73	16.1
Missing/unknown/other	4	0.9

Table 278. Distribution of Bearing Surface for Echo FX/G7 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	144	28.6
Ceramic-on-plastic	304	60.3
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	49	9.7
Missing/unknown/other	7	1.4

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Table 279. Distribution of Polyethylene Used for Echo FX/G7 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	81	16.2
Antioxidant XLPE	418	83.8
Missing/unknown/other	0	0.0

Table 280. Volume of Cases by Surgeon and Site for the Echo FX/G7 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	14 (54)	2 (5)
Cases per site	21 (69)	4 (7)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

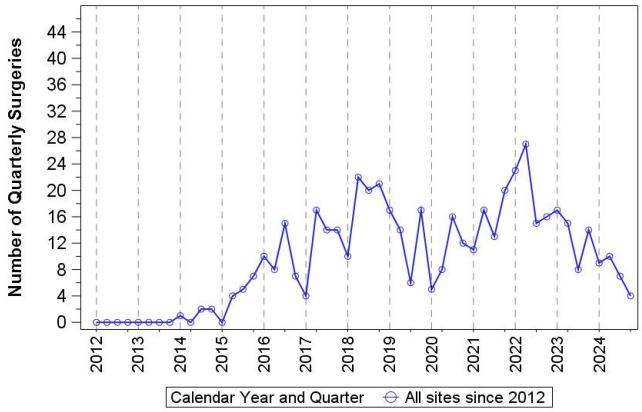


Figure 126. Utilization of the Echo FX/G7 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

12151307	12151311	12151413
12151409	12151411	12151315
12151309	12151313	

Catalog numbers of Acetabular Cups Used in the Analysis

110010245	110017103	110010263
110010244	110010242	110010266
110010246	110010249	110017101
110010243	110010267	10000668
110010247	110017105	110010240
10000663	110010265	110010250
10000664	110017104	110010261
10000665	110017107	110010270
110010248	110010264	110010272
10000666	110017106	
10000662	10000661	
110017102	10000667	

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3.1.19 Fitmore/Continuum

N = 2,815 primary cases were used for this analysis. Distribution of utilization: 38 surgeons across 19 sites used this implant combination in primary THA cases.

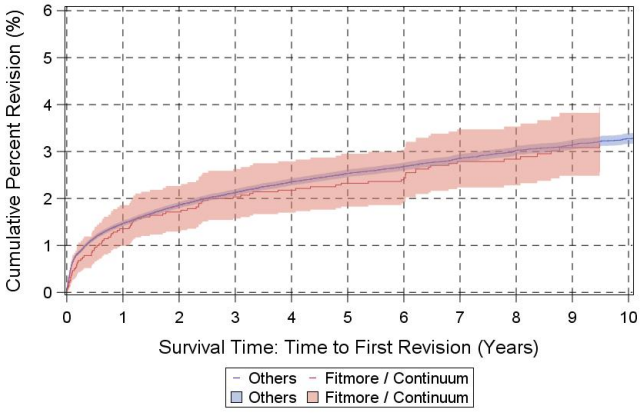


Figure 127. Cumulative Percent Revision Curve for the Fitmore/Continuum Combination, Compared to All Other Implant Combinations in Primary THA Cases

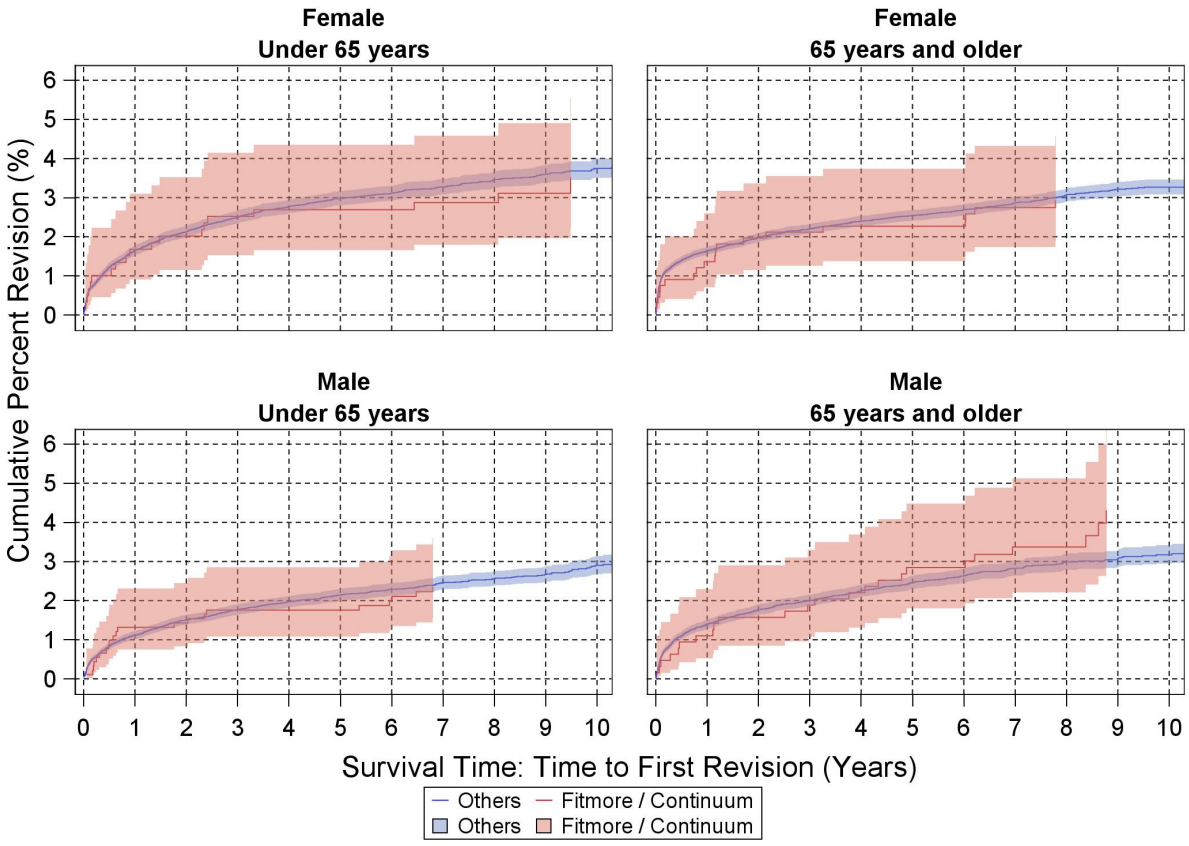


Figure 128. Cumulative Percent Revision Curve for the Fitmore/Continuum Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 281. Cumulative Percent Revision and Number at Risk for the Fitmore/Continuum Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	2,802	0.00 (0.00,0.00)	595	0.00 (0.00,0.00)	661	0.00 (0.00,0.00)	910	0.00 (0.00,0.00)	636	0.00 (0.00,0.00)
1	2,763	1.36 (0.99,1.86)	585	1.68 (0.91,3.10)	652	1.36 (0.71,2.60)	897	1.32 (0.75,2.31)	629	1.10 (0.53,2.29)
2	2,752	1.71 (1.29,2.27)	583	2.02 (1.15,3.52)	648	1.97 (1.15,3.36)	896	1.43 (0.83,2.45)	625	1.57 (0.85,2.90)
3	2,741	2.03 (1.57,2.63)	580	2.52 (1.53,4.15)	646	2.12 (1.26,3.55)	892	1.76 (1.08,2.86)	623	1.89 (1.08,3.30)
4	2,715	2.18 (1.70,2.79)	574	2.69 (1.66,4.35)	642	2.27 (1.37,3.74)	882	1.76 (1.08,2.86)	617	2.20 (1.31,3.69)
5	2,657	2.32 (1.83,2.95)	560	2.69 (1.66,4.35)	633	2.27 (1.37,3.74)	866	1.76 (1.08,2.86)	598	2.85 (1.80,4.48)
6	2,573	2.40 (1.89,3.04)	538	2.69 (1.66,4.35)	619	2.27 (1.37,3.74)	833	1.99 (1.26,3.14)	583	2.85 (1.80,4.48)
7	2,317	2.79 (2.24,3.47)	500	2.87 (1.80,4.58)	573	2.75 (1.74,4.32)	740	2.36 (1.54,3.60)	504	3.37 (2.21,5.12)
8	1,817	2.84 (2.28,3.53)	419	2.87 (1.80,4.58)	473	2.94 (1.88,4.58)	546	2.36 (1.54,3.60)	379	3.37 (2.21,5.12)
9	1,305	3.08 (2.48,3.83)	321	3.11 (1.97,4.90)	352	2.94 (1.88,4.58)	379	2.36 (1.54,3.60)	253	4.31 (2.86,6.47)
10	649	3.19 (2.56,3.96)	151	3.52 (2.21,5.57)	188	2.94 (1.88,4.58)	186	2.36 (1.54,3.60)	124	4.31 (2.86,6.47)

Table 282. Reasons for First Revision Following Primary THA for Fitmore/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	21	25.6
2	Dislocation/Instability	18	22.0
3	Aseptic Loosening	17	20.7
4	Joint Infection	13	15.9
5	Pain	7	8.5
6	Implant Failure	3	3.7
7	Malalignment	3	3.7

Table 283. Reasons for First Revision in the First 90 Days Following Primary THA for Fitmore/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	11	61.1
2	Dislocation/Instability	5	27.8
3	Joint Infection	1	5.6
4	Implant Failure	1	5.6

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Table 284. Reasons for First Revision Between 91 and 365 days Following Primary THA for Fitmore/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	5	26.3
2	Dislocation/Instability	4	21.0
3	Pain	4	21.0
4	Implant Failure	2	10.5
5	Peri-prosthetic fracture - Femur	2	10.5
6	Joint Infection	1	5.3
7	Malalignment	1	5.3

Table 285. Descriptive Statistics of Cases Receiving the Fitmore/Continuum Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,261	44.8	
Age (years)	2,815	63.67 (10.21)	63.00 (14.00)
Height (cm)	2,731	171.63 (10.18)	172.70 (14.17)
Weight (kg)	2,731	89.45 (21.36)	87.70 (28.50)
BMI(kg/m^2)	2,731	30.21 (6.13)	29.34 (7.80)
Smoker - Never (%)	1,353	48.06	
Smoker - Previous (%)	1,093	38.83	
Smoker - Current (%)	365	12.97	
Smoker - Unknown (%)	4	0.14	

Table 286. Distribution of Approach Used for Fitmore/Continuum Combination in Primary THA Cases

Approach	N	Percent
Anterior	2,390	84.9
Anterolateral	26	0.9
Posterior	315	11.2
Transtrochanteric	0	0.0
Missing/unknown/other	84	3.0

Table 287. Distribution of Head Size for Fitmore/Continuum Combination in Primary THA Cases

Size (mm)	N	Percent
28	2	0.1
32	540	19.2
36	2,033	72.5
40	202	7.2
Missing/unknown/other	29	1.0

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Table 288. Distribution of Bearing Surface for Fitmore/Continuum Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	554	19.7
Ceramic-on-plastic	2,223	79.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	38	1.4

Table 289. Distribution of Polyethylene Used for Fitmore/Continuum Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.0
XLPE	1,069	38.1
Antioxidant XLPE	1,736	61.9
Missing/unknown/other	0	0.0

Table 290. Volume of Cases by Surgeon and Site for the Fitmore/Continuum Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	74 (234)	5 (23)
Cases per site	148 (258)	20 (224)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

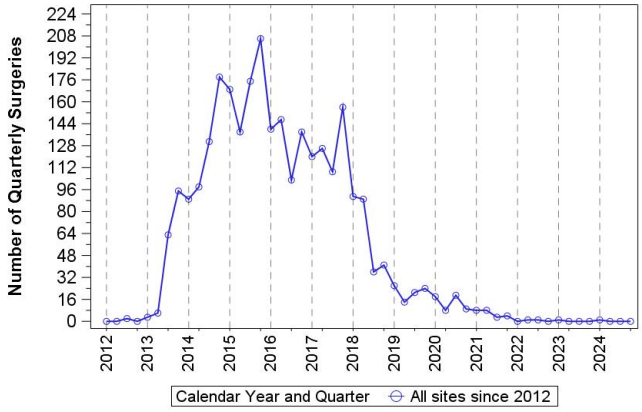


Figure 129. Utilization of the Fitmore/Continuum Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

100551306	100551204	100551411
100551307	100551207	100551106
100551305	100551403	100551108
100551308	100551203	100551313
100551304	100551301	100551102
100551309	100551409	100551104
100551303	100551402	100551314
100551310	100551401	100551103
100551405	100551311	100551211
100551406	100551208	100551105
100551302	100551202	100551412
100551407	100551410	100551107
100551206	100551201	100551110
100551205	100551210	100551109
100551404	100551209	100551212
100551408	100551312	

Catalog numbers of Acetabular Cups Used in the Analysis

875705401	875705402	875704601
875705601	875705602	875706000
875705801	875705800	875704002
875705201	875705802	875705002
875706001	875705400	875706200
875705001	875706601	875706202
875706201	875704800	875706402
875704801	875705202	875706602
875706401	875704802	
875705200	875705000	
875705600	875706002	

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3.1.20 Fitmore/G7

N = 3,048 primary cases were used for this analysis. Distribution of utilization: 36 surgeons across 28 sites used this implant combination in primary THA cases.

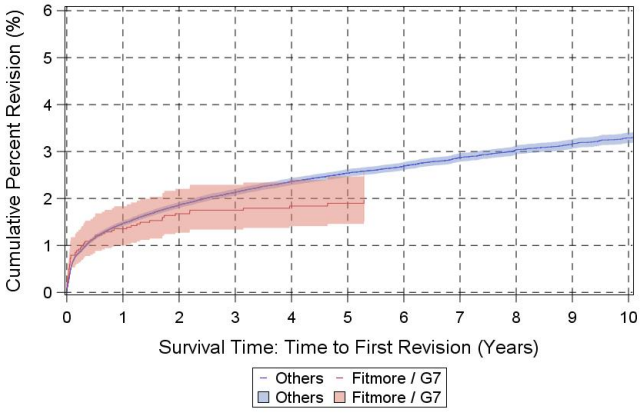


Figure 130. Cumulative Percent Revision Curve for the Fitmore/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases

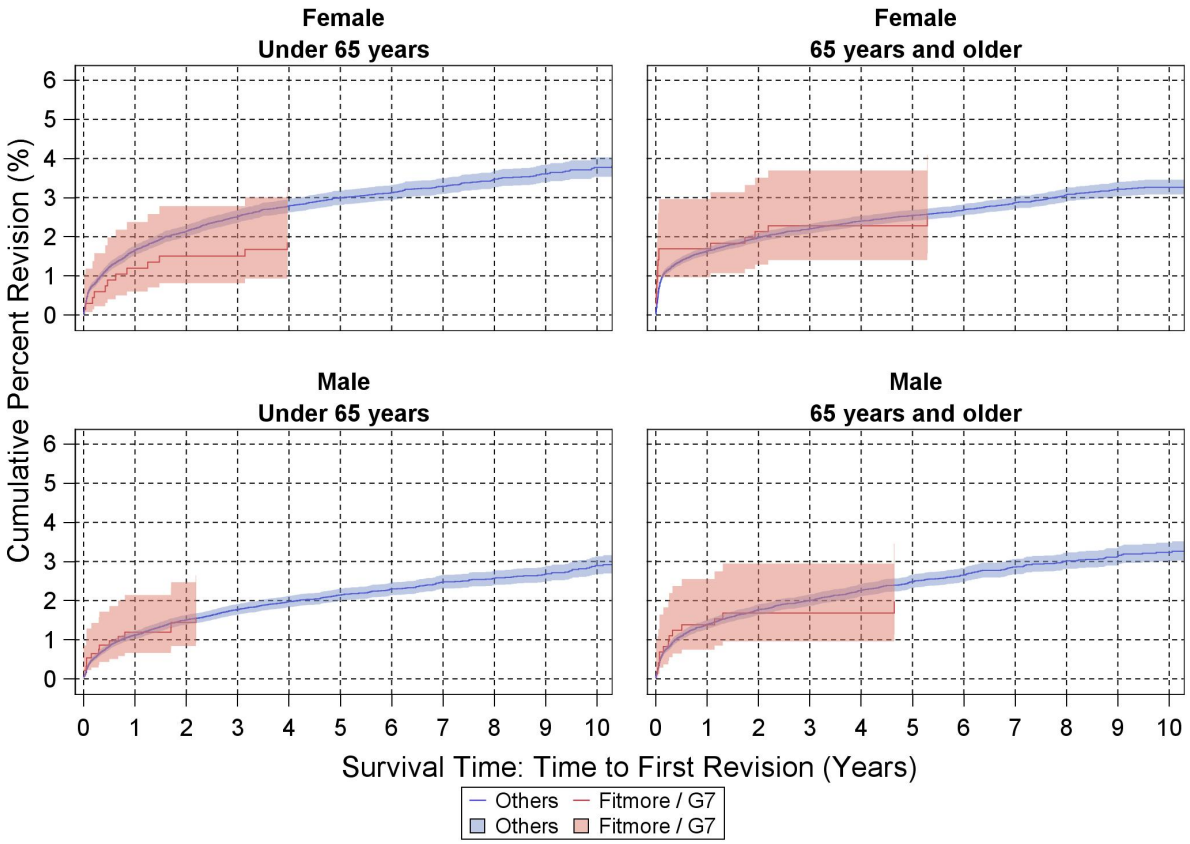


Figure 131. Cumulative Percent Revision Curve for the Fitmore/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 291. Cumulative Percent Revision and Number at Risk for the Fitmore/G7 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	3,041	0.00 (0.00,0.00)	672	0.00 (0.00,0.00)	709	0.00 (0.00,0.00)	932	0.00 (0.00,0.00)	728	0.00 (0.00,0.00)
1	2,900	1.35 (1.00,1.84)	648	1.20 (0.60,2.38)	696	1.69 (0.96,2.96)	932	0.00 (0.00,0.00)	679	1.38 (0.75,2.55)
2	2,637	1.68 (1.27,2.21)	617	1.51 (0.81,2.78)	657	2.13 (1.29,3.51)	877	1.19 (0.66,2.14)	600	1.68 (0.96,2.95)
3	2,415	1.75 (1.34,2.29)	586	1.51 (0.81,2.78)	628	2.28 (1.40,3.69)	763	1.44 (0.84,2.47)	544	1.68 (0.96,2.95)
4	2,084	1.84 (1.41,2.40)	532	1.86 (1.06,3.26)	571	2.28 (1.40,3.69)	657	1.57 (0.93,2.65)	448	1.68 (0.96,2.95)
5	1,512	1.90 (1.46,2.47)	414	1.86 (1.06,3.26)	419	2.28 (1.40,3.69)	533	1.57 (0.93,2.65)	295	1.98 (1.13,3.46)
6	852	1.97 (1.51,2.57)	274	1.86 (1.06,3.26)	241	2.54 (1.57,4.09)	384	1.57 (0.93,2.65)	136	1.98 (1.13,3.46)
7	436	1.97 (1.51,2.57)	154	1.86 (1.06,3.26)	112	2.54 (1.57,4.09)	201	1.57 (0.93,2.65)	68	1.98 (1.13,3.46)
8	200	1.97 (1.51,2.57)	70	1.86 (1.06,3.26)	49	2.54 (1.57,4.09)	102	1.57 (0.93,2.65)	31	1.98 (1.13,3.46)
9	39	1.97 (1.51,2.57)	13	1.86 (1.06,3.26)	*	2.54 (1.57,4.09)	50	1.57 (0.93,2.65)	*	1.98 (1.13,3.46)
10	0	N/A	0	N/A	0	N/A	12	1.57 (0.93,2.65)	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 292. Reasons for First Revision Following Primary THA for Fitmore/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	18	32.1
2	Joint Infection	11	19.6
3	Dislocation/Instability	10	17.9
4	Aseptic Loosening	7	12.5
5	Implant Failure	4	7.1
6	Malalignment	4	7.1
7	Peri-prosthetic fracture - Acetabulum	1	1.8
8	Pain	1	1.8

Table 293. Reasons for First Revision in the First 90 Days Following Primary THA for Fitmore/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	14	48.3
2	Dislocation/Instability	7	24.1
3	Implant Failure	4	13.8
4	Malalignment	2	6.9
5	Joint Infection	1	3.4
6	Peri-prosthetic fracture - Acetabulum	1	3.4

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Table 294. Reasons for First Revision Between 91 and 365 days Following Primary THA for Fitmore/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	3	25.0
2	Joint Infection	3	25.0
3	Aseptic Loosening	2	16.7
4	Malalignment	2	16.7
5	Peri-prosthetic fracture - Femur	1	8.3
6	Pain	1	8.3

Table 295. Descriptive Statistics of Cases Receiving the Fitmore/G7 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,382	45.34	
Age (years)	3,048	63.44 (10.06)	64.00 (13.00)
Height (cm)	3,005	172.13 (10.51)	172.70 (15.20)
Weight (kg)	3,005	91.33 (20.56)	89.70 (27.63)
BMI(kg/m^2)	3,005	30.71 (5.94)	29.97 (7.83)
Smoker - Never (%)	1,522	49.93	
Smoker - Previous (%)	1,144	37.53	
Smoker - Current (%)	379	12.43	
Smoker - Unknown (%)	3	0.1	

Table 296. Distribution of Approach Used for Fitmore/G7 Combination in Primary THA Cases

Approach	N	Percent
Anterior	2,535	83.2
Anterolateral	21	0.7
Posterior	448	14.7
Transtrochanteric	0	0.0
Missing/unknown/other	44	1.4

Table 297. Distribution of Head Size for Fitmore/G7 Combination in Primary THA Cases

Size (mm)	N	Percent
28	4	0.1
32	213	7.4
36	2,076	72.1
40	571	19.8
Missing/unknown/other	16	0.6

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Table 298. Distribution of Bearing Surface for Fitmore/G7 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	311	10.2
Ceramic-on-plastic	2,553	83.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	140	4.6
Missing/unknown/other	44	1.4

Table 299. Distribution of Polyethylene Used for Fitmore/G7 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	589	19.5
Antioxidant XLPE	2,428	80.5
Missing/unknown/other	0	0.0

Table 300. Volume of Cases by Surgeon and Site for the Fitmore/G7 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	84 (218)	7 (69)
Cases per site	108 (234)	10 (103)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

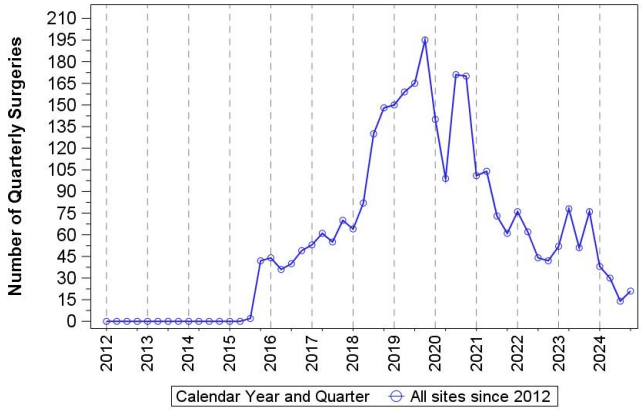


Figure 132. Utilization of the Fitmore/G7 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

100551304	100551310	100551402
100551306	100551301	100551209
100551305	100551206	100551210
100551307	100551403	100551411
100551303	100551204	100551312
100551308	100551410	100551211
100551407	100551203	100551412
100551406	100551205	100551102
100551405	100551207	100551313
100551309	100551208	100551103
100551408	100551201	100551212
100551302	100551401	100551109
100551404	100551311	100551110
100551409	100551202	

Catalog numbers of Acetabular Cups Used in the Analysis

110010244	110010249	110010267
110010245	10000668	110010269
110010246	110010266	10000659
110010247	110010264	10000670
110010243	110010241	110010239
10000664	110010263	110010240
110010248	110010265	110010251
10000666	10000669	110010261
10000665	110010250	110010262
10000663	110010268	110010270
110010242	10000661	110010271
10000667	10000660	110010272
10000662	10000671	

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3.1.21 Insignia/Trident II

N = 6,046 primary cases were used for this analysis. Distribution of utilization: 84 surgeons across 53 sites used this implant combination in primary THA cases.

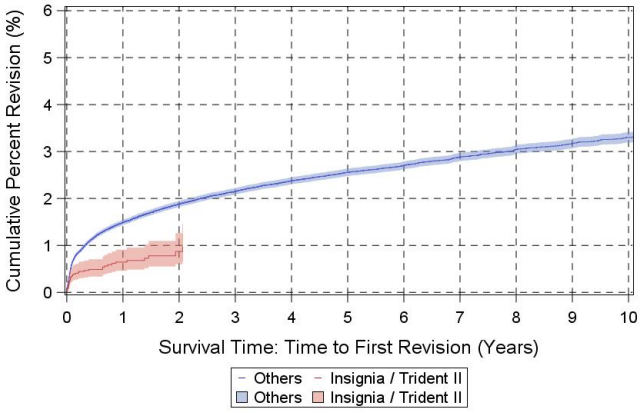


Figure 133. Cumulative Percent Revision Curve for the Insignia/Trident II Combination, Compared to All Other Implant Combinations in Primary THA Cases

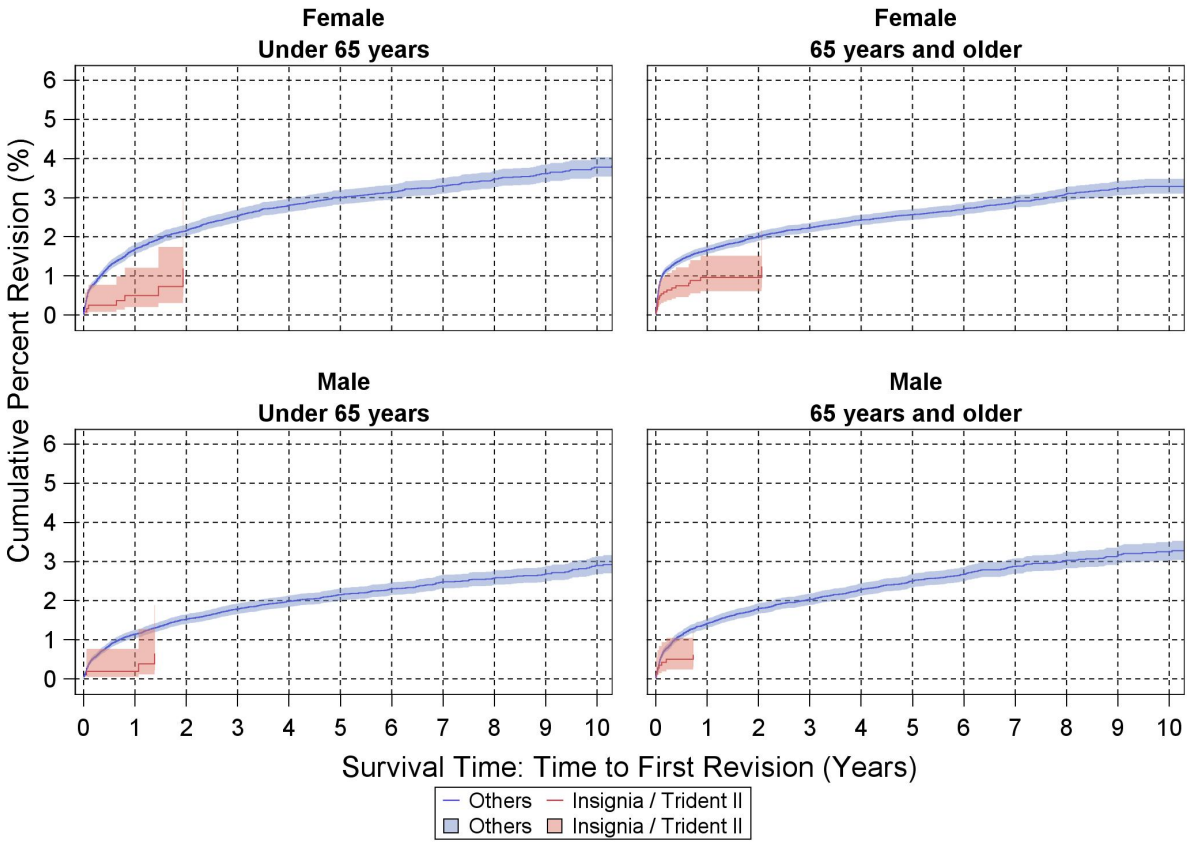


Figure 134. Cumulative Percent Revision Curve for the Insignia/Trident II Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 301. Cumulative Percent Revision and Number at Risk for the Insignia/Trident II Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	6,031	0.00 (0.00,0.00)	1,248	0.00 (0.00,0.00)	2,256	0.00 (0.00,0.00)	1,074	0.00 (0.00,0.00)	1,453	0.00 (0.00,0.00)
1	3,044	0.65 (0.46,0.91)	653	0.50 (0.20,1.21)	1,139	0.96 (0.61,1.51)	554	0.19 (0.05,0.77)	698	0.62 (0.30,1.24)
2	979	0.87 (0.60,1.26)	204	1.19 (0.47,2.99)	376	0.96 (0.61,1.51)	168	0.65 (0.22,1.89)	231	0.62 (0.30,1.24)
3	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
4	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
5	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
6	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
7	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

Table 302. Reasons for First Revision Following Primary THA for Insignia/Trident II Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	10	25.6
2	Peri-prosthetic fracture - Femur	10	25.6
3	Aseptic Loosening	8	20.5
4	Joint Infection	8	20.5
5	Malalignment	2	5.1
6	Implant Failure	1	2.6

Table 303. Reasons for First Revision in the First 90 Days Following Primary THA for Insignia/Trident II Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	10	38.5
2	Dislocation/Instability	7	26.9
3	Aseptic Loosening	5	19.2
4	Joint Infection	3	11.5
5	Implant Failure	1	3.8

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Table 304. Reasons for First Revision Between 91 and 365 days Following Primary THA for Insignia/Trident II Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	3	37.5
2	Joint Infection	3	37.5
3	Aseptic Loosening	1	12.5
4	Malalignment	1	12.5

Table 305. Descriptive Statistics of Cases Receiving the Insignia/Trident II Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	3,512	58.09	
Age (years)	6,046	66.19 (10.42)	67.00 (13.00)
Height (cm)	6,046	169.35 (10.02)	168.91 (15.30)
Weight (kg)	6,046	88.32 (21.07)	86.50 (28.90)
BMI(kg/m^2)	6,046	30.66 (6.22)	29.99 (8.34)
Smoker - Never (%)	3,190	52.76	
Smoker - Previous (%)	2,141	35.41	
Smoker - Current (%)	697	11.53	
Smoker - Unknown (%)	18	0.3	

Table 306. Distribution of Approach Used for Insignia/Trident II Combination in Primary THA Cases

Approach	N	Percent
Anterior	3,933	65.0
Anterolateral	302	5.0
Posterior	1,810	29.9
Transtrochanteric	0	0.0
Missing/unknown/other	1	0.0

Table 307. Distribution of Head Size for Insignia/Trident II Combination in Primary THA Cases

Size (mm)	N	Percent
22	1	0.0
32	298	5.6
36	4,390	83.0
40	579	10.9
44	8	0.1
Missing/unknown/other	12	0.2

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Table 308. Distribution of Bearing Surface for Insignia/Trident II Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	90	1.5
Ceramic-on-plastic	5,186	85.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	703	11.6
Missing/unknown/other	67	1.1

Table 309. Distribution of Polyethylene Used for Insignia/Trident II Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	5,920	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 310. Volume of Cases by Surgeon and Site for the Insignia/Trident II Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	72 (134)	20 (70)
Cases per site	114 (183)	39 (143)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

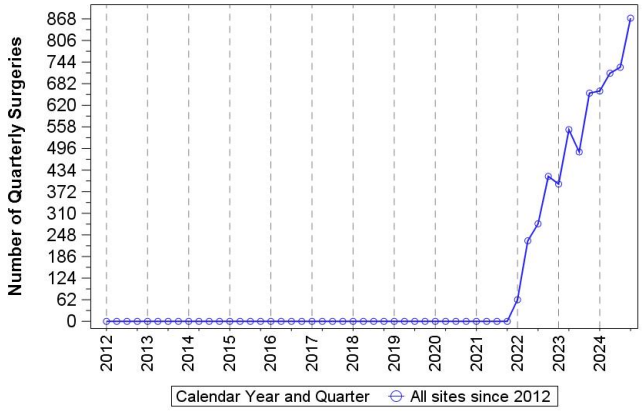


Figure 135. Utilization of the Insignia/Trident II Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

70006605	70005504	70005502
70006604	70005506	70006601
70006606	70005503	70005508
70006603	70006602	
70005505	70005507	
70006607	70006608	

Catalog numbers of Acetabular Cups Used in the Analysis

7020452E	7021148D	7000446C
7020454E	7000454E	7090454E
7020450D	7000450D	7090450D
7020448D	7000448D	7021162G
7020456F	7000456F	7000460G
7020458F	7021160G	7090446C
7021152E	7020462G	7090460G
7021150D	7020444B	7090464H
7021156F	7000458F	7020464H
7021154E	7090448D	7021164H
7021158F	7021146C	7090462G
7020460G	7090452E	7421152E
7000452E	7090456F	7421156F
7020446C	7090458F	

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3.1.22 M/L Taper/Continuum

This analysis excludes M/L Taper Kinectiv. N = 8,713 primary cases were used for this analysis. Distribution of utilization: 70 surgeons across 36 sites used this implant combination in primary THA cases.

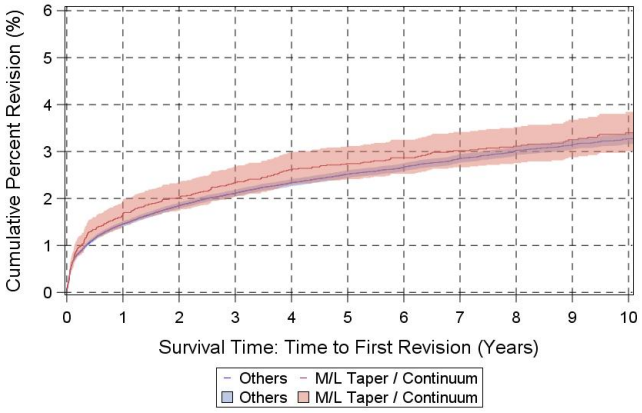


Figure 136. Cumulative Percent Revision Curve for the M/L Taper/Continuum Combination, Compared to All Other Implant Combinations in Primary THA Cases

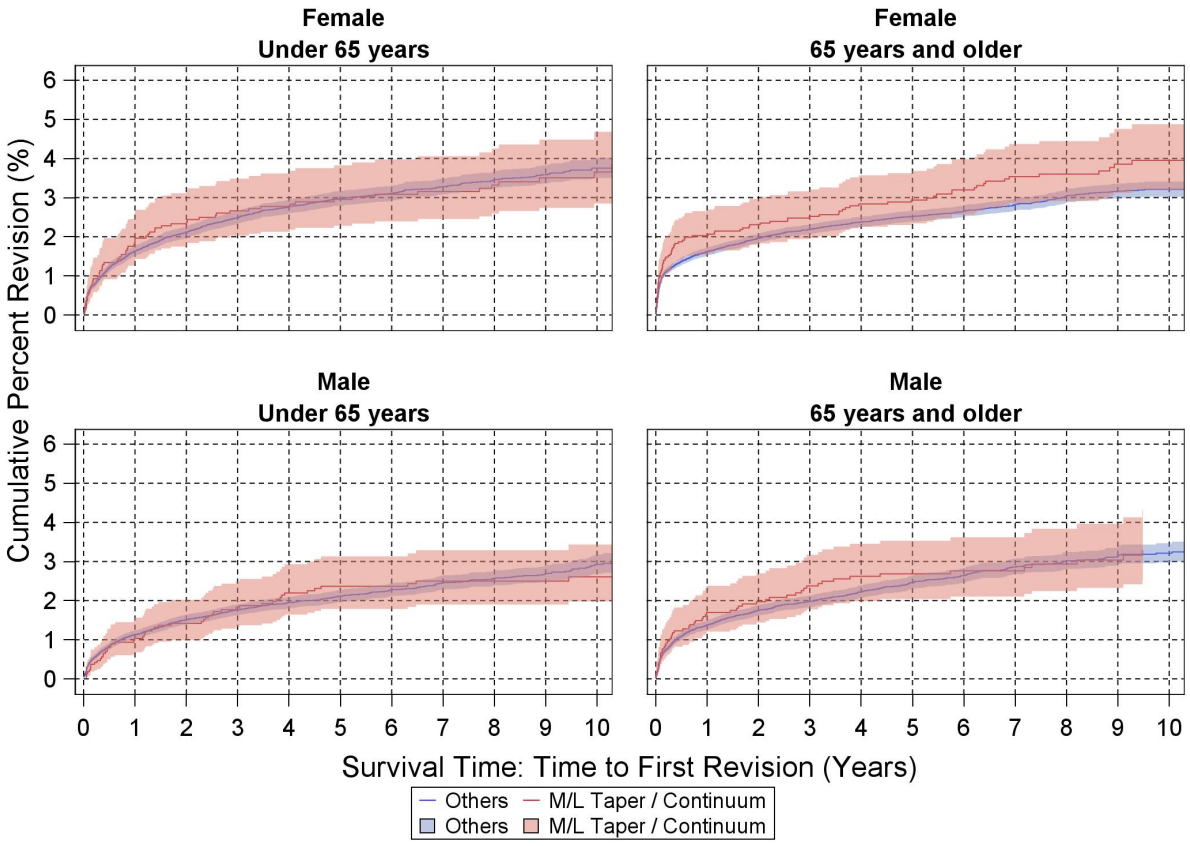


Figure 137. Cumulative Percent Revision Curve for the M/L Taper/Continuum Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 311. Cumulative Percent Revision and Number at Risk for the M/L Taper/Continuum Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	8,621	0.00 (0.00,0.00)	1,943	0.00 (0.00,0.00)	2,569	0.00 (0.00,0.00)	2,147	0.00 (0.00,0.00)	1,962	0.00 (0.00,0.00)
1	8,300	1.68 (1.43,1.97)	1,880	1.91 (1.39,2.63)	2,481	2.03 (1.55,2.65)	2,078	1.03 (0.68,1.56)	1,861	1.70 (1.21,2.38)
2	7,947	2.02 (1.74,2.34)	1,816	2.33 (1.75,3.11)	2,366	2.31 (1.79,2.97)	2,006	1.42 (0.99,2.02)	1,759	1.97 (1.44,2.70)
3	7,515	2.34 (2.04,2.69)	1,738	2.66 (2.03,3.49)	2,234	2.52 (1.98,3.21)	1,898	1.82 (1.33,2.49)	1,645	2.38 (1.78,3.17)
4	7,026	2.61 (2.29,2.98)	1,641	2.78 (2.13,3.62)	2,079	2.84 (2.26,3.57)	1,785	2.20 (1.64,2.93)	1,521	2.62 (1.99,3.45)
5	6,573	2.74 (2.41,3.12)	1,556	2.96 (2.28,3.82)	1,940	2.94 (2.34,3.68)	1,671	2.37 (1.79,3.13)	1,406	2.69 (2.04,3.53)
6	6,037	2.87 (2.53,3.25)	1,434	3.09 (2.39,3.98)	1,794	3.20 (2.57,3.98)	1,538	2.37 (1.79,3.13)	1,271	2.76 (2.10,3.62)
7	5,426	3.02 (2.67,3.42)	1,296	3.16 (2.45,4.06)	1,605	3.54 (2.86,4.37)	1,370	2.50 (1.90,3.29)	1,155	2.76 (2.10,3.62)
8	4,748	3.11 (2.75,3.52)	1,157	3.32 (2.59,4.26)	1,384	3.60 (2.91,4.44)	1,217	2.50 (1.90,3.29)	990	2.94 (2.24,3.84)
9	3,827	3.25 (2.88,3.68)	938	3.51 (2.74,4.48)	1,077	3.86 (3.12,4.76)	1,011	2.50 (1.90,3.29)	801	3.04 (2.32,3.96)
10	2,629	3.40 (3.00,3.85)	636	3.65 (2.85,4.68)	727	3.95 (3.20,4.87)	717	2.61 (1.98,3.43)	549	3.30 (2.52,4.31)

Table 312. Reasons for First Revision Following Primary THA for M/L Taper/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	64	26.9
2	Dislocation/Instability	59	24.8
3	Aseptic Loosening	42	17.6
4	Joint Infection	32	13.4
5	Implant Failure	11	4.6
6	Malalignment	11	4.6
7	Pain	9	3.8
8	Metal Reaction/Metallosis	6	2.5
9	Peri-prosthetic fracture - Acetabulum	4	1.7

Table 313. Reasons for First Revision in the First 90 Days Following Primary THA for M/L Taper/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	41	50.6
2	Dislocation/Instability	21	25.9
3	Aseptic Loosening	5	6.2
4	Joint Infection	5	6.2
5	Implant Failure	3	3.7
6	Peri-prosthetic fracture - Acetabulum	3	3.7
7	Malalignment	3	3.7

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Table 314. Reasons for First Revision Between 91 and 365 days Following Primary THA for M/L Taper/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	12	30.0
2	Dislocation/Instability	9	22.5
3	Aseptic Loosening	6	15.0
4	Peri-prosthetic fracture - Femur	6	15.0
5	Pain	4	10.0
6	Implant Failure	3	7.5

Table 315. Descriptive Statistics of Cases Receiving the M/L Taper/Continuum Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	4,557	52.3	
Age (years)	8,713	64.90 (10.45)	65.00 (14.00)
Height (cm)	8,704	170.45 (10.39)	170.18 (15.20)
Weight (kg)	8,703	87.94 (19.97)	86.20 (27.22)
BMI(kg/m^2)	8,703	30.14 (5.77)	29.54 (7.59)
Smoker - Never (%)	4,386	50.34	
Smoker - Previous (%)	3,320	38.1	
Smoker - Current (%)	986	11.32	
Smoker - Unknown (%)	21	0.24	

Table 316. Distribution of Approach Used for M/L Taper/Continuum Combination in Primary THA Cases

Approach	N	Percent
Anterior	1,971	22.6
Anterolateral	1386	15.9
Posterior	5,248	60.2
Transtrochanteric	69	0.8
Missing/unknown/other	39	0.5

Table 317. Distribution of Head Size for M/L Taper/Continuum Combination in Primary THA Cases

Size (mm)	N	Percent
28	24	0.3
32	1,826	21.1
36	5,889	68.0
40	848	9.8
Missing/unknown/other	75	0.9

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Table 318. Distribution of Bearing Surface for M/L Taper/Continuum Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	2,335	26.8
Ceramic-on-plastic	6,249	71.7
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	129	1.5

Table 319. Distribution of Polyethylene Used for M/L Taper/Continuum Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	6,003	69.3
Antioxidant XLPE	2,656	30.7
Missing/unknown/other	0	0.0

Table 320. Volume of Cases by Surgeon and Site for the M/L Taper/Continuum Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	124 (283)	30 (91)
Cases per site	242 (620)	44 (153)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

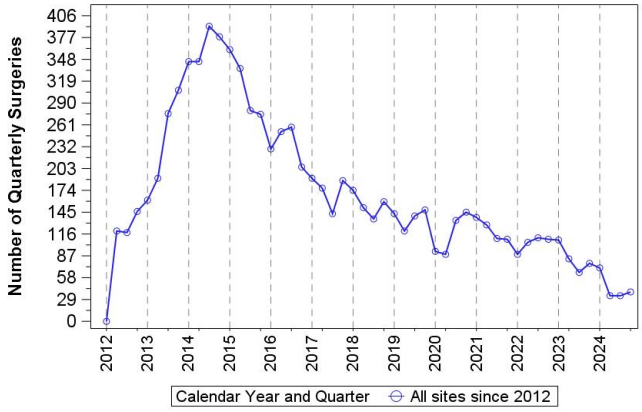


Figure 138. Utilization of the M/L Taper/Continuum Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

771101220	771100910	771100440
771100900	771101140	771100500
771101320	771100710	771101600
771101200	771101240	771100540
771101120	771101010	771100620
771101000	771100720	771100510
771101100	771101500	771100520
771100700	771101110	771102020
771101520	771100640	771101700
771100940	771101210	771102000
771101020	771100600	771102200
771100920	771101620	771102220
771101300	771100610	
771100740	771101720	
771101040	771100410	

Catalog numbers of Acetabular Cups Used in the Analysis

875705201	875705402	875706801
875705401	875705200	875704800
875705601	875705400	875704601
875705801	875705600	875704401
875706001	875705802	875706200
875705001	875705800	875706202
875704801	875705602	875704402
875706201	875706601	875706402
875706401	875704602	875706602
875705002	875705000	875706802
875705202	875706000	875707001
875704802	875706002	

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3.1.23 M/L Taper/G7

This analysis excludes M/L Taper Kinectiv. N = 5,349 primary cases were used for this analysis. Distribution of utilization: 40 surgeons across 28 sites used this implant combination in primary THA cases.

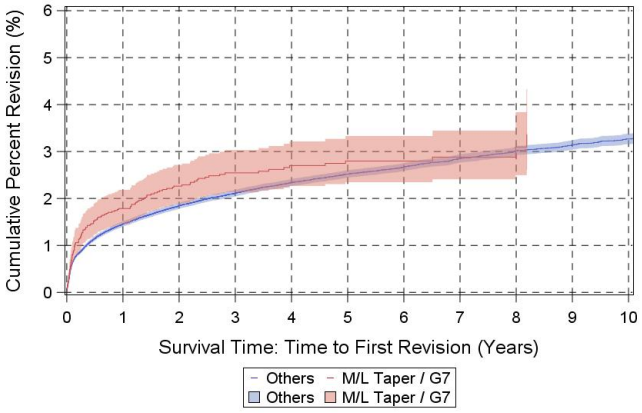


Figure 139. Cumulative Percent Revision Curve for the M/L Taper/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases

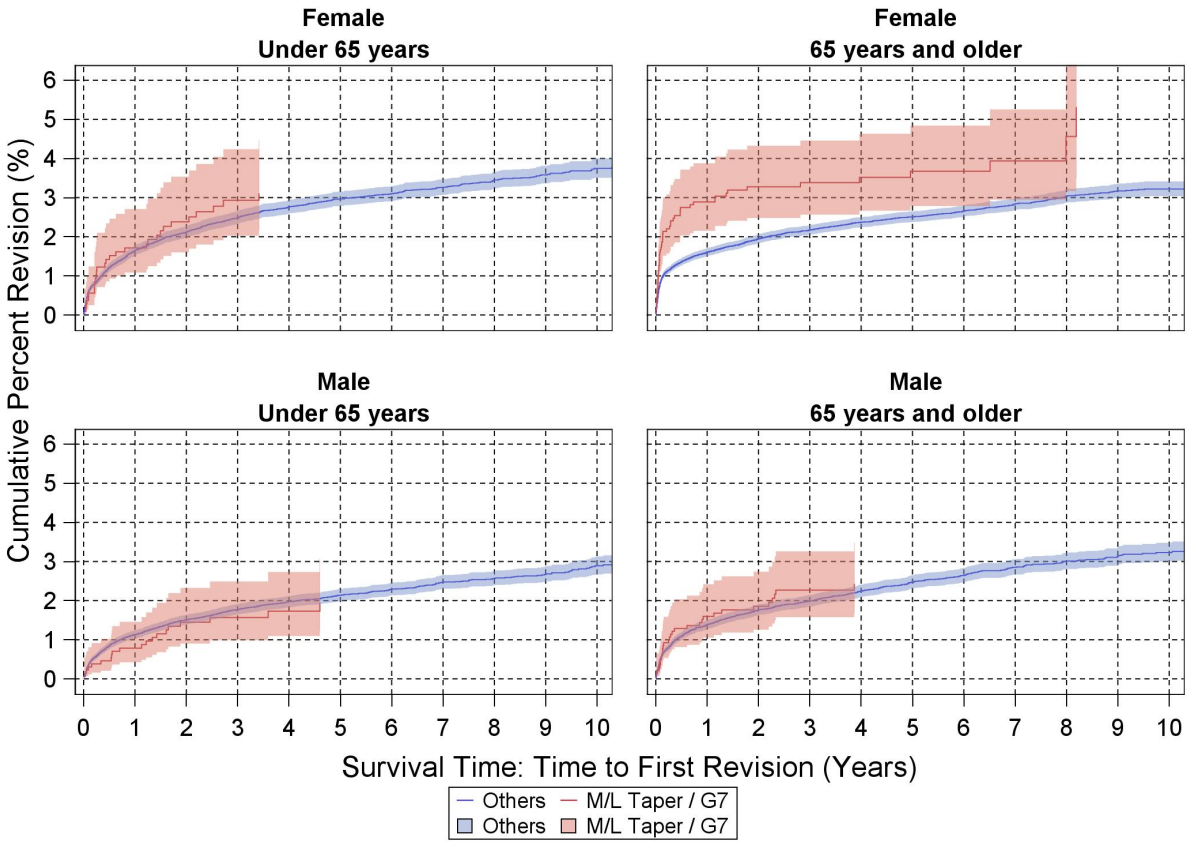


Figure 140. Cumulative Percent Revision Curve for the M/L Taper/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 321. Cumulative Percent Revision and Number at Risk for the M/L Taper/G7 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	5,320	0.00 (0.00,0.00)	1,077	0.00 (0.00,0.00)	1,501	0.00 (0.00,0.00)	1,320	0.00 (0.00,0.00)	1,422	0.00 (0.00,0.00)
1	4,659	1.79 (1.46,2.19)	950	1.72 (1.08,2.71)	1,335	2.89 (2.15,3.88)	1,137	0.79 (0.42,1.46)	1,237	1.60 (1.06,2.42)
2	3,848	2.26 (1.89,2.72)	784	2.38 (1.60,3.54)	1,104	3.28 (2.48,4.33)	931	1.45 (0.90,2.33)	1,029	1.86 (1.26,2.74)
3	2,952	2.54 (2.14,3.03)	601	2.93 (2.02,4.24)	865	3.38 (2.56,4.46)	708	1.57 (0.99,2.49)	778	2.27 (1.58,3.26)
4	2,345	2.70 (2.27,3.21)	490	3.11 (2.16,4.47)	719	3.52 (2.67,4.63)	539	1.73 (1.10,2.73)	597	2.43 (1.69,3.49)
5	1,943	2.80 (2.35,3.33)	417	3.11 (2.16,4.47)	613	3.67 (2.78,4.84)	440	1.94 (1.23,3.06)	473	2.43 (1.69,3.49)
6	1,400	2.80 (2.35,3.33)	312	3.11 (2.16,4.47)	449	3.67 (2.78,4.84)	310	1.94 (1.23,3.06)	329	2.43 (1.69,3.49)
7	937	2.88 (2.41,3.45)	215	3.11 (2.16,4.47)	304	3.94 (2.95,5.25)	204	1.94 (1.23,3.06)	214	2.43 (1.69,3.49)
8	448	3.10 (2.50,3.84)	105	3.11 (2.16,4.47)	153	4.56 (3.16,6.56)	82	1.94 (1.23,3.06)	108	2.43 (1.69,3.49)
9	73	3.37 (2.62,4.33)	25	3.11 (2.16,4.47)	21	5.31 (3.50,8.03)	12	1.94 (1.23,3.06)	15	2.43 (1.69,3.49)
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

Table 322. Reasons for First Revision Following Primary THA for M/L Taper/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	44	33.1
2	Dislocation/Instability	43	32.3
3	Joint Infection	19	14.3
4	Aseptic Loosening	16	12.0
5	Implant Failure	4	3.0
6	Pain	3	2.3
7	Malalignment	3	2.3
8	Poly liner wear	1	0.8

Table 323. Reasons for First Revision in the First 90 Days Following Primary THA for M/L Taper/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	38	61.3
2	Dislocation/Instability	13	21.0
3	Aseptic Loosening	4	6.4
4	Joint Infection	3	4.8
5	Implant Failure	3	4.8
6	Malalignment	1	1.6

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Table 324. Reasons for First Revision Between 91 and 365 days Following Primary THA for M/L Taper/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	14	45.2
2	Joint Infection	9	29.0
3	Aseptic Loosening	3	9.7
4	Peri-prosthetic fracture - Femur	3	9.7
5	Poly liner wear	1	3.2
6	Pain	1	3.2

Table 325. Descriptive Statistics of Cases Receiving the M/L Taper/G7 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,590	48.42	
Age (years)	5,349	64.74 (10.19)	66.00 (13.00)
Height (cm)	5,349	171.05 (10.34)	170.20 (15.20)
Weight (kg)	5,349	89.60 (19.82)	88.20 (27.76)
BMI(kg/m^2)	5,349	30.54 (5.89)	29.88 (8.16)
Smoker - Never (%)	2,702	50.51	
Smoker - Previous (%)	2,034	38.03	
Smoker - Current (%)	612	11.44	
Smoker - Unknown (%)	1	0.02	

Table 326. Distribution of Approach Used for M/L Taper/G7 Combination in Primary THA Cases

Approach	N	Percent
Anterior	1,130	21.1
Anterolateral	370	6.9
Posterior	3,847	71.9
Transtrochanteric	2	0.0
Missing/unknown/other	0	0.0

Table 327. Distribution of Head Size for M/L Taper/G7 Combination in Primary THA Cases

Size (mm)	N	Percent
28	2	0.0
32	306	6.0
36	3,909	77.1
40	847	16.7
Missing/unknown/other	6	0.1

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Table 328. Distribution of Bearing Surface for M/L Taper/G7 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	438	8.2
Ceramic-on-plastic	4,626	86.5
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	228	4.3
Missing/unknown/other	57	1.1

Table 329. Distribution of Polyethylene Used for M/L Taper/G7 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,372	26.0
Antioxidant XLPE	3,900	74.0
Missing/unknown/other	0	0.0

Table 330. Volume of Cases by Surgeon and Site for the M/L Taper/G7 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	133 (297)	12 (86)
Cases per site	191 (393)	16 (258)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

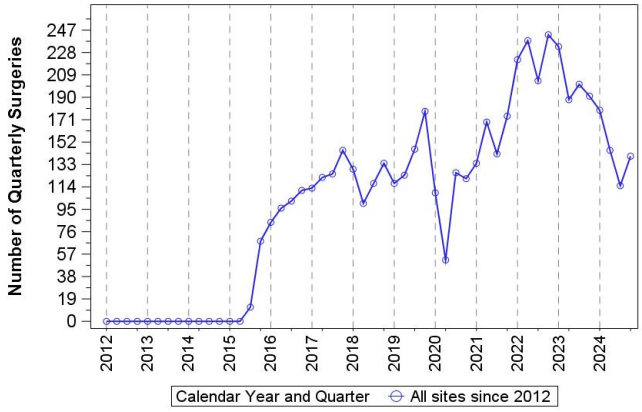


Figure 141. Utilization of the M/L Taper/G7 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

771100900	771101020	771100440
771101240	771100920	771100540
771100940	771101300	771101110
771101320	771100600	771100520
771100700	771100720	771101210
771101140	771100910	771101720
771101220	771101620	771101600
771101100	771100640	771100510
771101040	771100710	771100410
771101120	771100620	771101700
771101000	771100500	771102020
771100740	771101500	
771101520	771101010	
771101200	771100610	

Catalog numbers of Acetabular Cups Used in the Analysis

10000664	110010242	110010250
10000665	110010248	110010240
10000663	10000668	110010269
10000662	110010249	10000670
10000666	10000660	110010251
10000667	110010241	110010268
110010245	10000669	110010270
110010246	110010264	110010272
110010244	110010265	110010273
110010243	110010267	110017100
110010247	110010263	110017102
10000661	110010266	

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3.1.24 M/L Taper/Trabecular Metal

This analysis excludes M/L Taper Kinectiv. N = 1,067 primary cases were used for this analysis. Distribution of utilization: 22 surgeons across 15 sites used this implant combination in primary THA cases.

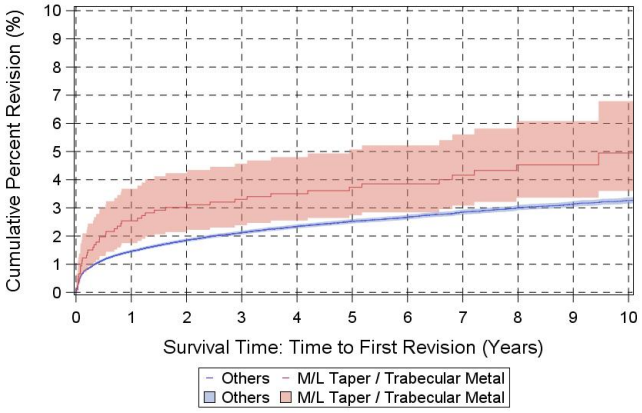


Figure 142. Cumulative Percent Revision Curve for the M/L Taper/Trabecular Metal Combination, Compared to All Other Implant Combinations in Primary THA Cases

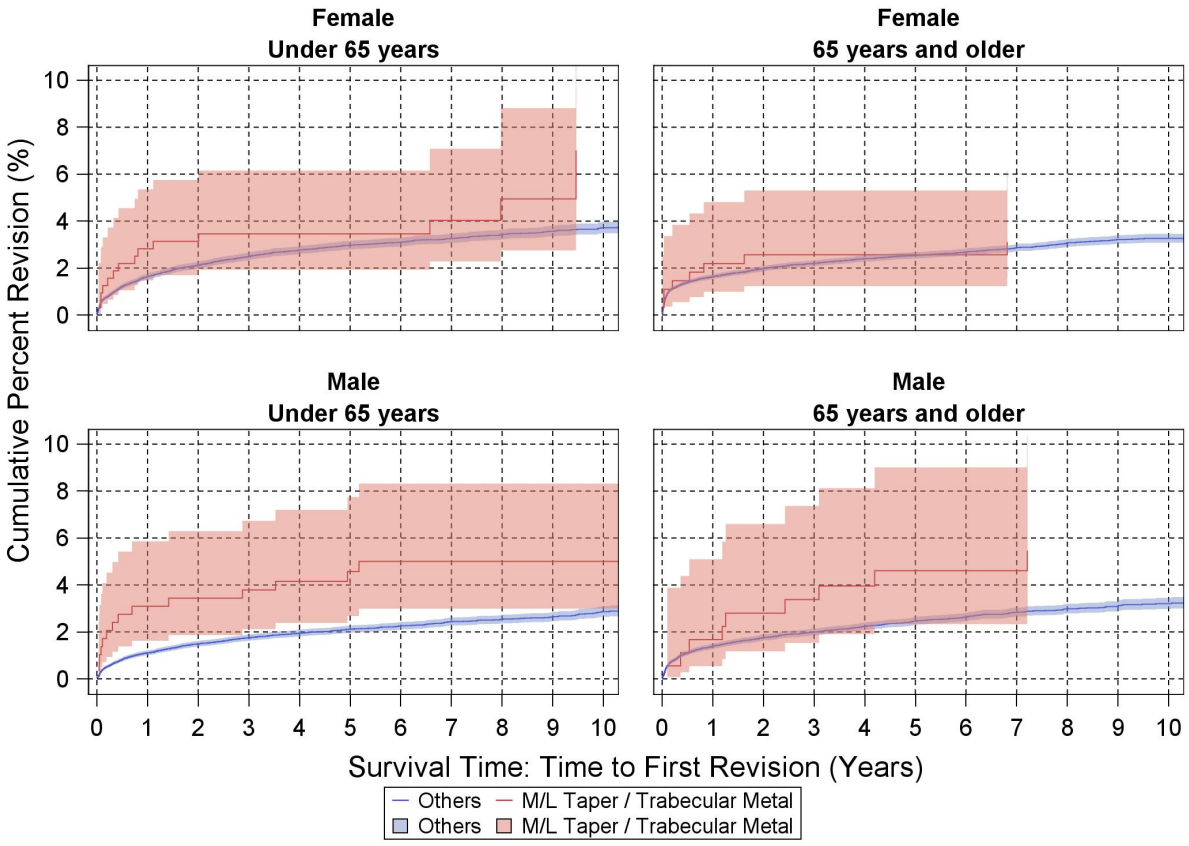


Figure 143. Cumulative Percent Revision Curve for the M/L Taper/Trabecular Metal Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 331. Cumulative Percent Revision and Number at Risk for the M/L Taper/Trabecular Metal Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,064	0.00 (0.00,0.00)	319	0.00 (0.00,0.00)	274	0.00 (0.00,0.00)	291	0.00 (0.00,0.00)	180	0.00 (0.00,0.00)
1	1,034	2.54 (1.75,3.68)	310	2.82 (1.48,5.35)	267	2.19 (0.99,4.81)	282	3.09 (1.62,5.86)	175	1.67 (0.54,5.10)
2	1,009	3.01 (2.14,4.23)	303	3.14 (1.70,5.75)	259	2.56 (1.23,5.30)	278	3.44 (1.86,6.29)	169	2.80 (1.17,6.60)
3	991	3.30 (2.38,4.57)	295	3.46 (1.93,6.15)	255	2.56 (1.23,5.30)	274	3.79 (2.12,6.74)	167	3.38 (1.53,7.37)
4	892	3.50 (2.55,4.80)	259	3.46 (1.93,6.15)	232	2.56 (1.23,5.30)	251	4.15 (2.38,7.20)	150	3.96 (1.91,8.12)
5	805	3.73 (2.74,5.07)	224	3.46 (1.93,6.15)	218	2.56 (1.23,5.30)	225	4.57 (2.68,7.75)	138	4.61 (2.33,9.01)
6	704	3.85 (2.84,5.22)	190	3.46 (1.93,6.15)	199	2.56 (1.23,5.30)	191	5.00 (2.99,8.32)	124	4.61 (2.33,9.01)
7	595	4.16 (3.08,5.61)	145	4.03 (2.28,7.08)	179	3.10 (1.55,6.16)	158	5.00 (2.99,8.32)	113	4.61 (2.33,9.01)
8	471	4.53 (3.36,6.08)	103	4.95 (2.75,8.81)	150	3.10 (1.55,6.16)	118	5.00 (2.99,8.32)	100	5.47 (2.86,10.33)
9	269	4.53 (3.36,6.08)	54	4.95 (2.75,8.81)	98	3.10 (1.55,6.16)	55	5.00 (2.99,8.32)	62	5.47 (2.86,10.33)
10	184	4.95 (3.60,6.79)	37	7.01 (3.46,13.94)	68	3.10 (1.55,6.16)	36	5.00 (2.99,8.32)	43	5.47 (2.86,10.33)

Table 332. Reasons for First Revision Following Primary THA for M/L Taper/Trabecular Metal Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	13	28.3
2	Peri-prosthetic fracture - Femur	12	26.1
3	Dislocation/Instability	8	17.4
4	Joint Infection	6	13.0
5	Implant Failure	5	10.9
6	Pain	1	2.2
7	Malalignment	1	2.2

Table 333. Reasons for First Revision in the First 90 Days Following Primary THA for M/L Taper/Trabecular Metal Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	9	56.2
2	Dislocation/Instability	4	25.0
3	Aseptic Loosening	3	18.8

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Table 334. Reasons for First Revision Between 91 and 365 days Following Primary THA for M/L Taper/Trabecular Metal Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	4	36.4
2	Implant Failure	3	27.3
3	Joint Infection	1	9.1
4	Peri-prosthetic fracture - Femur	1	9.1
5	Pain	1	9.1
6	Malalignment	1	9.1

Table 335. Descriptive Statistics of Cases Receiving the M/L Taper/Trabecular Metal Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	594	55.67	
Age (years)	1,067	62.60 (10.64)	63.00 (13.00)
Height (cm)	1,067	169.50 (10.80)	168.00 (15.80)
Weight (kg)	1,066	91.70 (22.68)	90.00 (31.00)
BMI(kg/m^2)	1,066	32.03 (8.80)	31.02 (10.00)
Smoker - Never (%)	372	34.86	
Smoker - Previous (%)	349	32.71	
Smoker - Current (%)	344	32.24	
Smoker - Unknown (%)	2	0.19	

Table 336. Distribution of Approach Used for M/L Taper/Trabecular Metal Combination in Primary THA Cases

Approach	N	Percent
Anterior	6	0.6
Anterolateral	384	36.0
Posterior	649	60.8
Transtrochanteric	23	2.2
Missing/unknown/other	5	0.5

Table 337. Distribution of Head Size for M/L Taper/Trabecular Metal Combination in Primary THA Cases

Size (mm)	N	Percent
28	31	2.9
32	519	48.9
36	456	43.0
40	34	3.2
Missing/unknown/other	21	2.0

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Table 338. Distribution of Bearing Surface for M/L Taper/Trabecular Metal Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	410	38.4
Ceramic-on-plastic	630	59.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	27	2.5

Table 339. Distribution of Polyethylene Used for M/L Taper/Trabecular Metal Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,060	99.9
Antioxidant XLPE	1	0.1
Missing/unknown/other	0	0.0

Table 340. Volume of Cases by Surgeon and Site for the M/L Taper/Trabecular Metal Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	48 (140)	2 (6)
Cases per site	71 (167)	4 (60)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

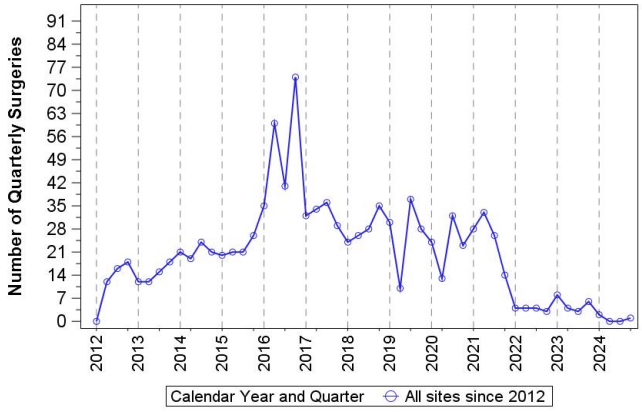


Figure 144. Utilization of the M/L Taper/Trabecular Metal Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

771100700	771101520	771101140
771100900	771101500	771100740
771101200	771100620	771101240
771101000	771100440	771102020
771101100	771100520	771100610
771101220	771101600	771100710
771101020	771101620	771101040
771101120	771100410	771102000
771101320	771101700	771100540
771100920	771100910	771100940
771100500	771101720	771102220
771100600	771101210	
771101300	771101010	
771100720	771101110	

Catalog numbers of Acetabular Cups Used in the Analysis

620204822	620206222	620204820
620205022	620205020	620205420
620205222	620205820	620207022
620205422	620205620	620206420
620205622	620206020	620206820
620205822	620206220	620207020
620206022	620205220	712306254
620204622	620206422	

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3.1.25 M/L Taper/Trilogy

This analysis excludes M/L Taper Kinectiv. N = 1,335 primary cases were used for this analysis. Distribution of utilization: 16 surgeons across 10 sites used this implant combination in primary THA cases.

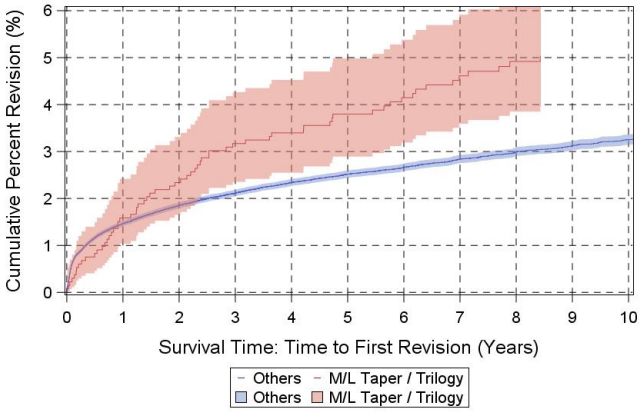


Figure 145. Cumulative Percent Revision Curve for the M/L Taper/Trilogy Combination, Compared to All Other Implant Combinations in Primary THA Cases

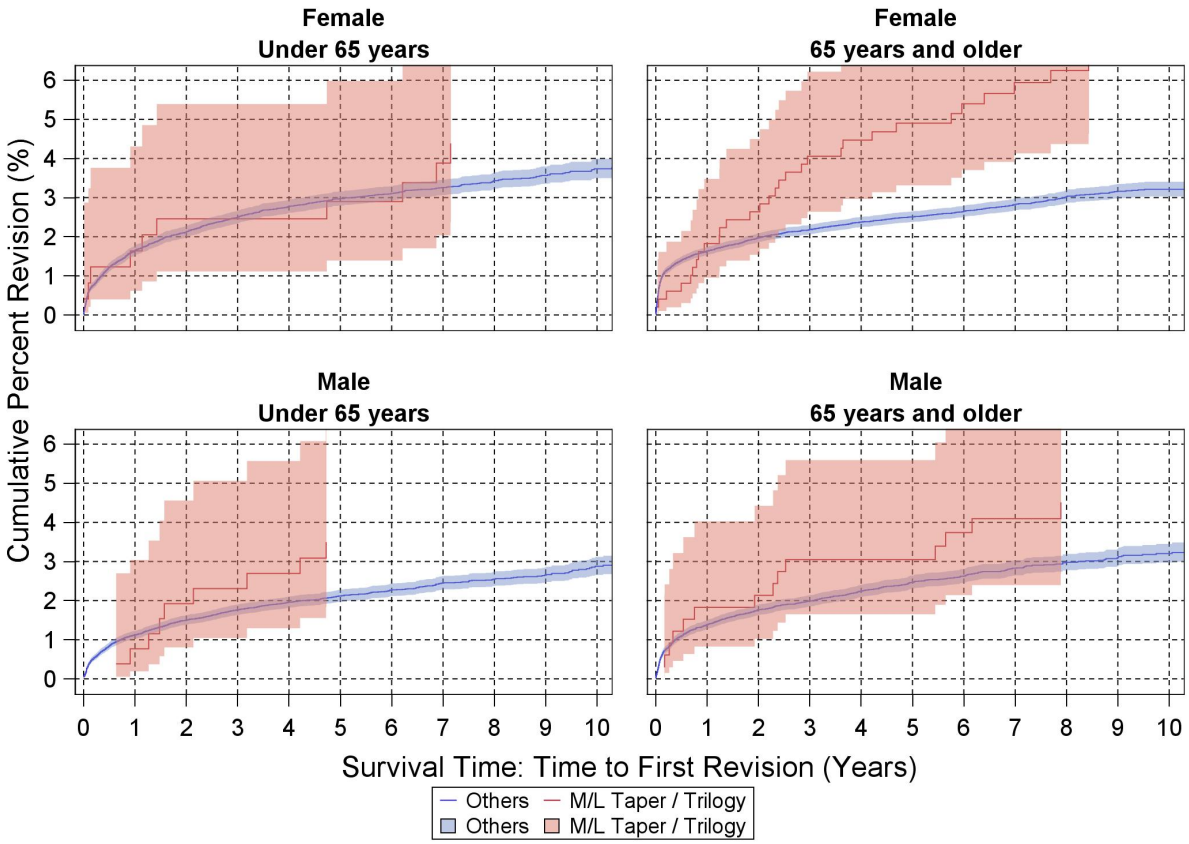


Figure 146. Cumulative Percent Revision Curve for the M/L Taper/Trilogy Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 341. Cumulative Percent Revision and Number at Risk for the M/L Taper/Trilogy Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,325	0.00 (0.00,0.00)	244	0.00 (0.00,0.00)	493	0.00 (0.00,0.00)	260	0.00 (0.00,0.00)	328	0.00 (0.00,0.00)
1	1,304	1.58 (1.04,2.42)	240	1.64 (0.62,4.31)	484	1.83 (0.95,3.48)	258	0.77 (0.19,3.04)	322	1.83 (0.83,4.03)
2	1,294	2.34 (1.65,3.31)	238	2.46 (1.11,5.39)	480	2.64 (1.54,4.50)	255	1.92 (0.80,4.56)	321	2.13 (1.02,4.42)
3	1,283	3.17 (2.35,4.27)	238	2.46 (1.11,5.39)	473	4.06 (2.64,6.22)	254	2.31 (1.04,5.06)	318	3.05 (1.65,5.59)
4	1,249	3.40 (2.55,4.52)	234	2.46 (1.11,5.39)	456	4.47 (2.97,6.71)	250	2.69 (1.29,5.57)	309	3.05 (1.65,5.59)
5	1,168	3.80 (2.89,4.98)	218	2.90 (1.39,5.99)	423	4.90 (3.31,7.23)	235	3.49 (1.83,6.61)	292	3.05 (1.65,5.59)
6	1,074	4.15 (3.19,5.38)	202	2.90 (1.39,5.99)	377	5.40 (3.70,7.83)	222	3.49 (1.83,6.61)	273	3.74 (2.14,6.50)
7	990	4.61 (3.59,5.92)	191	3.88 (2.03,7.35)	336	5.94 (4.13,8.51)	209	3.49 (1.83,6.61)	254	4.09 (2.40,6.95)
8	887	4.92 (3.85,6.27)	171	4.39 (2.38,8.02)	297	6.25 (4.37,8.89)	192	3.49 (1.83,6.61)	227	4.51 (2.69,7.52)
9	688	5.04 (3.95,6.41)	126	4.39 (2.38,8.02)	234	6.59 (4.63,9.34)	146	3.49 (1.83,6.61)	182	4.51 (2.69,7.52)
10	494	5.04 (3.95,6.41)	88	4.39 (2.38,8.02)	165	6.59 (4.63,9.34)	118	3.49 (1.83,6.61)	123	4.51 (2.69,7.52)

Table 342. Reasons for First Revision Following Primary THA for M/L Taper/Trilogy Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	14	24.1
2	Dislocation/Instability	10	17.2
3	Peri-prosthetic fracture - Femur	9	15.5
4	Joint Infection	8	13.8
5	Metal Reaction/Metallosis	5	8.6
6	Malalignment	5	8.6
7	Implant Failure	3	5.2
8	Peri-prosthetic fracture - Acetabulum	2	3.4
9	Poly liner wear	1	1.7
10	Pain	1	1.7

Table 343. Reasons for First Revision in the First 90 Days Following Primary THA for M/L Taper/Trilogy Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	5	71.4
2	Dislocation/Instability	1	14.3
3	Peri-prosthetic fracture - Acetabulum	1	14.3

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Table 344. Reasons for First Revision Between 91 and 365 days Following Primary THA for M/L Taper/Trilogy Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	4	40.0
2	Aseptic Loosening	2	20.0
3	Joint Infection	2	20.0
4	Peri-prosthetic fracture - Acetabulum	1	10.0
5	Peri-prosthetic fracture - Femur	1	10.0

Table 345. Descriptive Statistics of Cases Receiving the M/L Taper/Trilogy Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	744	55.73	
Age (years)	1,335	67.56 (9.36)	67.00 (13.00)
Height (cm)	1,335	169.13 (10.29)	167.64 (16.80)
Weight (kg)	1,335	87.03 (19.64)	85.30 (27.70)
BMI(kg/m^2)	1,335	30.31 (5.81)	29.67 (7.55)
Smoker - Never (%)	600	44.94	
Smoker - Previous (%)	558	41.8	
Smoker - Current (%)	176	13.18	
Smoker - Unknown (%)	1	0.07	

Table 346. Distribution of Approach Used for M/L Taper/Trilogy Combination in Primary THA Cases

Approach	N	Percent
Anterior	6	0.5
Anterolateral	1037	77.7
Posterior	267	20.0
Transtrochanteric	23	1.7
Missing/unknown/other	2	0.1

Table 347. Distribution of Head Size for M/L Taper/Trilogy Combination in Primary THA Cases

Size (mm)	N	Percent
28	15	1.1
32	786	59.0
36	484	36.3
40	15	1.1
Missing/unknown/other	32	2.4

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Table 348. Distribution of Bearing Surface for M/L Taper/Trilogy Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,009	75.6
Ceramic-on-plastic	291	21.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	35	2.6

Table 349. Distribution of Polyethylene Used for M/L Taper/Trilogy Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,332	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 350. Volume of Cases by Surgeon and Site for the M/L Taper/Trilogy Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	83 (138)	27 (93)
Cases per site	133 (205)	13 (271)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

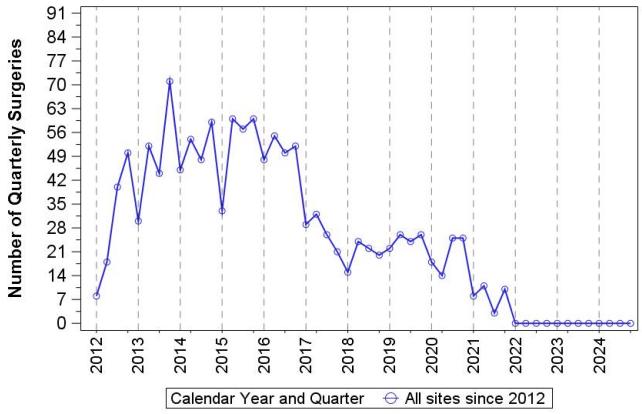


Figure 147. Utilization of the M/L Taper/Trilogy Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

771100910	771101300	771101620
771100710	771101200	771101700
771101010	771101220	771101720
771100940	771101040	771100500
771100900	771100610	771100540
771101240	771100920	771101600
771100740	771100720	771100440
771101000	771100640	771100620
771100700	771101520	771100520
771101140	771101120	771102000
771101100	771101500	771102020
771101210	771101020	
771101110	771100600	
771101320	771100510	

Catalog numbers of Acetabular Cups Used in the Analysis

620005222	620004822	620005824
620005422	620005020	620006024
620005022	620006422	620006622
620005822	620006224	620006624
620005622	620005024	
620006022	620005424	
620006222	620005624	

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3.1.26 Polarstem/Reflection 3

N = 3,828 primary cases were used for this analysis. Distribution of utilization: 48 surgeons across 33 sites used this implant combination in primary THA cases.

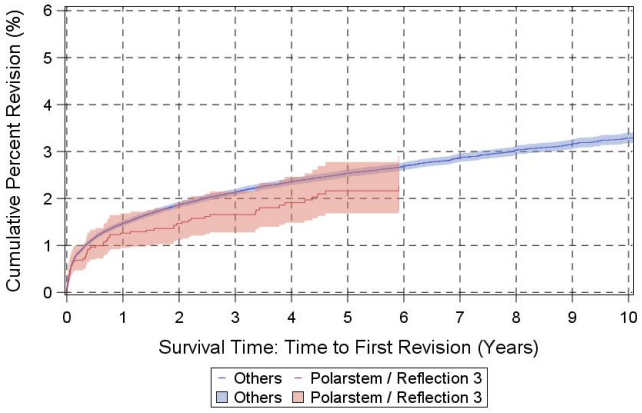


Figure 148. Cumulative Percent Revision Curve for the Polarstem/Reflection 3 Combination, Compared to All Other Implant Combinations in Primary THA Cases

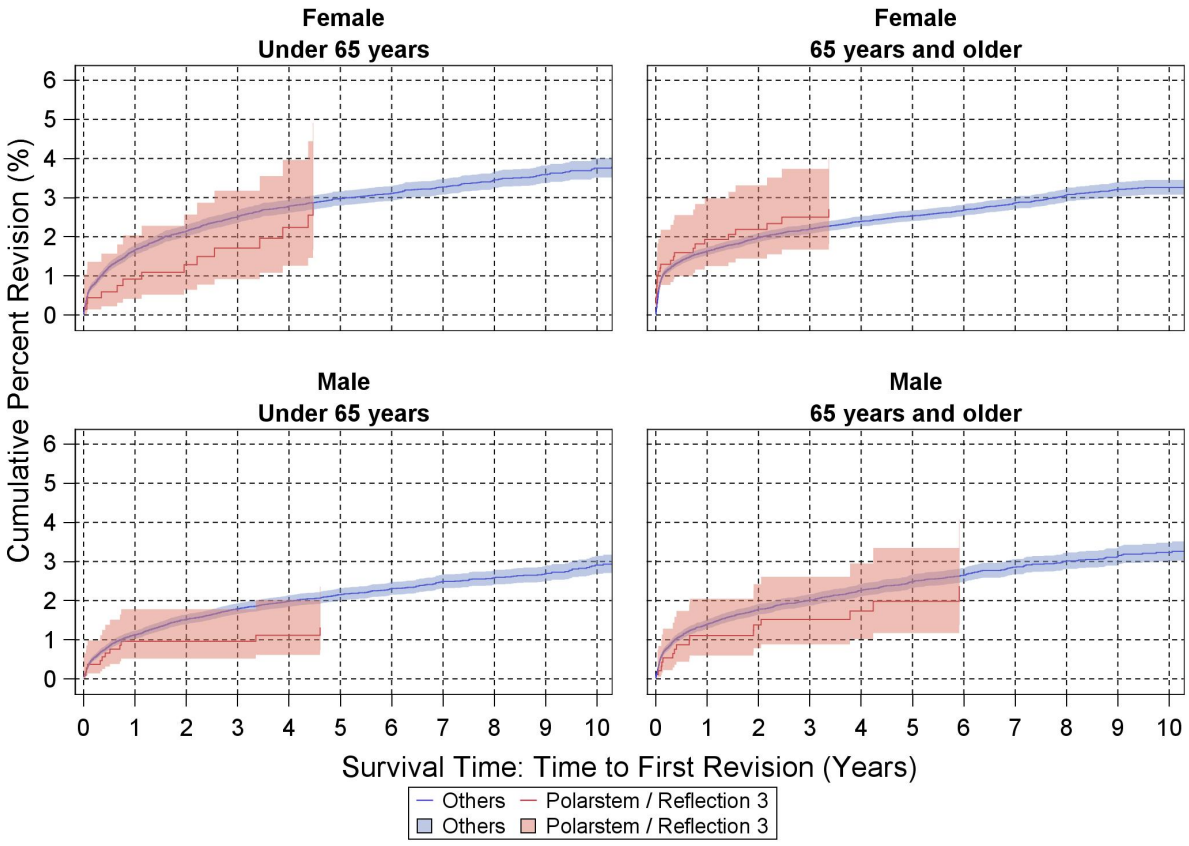


Figure 149. Cumulative Percent Revision Curve for the Polarstem/Reflection 3 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 351. Cumulative Percent Revision and Number at Risk for the Polarstem/Reflection 3 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	3,812	0.00 (0.00,0.00)	686	0.00 (0.00,0.00)	1,084	0.00 (0.00,0.00)	1,086	0.00 (0.00,0.00)	950	0.00 (0.00,0.00)
1	3,181	1.26 (0.95,1.68)	583	0.92 (0.41,2.03)	845	1.93 (1.25,2.98)	1,086	0.00 (0.00,0.00)	794	1.11 (0.60,2.05)
2	2,744	1.47 (1.12,1.92)	502	1.29 (0.64,2.57)	680	2.19 (1.44,3.31)	953	0.96 (0.52,1.78)	709	1.38 (0.78,2.42)
3	2,202	1.66 (1.28,2.15)	422	1.71 (0.92,3.18)	525	2.50 (1.67,3.74)	850	0.96 (0.52,1.78)	545	1.52 (0.88,2.61)
4	1,757	1.91 (1.48,2.46)	340	2.24 (1.26,3.96)	406	2.71 (1.81,4.03)	710	0.96 (0.52,1.78)	429	1.73 (1.02,2.95)
5	1,405	2.16 (1.68,2.78)	278	2.87 (1.67,4.91)	317	2.71 (1.81,4.03)	582	1.11 (0.61,2.02)	344	1.98 (1.17,3.35)
6	969	2.26 (1.75,2.91)	183	2.87 (1.67,4.91)	213	2.71 (1.81,4.03)	466	1.32 (0.73,2.36)	247	2.37 (1.38,4.07)
7	598	2.26 (1.75,2.91)	114	2.87 (1.67,4.91)	129	2.71 (1.81,4.03)	326	1.32 (0.73,2.36)	158	2.37 (1.38,4.07)
8	314	2.26 (1.75,2.91)	65	2.87 (1.67,4.91)	78	2.71 (1.81,4.03)	197	1.32 (0.73,2.36)	68	2.37 (1.38,4.07)
9	47	2.26 (1.75,2.91)	15	2.87 (1.67,4.91)	11	2.71 (1.81,4.03)	103	1.32 (0.73,2.36)	*	2.37 (1.38,4.07)
10	*	2.26 (1.75,2.91)	*	2.87 (1.67,4.91)	*	2.71 (1.81,4.03)	13	1.32 (0.73,2.36)	*	2.37 (1.38,4.07)

* Denotes that the number of cases is between 1 and 10.

Table 352. Reasons for First Revision Following Primary THA for Polarstem/Reflection 3 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	23	34.3
2	Joint Infection	16	23.9
3	Aseptic Loosening	12	17.9
4	Dislocation/Instability	10	14.9
5	Pain	3	4.5
6	Poly liner wear	1	1.5
7	Implant Failure	1	1.5
8	Malalignment	1	1.5

Table 353. Reasons for First Revision in the First 90 Days Following Primary THA for Polarstem/Reflection 3 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	18	69.2
2	Dislocation/Instability	4	15.4
3	Joint Infection	3	11.5
4	Aseptic Loosening	1	3.8

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Table 354. Reasons for First Revision Between 91 and 365 days Following Primary THA for Polarstem/Reflection 3 Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	8	40.0
2	Aseptic Loosening	5	25.0
3	Dislocation/Instability	3	15.0
4	Peri-prosthetic fracture - Femur	2	10.0
5	Pain	1	5.0
6	Malalignment	1	5.0

Table 355. Descriptive Statistics of Cases Receiving the Polarstem/Reflection 3 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,775	46.37	
Age (years)	3,828	65.12 (10.93)	65.00 (15.00)
Height (cm)	3,828	171.17 (10.61)	170.20 (15.44)
Weight (kg)	3,828	91.14 (21.58)	89.00 (28.10)
BMI(kg/m^2)	3,828	30.98 (6.27)	30.30 (8.23)
Smoker - Never (%)	1,737	45.38	
Smoker - Previous (%)	1,440	37.62	
Smoker - Current (%)	638	16.67	
Smoker - Unknown (%)	13	0.34	

Table 356. Distribution of Approach Used for Polarstem/Reflection 3 Combination in Primary THA Cases

Approach	N	Percent
Anterior	3,073	80.3
Anterolateral	366	9.6
Posterior	386	10.1
Transtrochanteric	2	0.1
Missing/unknown/other	1	0.0

Table 357. Distribution of Head Size for Polarstem/Reflection 3 Combination in Primary THA Cases

Size (mm)	N	Percent
22	1	0.0
28	4	0.1
32	554	16.9
36	2,506	76.2
40	213	6.5
Missing/unknown/other	10	0.3

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Table 358. Distribution of Bearing Surface for Polarstem/Reflection 3 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	109	2.9
Ceramic-on-plastic	3,170	82.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	479	12.5
Missing/unknown/other	70	1.8

Table 359. Distribution of Polyethylene Used for Polarstem/Reflection 3 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.0
XLPE	3,669	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 360. Volume of Cases by Surgeon and Site for the Polarstem/Reflection 3 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	79 (198)	12 (62)
Cases per site	116 (236)	26 (107)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

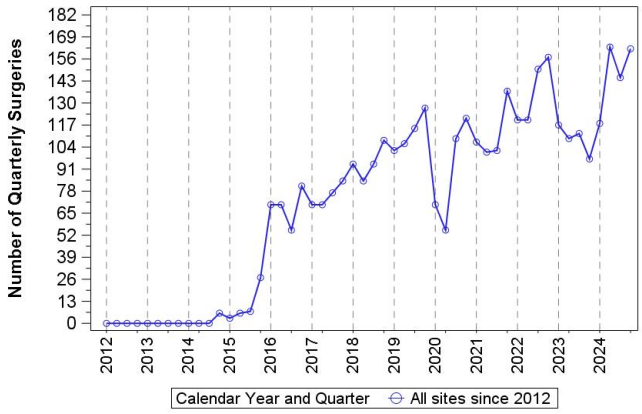


Figure 150. Utilization of the Polarstem/Reflection 3 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

75100466	75100478	75102250
75100465	75018413	75102252
75100467	75100479	75102246
75100468	75018407	75102251
75100464	75018419	75102211
75018402	75100476	75102244
75018403	75100480	75102255
75100469	75018400	75102256
75018404	75100475	75100483
75018416	75100471	75102245
75018417	75102209	75102257
75018405	75100481	75102258
75018415	75100474	75100473
75100463	75018408	75102074
75100470	75100472	75102248
75018401	75102253	75102249
75018406	75102254	75102076
75018414	75102210	75102259
75018418	75018409	
75100477	75100482	

Catalog numbers of Acetabular Cups Used in the Analysis

71335552	71338667	71331852
71335554	71335562	71331848
71335556	71338664	71331850
71335548	71338668	71331854
71335558	71338669	71331860
71335550	71335564	71338672
71335560	71338663	
71338665	71335546	
71338666	71338671	

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3.1.27 ProFemur Gladiator/Procotyl Prime

N = 510 primary cases were used for this analysis. Fewer than ten surgeons used this implant combination at fewer than ten sites in primary THA cases.

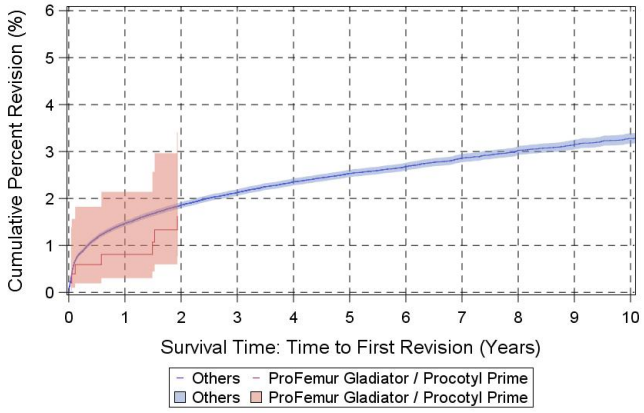


Figure 151. Cumulative Percent Revision Curve for the ProFemur Gladiator/Procotyl Prime Combination, Compared to All Other Implant Combinations in Primary THA Cases

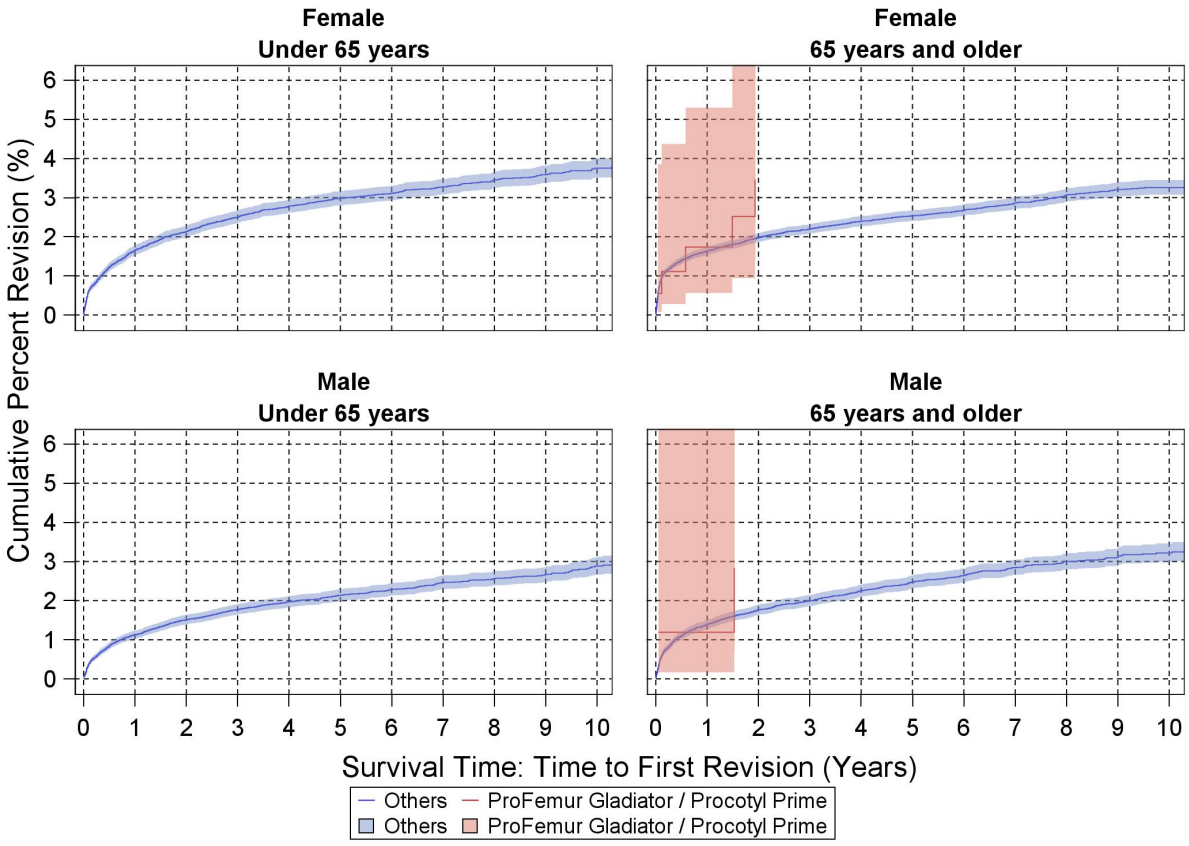


Figure 152. Cumulative Percent Revision Curve for the ProFemur Gladiator/Procotyl Prime Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 361. Cumulative Percent Revision and Number at Risk for the ProFemur Gladiator/Procotyl Prime Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	509	0.00 (0.00,0.00)	132	0.00 (0.00,0.00)	181	0.00 (0.00,0.00)	111	0.00 (0.00,0.00)	85	0.00 (0.00,0.00)
1	427	0.81 (0.30,2.14)	118	0.00 (0.00,0.00)	145	1.74 (0.56,5.30)	94	0.00 (0.00,0.00)	70	1.19 (0.17,8.15)
2	328	1.63 (0.77,3.41)	97	0.00 (0.00,0.00)	102	3.46 (1.42,8.30)	78	0.00 (0.00,0.00)	51	2.84 (0.70,11.07)
3	212	1.63 (0.77,3.41)	56	0.00 (0.00,0.00)	65	3.46 (1.42,8.30)	56	0.00 (0.00,0.00)	35	2.84 (0.70,11.07)
4	47	1.63 (0.77,3.41)	17	0.00 (0.00,0.00)	14	3.46 (1.42,8.30)	*	0.00 (0.00,0.00)	*	2.84 (0.70,11.07)
5	22	1.63 (0.77,3.41)	*	0.00 (0.00,0.00)	*	3.46 (1.42,8.30)	*	0.00 (0.00,0.00)	*	2.84 (0.70,11.07)
6	14	1.63 (0.77,3.41)	*	0.00 (0.00,0.00)	*	3.46 (1.42,8.30)	*	0.00 (0.00,0.00)	*	2.84 (0.70,11.07)
7	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 362. Reasons for First Revision Following Primary THA for ProFemur Gladiator/Procotyl Prime Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	4	57.1
2	Aseptic Loosening	3	42.9

Table 363. Reasons for First Revision in the First 90 Days Following Primary THA for ProFemur Gladiator/Procotyl Prime Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	2	66.7
2	Aseptic Loosening	1	33.3

Table 364. Reasons for First Revision Between 91 and 365 days Following Primary THA for ProFemur Gladiator/Procotyl Prime Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	100.0

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Table 365. Descriptive Statistics of Cases Receiving the ProFemur Gladiator/Procotyl Prime Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	314	61.57	
Age (years)	510	64.21 (11.03)	65.00 (14.00)
Height (cm)	510	168.04 (10.08)	167.64 (15.24)
Weight (kg)	510	89.69 (21.25)	88.45 (26.76)
BMI(kg/m^2)	510	31.69 (6.72)	30.53 (8.87)
Smoker - Never (%)	250	49.02	
Smoker - Previous (%)	180	35.29	
Smoker - Current (%)	80	15.69	
Smoker - Unknown (%)	0	0.0	

Table 366. Distribution of Approach Used for ProFemur Gladiator/Procotyl Prime Combination in Primary THA Cases

Approach	N	Percent
Anterior	495	97.1
Anterolateral	12	2.4
Posterior	3	0.6
Transtrochanteric	0	0.0
Missing/unknown/other	0	0.0

Table 367. Distribution of Head Size for ProFemur Gladiator/Procotyl Prime Combination in Primary THA Cases

Size (mm)	N	Percent
32	14	2.8
36	349	70.1
40	80	16.1
Missing/unknown/other	55	11.0

Table 368. Distribution of Bearing Surface for ProFemur Gladiator/Procotyl Prime Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	0	0.0
Ceramic-on-plastic	443	86.9
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	67	13.1

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Table 369. Distribution of Polyethylene Used for ProFemur Gladiator/Procotyl Prime Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	32	6.4
Antioxidant XLPE	466	93.6
Missing/unknown/other	0	0.0

Table 370. Volume of Cases by Surgeon and Site for the ProFemur Gladiator/Procotyl Prime Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	85 (173)	12 (35)
Cases per site	56 (83)	13 (34)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

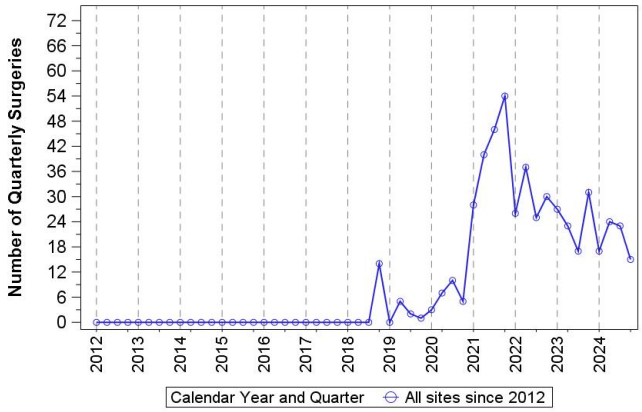


Figure 153. Utilization of the ProFemur Gladiator/Procotyl Prime Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

PRGLCLE5	PRGLCLS5	PRGLCLS6
PRGLCLE6	PRGLCLE7	PRGLCLS2
PRGLCLE4	PRGLCLE8	PRGLCLE9
PRGLCLE3	PRGLCLS1	PRGLCLS7
PRGLCLS4	PRGLCLE1	
PRGLCLS3	PRGLCLE2	

Catalog numbers of Acetabular Cups Used in the Analysis

P3SBQC50	P3SBQD56	P3SBQB46
P3SBQC52	P3SBQB48	P3SBQG66
P3SBQD54	P3SBQE60	
P3SBQE58	P3SBQF62	

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3.1.28 Secur-Fit/Trident

N = 1,106 primary cases were used for this analysis. Distribution of utilization: 35 surgeons across 23 sites used this implant combination in primary THA cases.

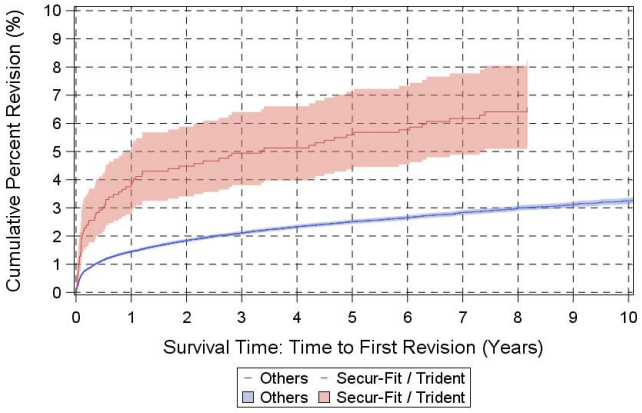


Figure 154. Cumulative Percent Revision Curve for the Secur-Fit/Trident Combination, Compared to All Other Implant Combinations in Primary THA Cases

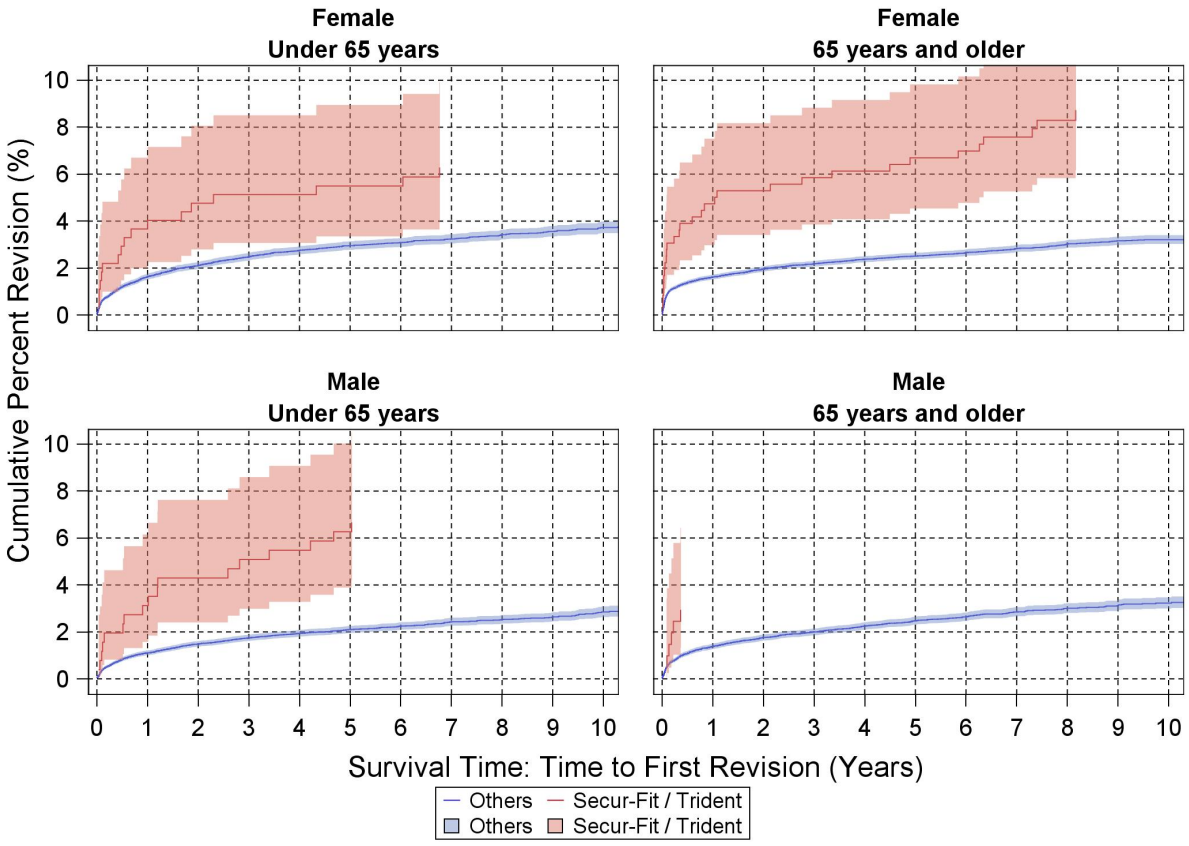


Figure 155. Cumulative Percent Revision Curve for the Secur-Fit/Trident Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 371. Cumulative Percent Revision and Number at Risk for the Secur-Fit/Trident Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,093	0.00 (0.00,0.00)	273	0.00 (0.00,0.00)	359	0.00 (0.00,0.00)	256	0.00 (0.00,0.00)	204	0.00 (0.00,0.00)
1	1,052	3.75 (2.78,5.06)	263	3.66 (1.99,6.70)	342	4.74 (2.97,7.51)	248	3.13 (1.58,6.15)	198	2.94 (1.33,6.43)
2	1,041	4.48 (3.41,5.89)	260	4.76 (2.79,8.06)	339	5.29 (3.41,8.17)	243	4.30 (2.40,7.62)	198	2.94 (1.33,6.43)
3	1,036	4.94 (3.81,6.40)	259	5.13 (3.07,8.51)	337	5.85 (3.85,8.83)	241	5.08 (2.98,8.60)	198	2.94 (1.33,6.43)
4	1,034	5.13 (3.97,6.61)	259	5.13 (3.07,8.51)	336	6.13 (4.08,9.16)	240	5.48 (3.28,9.08)	198	2.94 (1.33,6.43)
5	1,023	5.59 (4.37,7.12)	257	5.49 (3.35,8.95)	330	6.69 (4.54,9.82)	237	6.27 (3.89,10.03)	198	2.94 (1.33,6.43)
6	986	5.77 (4.54,7.33)	248	5.49 (3.35,8.95)	319	6.98 (4.77,10.16)	226	6.66 (4.20,10.50)	192	2.94 (1.33,6.43)
7	850	6.17 (4.89,7.77)	224	6.28 (3.95,9.91)	281	7.58 (5.26,10.86)	190	6.66 (4.20,10.50)	154	2.94 (1.33,6.43)
8	651	6.41 (5.09,8.05)	179	6.28 (3.95,9.91)	221	8.29 (5.83,11.73)	138	6.66 (4.20,10.50)	112	2.94 (1.33,6.43)
9	412	6.56 (5.22,8.23)	122	6.28 (3.95,9.91)	136	8.73 (6.17,12.29)	84	6.66 (4.20,10.50)	69	2.94 (1.33,6.43)
10	213	6.56 (5.22,8.23)	65	6.28 (3.95,9.91)	67	8.73 (6.17,12.29)	47	6.66 (4.20,10.50)	34	2.94 (1.33,6.43)

Table 372. Reasons for First Revision Following Primary THA for Secur-Fit/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	18	26.9
2	Aseptic Loosening	17	25.4
3	Joint Infection	12	17.9
4	Dislocation/Instability	11	16.4
5	Implant Failure	4	6.0
6	Malalignment	2	3.0
7	Peri-prosthetic fracture - Acetabulum	1	1.5
8	Metal Reaction/Metallosis	1	1.5
9	Pain	1	1.5

Table 373. Reasons for First Revision in the First 90 Days Following Primary THA for Secur-Fit/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	15	55.6
2	Dislocation/Instability	8	29.6
3	Joint Infection	3	11.1
4	Aseptic Loosening	1	3.7

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Table 374. Reasons for First Revision Between 91 and 365 days Following Primary THA for Secur-Fit/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	5	45.4
2	Aseptic Loosening	2	18.2
3	Implant Failure	2	18.2
4	Dislocation/Instability	1	9.1
5	Malalignment	1	9.1

Table 375. Descriptive Statistics of Cases Receiving the Secur-Fit/Trident Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	639	57.78	
Age (years)	1,106	64.72 (10.47)	65.00 (13.00)
Height (cm)	1,106	169.56 (10.34)	170.00 (15.30)
Weight (kg)	1,106	90.50 (21.81)	87.85 (29.05)
BMI(kg/m^2)	1,106	31.37 (6.58)	30.53 (9.17)
Smoker - Never (%)	509	46.02	
Smoker - Previous (%)	401	36.26	
Smoker - Current (%)	186	16.82	
Smoker - Unknown (%)	10	0.9	

Table 376. Distribution of Approach Used for Secur-Fit/Trident Combination in Primary THA Cases

Approach	N	Percent
Anterior	2	0.2
Anterolateral	513	46.4
Posterior	587	53.1
Transtrochanteric	1	0.1
Missing/unknown/other	3	0.3

Table 377. Distribution of Head Size for Secur-Fit/Trident Combination in Primary THA Cases

Size (mm)	N	Percent
28	1	0.1
32	151	16.2
36	537	57.5
40	237	25.4
Missing/unknown/other	8	0.9

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Table 378. Distribution of Bearing Surface for Secur-Fit/Trident Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	271	24.5
Ceramic-on-plastic	652	59.0
Ceramic-on-ceramic	3	0.3
Metal-on-metal	0	0.0
Dual mobility	168	15.2
Missing/unknown/other	12	1.1

Table 379. Distribution of Polyethylene Used for Secur-Fit/Trident Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,099	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 380. Volume of Cases by Surgeon and Site for the Secur-Fit/Trident Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	31 (67)	4 (21)
Cases per site	48 (77)	13 (58)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

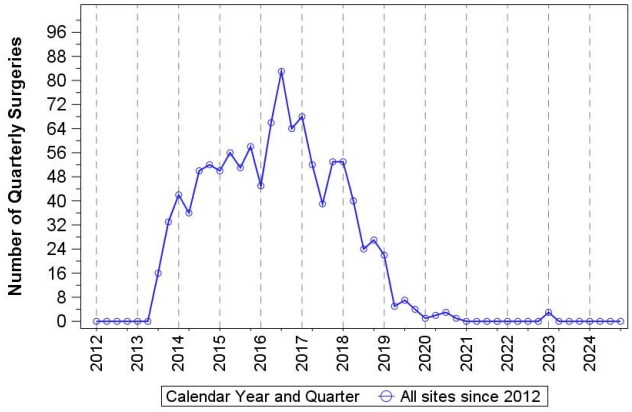


Figure 156. Utilization of the Secur-Fit/Trident Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

160108132	160106132	160111127
160107132	160110132	160112132
160109132	160110127	160112127
160108127	160106127	
160107127	160105132	
160109127	160111132	

Catalog numbers of Acetabular Cups Used in the Analysis

5020354E	5020362G	5020152E
5021152E	5021162G	5020156F
5020352D	5421158G	5020366H
5021150D	5000356E	5021146C
5020356E	5000360F	5081152E
5020350D	5000354E	5081158F
5021154E	5000358F	5081160G
5021156F	5020346B	5090254E
5421150E	5421160G	5090256E
5020358F	5421148D	5090258F
5421152E	5000352D	5090260F
5421154F	5020364G	5401150E
5021158F	5421146D	5401158G
5021160G	5000350D	5421144C
5020360F	5021164H	5421162H
5421156F	5090268H	
5020348C	5401156F	
5021148D	5000362G	

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3.1.29 Secur-Fit/Trident II

N = 941 primary cases were used for this analysis. Distribution of utilization: 25 surgeons across 20 sites used this implant combination in primary THA cases.

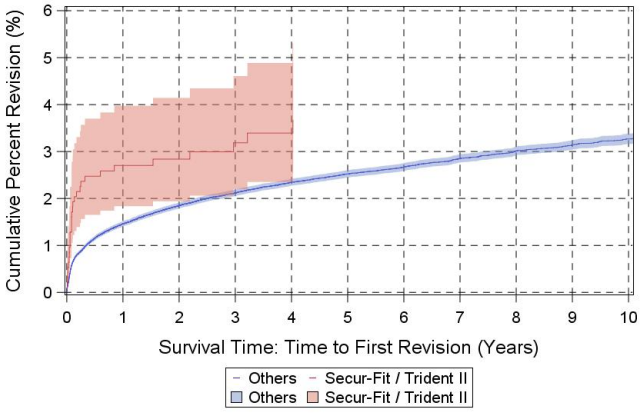


Figure 157. Cumulative Percent Revision Curve for the Secur-Fit/Trident II Combination, Compared to All Other Implant Combinations in Primary THA Cases

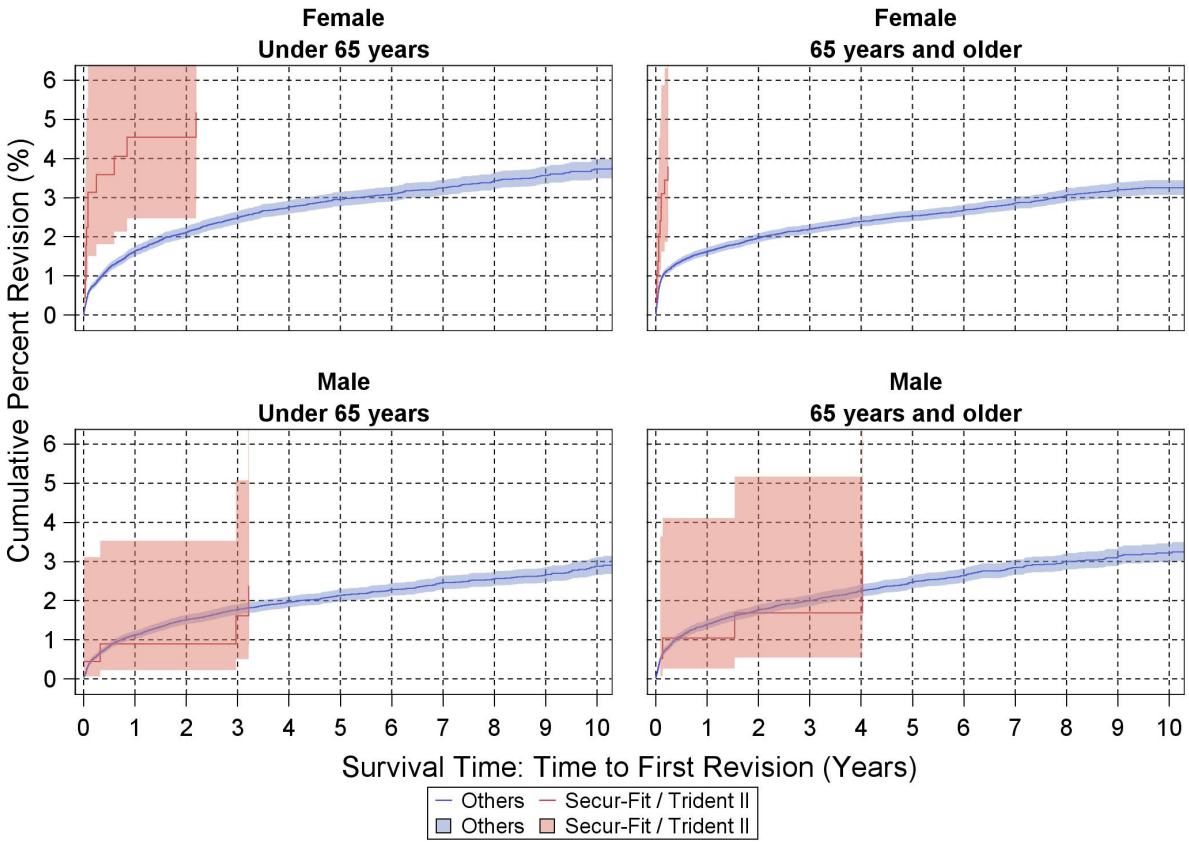


Figure 158. Cumulative Percent Revision Curve for the Secur-Fit/Trident II Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 381. Cumulative Percent Revision and Number at Risk for the Secur-Fit/Trident II Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	938	0.00 (0.00,0.00)	225	0.00 (0.00,0.00)	292	0.00 (0.00,0.00)	225	0.00 (0.00,0.00)	196	0.00 (0.00,0.00)
1	811	2.70 (1.83,3.98)	191	4.54 (2.47,8.28)	243	3.80 (2.12,6.75)	211	0.89 (0.22,3.53)	166	1.04 (0.26,4.11)
2	653	2.84 (1.94,4.14)	152	4.54 (2.47,8.28)	195	3.80 (2.12,6.75)	174	0.89 (0.22,3.53)	132	1.69 (0.54,5.17)
3	497	3.19 (2.20,4.61)	119	5.18 (2.89,9.20)	146	3.80 (2.12,6.75)	135	1.61 (0.51,5.08)	97	1.69 (0.54,5.17)
4	343	3.39 (2.35,4.89)	88	5.18 (2.89,9.20)	93	3.80 (2.12,6.75)	100	2.38 (0.87,6.41)	62	1.69 (0.54,5.17)
5	223	3.68 (2.54,5.31)	58	5.18 (2.89,9.20)	63	3.80 (2.12,6.75)	66	2.38 (0.87,6.41)	36	3.27 (1.08,9.70)
6	64	3.68 (2.54,5.31)	13	5.18 (2.89,9.20)	21	3.80 (2.12,6.75)	18	2.38 (0.87,6.41)	12	3.27 (1.08,9.70)
7	*	3.68 (2.54,5.31)	0	N/A	*	3.80 (2.12,6.75)	0	N/A	0	N/A
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 382. Reasons for First Revision Following Primary THA for Secur-Fit/Trident II Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	12	40.0
2	Aseptic Loosening	8	26.7
3	Implant Failure	5	16.7
4	Dislocation/Instability	2	6.7
5	Joint Infection	2	6.7
6	Malalignment	1	3.3

Table 383. Reasons for First Revision in the First 90 Days Following Primary THA for Secur-Fit/Trident II Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	12	57.1
2	Implant Failure	3	14.3
3	Aseptic Loosening	2	9.5
4	Dislocation/Instability	2	9.5
5	Joint Infection	1	4.8
6	Malalignment	1	4.8

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Table 384. Reasons for First Revision Between 91 and 365 days Following Primary THA for Secur-Fit/Trident II Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	2	50.0
2	Joint Infection	1	25.0
3	Implant Failure	1	25.0

Table 385. Descriptive Statistics of Cases Receiving the Secur-Fit/Trident II Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	518	55.05	
Age (years)	941	64.84 (10.66)	65.00 (13.00)
Height (cm)	941	170.04 (10.29)	170.10 (15.24)
Weight (kg)	941	92.25 (23.00)	90.00 (29.10)
BMI(kg/m^2)	941	31.84 (7.18)	30.67 (9.14)
Smoker - Never (%)	440	46.76	
Smoker - Previous (%)	307	32.62	
Smoker - Current (%)	192	20.4	
Smoker - Unknown (%)	2	0.21	

Table 386. Distribution of Approach Used for Secur-Fit/Trident II Combination in Primary THA Cases

Approach	N	Percent
Anterior	3	0.3
Anterolateral	733	77.9
Posterior	199	21.1
Transtrochanteric	0	0.0
Missing/unknown/other	6	0.6

Table 387. Distribution of Head Size for Secur-Fit/Trident II Combination in Primary THA Cases

Size (mm)	N	Percent
28	1	0.2
32	82	13.0
36	405	64.4
40	137	21.8
Missing/unknown/other	4	0.6

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Table 388. Distribution of Bearing Surface for Secur-Fit/Trident II Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	7	0.7
Ceramic-on-plastic	618	65.7
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	307	32.6
Missing/unknown/other	9	1.0

Table 389. Distribution of Polyethylene Used for Secur-Fit/Trident II Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	931	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 390. Volume of Cases by Surgeon and Site for the Secur-Fit/Trident II Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	37 (70)	5 (39)
Cases per site	47 (76)	12 (60)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

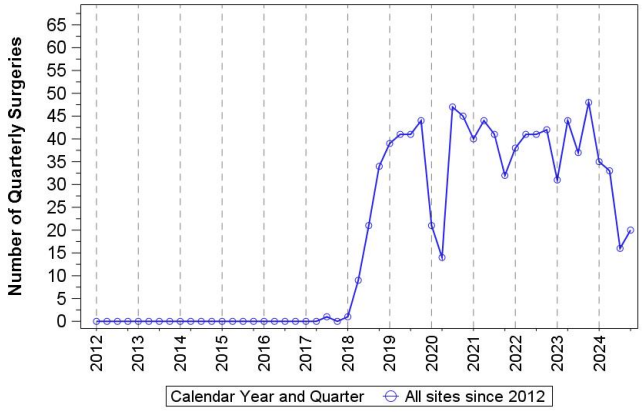


Figure 159. Utilization of the Secur-Fit/Trident II Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

160108127	160110127	160105132
160107127	160110132	160112132
160109132	160106127	160112127
160108132	160111132	
160109127	160111127	
160107132	160106132	

Catalog numbers of Acetabular Cups Used in the Analysis

7020452E	7421156F	7421148D
7020454E	7021154E	7000446C
7020450D	7090450D	7090448D
7020456F	7421150D	7090454E
7020458F	7020446C	7000460G
7020448D	7021150D	7021146C
7020460G	7021156F	7090452E
7000452E	7021158F	7090458F
7020462G	7021160G	7090466H
7421152E	7421160G	7020444B
7000450D	7000456F	7020464H
7421154E	7021148D	7021162G
7000454E	7090464H	7021164H
7021152E	7421158F	7090462G
7000448D	7000458F	

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3.1.30 Secur-Fit Max/Trident

N = 3,077 primary cases were used for this analysis. Distribution of utilization: 56 surgeons across 26 sites used this implant combination in primary THA cases.

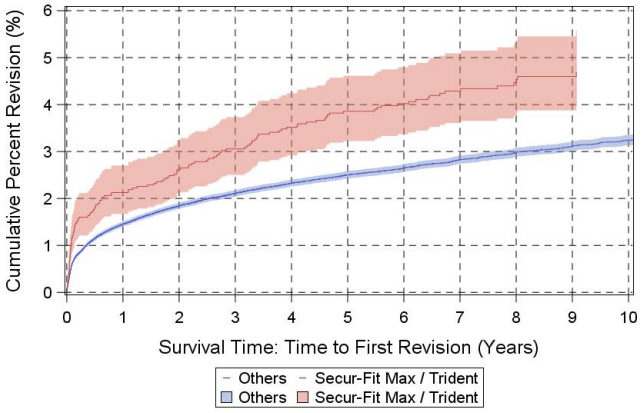


Figure 160. Cumulative Percent Revision Curve for the Secur-Fit Max/Trident Combination, Compared to All Other Implant Combinations in Primary THA Cases

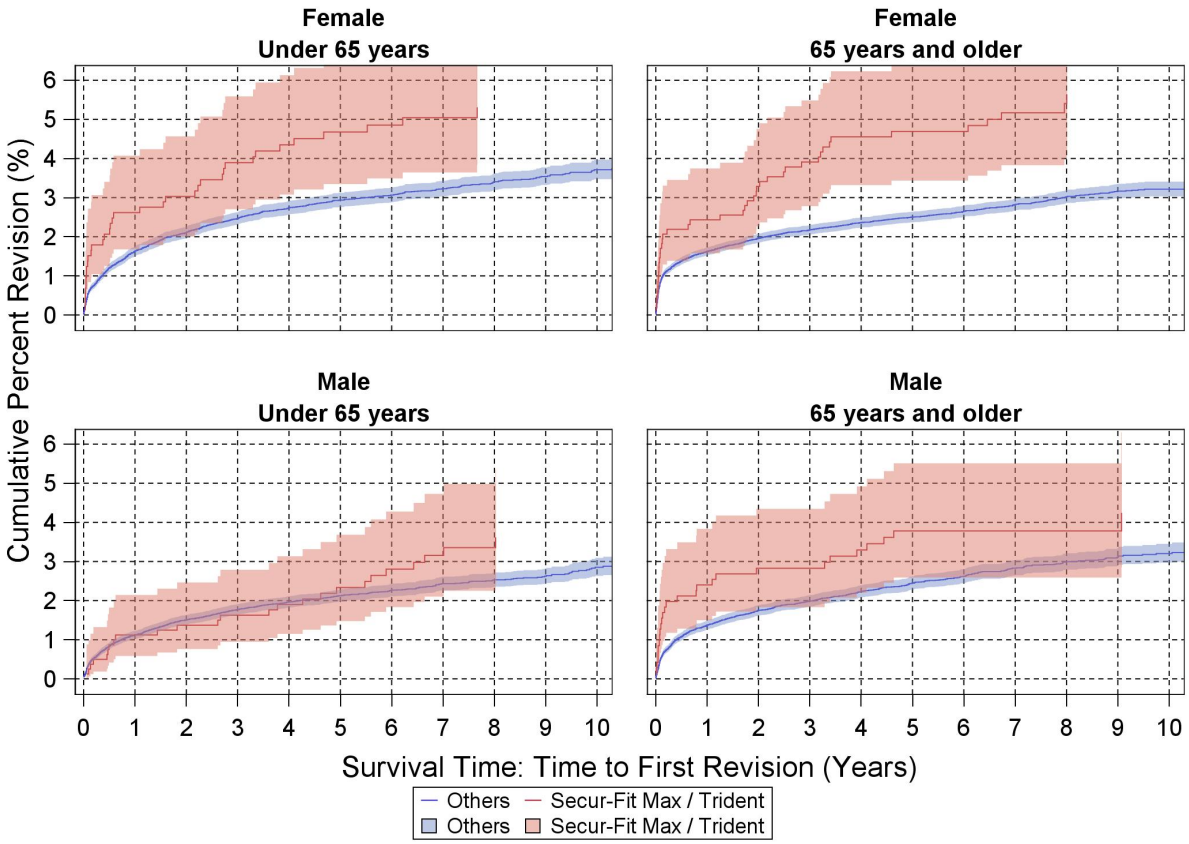


Figure 161. Cumulative Percent Revision Curve for the Secur-Fit Max/Trident Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 391. Cumulative Percent Revision and Number at Risk for the Secur-Fit Max/Trident Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	3,058	0.00 (0.00,0.00)	726	0.00 (0.00,0.00)	822	0.00 (0.00,0.00)	802	0.00 (0.00,0.00)	708	0.00 (0.00,0.00)
1	2,993	2.13 (1.67,2.70)	707	2.62 (1.68,4.07)	802	2.43 (1.58,3.75)	793	1.12 (0.59,2.15)	691	2.40 (1.50,3.83)
2	2,945	2.62 (2.11,3.25)	692	3.03 (2.01,4.57)	788	3.29 (2.27,4.76)	784	1.37 (0.76,2.46)	681	2.83 (1.83,4.35)
3	2,796	3.06 (2.50,3.73)	652	3.89 (2.70,5.59)	753	3.91 (2.78,5.48)	749	1.63 (0.95,2.79)	642	2.83 (1.83,4.35)
4	2,639	3.52 (2.92,4.24)	606	4.35 (3.08,6.13)	719	4.55 (3.32,6.23)	705	1.90 (1.15,3.13)	609	3.29 (2.20,4.92)
5	2,474	3.86 (3.22,4.61)	556	4.68 (3.34,6.52)	678	4.69 (3.43,6.39)	662	2.33 (1.48,3.68)	578	3.78 (2.59,5.51)
6	2,289	4.02 (3.37,4.79)	518	4.85 (3.49,6.73)	633	4.69 (3.43,6.39)	602	2.80 (1.83,4.28)	536	3.78 (2.59,5.51)
7	1,897	4.29 (3.61,5.09)	425	5.04 (3.64,6.96)	529	5.17 (3.83,6.96)	494	3.16 (2.10,4.73)	449	3.78 (2.59,5.51)
8	1,432	4.47 (3.76,5.30)	327	5.31 (3.84,7.32)	399	5.40 (4.01,7.27)	366	3.35 (2.25,4.98)	340	3.78 (2.59,5.51)
9	994	4.60 (3.88,5.45)	234	5.31 (3.84,7.32)	303	5.64 (4.19,7.58)	244	3.62 (2.43,5.36)	213	3.78 (2.59,5.51)
10	603	4.70 (3.95,5.58)	133	5.31 (3.84,7.32)	188	5.64 (4.19,7.58)	153	3.62 (2.43,5.36)	129	4.24 (2.85,6.30)

Table 392. Reasons for First Revision Following Primary THA for Secur-Fit Max/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	46	36.2
2	Aseptic Loosening	22	17.3
3	Joint Infection	17	13.4
4	Dislocation/Instability	13	10.2
5	Malalignment	13	10.2
6	Implant Failure	5	3.9
7	Metal Reaction/Metallosis	5	3.9
8	Peri-prosthetic fracture - Acetabulum	3	2.4
9	Pain	3	2.4

Table 393. Reasons for First Revision in the First 90 Days Following Primary THA for Secur-Fit Max/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	31	64.6
2	Joint Infection	5	10.4
3	Dislocation/Instability	4	8.3
4	Aseptic Loosening	3	6.2
5	Implant Failure	2	4.2
6	Peri-prosthetic fracture - Acetabulum	1	2.1
7	Pain	1	2.1
8	Malalignment	1	2.1

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Table 394. Reasons for First Revision Between 91 and 365 days Following Primary THA for Secur-Fit Max/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	4	28.6
2	Peri-prosthetic fracture - Femur	4	28.6
3	Aseptic Loosening	3	21.4
4	Dislocation/Instability	2	14.3
5	Peri-prosthetic fracture - Acetabulum	1	7.1

Table 395. Descriptive Statistics of Cases Receiving the Secur-Fit Max/Trident Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,559	50.67	
Age (years)	3,077	63.64 (11.17)	65.00 (14.00)
Height (cm)	3,077	170.52 (10.22)	170.18 (15.20)
Weight (kg)	3,077	91.85 (21.69)	89.60 (27.90)
BMI(kg/m^2)	3,077	31.48 (6.50)	30.80 (8.43)
Smoker - Never (%)	1,452	47.19	
Smoker - Previous (%)	1,178	38.28	
Smoker - Current (%)	438	14.23	
Smoker - Unknown (%)	9	0.29	

Table 396. Distribution of Approach Used for Secur-Fit Max/Trident Combination in Primary THA Cases

Approach	N	Percent
Anterior	17	0.6
Anterolateral	1750	56.9
Posterior	1,268	41.2
Transtrochanteric	22	0.7
Missing/unknown/other	20	0.7

Table 397. Distribution of Head Size for Secur-Fit Max/Trident Combination in Primary THA Cases

Size (mm)	N	Percent
22	3	0.1
28	36	1.3
32	1,018	35.6
36	1,630	57.0
40	161	5.6
44	2	0.1
Missing/unknown/other	10	0.3

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Table 398. Distribution of Bearing Surface for Secur-Fit Max/Trident Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,048	34.1
Ceramic-on-plastic	591	19.2
Ceramic-on-ceramic	1,211	39.4
Metal-on-metal	0	0.0
Dual mobility	184	6.0
Missing/unknown/other	43	1.4

Table 399. Distribution of Polyethylene Used for Secur-Fit Max/Trident Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,825	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 400. Volume of Cases by Surgeon and Site for the Secur-Fit Max/Trident Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	55 (172)	8 (43)
Cases per site	118 (241)	24 (108)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

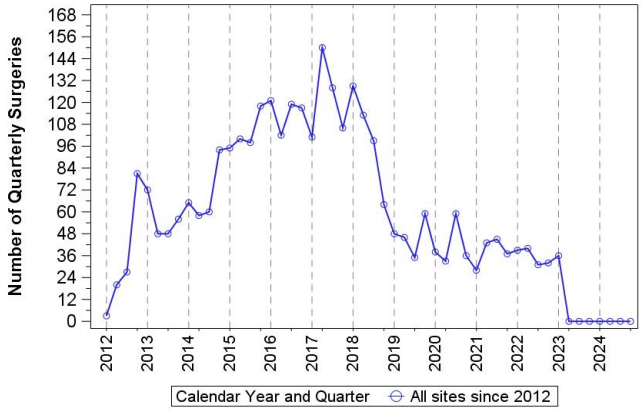


Figure 162. Utilization of the Secur-Fit Max/Trident Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

60510935S	60521035S	60510525S
60510830S	60520730S	60521340S
60511035S	60510625S	60511340S
60510730S	60511240S	60511440S
60520830S	60520625S	60510425S
60520935S	60521140S	
60511140S	60521240S	

Catalog numbers of Acetabular Cups Used in the Analysis

5421150E	5401156F	5401160G
5421154F	5020362G	5000356E
5421152E	5021148D	5000360F
5421158G	5421146D	5020348C
5421156F	5090256E	5000350D
5020356E	5421164H	5000352D
5020354E	5000354E	5081154E
5021154E	5401148D	5081156F
5421148D	5020364G	5081158F
5421160G	5401158G	5401144C
5021152E	5421162H	5020346B
5021156F	5021160G	5020366H
5020352D	5081152E	5021164H
5020358F	5090260F	5081160G
5021150D	5000358F	5090268H
5401150E	5081150D	5090270I
5020360F	5090254E	5421144C
5401154F	5090262G	5421168I
5021158F	5090258F	
5020350D	5090264G	
5401152E	5401146D	

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3.1.31 Secur-Fit Plus Max/Trident

N = 2,019 primary cases were used for this analysis. Distribution of utilization: 31 surgeons across 19 sites used this implant combination in primary THA cases.

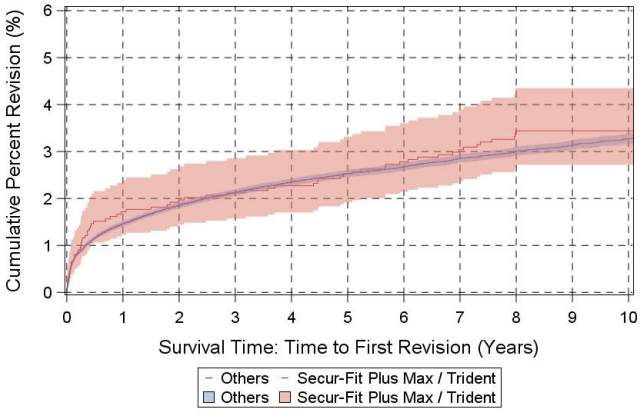


Figure 163. Cumulative Percent Revision Curve for the Secur-Fit Plus Max/Trident Combination, Compared to All Other Implant Combinations in Primary THA Cases

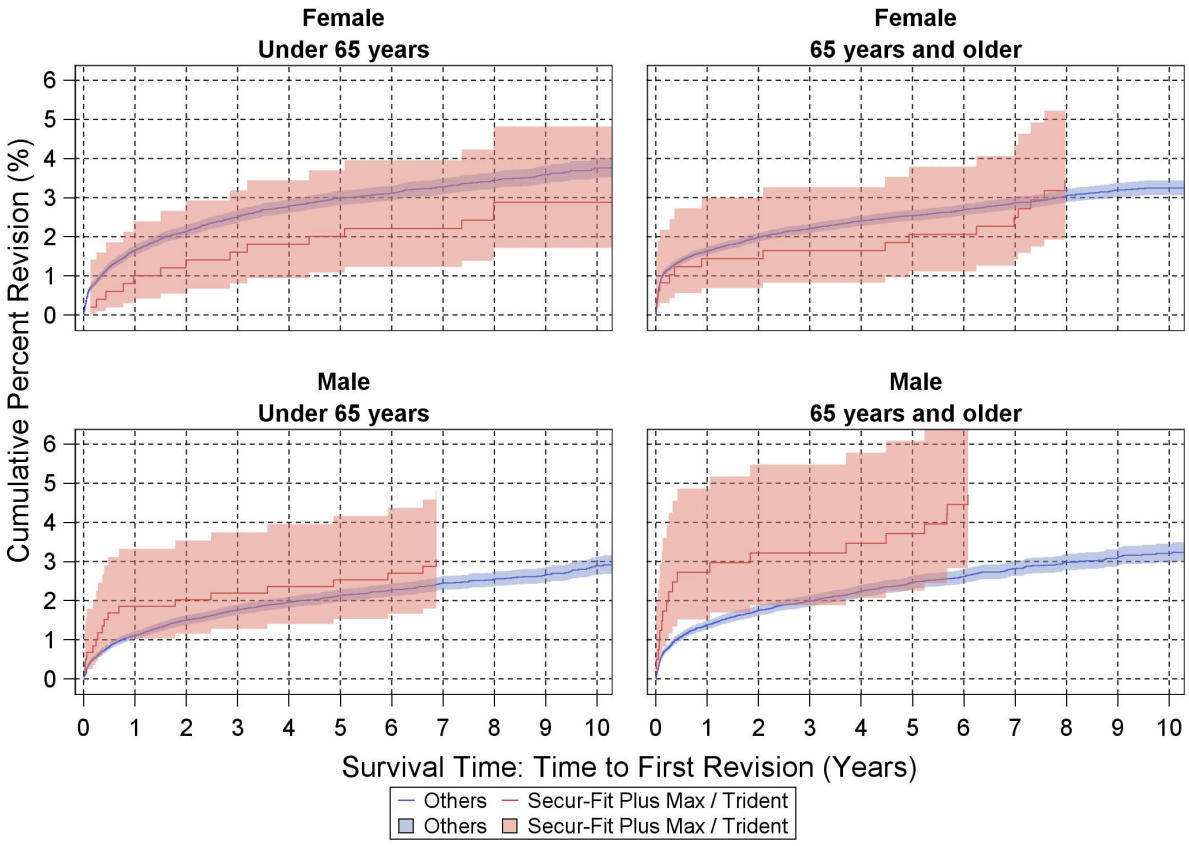


Figure 164. Cumulative Percent Revision Curve for the Secur-Fit Plus Max/Trident Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 401. Cumulative Percent Revision and Number at Risk for the Secur-Fit Plus Max/Trident Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,981	0.00 (0.00,0.00)	498	0.00 (0.00,0.00)	486	0.00 (0.00,0.00)	593	0.00 (0.00,0.00)	404	0.00 (0.00,0.00)
1	1,947	1.72 (1.23,2.39)	493	1.00 (0.42,2.40)	479	1.44 (0.69,3.00)	582	1.85 (1.03,3.32)	393	2.72 (1.52,4.86)
2	1,942	1.97 (1.44,2.68)	491	1.41 (0.67,2.93)	479	1.44 (0.69,3.00)	581	2.02 (1.15,3.54)	391	3.22 (1.88,5.48)
3	1,939	2.12 (1.57,2.86)	490	1.61 (0.81,3.19)	478	1.65 (0.83,3.26)	580	2.19 (1.28,3.75)	391	3.22 (1.88,5.48)
4	1,934	2.27 (1.70,3.03)	489	1.81 (0.94,3.44)	477	1.65 (0.83,3.26)	578	2.36 (1.41,3.95)	390	3.47 (2.07,5.78)
5	1,925	2.52 (1.92,3.32)	487	2.01 (1.09,3.70)	475	2.06 (1.11,3.79)	574	2.53 (1.53,4.16)	389	3.71 (2.26,6.08)
6	1,905	2.78 (2.14,3.60)	483	2.21 (1.23,3.95)	468	2.06 (1.11,3.79)	571	2.70 (1.66,4.37)	383	4.46 (2.83,6.98)
7	1,812	3.04 (2.37,3.90)	466	2.21 (1.23,3.95)	438	2.49 (1.42,4.35)	550	3.05 (1.93,4.80)	358	4.71 (3.03,7.28)
8	1,593	3.44 (2.72,4.35)	424	2.88 (1.71,4.82)	374	3.44 (2.12,5.56)	492	3.05 (1.93,4.80)	303	4.71 (3.03,7.28)
9	1,232	3.44 (2.72,4.35)	339	2.88 (1.71,4.82)	283	3.44 (2.12,5.56)	381	3.05 (1.93,4.80)	229	4.71 (3.03,7.28)
10	880	3.44 (2.72,4.35)	246	2.88 (1.71,4.82)	199	3.44 (2.12,5.56)	279	3.05 (1.93,4.80)	156	4.71 (3.03,7.28)

Table 402. Reasons for First Revision Following Primary THA for Secur-Fit Plus Max/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	16	28.1
2	Dislocation/Instability	13	22.8
3	Joint Infection	12	21.1
4	Aseptic Loosening	9	15.8
5	Implant Failure	3	5.3
6	Metal Reaction/Metallosis	2	3.5
7	Pain	1	1.8
8	Malalignment	1	1.8

Table 403. Reasons for First Revision in the First 90 Days Following Primary THA for Secur-Fit Plus Max/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	8	44.4
2	Dislocation/Instability	5	27.8
3	Joint Infection	3	16.7
4	Aseptic Loosening	1	5.6
5	Implant Failure	1	5.6

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Table 404. Reasons for First Revision Between 91 and 365 days Following Primary THA for Secur-Fit Plus Max/Trident Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	3	50.0
2	Joint Infection	2	33.3
3	Aseptic Loosening	1	16.7

Table 405. Descriptive Statistics of Cases Receiving the Secur-Fit Plus Max/Trident Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,003	49.68	
Age (years)	2,019	62.18 (13.16)	63.00 (16.00)
Height (cm)	2,019	169.85 (10.67)	170.00 (15.24)
Weight (kg)	2,019	87.16 (19.81)	86.00 (26.70)
BMI(kg/m^2)	2,019	30.11 (6.13)	29.54 (7.22)
Smoker - Never (%)	958	47.45	
Smoker - Previous (%)	741	36.7	
Smoker - Current (%)	279	13.82	
Smoker - Unknown (%)	41	2.03	

Table 406. Distribution of Approach Used for Secur-Fit Plus Max/Trident Combination in Primary THA Cases

Approach	N	Percent
Anterior	5	0.2
Anterolateral	137	6.8
Posterior	1,867	92.5
Transtrochanteric	4	0.2
Missing/unknown/other	6	0.3

Table 407. Distribution of Head Size for Secur-Fit Plus Max/Trident Combination in Primary THA Cases

Size (mm)	N	Percent
28	1	0.1
32	154	7.9
36	1,457	74.7
40	289	14.8
44	45	2.3
Missing/unknown/other	5	0.3

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Table 408. Distribution of Bearing Surface for Secur-Fit Plus Max/Trident Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,172	58.0
Ceramic-on-plastic	774	38.3
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	58	2.9
Missing/unknown/other	15	0.7

Table 409. Distribution of Polyethylene Used for Secur-Fit Plus Max/Trident Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	2,008	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 410. Volume of Cases by Surgeon and Site for the Secur-Fit Plus Max/Trident Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	65 (192)	8 (67)
Cases per site	106 (263)	29 (101)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

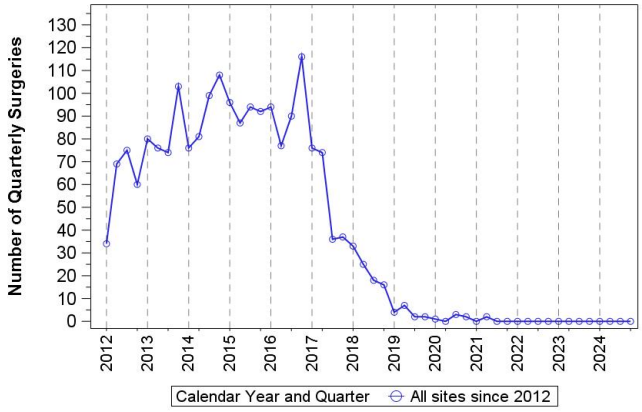


Figure 165. Utilization of the Secur-Fit Plus Max/Trident Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

60540913S	60541016S	60540511S
60540812S	S2337HF09	S2337HF12
60541014S	S2337HF10	60540509S
60540711S	60541117S	60540812
60541115S	60540610S	60540915
60540814S	60540612S	60541319S
60540915S	60541216S	S2337HF05
S2337HF08	S2337HF06	
S2337HF07	S2337HF11	
60540713S	60541218S	

Catalog numbers of Acetabular Cups Used in the Analysis

5421154F	5021158F	5021162G
5421150E	5020360F	5090258F
5421158G	5021148D	5090262G
5421156F	5020362G	5401150E
5421152E	5090254E	5401152E
5421146D	5401154F	5000352D
5020354E	5401158G	5020364G
5421160G	5421162H	5020366H
5020352D	5421164H	5021146C
5021152E	5020348C	5021160G
5020358F	5090256E	5081150D
5020356E	5081148D	5081152E
5421148D	5401156F	5081158F
5021154E	5090260F	5090266H
5020350D	5000356E	5401160G
5021150D	5000358F	5421142B
5021156F	5000360F	

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3.1.32 SROM/Pinnacle

N = 1,120 primary cases were used for this analysis. Distribution of utilization: 50 surgeons across 27 sites used this implant combination in primary THA cases.

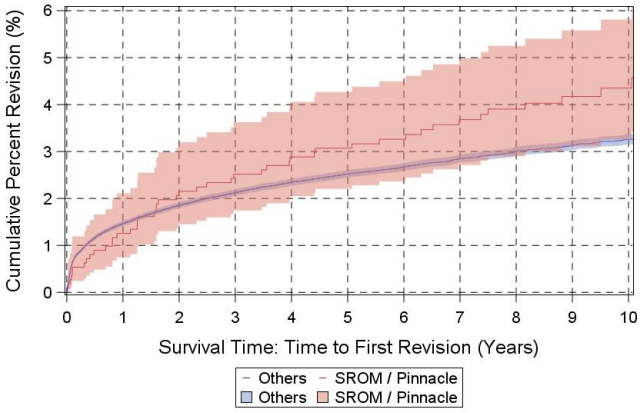


Figure 166. Cumulative Percent Revision Curve for the SROM/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases

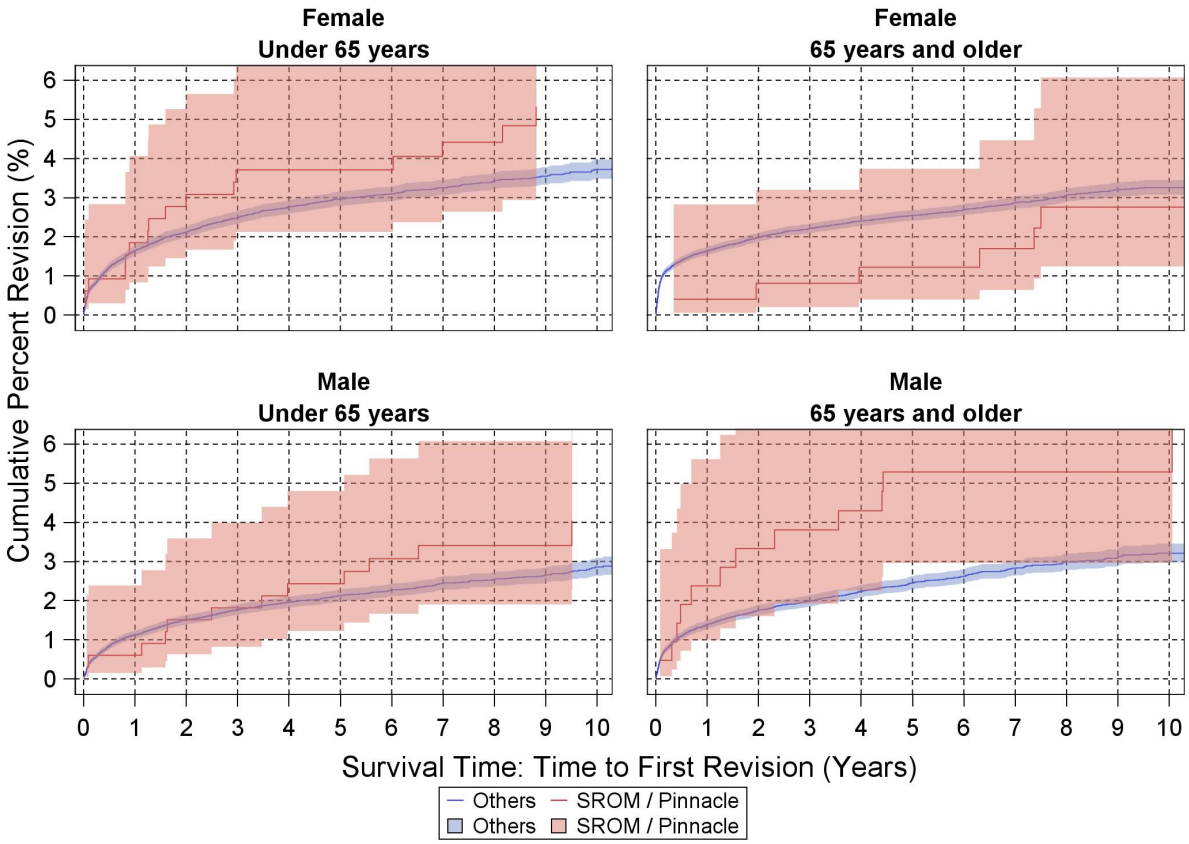


Figure 167. Cumulative Percent Revision Curve for the SROM/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 411. Cumulative Percent Revision and Number at Risk for the SROM/Pinnacle Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,117	0.00 (0.00,0.00)	325	0.00 (0.00,0.00)	249	0.00 (0.00,0.00)	332	0.00 (0.00,0.00)	211	0.00 (0.00,0.00)
1	1,098	1.25 (0.75,2.11)	318	1.85 (0.83,4.07)	246	0.40 (0.06,2.83)	329	0.60 (0.15,2.39)	205	2.38 (1.00,5.61)
2	1,085	2.16 (1.45,3.20)	314	3.08 (1.67,5.65)	244	0.81 (0.20,3.20)	324	1.51 (0.63,3.59)	203	3.33 (1.60,6.86)
3	1,072	2.52 (1.75,3.63)	307	3.71 (2.12,6.44)	243	0.81 (0.20,3.20)	322	1.81 (0.82,3.99)	200	3.81 (1.92,7.47)
4	1,054	2.89 (2.05,4.06)	304	3.71 (2.12,6.44)	240	1.22 (0.40,3.74)	315	2.43 (1.22,4.80)	195	4.30 (2.26,8.09)
5	1,030	3.07 (2.20,4.27)	299	3.71 (2.12,6.44)	236	1.22 (0.40,3.74)	310	2.43 (1.22,4.80)	185	5.29 (2.96,9.35)
6	958	3.26 (2.36,4.49)	282	3.71 (2.12,6.44)	212	1.22 (0.40,3.74)	294	3.07 (1.66,5.64)	170	5.29 (2.96,9.35)
7	887	3.68 (2.71,4.98)	262	4.42 (2.64,7.35)	194	1.70 (0.64,4.47)	275	3.41 (1.90,6.08)	156	5.29 (2.96,9.35)
8	780	3.91 (2.90,5.25)	227	4.42 (2.64,7.35)	173	2.76 (1.24,6.07)	244	3.41 (1.90,6.08)	136	5.29 (2.96,9.35)
9	639	4.17 (3.12,5.58)	188	5.32 (3.28,8.60)	144	2.76 (1.24,6.07)	190	3.41 (1.90,6.08)	117	5.29 (2.96,9.35)
10	433	4.35 (3.25,5.81)	129	5.32 (3.28,8.60)	102	2.76 (1.24,6.07)	120	4.05 (2.27,7.16)	82	5.29 (2.96,9.35)

Table 412. Reasons for First Revision Following Primary THA for SROM/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	16	36.4
2	Aseptic Loosening	8	18.2
3	Dislocation/Instability	8	18.2
4	Implant Failure	6	13.6
5	Peri-prosthetic fracture - Femur	2	4.5
6	Malalignment	2	4.5
7	Metal Reaction/Metallosis	1	2.3
8	Pain	1	2.3

Table 413. Reasons for First Revision in the First 90 Days Following Primary THA for SROM/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	3	50.0
2	Dislocation/Instability	2	33.3
3	Peri-prosthetic fracture - Femur	1	16.7

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Table 414. Reasons for First Revision Between 91 and 365 days Following Primary THA for SROM/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	3	60.0
2	Dislocation/Instability	1	20.0
3	Implant Failure	1	20.0

Table 415. Descriptive Statistics of Cases Receiving the SROM/Pinnacle Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	576	51.43	
Age (years)	1,120	61.22 (12.40)	62.00 (16.00)
Height (cm)	1,120	170.42 (11.80)	170.18 (17.44)
Weight (kg)	1,120	89.43 (22.33)	88.45 (30.42)
BMI(kg/m^2)	1,120	30.65 (6.50)	29.96 (8.79)
Smoker - Never (%)	551	49.2	
Smoker - Previous (%)	397	35.45	
Smoker - Current (%)	170	15.18	
Smoker - Unknown (%)	2	0.18	

Table 416. Distribution of Approach Used for SROM/Pinnacle Combination in Primary THA Cases

Approach	N	Percent
Anterior	12	1.1
Anterolateral	591	52.8
Posterior	497	44.4
Transtrochanteric	13	1.2
Missing/unknown/other	7	0.6

Table 417. Distribution of Head Size for SROM/Pinnacle Combination in Primary THA Cases

Size (mm)	N	Percent
22	8	0.7
28	35	3.1
32	257	23.0
36	783	70.0
40	26	2.3
44	2	0.2
Missing/unknown/other	7	0.6

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Table 418. Distribution of Bearing Surface for SROM/Pinnacle Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	322	28.8
Ceramic-on-plastic	787	70.3
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	11	1.0

Table 419. Distribution of Polyethylene Used for SROM/Pinnacle Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,116	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 420. Volume of Cases by Surgeon and Site for the SROM/Pinnacle Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	22 (50)	3 (13)
Cases per site	41 (135)	4 (12)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

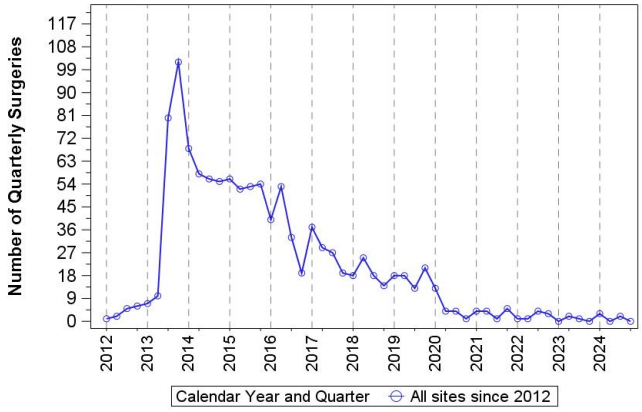


Figure 168. Utilization of the SROM/Pinnacle Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

523418	563514	563216L
563618	523191	523197
563517	523291	523251
563620	523394	523396
523420	523393	526516L
523193	523208	526520L
563516	523293	526520R
563518	523395	563118L
563622	563626	563118N
523192	523195	563120N
523194	523424	563122N
523422	563624	563124N
523292	563118R	

Catalog numbers of Acetabular Cups Used in the Analysis

121732052	121701054	121722064
121722052	121701058	121730038
121732054	121722062	121730042
121722054	121701050	121730050
121722056	121730044	121730062
121732050	121732060	121730064
121732048	121730052	121701062
121732056	121732062	121730040
121722058	121730054	121701048
121722050	121730048	121703048
121701056	121730058	121703052
121722048	121730056	121703058
121732058	121732064	121731052
121701052	121730060	121731054
121722060	121701060	121732066
121730046	121703054	

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3.1.33 Summit/Pinnacle

N = 8,342 primary cases were used for this analysis. Distribution of utilization: 82 surgeons across 41 sites used this implant combination in primary THA cases.

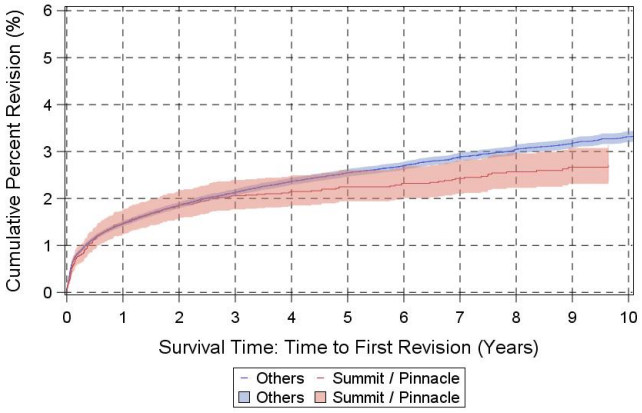


Figure 169. Cumulative Percent Revision Curve for the Summit/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases

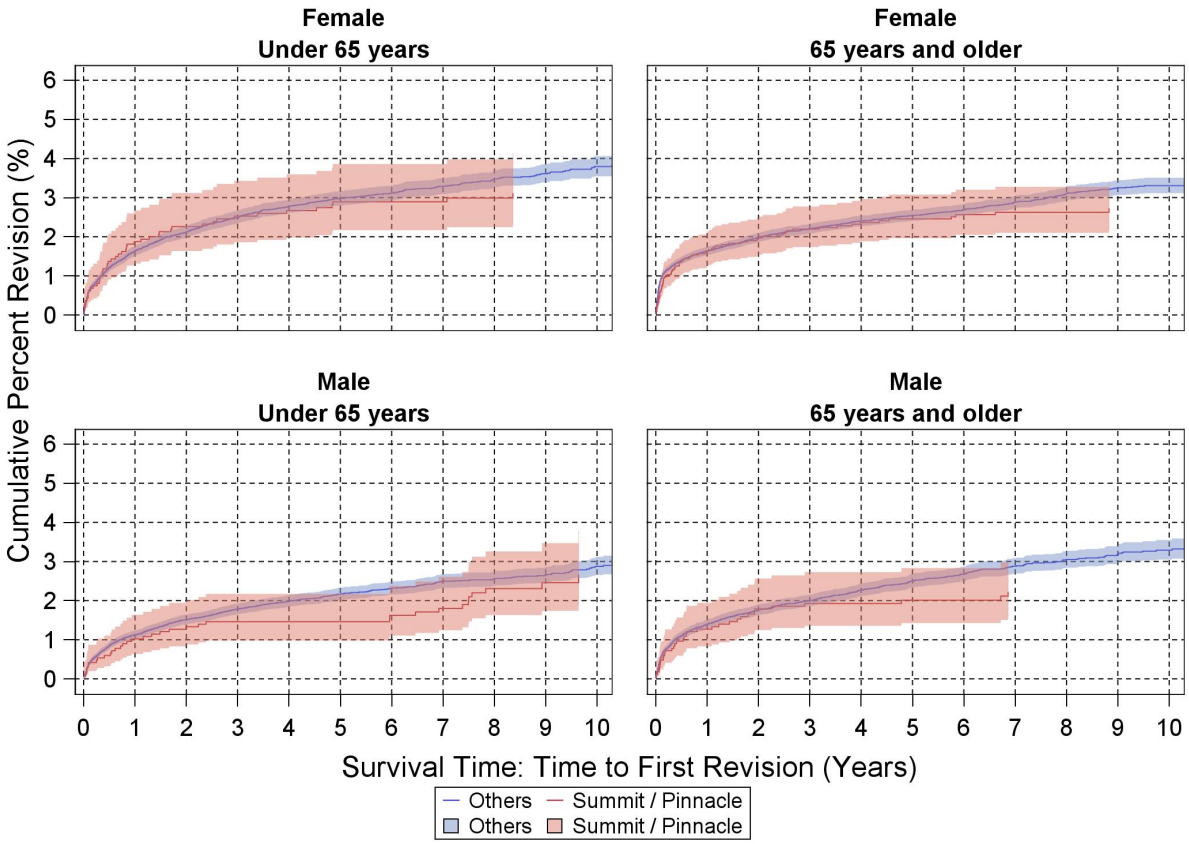


Figure 170. Cumulative Percent Revision Curve for the Summit/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 421. Cumulative Percent Revision and Number at Risk for the Summit/Pinnacle Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	8,250	0.00 (0.00,0.00)	1,608	0.00 (0.00,0.00)	3,294	0.00 (0.00,0.00)	1,677	0.00 (0.00,0.00)	1,670	0.00 (0.00,0.00)
1	7,756	1.48 (1.24,1.77)	1,554	1.87 (1.31,2.67)	3,009	1.63 (1.25,2.13)	1,620	1.02 (0.64,1.64)	1,572	1.27 (0.83,1.94)
2	7,317	1.85 (1.58,2.17)	1,499	2.26 (1.63,3.12)	2,771	1.94 (1.51,2.48)	1,557	1.33 (0.88,2.02)	1,489	1.79 (1.25,2.56)
3	6,754	2.06 (1.77,2.39)	1,430	2.53 (1.86,3.43)	2,479	2.20 (1.74,2.77)	1,463	1.46 (0.98,2.17)	1,381	1.93 (1.36,2.73)
4	6,212	2.15 (1.85,2.49)	1,349	2.67 (1.98,3.59)	2,219	2.36 (1.88,2.97)	1,396	1.46 (0.98,2.17)	1,247	1.93 (1.36,2.73)
5	5,729	2.25 (1.94,2.60)	1,279	2.89 (2.17,3.86)	1,998	2.46 (1.96,3.08)	1,305	1.46 (0.98,2.17)	1,146	2.01 (1.42,2.83)
6	5,183	2.32 (2.01,2.69)	1,176	2.89 (2.17,3.86)	1,761	2.56 (2.05,3.21)	1,211	1.62 (1.11,2.38)	1,034	2.01 (1.42,2.83)
7	4,524	2.43 (2.10,2.80)	1,026	2.89 (2.17,3.86)	1,538	2.62 (2.10,3.28)	1,063	1.80 (1.24,2.61)	896	2.22 (1.59,3.11)
8	3,683	2.57 (2.23,2.96)	835	2.99 (2.24,3.98)	1,246	2.62 (2.10,3.28)	863	2.31 (1.63,3.26)	738	2.22 (1.59,3.11)
9	2,705	2.67 (2.31,3.08)	630	3.11 (2.34,4.14)	900	2.73 (2.17,3.42)	622	2.46 (1.74,3.47)	553	2.22 (1.59,3.11)
10	1,672	2.71 (2.35,3.14)	391	3.11 (2.34,4.14)	552	2.73 (2.17,3.42)	386	2.67 (1.87,3.79)	343	2.22 (1.59,3.11)

Table 422. Reasons for First Revision Following Primary THA for Summit/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	60	32.6
2	Joint Infection	37	20.1
3	Peri-prosthetic fracture - Femur	37	20.1
4	Aseptic Loosening	20	10.9
5	Pain	13	7.1
6	Metal Reaction/Metallosis	5	2.7
7	Implant Failure	4	2.2
8	Peri-prosthetic fracture - Acetabulum	3	1.6
9	Malalignment	3	1.6
10	Osteolysis	1	0.5
	Unknown/missing/other	1	0.5

Table 423. Reasons for First Revision in the First 90 Days Following Primary THA for Summit/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	31	50.8
2	Dislocation/Instability	15	24.6
3	Joint Infection	10	16.4
4	Aseptic Loosening	4	6.6
5	Peri-prosthetic fracture - Acetabulum	1	1.6

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Table 424. Reasons for First Revision Between 91 and 365 days Following Primary THA for Summit/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	19	38.8
2	Joint Infection	18	36.7
3	Aseptic Loosening	7	14.3
4	Pain	3	6.1
5	Peri-prosthetic fracture - Acetabulum	2	4.1

Table 425. Descriptive Statistics of Cases Receiving the Summit/Pinnacle Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	4,957	59.42	
Age (years)	8,342	67.07 (11.07)	67.00 (15.00)
Height (cm)	8,239	168.83 (10.40)	167.64 (17.78)
Weight (kg)	8,240	88.63 (22.59)	86.18 (29.49)
BMI(kg/m^2)	8,239	30.93 (6.72)	30.02 (8.75)
Smoker - Never (%)	3,863	46.31	
Smoker - Previous (%)	3,326	39.87	
Smoker - Current (%)	1,132	13.57	
Smoker - Unknown (%)	21	0.25	

Table 426. Distribution of Approach Used for Summit/Pinnacle Combination in Primary THA Cases

Approach	N	Percent
Anterior	264	3.2
Anterolateral	2934	35.2
Posterior	4,981	59.7
Transtrochanteric	36	0.4
Missing/unknown/other	127	1.5

Table 427. Distribution of Head Size for Summit/Pinnacle Combination in Primary THA Cases

Size (mm)	N	Percent
22	2	0.0
28	106	1.3
32	2,031	24.6
36	5,335	64.6
40	711	8.6
44	26	0.3
Missing/unknown/other	47	0.6

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Table 428. Distribution of Bearing Surface for Summit/Pinnacle Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	3,151	37.8
Ceramic-on-plastic	5,009	60.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	23	0.3
Missing/unknown/other	159	1.9

Table 429. Distribution of Polyethylene Used for Summit/Pinnacle Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	23	0.3
XLPE	8,203	99.7
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 430. Volume of Cases by Surgeon and Site for the Summit/Pinnacle Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	101 (266)	14 (87)
Cases per site	203 (399)	47 (249)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

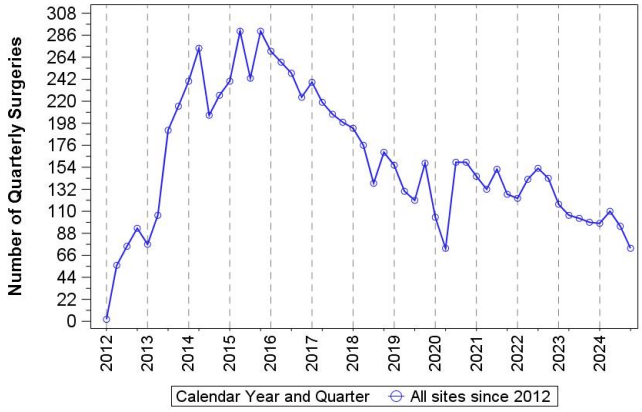


Figure 171. Utilization of the Summit/Pinnacle Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

157001110	157003110	157013090
157011110	157001080	157001070
157011135	157011080	157013120
157011120	157011165	157013135
157001100	157003100	157011070
157001120	157001165	157003150
157001135	157003120	157011180
157011100	157003090	157001180
157001090	157003080	157013150
157011090	157013110	
157011150	157013100	
157001150	157003135	

Catalog numbers of Acetabular Cups Used in the Analysis

121732052	121731050	121730064
121722052	121701052	121701060
121722054	121722062	121730062
121732054	121731048	121703052
121732056	121701056	121722064
121722050	121701054	121703056
121722056	121731058	121703050
121722048	121730054	121703054
121732050	121701048	121722066
121732058	121730048	121731062
121722058	121701050	121732066
121732048	121730056	121703048
121732060	121730058	121716070
121722060	121732064	121717062
121731052	121730044	121720038
121731054	121701058	121720054
121732062	121730060	121730066
121730046	121731060	
121730052	121720046	
121731056	121730050	

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3.1.34 Synergy/Reflection 3

N = 1,515 primary cases were used for this analysis. Distribution of utilization: 39 surgeons across 28 sites used this implant combination in primary THA cases.

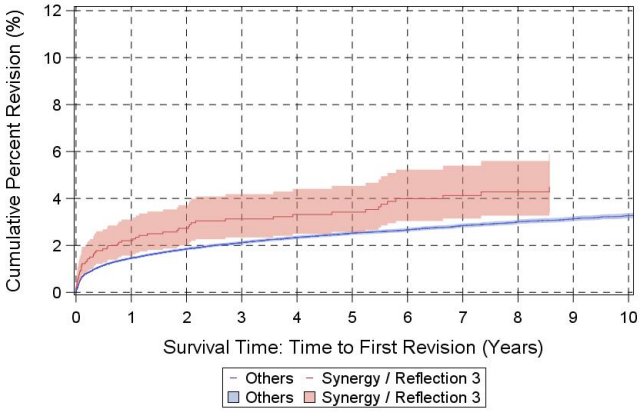


Figure 172. Cumulative Percent Revision Curve for the Synergy/Reflection 3 Combination, Compared to All Other Implant Combinations in Primary THA Cases

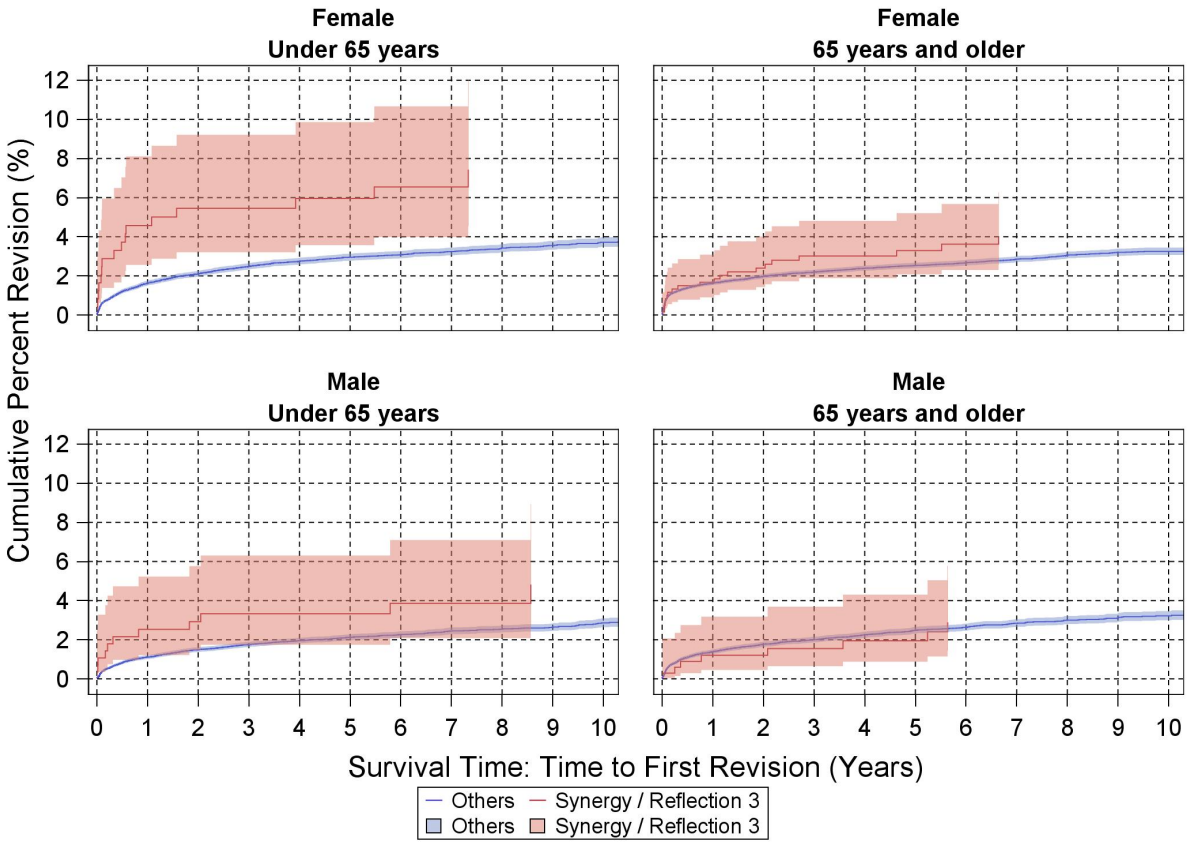


Figure 173. Cumulative Percent Revision Curve for the Synergy/Reflection 3 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 431. Cumulative Percent Revision and Number at Risk for the Synergy/Reflection 3 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,474	0.00 (0.00,0.00)	243	0.00 (0.00,0.00)	608	0.00 (0.00,0.00)	281	0.00 (0.00,0.00)	341	0.00 (0.00,0.00)
1	1,350	2.21 (1.56,3.11)	219	4.57 (2.56,8.10)	608	0.00 (0.00,0.00)	260	2.53 (1.21,5.23)	312	1.21 (0.45,3.18)
2	1,230	2.73 (2.00,3.72)	208	5.46 (3.20,9.21)	558	1.67 (0.90,3.08)	240	2.92 (1.47,5.77)	288	1.21 (0.45,3.18)
3	1,110	3.13 (2.34,4.19)	197	5.46 (3.20,9.21)	494	2.40 (1.43,4.01)	224	3.33 (1.74,6.31)	263	1.55 (0.65,3.69)
4	1,000	3.32 (2.49,4.41)	185	5.96 (3.57,9.86)	426	3.01 (1.88,4.82)	209	3.33 (1.74,6.31)	233	1.95 (0.87,4.30)
5	914	3.42 (2.58,4.54)	169	5.96 (3.57,9.86)	373	3.01 (1.88,4.82)	194	3.33 (1.74,6.31)	214	1.95 (0.87,4.30)
6	796	3.99 (3.04,5.23)	145	6.55 (3.98,10.66)	337	3.29 (2.08,5.21)	173	3.86 (2.08,7.10)	196	2.89 (1.44,5.78)
7	663	4.13 (3.15,5.40)	116	6.55 (3.98,10.66)	282	3.62 (2.30,5.68)	141	3.86 (2.08,7.10)	167	2.89 (1.44,5.78)
8	525	4.28 (3.27,5.60)	92	7.43 (4.54,12.04)	239	4.01 (2.55,6.27)	113	3.86 (2.08,7.10)	130	2.89 (1.44,5.78)
9	384	4.49 (3.42,5.89)	75	7.43 (4.54,12.04)	190	4.01 (2.55,6.27)	83	4.82 (2.58,8.93)	93	2.89 (1.44,5.78)
10	246	4.49 (3.42,5.89)	54	7.43 (4.54,12.04)	133	4.01 (2.55,6.27)	54	4.82 (2.58,8.93)	56	2.89 (1.44,5.78)

Table 432. Reasons for First Revision Following Primary THA for Synergy/Reflection 3 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	24	49.0
2	Peri-prosthetic fracture - Femur	8	16.3
3	Joint Infection	6	12.2
4	Aseptic Loosening	4	8.2
5	Pain	2	4.1
6	Malalignment	2	4.1
7	Poly liner wear	1	2.0
8	Implant Failure	1	2.0
9	Metal Reaction/Metallosis	1	2.0

Table 433. Reasons for First Revision in the First 90 Days Following Primary THA for Synergy/Reflection 3 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	9	47.4
2	Peri-prosthetic fracture - Femur	4	21.0
3	Joint Infection	2	10.5
4	Malalignment	2	10.5
5	Aseptic Loosening	1	5.3
6	Implant Failure	1	5.3

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Table 434. Reasons for First Revision Between 91 and 365 days Following Primary THA for Synergy/Reflection 3 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	7	77.8
2	Aseptic Loosening	1	11.1
3	Joint Infection	1	11.1

Table 435. Descriptive Statistics of Cases Receiving the Synergy/Reflection 3 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	871	57.49	
Age (years)	1,515	68.51 (10.64)	69.00 (15.00)
Height (cm)	1,515	168.49 (10.77)	167.64 (16.98)
Weight (kg)	1,515	88.21 (20.85)	86.60 (28.63)
BMI(kg/m^2)	1,515	30.92 (6.02)	30.36 (8.40)
Smoker - Never (%)	678	44.75	
Smoker - Previous (%)	610	40.26	
Smoker - Current (%)	223	14.72	
Smoker - Unknown (%)	4	0.26	

Table 436. Distribution of Approach Used for Synergy/Reflection 3 Combination in Primary THA Cases

Approach	N	Percent
Anterior	137	9.0
Anterolateral	496	32.7
Posterior	873	57.6
Transtrochanteric	3	0.2
Missing/unknown/other	6	0.4

Table 437. Distribution of Head Size for Synergy/Reflection 3 Combination in Primary THA Cases

Size (mm)	N	Percent
22	2	0.1
28	16	1.1
32	363	25.2
36	972	67.4
40	79	5.5
44	4	0.3
Missing/unknown/other	7	0.5

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Table 438. Distribution of Bearing Surface for Synergy/Reflection 3 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	597	39.4
Ceramic-on-plastic	839	55.4
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	67	4.4
Missing/unknown/other	12	0.8

Table 439. Distribution of Polyethylene Used for Synergy/Reflection 3 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	2	0.1
XLPE	1,498	99.9
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 440. Volume of Cases by Surgeon and Site for the Synergy/Reflection 3 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	38 (74)	3 (21)
Cases per site	54 (100)	8 (49)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

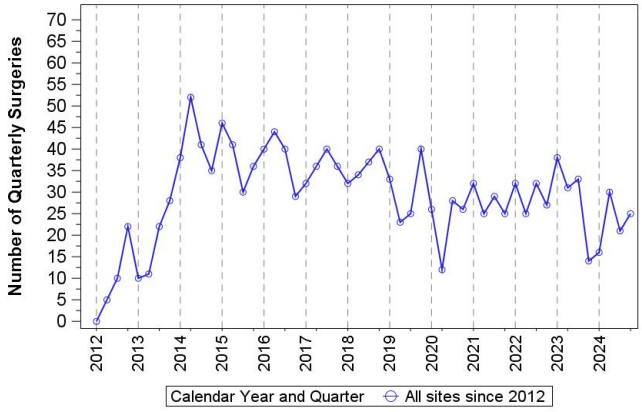


Figure 174. Utilization of the Synergy/Reflection 3 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

71306114	71306617	71316015
71306614	71306111	71316016
71306113	71316012	71316213
71306613	71316010	71306610
71306612	71306118	71306618
71306112	71316211	71316214
71306115	71316210	71926107
71306116	71316009	71316215
71306615	71316212	71316217
71306616	71316216	71306609
71306117	71316014	71316017
71306611	71306110	71306608
71316011	71316013	

Catalog numbers of Acetabular Cups Used in the Analysis

71335552	71331858	71338664
71335554	71335562	71338669
71335556	71331848	71338671
71335550	71331860	71331864
71335558	71335564	71335544
71331854	71338665	71335566
71331850	71338666	71335568
71331852	71331862	71338672
71331856	71335546	71338675
71335548	71338668	
71335560	71331846	

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3.1.35 Taperloc 133/Continuum

N = 844 primary cases were used for this analysis. Distribution of utilization: 15 surgeons across 11 sites used this implant combination in primary THA cases.

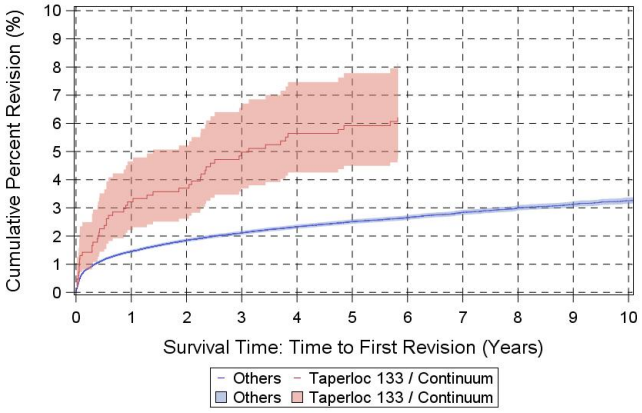


Figure 175. Cumulative Percent Revision Curve for the Taperloc 133/Continuum Combination, Compared to All Other Implant Combinations in Primary THA Cases

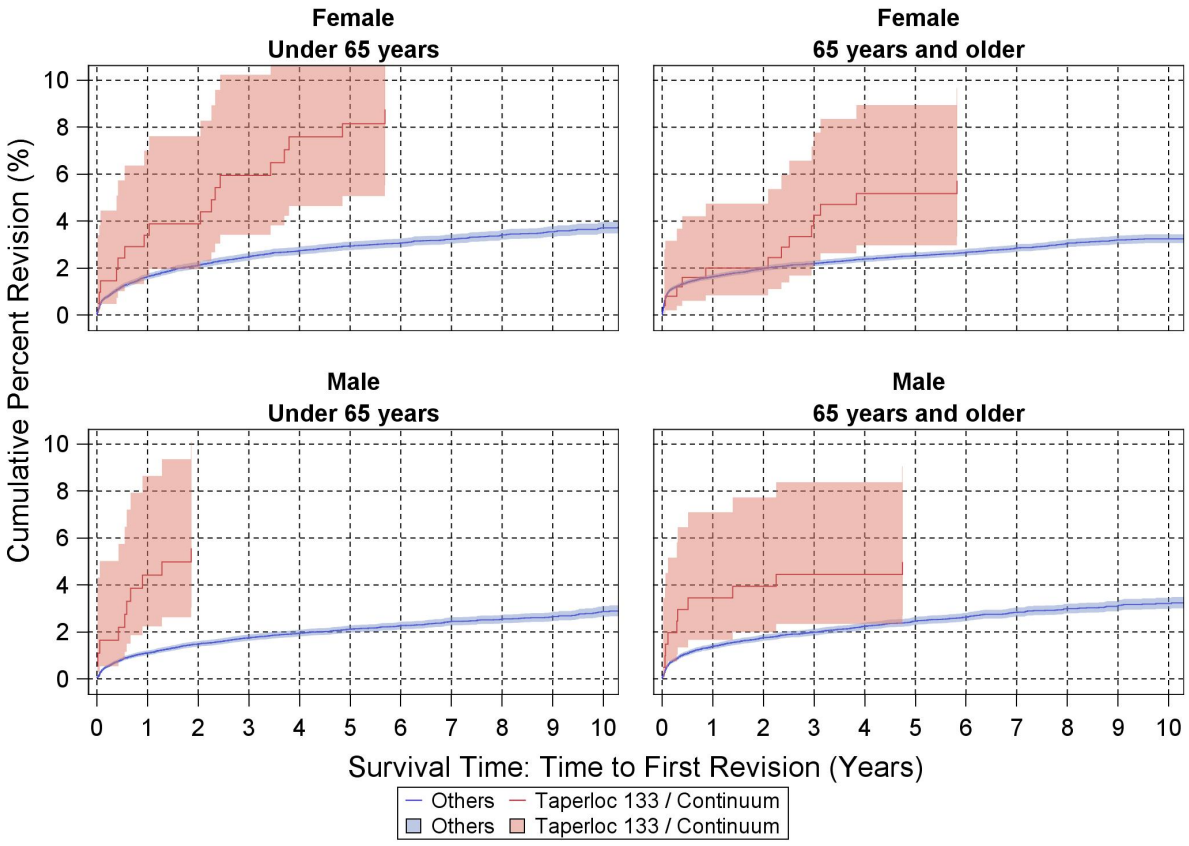


Figure 176. Cumulative Percent Revision Curve for the Taperloc 133/Continuum Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 441. Cumulative Percent Revision and Number at Risk for the Taperloc 133/Continuum Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	842	0.00 (0.00,0.00)	206	0.00 (0.00,0.00)	250	0.00 (0.00,0.00)	182	0.00 (0.00,0.00)	203	0.00 (0.00,0.00)
1	805	3.21 (2.21,4.65)	199	3.40 (1.63,7.00)	240	2.00 (0.84,4.74)	170	4.42 (2.24,8.65)	195	3.45 (1.66,7.10)
2	764	3.70 (2.62,5.22)	188	3.88 (1.96,7.62)	221	2.00 (0.84,4.74)	162	5.57 (3.03,10.10)	192	3.94 (1.99,7.73)
3	723	4.98 (3.69,6.70)	174	5.95 (3.42,10.24)	210	4.25 (2.31,7.77)	154	5.57 (3.03,10.10)	184	4.45 (2.34,8.38)
4	701	5.64 (4.26,7.47)	166	7.59 (4.64,12.29)	204	5.17 (2.97,8.94)	150	5.57 (3.03,10.10)	180	4.45 (2.34,8.38)
5	678	5.92 (4.49,7.78)	161	8.15 (5.07,12.97)	196	5.17 (2.97,8.94)	141	5.57 (3.03,10.10)	179	4.98 (2.71,9.06)
6	593	6.22 (4.74,8.13)	146	8.76 (5.53,13.74)	164	5.72 (3.35,9.67)	125	5.57 (3.03,10.10)	157	4.98 (2.71,9.06)
7	434	6.22 (4.74,8.13)	115	8.76 (5.53,13.74)	124	5.72 (3.35,9.67)	89	5.57 (3.03,10.10)	105	4.98 (2.71,9.06)
8	230	6.22 (4.74,8.13)	68	8.76 (5.53,13.74)	62	5.72 (3.35,9.67)	52	5.57 (3.03,10.10)	47	4.98 (2.71,9.06)
9	61	6.22 (4.74,8.13)	21	8.76 (5.53,13.74)	15	5.72 (3.35,9.67)	*	5.57 (3.03,10.10)	15	4.98 (2.71,9.06)
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 442. Reasons for First Revision Following Primary THA for Taperloc 133/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	27	54.0
2	Joint Infection	9	18.0
3	Peri-prosthetic fracture - Femur	5	10.0
4	Aseptic Loosening	3	6.0
5	Malalignment	3	6.0
6	Pain	2	4.0
7	Poly liner wear	1	2.0

Table 443. Reasons for First Revision in the First 90 Days Following Primary THA for Taperloc 133/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	6	50.0
2	Peri-prosthetic fracture - Femur	4	33.3
3	Joint Infection	1	8.3
4	Malalignment	1	8.3

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Table 444. Reasons for First Revision Between 91 and 365 days Following Primary THA for Taperloc 133/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	7	46.7
2	Joint Infection	6	40.0
3	Malalignment	2	13.3

Table 445. Descriptive Statistics of Cases Receiving the Taperloc 133/Continuum Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	457	54.15	
Age (years)	844	65.17 (10.23)	65.00 (13.00)
Height (cm)	844	170.23 (10.31)	170.18 (15.24)
Weight (kg)	844	93.22 (22.72)	90.80 (31.65)
BMI(kg/m^2)	844	32.07 (6.93)	31.05 (10.49)
Smoker - Never (%)	407	48.22	
Smoker - Previous (%)	324	38.39	
Smoker - Current (%)	113	13.39	
Smoker - Unknown (%)	0	0.0	

Table 446. Distribution of Approach Used for Taperloc 133/Continuum Combination in Primary THA Cases

Approach	N	Percent
Anterior	18	2.1
Anterolateral	49	5.8
Posterior	768	91.0
Transtrochanteric	1	0.1
Missing/unknown/other	8	0.9

Table 447. Distribution of Head Size for Taperloc 133/Continuum Combination in Primary THA Cases

Size (mm)	N	Percent
28	2	0.2
32	127	15.1
36	699	83.1
40	5	0.6
Missing/unknown/other	8	0.9

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Table 448. Distribution of Bearing Surface for Taperloc 133/Continuum Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	117	13.9
Ceramic-on-plastic	716	84.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	11	1.3

Table 449. Distribution of Polyethylene Used for Taperloc 133/Continuum Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	388	46.1
Antioxidant XLPE	453	53.9
Missing/unknown/other	0	0.0

Table 450. Volume of Cases by Surgeon and Site for the Taperloc 133/Continuum Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	56 (143)	2 (55)
Cases per site	76 (167)	11 (57)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

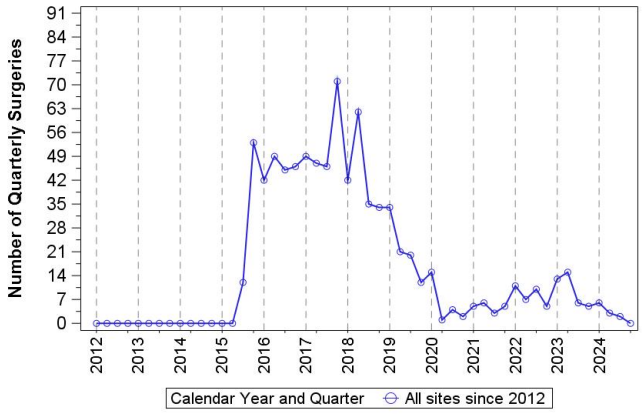


Figure 177. Utilization of the Taperloc 133/Continuum Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

51103120	51103150	51104180
51103100	51104100	51104200
51103110	51103140	51101080
51103130	51104170	51101060
51103090	51100060	51103200
51104120	51100070	51101050
51104150	51103160	51100040
51104140	51104090	51103220
51100080	51100050	51104220
51104110	51103170	
51104130	51103180	
51104160	51101070	

Catalog numbers of Acetabular Cups Used in the Analysis

875705401	875705402	875704402
875705201	875706201	875706202
875705601	875705802	875706002
875705801	875705602	875706601
875705001	875705202	
875706001	875706401	
875704801	875705002	

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3.1.36 Taperloc 133/G7

N = 13,828 primary cases were used for this analysis. Distribution of utilization: 100 surgeons across 60 sites used this implant combination in primary THA cases.

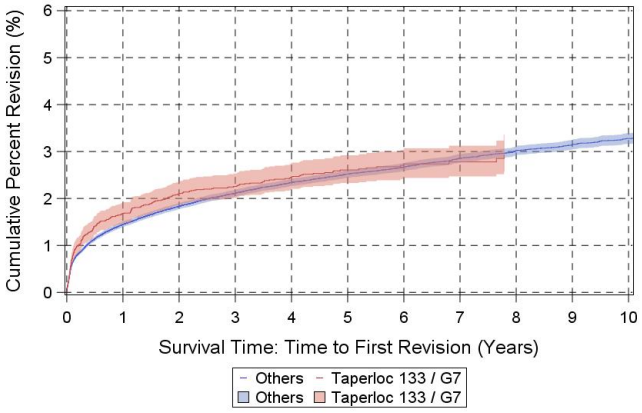


Figure 178. Cumulative Percent Revision Curve for the Taperloc 133/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases

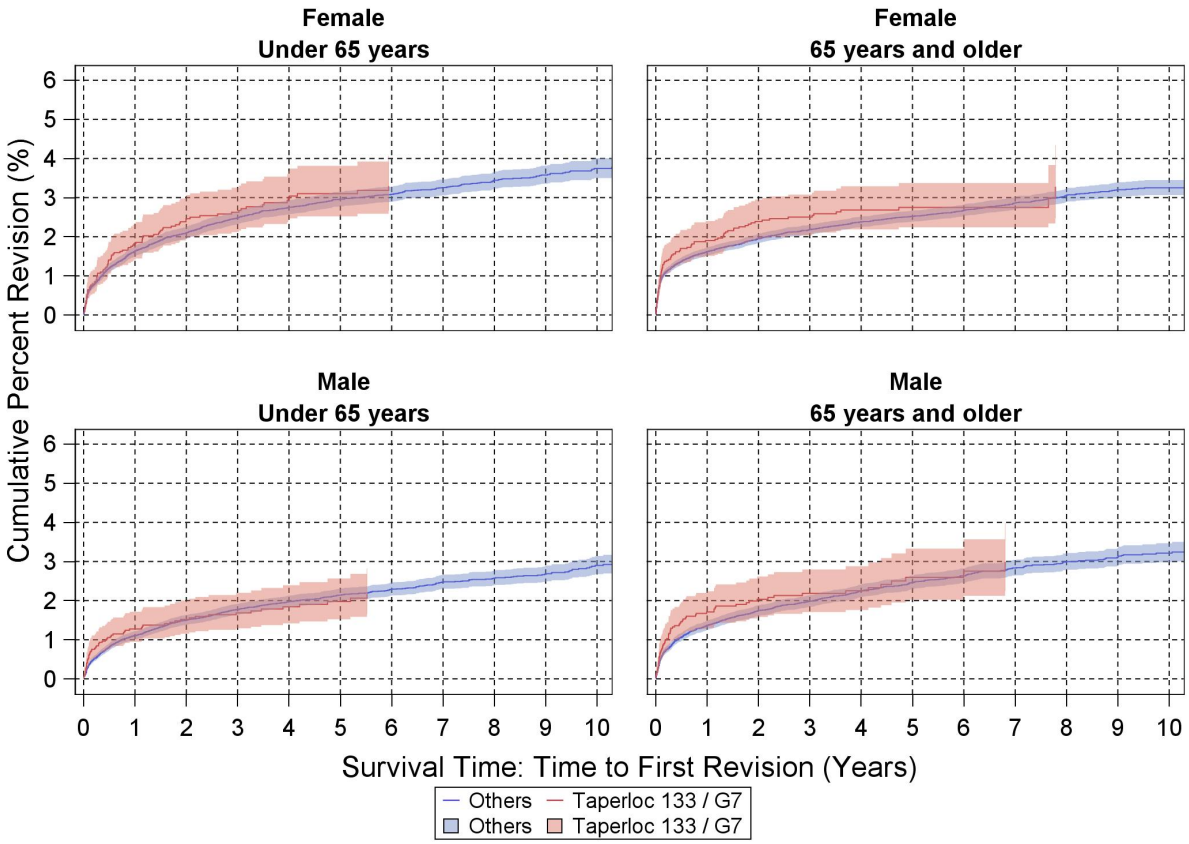


Figure 179. Cumulative Percent Revision Curve for the Taperloc 133/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 451. Cumulative Percent Revision and Number at Risk for the Taperloc 133/G7 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	13,779	0.00 (0.00,0.00)	3,415	0.00 (0.00,0.00)	3,747	0.00 (0.00,0.00)	3,473	0.00 (0.00,0.00)	3,144	0.00 (0.00,0.00)
1	11,863	1.68 (1.48,1.91)	2,967	1.82 (1.42,2.34)	3,243	1.90 (1.51,2.40)	3,011	1.28 (0.95,1.72)	2,642	1.71 (1.31,2.24)
2	10,070	2.11 (1.87,2.37)	2,540	2.46 (1.97,3.06)	2,772	2.39 (1.94,2.95)	2,597	1.52 (1.15,2.00)	2,161	2.04 (1.58,2.62)
3	8,275	2.26 (2.01,2.53)	2,121	2.63 (2.12,3.25)	2,299	2.50 (2.03,3.08)	2,123	1.69 (1.29,2.20)	1,732	2.19 (1.71,2.80)
4	6,456	2.45 (2.19,2.75)	1,681	2.98 (2.42,3.67)	1,783	2.68 (2.19,3.29)	1,667	1.84 (1.42,2.39)	1,325	2.25 (1.76,2.88)
5	4,925	2.61 (2.33,2.92)	1,292	3.10 (2.52,3.81)	1,381	2.75 (2.24,3.37)	1,257	1.98 (1.52,2.57)	995	2.60 (2.02,3.33)
6	3,272	2.74 (2.44,3.07)	892	3.29 (2.67,4.06)	963	2.75 (2.24,3.37)	799	2.16 (1.66,2.82)	618	2.75 (2.12,3.57)
7	1,994	2.78 (2.47,3.13)	569	3.29 (2.67,4.06)	599	2.75 (2.24,3.37)	467	2.16 (1.66,2.82)	359	2.99 (2.25,3.98)
8	965	2.94 (2.57,3.36)	286	3.29 (2.67,4.06)	288	3.28 (2.47,4.34)	233	2.16 (1.66,2.82)	158	2.99 (2.25,3.98)
9	360	2.94 (2.57,3.36)	112	3.29 (2.67,4.06)	120	3.28 (2.47,4.34)	85	2.16 (1.66,2.82)	43	2.99 (2.25,3.98)
10	110	2.94 (2.57,3.36)	32	3.29 (2.67,4.06)	34	3.28 (2.47,4.34)	28	2.16 (1.66,2.82)	16	2.99 (2.25,3.98)

Table 452. Reasons for First Revision Following Primary THA for Taperloc 133/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	88	27.6
2	Peri-prosthetic fracture - Femur	75	23.5
3	Joint Infection	71	22.3
4	Aseptic Loosening	47	14.7
5	Pain	13	4.1
6	Implant Failure	12	3.8
7	Malalignment	7	2.2
8	Peri-prosthetic fracture - Acetabulum	5	1.6
9	Metal Reaction/Metallosis	1	0.3

Table 453. Reasons for First Revision in the First 90 Days Following Primary THA for Taperloc 133/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	67	47.5
2	Joint Infection	25	17.7
3	Dislocation/Instability	21	14.9
4	Aseptic Loosening	11	7.8
5	Implant Failure	10	7.1
6	Peri-prosthetic fracture - Acetabulum	4	2.8
7	Malalignment	2	1.4
8	Pain	1	0.7

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Table 454. Reasons for First Revision Between 91 and 365 days Following Primary THA for Taperloc 133/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	29	34.5
2	Joint Infection	27	32.1
3	Aseptic Loosening	15	17.9
4	Pain	6	7.1
5	Peri-prosthetic fracture - Femur	4	4.8
6	Implant Failure	1	1.2
7	Peri-prosthetic fracture - Acetabulum	1	1.2
8	Malalignment	1	1.2

Table 455. Descriptive Statistics of Cases Receiving the Taperloc 133/G7 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	7,182	51.94	
Age (years)	13,828	64.01 (10.54)	65.00 (13.00)
Height (cm)	13,828	170.51 (10.31)	170.18 (15.20)
Weight (kg)	13,828	91.52 (20.94)	90.00 (27.50)
BMI(kg/m^2)	13,828	31.39 (6.27)	30.82 (8.67)
Smoker - Never (%)	6,641	48.03	
Smoker - Previous (%)	5,033	36.4	
Smoker - Current (%)	2,036	14.72	
Smoker - Unknown (%)	118	0.85	

Table 456. Distribution of Approach Used for Taperloc 133/G7 Combination in Primary THA Cases

Approach	N	Percent
Anterior	3,112	22.5
Anterolateral	3901	28.2
Posterior	6,790	49.1
Transtrochanteric	10	0.1
Missing/unknown/other	15	0.1

Table 457. Distribution of Head Size for Taperloc 133/G7 Combination in Primary THA Cases

Size (mm)	N	Percent
28	10	0.1
32	848	6.9
36	7,442	60.5
40	3,939	32.0
44	3	0.0
Missing/unknown/other	53	0.4

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Table 458. Distribution of Bearing Surface for Taperloc 133/G7 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	2,099	15.2
Ceramic-on-plastic	10,144	73.4
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	1,382	10.0
Missing/unknown/other	203	1.5

Table 459. Distribution of Polyethylene Used for Taperloc 133/G7 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	6,145	45.0
Antioxidant XLPE	7,507	55.0
Missing/unknown/other	0	0.0

Table 460. Volume of Cases by Surgeon and Site for the Taperloc 133/G7 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	138 (249)	19 (114)
Cases per site	230 (316)	88 (284)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

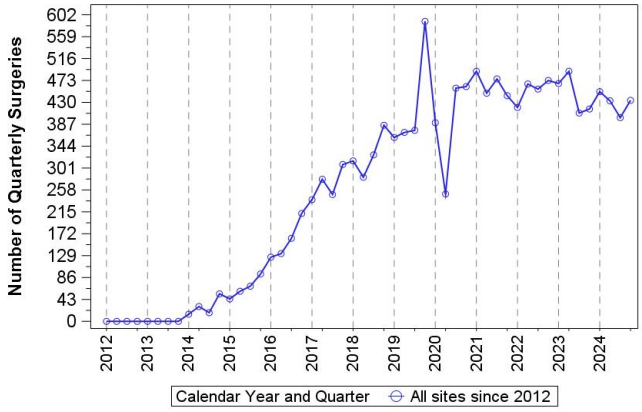


Figure 180. Utilization of the Taperloc 133/G7 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

51104120	51103150	51100090
51104110	51104170	51100110
51104100	51104180	51101110
51104130	51100070	51101160
51104090	51101050	51100140
51104150	51103160	51101120
51104140	51100060	51101130
51103110	51103180	51104240
51103120	51100050	51100120
51101080	51104200	51100130
51103100	51100040	51101100
51104160	51103170	51103240
51103090	51103200	51100100
51103130	51104220	51100160
51101070	51103220	51100170
51100080	51101090	
51103140	51101140	
51101060	51101150	

Catalog numbers of Acetabular Cups Used in the Analysis

10000664	110017106	110010268
110010244	110010242	10000669
110010245	110017101	110017100
10000663	10000661	110010250
10000665	110010263	110010269
10000662	110010265	110017109
110010246	110010266	110010270
110010243	110010264	10000670
110017103	110010249	110010261
110010247	10000660	110010271
110017104	110017107	10000671
10000666	10000668	110010240
110017102	110010262	10000659
110017105	110010267	110010272
110010248	110010241	110017099
10000667	110017108	

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3.1.37 Taperloc 133/Regenerex RingLoc+

N = 505 primary cases were used for this analysis. Distribution of utilization: 19 surgeons across 16 sites used this implant combination in primary THA cases.

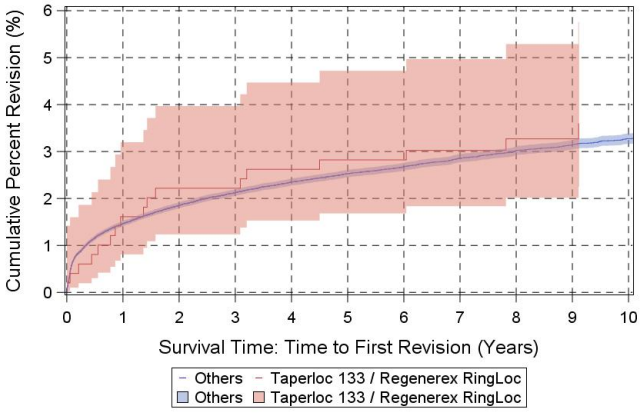


Figure 181. Cumulative Percent Revision Curve for the Taperloc 133/Regenerex RingLoc+ Combination, Compared to All Other Implant Combinations in Primary THA Cases

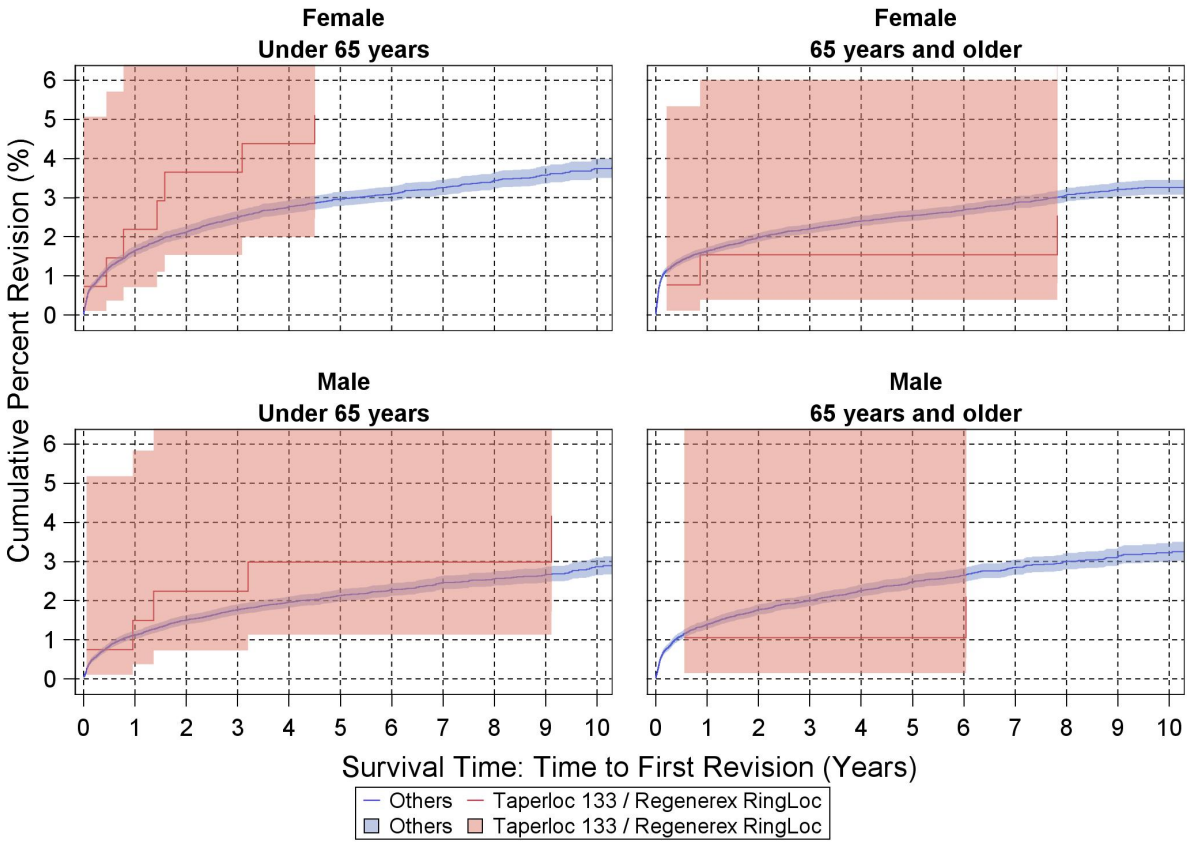


Figure 182. Cumulative Percent Revision Curve for the Taperloc 133/Regenerex RingLoc+ Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 461. Cumulative Percent Revision and Number at Risk for the Taperloc 133/Regenerex RingLoc+ Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	496	0.00 (0.00,0.00)	137	0.00 (0.00,0.00)	130	0.00 (0.00,0.00)	134	0.00 (0.00,0.00)	95	0.00 (0.00,0.00)
1	488	1.61 (0.81,3.20)	134	2.19 (0.71,6.63)	128	1.54 (0.39,6.01)	132	1.49 (0.38,5.84)	94	1.05 (0.15,7.24)
2	485	2.22 (1.23,3.97)	132	3.65 (1.54,8.55)	128	1.54 (0.39,6.01)	131	2.24 (0.73,6.78)	94	1.05 (0.15,7.24)
3	485	2.22 (1.23,3.97)	132	3.65 (1.54,8.55)	128	1.54 (0.39,6.01)	131	2.24 (0.73,6.78)	94	1.05 (0.15,7.24)
4	483	2.62 (1.53,4.47)	131	4.38 (1.99,9.49)	128	1.54 (0.39,6.01)	130	2.99 (1.13,7.76)	94	1.05 (0.15,7.24)
5	482	2.82 (1.68,4.72)	130	5.11 (2.47,10.42)	128	1.54 (0.39,6.01)	130	2.99 (1.13,7.76)	94	1.05 (0.15,7.24)
6	480	2.82 (1.68,4.72)	130	5.11 (2.47,10.42)	126	1.54 (0.39,6.01)	130	2.99 (1.13,7.76)	94	1.05 (0.15,7.24)
7	458	3.03 (1.83,4.97)	125	5.11 (2.47,10.42)	121	1.54 (0.39,6.01)	126	2.99 (1.13,7.76)	86	2.11 (0.53,8.16)
8	375	3.27 (2.02,5.29)	105	5.11 (2.47,10.42)	92	2.54 (0.82,7.76)	107	2.99 (1.13,7.76)	71	2.11 (0.53,8.16)
9	301	3.27 (2.02,5.29)	88	5.11 (2.47,10.42)	73	2.54 (0.82,7.76)	84	2.99 (1.13,7.76)	56	2.11 (0.53,8.16)
10	163	3.60 (2.24,5.76)	48	5.11 (2.47,10.42)	43	2.54 (0.82,7.76)	48	4.17 (1.72,9.92)	24	2.11 (0.53,8.16)

Table 462. Reasons for First Revision Following Primary THA for Taperloc 133/Regenerex RingLoc+ Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	5	29.4
2	Joint Infection	5	29.4
3	Peri-prosthetic fracture - Femur	2	11.8
4	Pain	2	11.8
5	Malalignment	2	11.8
6	Dislocation/Instability	1	5.9

Table 463. Reasons for First Revision in the First 90 Days Following Primary THA for Taperloc 133/Regenerex RingLoc+ Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	33.3
2	Peri-prosthetic fracture - Femur	1	33.3
3	Malalignment	1	33.3

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Table 464. Reasons for First Revision Between 91 and 365 days Following Primary THA for Taperloc 133/Regenerex RingLoc+ Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	2	40.0
2	Aseptic Loosening	1	20.0
3	Dislocation/Instability	1	20.0
4	Pain	1	20.0

Table 465. Descriptive Statistics of Cases Receiving the Taperloc 133/Regenerex RingLoc+ Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	272	53.86	
Age (years)	505	63.26 (11.40)	63.00 (15.00)
Height (cm)	505	170.15 (10.48)	170.00 (15.44)
Weight (kg)	505	90.63 (22.26)	89.00 (29.16)
BMI(kg/m^2)	505	31.21 (6.89)	29.84 (9.11)
Smoker - Never (%)	217	42.97	
Smoker - Previous (%)	163	32.28	
Smoker - Current (%)	122	24.16	
Smoker - Unknown (%)	3	0.59	

Table 466. Distribution of Approach Used for Taperloc 133/Regenerex RingLoc+ Combination in Primary THA Cases

Approach	N	Percent
Anterior	52	10.3
Anterolateral	350	69.3
Posterior	99	19.6
Transtrochanteric	2	0.4
Missing/unknown/other	2	0.4

Table 467. Distribution of Head Size for Taperloc 133/Regenerex RingLoc+ Combination in Primary THA Cases

Size (mm)	N	Percent
28	1	0.2
32	62	12.5
36	308	62.1
40	118	23.8
Missing/unknown/other	7	1.4

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Table 468. Distribution of Bearing Surface for Taperloc 133/Regenerex RingLoc+ Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	317	62.8
Ceramic-on-plastic	172	34.1
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	16	3.2

Table 469. Distribution of Polyethylene Used for Taperloc 133/Regenerex RingLoc+ Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.2
XLPE	196	39.5
Antioxidant XLPE	299	60.3
Missing/unknown/other	0	0.0

Table 470. Volume of Cases by Surgeon and Site for the Taperloc 133/Regenerex RingLoc+ Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	26 (53)	4 (12)
Cases per site	31 (54)	6 (16)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

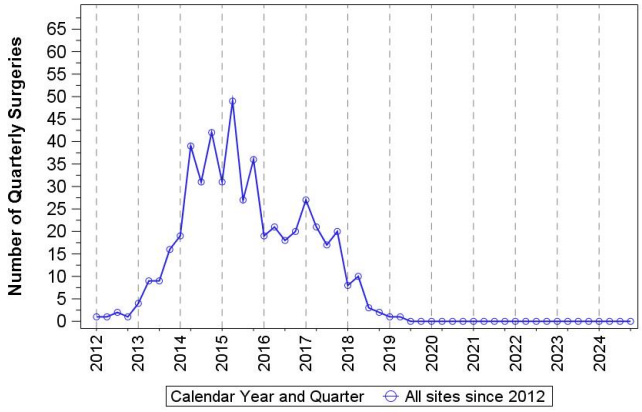


Figure 183. Utilization of the Taperloc 133/Regenerex RingLoc+ Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

51103110	51103160	51101080
51103120	51104100	51101070
51103130	51104160	51100050
51103100	51104140	51103180
51104130	51100070	51101060
51103150	51104150	51103200
51103090	51100060	51103220
51103140	51103170	51104220
51104120	51100080	
51104110	51104180	
51104170	51104090	

Catalog numbers of Acetabular Cups Used in the Analysis

PT116054	PT116062	PT104060
PT116052	PT104050	PT106060
PT116056	PT104056	PT106066
PT116058	PT106058	PT106068
PT116060	PT106062	PT106072
PT116050	PT104054	PT116066
PT116048	PT104058	
PT106056	PT106064	
PT106054	PT104048	

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3.1.38 Taperloc 133/RingLoc

N = 1,704 primary cases were used for this analysis. Distribution of utilization: 24 surgeons across 19 sites used this implant combination in primary THA cases.

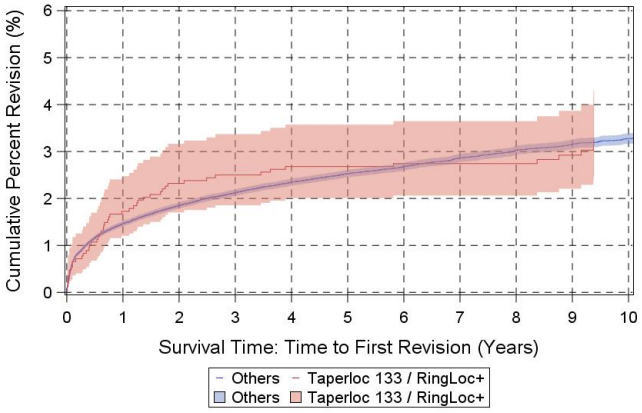


Figure 184. Cumulative Percent Revision Curve for the Taperloc 133/RingLoc Combination, Compared to All Other Implant Combinations in Primary THA Cases

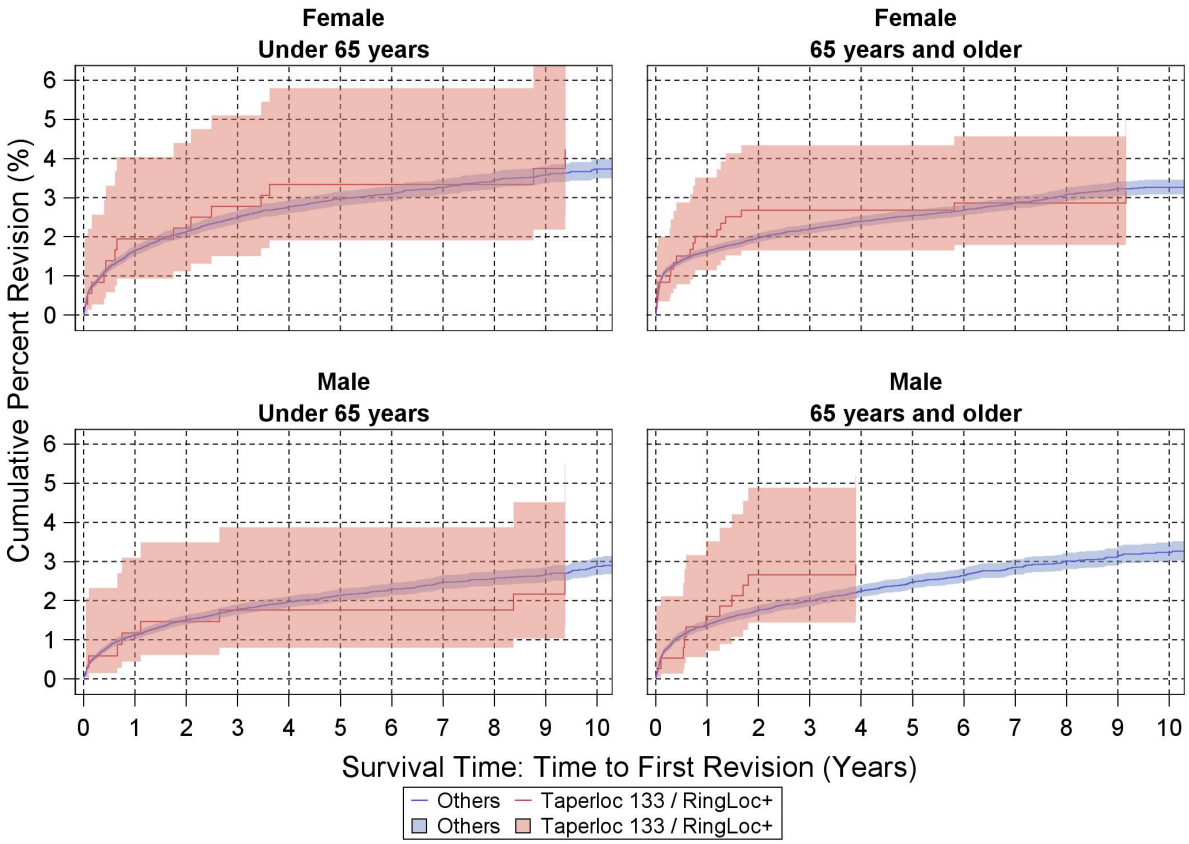


Figure 185. Cumulative Percent Revision Curve for the Taperloc 133/RingLoc Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 471. Cumulative Percent Revision and Number at Risk for the Taperloc 133/RingLoc Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,679	0.00 (0.00,0.00)	360	0.00 (0.00,0.00)	597	0.00 (0.00,0.00)	341	0.00 (0.00,0.00)	376	0.00 (0.00,0.00)
1	1,650	1.73 (1.20,2.48)	353	1.94 (0.93,4.04)	585	2.01 (1.15,3.51)	337	1.17 (0.44,3.09)	370	1.60 (0.72,3.52)
2	1,640	2.32 (1.70,3.17)	352	2.22 (1.12,4.39)	581	2.68 (1.65,4.34)	336	1.47 (0.61,3.49)	366	2.66 (1.44,4.89)
3	1,636	2.50 (1.85,3.37)	349	2.78 (1.50,5.10)	581	2.68 (1.65,4.34)	335	1.76 (0.79,3.87)	366	2.66 (1.44,4.89)
4	1,627	2.68 (2.01,3.57)	347	3.33 (1.91,5.80)	578	2.68 (1.65,4.34)	333	1.76 (0.79,3.87)	364	2.93 (1.63,5.22)
5	1,597	2.68 (2.01,3.57)	344	3.33 (1.91,5.80)	567	2.68 (1.65,4.34)	331	1.76 (0.79,3.87)	350	2.93 (1.63,5.22)
6	1,485	2.74 (2.06,3.65)	322	3.33 (1.91,5.80)	518	2.86 (1.79,4.57)	316	1.76 (0.79,3.87)	324	2.93 (1.63,5.22)
7	1,347	2.74 (2.06,3.65)	297	3.33 (1.91,5.80)	462	2.86 (1.79,4.57)	294	1.76 (0.79,3.87)	289	2.93 (1.63,5.22)
8	1,202	2.74 (2.06,3.65)	272	3.33 (1.91,5.80)	415	2.86 (1.79,4.57)	254	1.76 (0.79,3.87)	256	2.93 (1.63,5.22)
9	971	2.92 (2.21,3.87)	222	3.74 (2.18,6.39)	335	2.86 (1.79,4.57)	210	2.17 (1.03,4.52)	199	2.93 (1.63,5.22)
10	562	3.27 (2.48,4.30)	136	4.24 (2.50,7.14)	191	3.18 (2.00,5.04)	122	2.71 (1.33,5.47)	108	2.93 (1.63,5.22)

Table 472. Reasons for First Revision Following Primary THA for Taperloc 133/RingLoc Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	15	34.1
2	Joint Infection	9	20.5
3	Aseptic Loosening	7	15.9
4	Peri-prosthetic fracture - Femur	5	11.4
5	Implant Failure	3	6.8
6	Pain	3	6.8
7	Poly liner wear	1	2.3
8	Malalignment	1	2.3

Table 473. Reasons for First Revision in the First 90 Days Following Primary THA for Taperloc 133/RingLoc Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	5	45.4
2	Dislocation/Instability	2	18.2
3	Aseptic Loosening	1	9.1
4	Joint Infection	1	9.1
5	Implant Failure	1	9.1
6	Pain	1	9.1

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Table 474. Reasons for First Revision Between 91 and 365 days Following Primary THA for Taperloc 133/RingLoc Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	5	45.4
2	Dislocation/Instability	4	36.4
3	Aseptic Loosening	1	9.1
4	Implant Failure	1	9.1

Table 475. Descriptive Statistics of Cases Receiving the Taperloc 133/RingLoc Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	966	56.69	
Age (years)	1,704	66.18 (10.50)	67.00 (14.00)
Height (cm)	1,704	169.49 (10.40)	170.00 (15.24)
Weight (kg)	1,704	90.49 (22.03)	88.00 (28.67)
BMI(kg/m^2)	1,704	31.37 (6.61)	30.51 (9.00)
Smoker - Never (%)	799	46.89	
Smoker - Previous (%)	665	39.03	
Smoker - Current (%)	223	13.09	
Smoker - Unknown (%)	17	1	

Table 476. Distribution of Approach Used for Taperloc 133/RingLoc Combination in Primary THA Cases

Approach	N	Percent
Anterior	93	5.5
Anterolateral	728	42.7
Posterior	870	51.1
Transtrochanteric	7	0.4
Missing/unknown/other	6	0.3

Table 477. Distribution of Head Size for Taperloc 133/RingLoc Combination in Primary THA Cases

Size (mm)	N	Percent
32	111	6.5
36	955	56.2
40	543	32.0
44	66	3.9
Missing/unknown/other	23	1.4

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Table 478. Distribution of Bearing Surface for Taperloc 133/RingLoc Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,034	60.7
Ceramic-on-plastic	641	37.6
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	29	1.7

Table 479. Distribution of Polyethylene Used for Taperloc 133/RingLoc Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	11	0.7
XLPE	172	10.1
Antioxidant XLPE	1,515	89.2
Missing/unknown/other	0	0.0

Table 480. Volume of Cases by Surgeon and Site for the Taperloc 133/RingLoc Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	71 (92)	14 (140)
Cases per site	89 (120)	22 (139)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

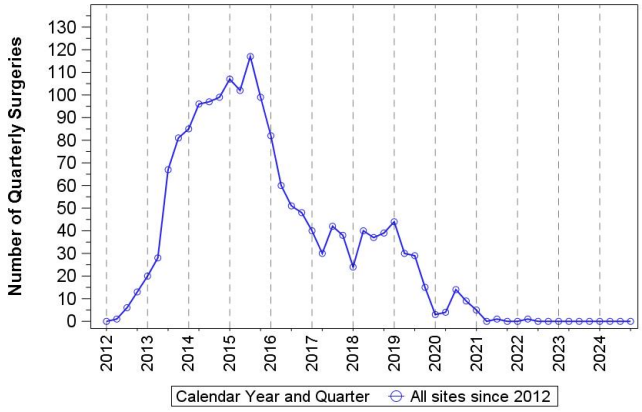


Figure 186. Utilization of the Taperloc 133/RingLoc Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

51104120	51103090	51100070
51104130	51103130	51104200
51104110	51104170	51103170
51104100	51101060	51100050
51104140	51101070	51103180
51104150	51100080	51100040
51104090	51103150	51103200
51104160	51104180	51104220
51103100	51103140	51101100
51103110	51101050	51103240
51101080	51103160	51104240
51103120	51100060	

Catalog numbers of Acetabular Cups Used in the Analysis

16104154	14103658	16116060
16104150	16116056	14103650
16104156	14103660	14103552
16104158	14103554	16116046
16104152	14103560	14103664
16104160	14103564	16116062
14103654	14103662	14103566
16116050	16104164	14103666
16116052	14103558	16116064
14103656	14103562	11165208
16116054	16116058	11165230
14103652	14103556	14103668
16104162	16116048	
16104148	16104146	

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3.1.39 Taperloc 133 Microplasty/Continuum

N = 804 primary cases were used for this analysis. Fewer than ten surgeons used this implant combination at fewer than ten sites in primary THA cases.

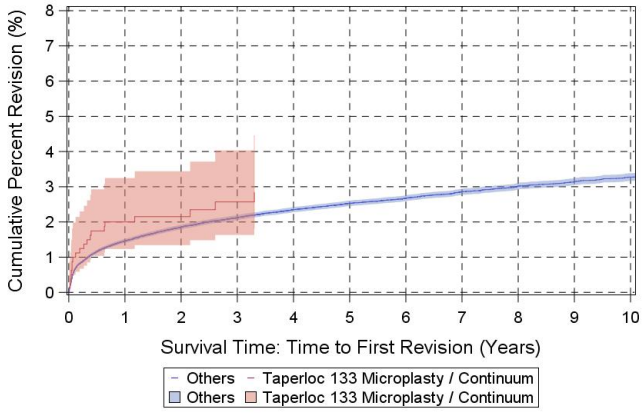


Figure 187. Cumulative Percent Revision Curve for the Taperloc 133 Microplasty/Continuum Combination, Compared to All Other Implant Combinations in Primary THA Cases

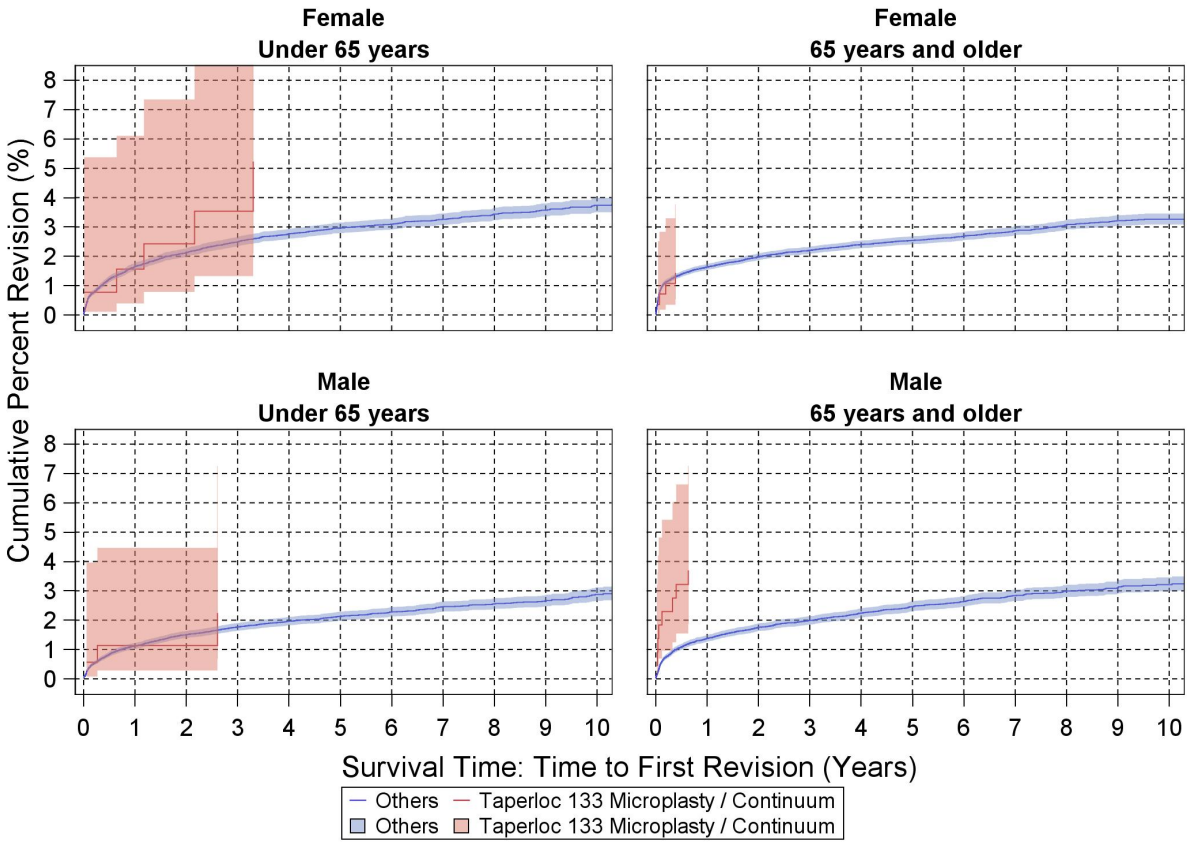


Figure 188. Cumulative Percent Revision Curve for the Taperloc 133 Microplasty/Continuum Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 481. Cumulative Percent Revision and Number at Risk for the Taperloc 133 Microplasty/Continuum Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	803	0.00 (0.00,0.00)	129	0.00 (0.00,0.00)	279	0.00 (0.00,0.00)	176	0.00 (0.00,0.00)	218	0.00 (0.00,0.00)
1	694	2.00 (1.23,3.25)	119	1.56 (0.39,6.10)	253	1.43 (0.54,3.77)	141	1.14 (0.29,4.47)	180	3.70 (1.87,7.26)
2	522	2.15 (1.34,3.44)	93	2.43 (0.79,7.34)	192	1.43 (0.54,3.77)	106	1.14 (0.29,4.47)	131	3.70 (1.87,7.26)
3	396	2.57 (1.63,4.03)	61	3.53 (1.32,9.26)	150	1.43 (0.54,3.77)	77	2.25 (0.68,7.25)	108	3.70 (1.87,7.26)
4	291	2.85 (1.81,4.46)	47	5.23 (2.10,12.69)	104	1.43 (0.54,3.77)	58	2.25 (0.68,7.25)	82	3.70 (1.87,7.26)
5	177	2.85 (1.81,4.46)	26	5.23 (2.10,12.69)	60	1.43 (0.54,3.77)	42	2.25 (0.68,7.25)	49	3.70 (1.87,7.26)
6	64	2.85 (1.81,4.46)	*	5.23 (2.10,12.69)	21	1.43 (0.54,3.77)	13	2.25 (0.68,7.25)	23	3.70 (1.87,7.26)
7	20	2.85 (1.81,4.46)	*	5.23 (2.10,12.69)	*	1.43 (0.54,3.77)	*	2.25 (0.68,7.25)	*	3.70 (1.87,7.26)
8	12	2.85 (1.81,4.46)	*	5.23 (2.10,12.69)	*	1.43 (0.54,3.77)	*	2.25 (0.68,7.25)	*	3.70 (1.87,7.26)
9	*	2.85 (1.81,4.46)	*	5.23 (2.10,12.69)	*	1.43 (0.54,3.77)	0	N/A	*	3.70 (1.87,7.26)
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 482. Reasons for First Revision Following Primary THA for Taperloc 133 Microplasty/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	6	30.0
2	Aseptic Loosening	5	25.0
3	Dislocation/Instability	5	25.0
4	Pain	2	10.0
5	Joint Infection	1	5.0
6	Malalignment	1	5.0

Table 483. Reasons for First Revision in the First 90 Days Following Primary THA for Taperloc 133 Microplasty/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	6	60.0
2	Aseptic Loosening	3	30.0
3	Dislocation/Instability	1	10.0

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Table 484. Reasons for First Revision Between 91 and 365 days Following Primary THA for Taperloc 133 Microplasty/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	4	66.7
2	Aseptic Loosening	1	16.7
3	Malalignment	1	16.7

Table 485. Descriptive Statistics of Cases Receiving the Taperloc 133 Microplasty/Continuum Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	408	50.75	
Age (years)	804	66.34 (9.69)	67.00 (13.00)
Height (cm)	804	171.08 (9.98)	170.20 (15.20)
Weight (kg)	804	85.96 (17.18)	85.55 (22.60)
BMI(kg/m^2)	804	29.26 (4.73)	28.99 (6.74)
Smoker - Never (%)	432	53.73	
Smoker - Previous (%)	304	37.81	
Smoker - Current (%)	68	8.46	
Smoker - Unknown (%)	0	0.0	

Table 486. Distribution of Approach Used for Taperloc 133 Microplasty/Continuum Combination in Primary THA Cases

Approach	N	Percent
Anterior	795	98.9
Anterolateral	1	0.1
Posterior	8	1.0
Transtrochanteric	0	0.0
Missing/unknown/other	0	0.0

Table 487. Distribution of Head Size for Taperloc 133 Microplasty/Continuum Combination in Primary THA Cases

Size (mm)	N	Percent
28	1	0.1
32	148	18.4
36	650	81.0
40	1	0.1
Missing/unknown/other	3	0.4

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Table 488. Distribution of Bearing Surface for Taperloc 133 Microplasty/Continuum Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	8	1.0
Ceramic-on-plastic	792	98.5
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	4	0.5

Table 489. Distribution of Polyethylene Used for Taperloc 133 Microplasty/Continuum Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	49	6.1
Antioxidant XLPE	754	93.9
Missing/unknown/other	0	0.0

Table 490. Volume of Cases by Surgeon and Site for the Taperloc 133 Microplasty/Continuum Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	134 (302)	1 (47)
Cases per site	134 (302)	1 (47)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

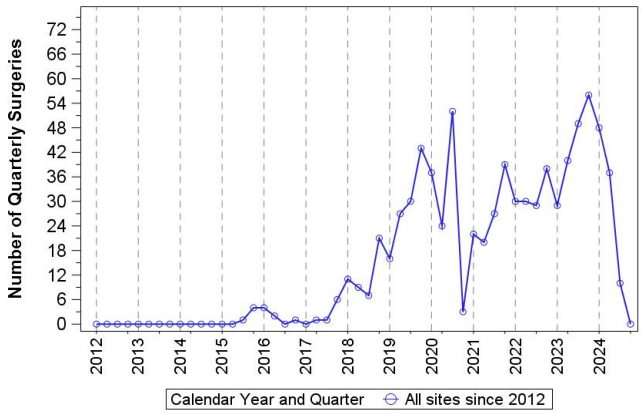


Figure 189. Utilization of the Taperloc 133 Microplasty/Continuum Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

51106110	51107150	51106170
51106130	51108060	51107180
51106120	51107120	51107200
51106100	51107100	51108040
51106140	51107140	51109080
51106090	51108070	51109070
51108080	51107170	51106200
51106150	51107090	51109060
51107160	51106160	51109050
51107130	51106180	
51107110	51108050	

Catalog numbers of Acetabular Cups Used in the Analysis

875705201	875705801	875704602
875705401	875704801	875706002
875705601	875706001	875706401
875705001	875706201	

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3.1.40 Taperloc 133 Microplasty/G7

N = 4,104 primary cases were used for this analysis. Distribution of utilization: 59 surgeons across 42 sites used this implant combination in primary THA cases.

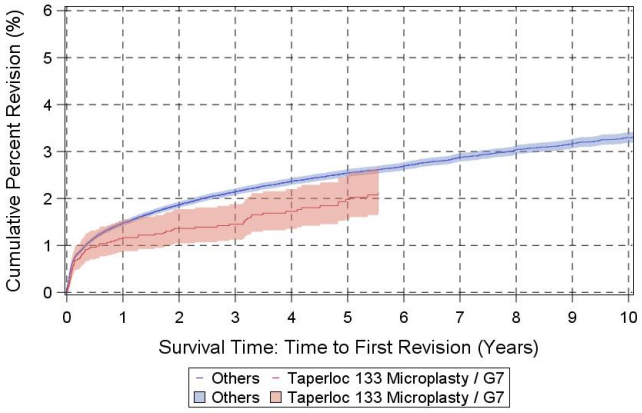


Figure 190. Cumulative Percent Revision Curve for the Taperloc 133 Microplasty/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases

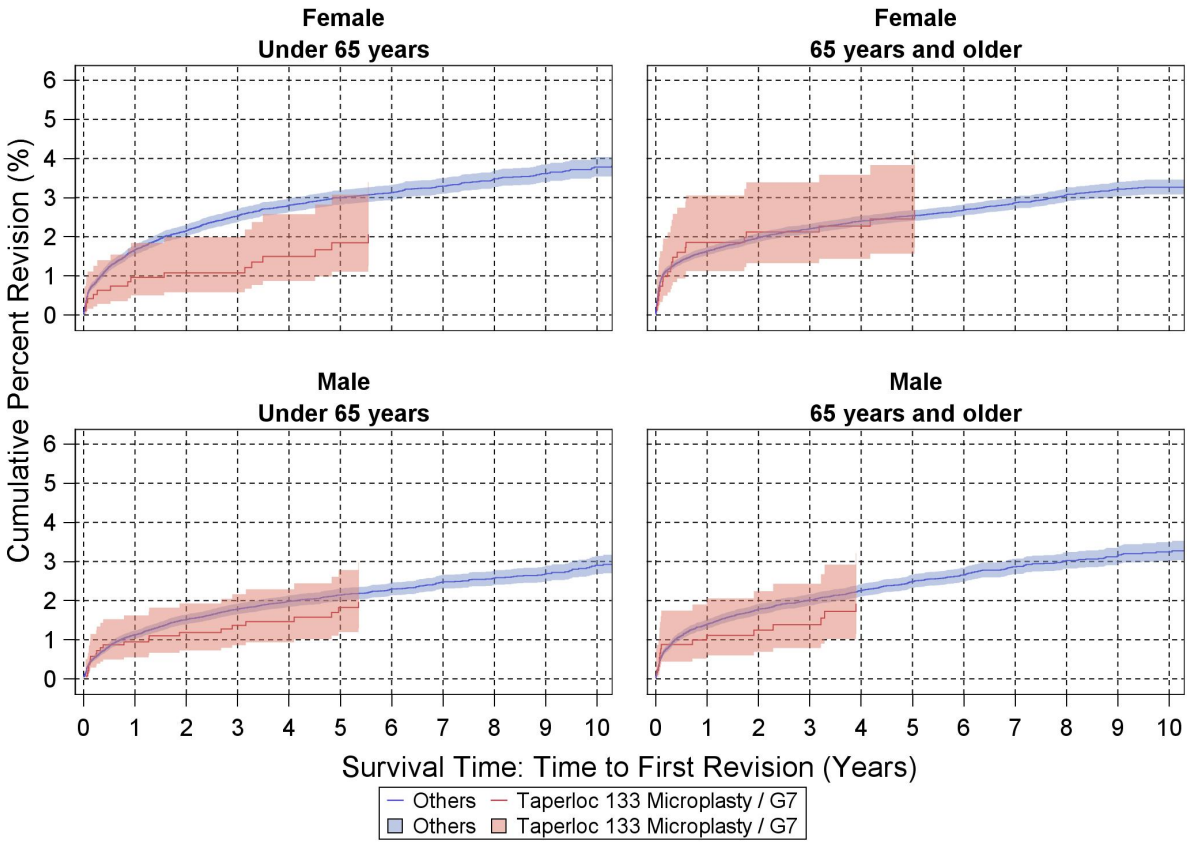


Figure 191. Cumulative Percent Revision Curve for the Taperloc 133 Microplasty/G7 Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 491. Cumulative Percent Revision and Number at Risk for the Taperloc 133 Microplasty/G7 Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	4,095	0.00 (0.00,0.00)	959	0.00 (0.00,0.00)	816	0.00 (0.00,0.00)	1,400	0.00 (0.00,0.00)	918	0.00 (0.00,0.00)
1	3,773	1.17 (0.88,1.55)	884	0.96 (0.50,1.84)	760	1.85 (1.12,3.06)	1,297	0.95 (0.55,1.62)	830	1.11 (0.60,2.06)
2	3,440	1.36 (1.04,1.77)	818	1.08 (0.58,1.99)	716	2.12 (1.32,3.39)	1,171	1.19 (0.73,1.93)	733	1.25 (0.69,2.24)
3	3,089	1.45 (1.12,1.88)	749	1.08 (0.58,1.99)	666	2.12 (1.32,3.39)	1,058	1.37 (0.86,2.16)	614	1.38 (0.79,2.43)
4	2,562	1.73 (1.35,2.20)	616	1.50 (0.87,2.58)	554	2.27 (1.44,3.58)	899	1.46 (0.93,2.29)	491	1.92 (1.15,3.21)
5	2,127	1.98 (1.56,2.50)	527	1.85 (1.11,3.08)	439	2.45 (1.57,3.83)	766	1.83 (1.20,2.78)	393	1.92 (1.15,3.21)
6	1,682	2.13 (1.69,2.69)	410	2.06 (1.25,3.40)	346	2.68 (1.72,4.15)	610	1.97 (1.30,2.98)	314	1.92 (1.15,3.21)
7	1,224	2.13 (1.69,2.69)	289	2.06 (1.25,3.40)	261	2.68 (1.72,4.15)	436	1.97 (1.30,2.98)	236	1.92 (1.15,3.21)
8	747	2.13 (1.69,2.69)	168	2.06 (1.25,3.40)	158	2.68 (1.72,4.15)	269	1.97 (1.30,2.98)	150	1.92 (1.15,3.21)
9	335	2.13 (1.69,2.69)	73	2.06 (1.25,3.40)	72	2.68 (1.72,4.15)	120	1.97 (1.30,2.98)	68	1.92 (1.15,3.21)
10	92	2.13 (1.69,2.69)	22	2.06 (1.25,3.40)	17	2.68 (1.72,4.15)	38	1.97 (1.30,2.98)	15	1.92 (1.15,3.21)

Table 492. Reasons for First Revision Following Primary THA for Taperloc 133 Microplasty/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	18	25.0
2	Aseptic Loosening	16	22.2
3	Joint Infection	14	19.4
4	Peri-prosthetic fracture - Femur	12	16.7
5	Malalignment	5	6.9
6	Implant Failure	4	5.6
7	Pain	2	2.8
8	Poly liner wear	1	1.4

Table 493. Reasons for First Revision in the First 90 Days Following Primary THA for Taperloc 133 Microplasty/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	10	34.5
2	Joint Infection	7	24.1
3	Dislocation/Instability	5	17.2
4	Implant Failure	4	13.8
5	Aseptic Loosening	2	6.9
6	Malalignment	1	3.4

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Table 494. Reasons for First Revision Between 91 and 365 days Following Primary THA for Taperloc 133 Microplasty/G7 Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	8	50.0
2	Dislocation/Instability	6	37.5
3	Joint Infection	1	6.2
4	Pain	1	6.2

Table 495. Descriptive Statistics of Cases Receiving the Taperloc 133 Microplasty/G7 Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,778	43.32	
Age (years)	4,104	61.88 (10.45)	62.00 (13.00)
Height (cm)	4,104	172.15 (10.17)	172.72 (15.20)
Weight (kg)	4,104	90.31 (20.07)	89.00 (27.17)
BMI(kg/m^2)	4,104	30.34 (5.62)	29.86 (7.40)
Smoker - Never (%)	2,152	52.44	
Smoker - Previous (%)	1,411	34.38	
Smoker - Current (%)	526	12.82	
Smoker - Unknown (%)	15	0.37	

Table 496. Distribution of Approach Used for Taperloc 133 Microplasty/G7 Combination in Primary THA Cases

Approach	N	Percent
Anterior	2,770	67.5
Anterolateral	104	2.5
Posterior	1,226	29.9
Transtrochanteric	0	0.0
Missing/unknown/other	4	0.1

Table 497. Distribution of Head Size for Taperloc 133 Microplasty/G7 Combination in Primary THA Cases

Size (mm)	N	Percent
28	5	0.1
32	573	15.0
36	2,975	78.0
40	239	6.3
44	1	0.0
Missing/unknown/other	20	0.5

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Table 498. Distribution of Bearing Surface for Taperloc 133 Microplasty/G7 Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	298	7.3
Ceramic-on-plastic	3,495	85.2
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	261	6.4
Missing/unknown/other	50	1.2

Table 499. Distribution of Polyethylene Used for Taperloc 133 Microplasty/G7 Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,214	29.9
Antioxidant XLPE	2,852	70.1
Missing/unknown/other	0	0.0

Table 500. Volume of Cases by Surgeon and Site for the Taperloc 133 Microplasty/G7 Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	69 (117)	11 (86)
Cases per site	97 (140)	23 (148)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

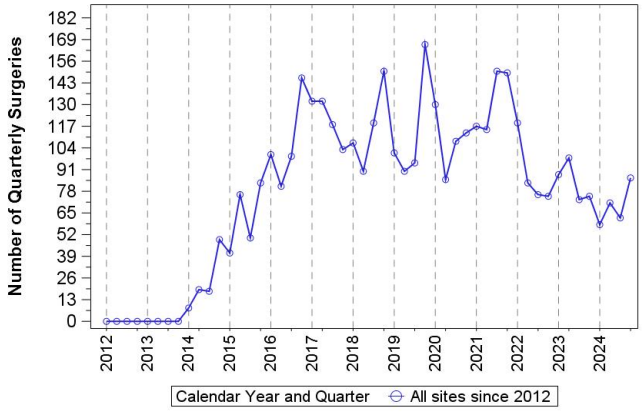


Figure 192. Utilization of the Taperloc 133 Microplasty/G7 Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

51107110	51106090	51109050
51107120	51109080	51106180
51107130	51108080	51106170
51107150	51109070	51108050
51106110	51106150	51106200
51107140	51107170	51108040
51107100	51106140	51107200
51106120	51108070	51106220
51106100	51107180	51107220
51107160	51106160	51107240
51106130	51109060	
51107090	51108060	

Catalog numbers of Acetabular Cups Used in the Analysis

110010244	110010241	10000659
110010245	110017103	110010240
10000665	110017107	110010250
110010243	110017102	110010263
10000664	110010248	110010266
10000663	10000668	110010268
10000666	10000661	110017100
110010246	110017108	10000670
110010242	110010249	110010267
110017105	110017101	110010270
10000662	10000669	110017110
110017106	10000660	110010262
110010247	110017109	
10000667	110010265	
110017104	110010264	

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3.1.41 Trabecular Metal/Continuum

N = 789 primary cases were used for this analysis. Distribution of utilization: 15 surgeons across 14 sites used this implant combination in primary THA cases.

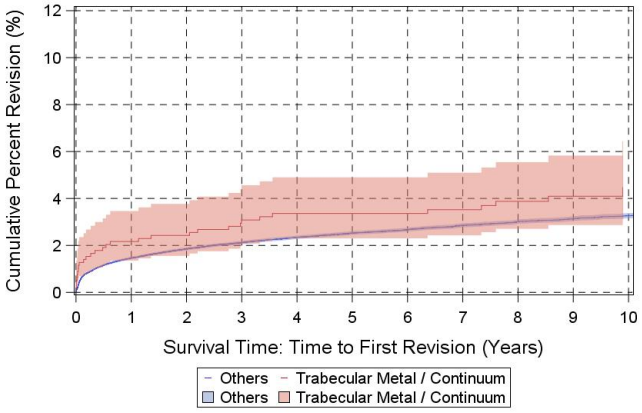


Figure 193. Cumulative Percent Revision Curve for the Trabecular Metal/Continuum Combination, Compared to All Other Implant Combinations in Primary THA Cases

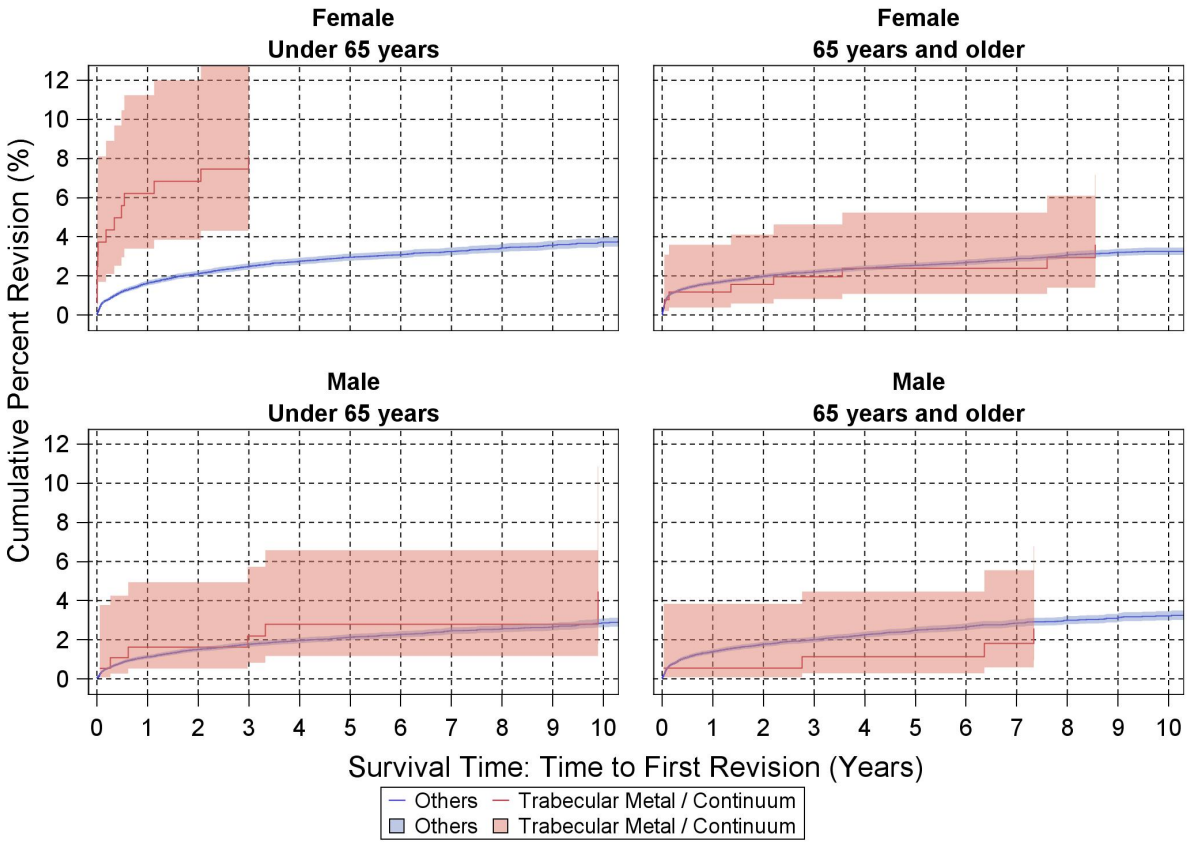


Figure 194. Cumulative Percent Revision Curve for the Trabecular Metal/Continuum Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 501. Cumulative Percent Revision and Number at Risk for the Trabecular Metal/Continuum Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	784	0.00 (0.00,0.00)	161	0.00 (0.00,0.00)	256	0.00 (0.00,0.00)	185	0.00 (0.00,0.00)	182	0.00 (0.00,0.00)
1	767	2.17 (1.35,3.46)	151	6.21 (3.39,11.24)	253	1.17 (0.38,3.59)	182	1.62 (0.53,4.94)	181	0.55 (0.08,3.84)
2	763	2.42 (1.55,3.77)	149	6.83 (3.84,12.00)	252	1.56 (0.59,4.11)	181	1.62 (0.53,4.94)	181	0.55 (0.08,3.84)
3	718	3.08 (2.08,4.56)	141	8.11 (4.79,13.56)	240	1.95 (0.82,4.63)	172	2.19 (0.83,5.73)	165	1.13 (0.28,4.46)
4	671	3.36 (2.30,4.90)	136	8.11 (4.79,13.56)	223	2.39 (1.08,5.24)	154	2.79 (1.17,6.58)	158	1.13 (0.28,4.46)
5	643	3.36 (2.30,4.90)	131	8.11 (4.79,13.56)	215	2.39 (1.08,5.24)	145	2.79 (1.17,6.58)	152	1.13 (0.28,4.46)
6	618	3.36 (2.30,4.90)	123	8.11 (4.79,13.56)	212	2.39 (1.08,5.24)	137	2.79 (1.17,6.58)	146	1.13 (0.28,4.46)
7	571	3.52 (2.43,5.10)	112	8.11 (4.79,13.56)	194	2.39 (1.08,5.24)	130	2.79 (1.17,6.58)	135	1.82 (0.59,5.55)
8	499	3.88 (2.71,5.55)	104	8.11 (4.79,13.56)	169	2.93 (1.40,6.10)	116	2.79 (1.17,6.58)	110	2.58 (0.97,6.78)
9	387	4.10 (2.87,5.83)	88	8.11 (4.79,13.56)	122	3.59 (1.78,7.17)	98	2.79 (1.17,6.58)	79	2.58 (0.97,6.78)
10	220	4.48 (3.11,6.44)	57	8.11 (4.79,13.56)	70	3.59 (1.78,7.17)	54	4.47 (1.80,10.86)	39	2.58 (0.97,6.78)

Table 502. Reasons for First Revision Following Primary THA for Trabecular Metal/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	11	37.9
2	Peri-prosthetic fracture - Femur	5	17.2
3	Pain	5	17.2
4	Aseptic Loosening	4	13.8
5	Joint Infection	3	10.3
6	Metal Reaction/Metallosis	1	3.4

Table 503. Reasons for First Revision in the First 90 Days Following Primary THA for Trabecular Metal/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	5	45.4
2	Pain	4	36.4
3	Peri-prosthetic fracture - Femur	2	18.2

Table 504. Reasons for First Revision Between 91 and 365 days Following Primary THA for Trabecular Metal/Continuum Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	3	75.0
2	Aseptic Loosening	1	25.0

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Table 505. Descriptive Statistics of Cases Receiving the Trabecular Metal/Continuum Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	418	52.98	
Age (years)	789	65.92 (10.88)	66.00 (15.00)
Height (cm)	789	170.02 (10.74)	170.18 (15.24)
Weight (kg)	789	90.30 (21.95)	88.36 (27.97)
BMI(kg/m^2)	789	31.08 (6.36)	30.02 (8.48)
Smoker - Never (%)	325	41.19	
Smoker - Previous (%)	343	43.47	
Smoker - Current (%)	120	15.21	
Smoker - Unknown (%)	1	0.13	

Table 506. Distribution of Approach Used for Trabecular Metal/Continuum Combination in Primary THA Cases

Approach	N	Percent
Anterior	3	0.4
Anterolateral	699	88.6
Posterior	85	10.8
Transtrochanteric	1	0.1
Missing/unknown/other	1	0.1

Table 507. Distribution of Head Size for Trabecular Metal/Continuum Combination in Primary THA Cases

Size (mm)	N	Percent
28	6	0.8
32	292	37.1
36	457	58.1
40	25	3.2
Missing/unknown/other	7	0.9

Table 508. Distribution of Bearing Surface for Trabecular Metal/Continuum Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	464	58.8
Ceramic-on-plastic	316	40.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	9	1.1

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Table 509. Distribution of Polyethylene Used for Trabecular Metal/Continuum Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	712	90.5
Antioxidant XLPE	75	9.5
Missing/unknown/other	0	0.0

Table 510. Volume of Cases by Surgeon and Site for the Trabecular Metal/Continuum Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	52 (98)	6 (66)
Cases per site	56 (88)	7 (90)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

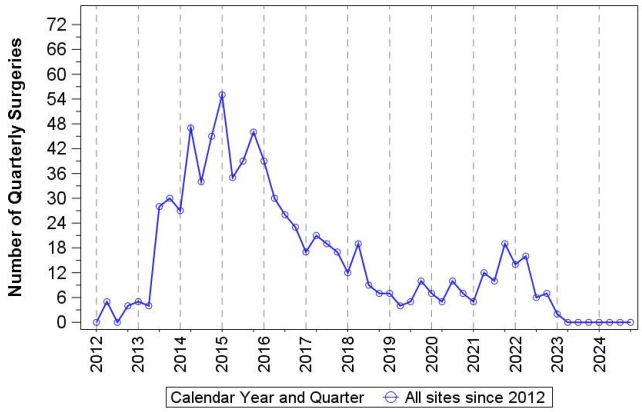


Figure 195. Utilization of the Trabecular Metal/Continuum Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

786401420	786401520	786401000
786401320	786401500	786401700
786401220	786401100	786401720
786401300	786401620	786401820
786401400	786401120	
786401200	786401600	

Catalog numbers of Acetabular Cups Used in the Analysis

875705601	875705001	875704601
875705801	875705800	875706002
875705401	875704800	875706402
875706001	875704801	875704802
875705201	875705402	875705002
875705200	875706401	875706602
875705400	875705802	875706200
875705600	875705602	875706601
875705000	875705202	
875706201	875706000	

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3.1.42 Tri-Lock BPS/Pinnacle

N = 4,294 primary cases were used for this analysis. Distribution of utilization: 51 surgeons across 31 sites used this implant combination in primary THA cases.

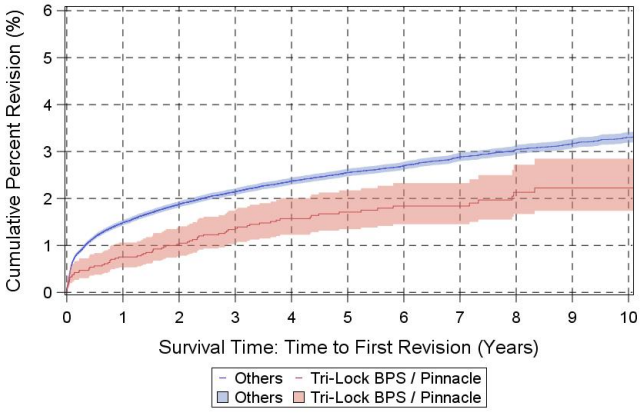


Figure 196. Cumulative Percent Revision Curve for the Tri-Lock BPS/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases

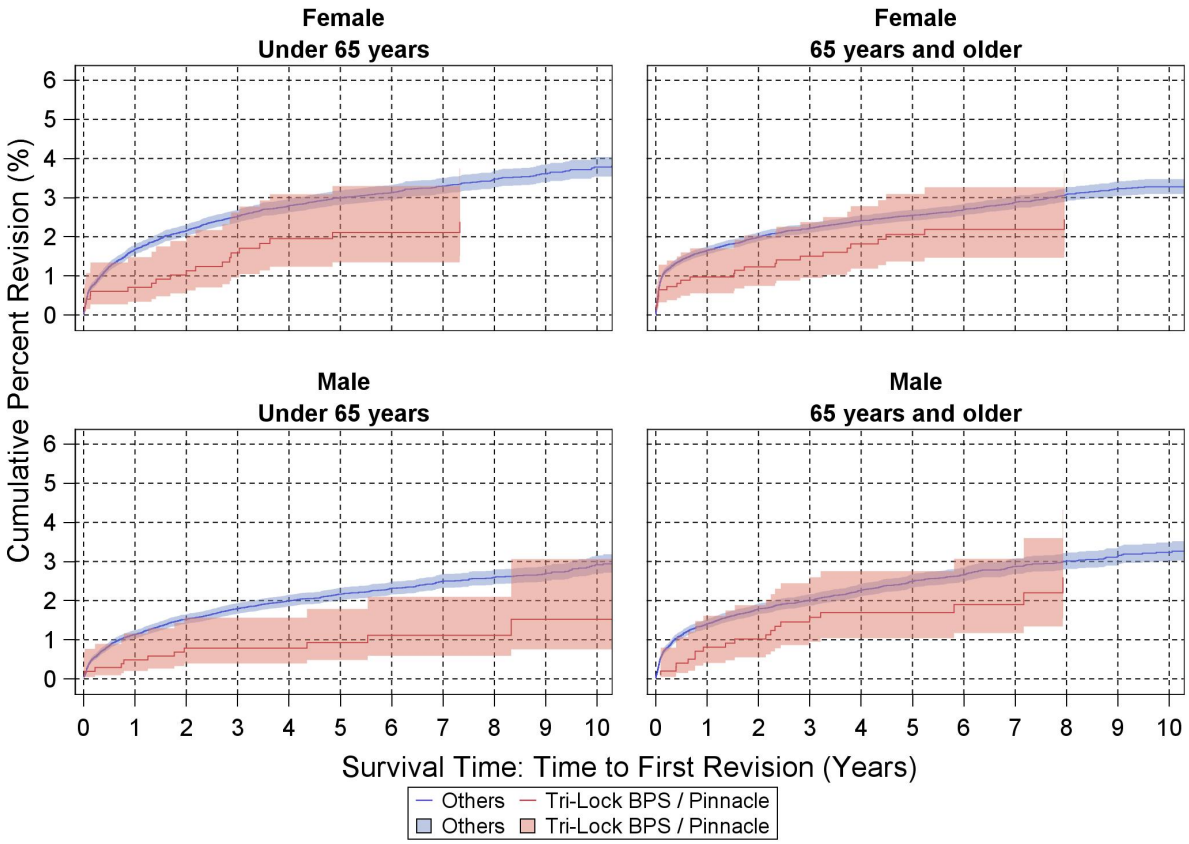


Figure 197. Cumulative Percent Revision Curve for the Tri-Lock BPS/Pinnacle Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 511. Cumulative Percent Revision and Number at Risk for the Tri-Lock BPS/Pinnacle Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	4,272	0.00 (0.00,0.00)	991	0.00 (0.00,0.00)	1,240	0.00 (0.00,0.00)	1,039	0.00 (0.00,0.00)	1,001	0.00 (0.00,0.00)
1	4,147	0.75 (0.53,1.06)	968	0.71 (0.34,1.48)	1,194	0.97 (0.55,1.70)	1,015	0.48 (0.20,1.16)	969	0.81 (0.41,1.61)
2	3,942	1.05 (0.78,1.41)	922	1.13 (0.63,2.03)	1,131	1.23 (0.74,2.03)	969	0.79 (0.39,1.57)	919	1.02 (0.55,1.88)
3	3,553	1.36 (1.05,1.77)	831	1.59 (0.96,2.62)	1,013	1.50 (0.95,2.38)	874	0.79 (0.39,1.57)	834	1.57 (0.95,2.60)
4	3,088	1.57 (1.23,2.01)	745	1.95 (1.23,3.09)	887	1.82 (1.19,2.78)	747	0.79 (0.39,1.57)	708	1.69 (1.04,2.75)
5	2,557	1.71 (1.35,2.17)	610	2.11 (1.35,3.30)	765	2.06 (1.37,3.09)	607	0.93 (0.48,1.79)	574	1.69 (1.04,2.75)
6	2,056	1.84 (1.45,2.33)	493	2.11 (1.35,3.30)	636	2.19 (1.46,3.27)	470	1.11 (0.59,2.10)	456	1.90 (1.17,3.07)
7	1,601	1.84 (1.45,2.33)	397	2.11 (1.35,3.30)	514	2.19 (1.46,3.27)	352	1.11 (0.59,2.10)	337	1.90 (1.17,3.07)
8	1,183	2.13 (1.67,2.72)	296	2.38 (1.51,3.75)	376	2.44 (1.62,3.69)	270	1.11 (0.59,2.10)	240	2.59 (1.55,4.32)
9	806	2.22 (1.74,2.85)	205	2.38 (1.51,3.75)	258	2.44 (1.62,3.69)	181	1.52 (0.75,3.06)	161	2.59 (1.55,4.32)
10	373	2.22 (1.74,2.85)	87	2.38 (1.51,3.75)	109	2.44 (1.62,3.69)	92	1.52 (0.75,3.06)	84	2.59 (1.55,4.32)

Table 512. Reasons for First Revision Following Primary THA for Tri-Lock BPS/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	19	25.3
2	Dislocation/Instability	17	22.7
3	Joint Infection	14	18.7
4	Peri-prosthetic fracture - Femur	12	16.0
5	Implant Failure	3	4.0
6	Metal Reaction/Metallosis	3	4.0
7	Pain	3	4.0
8	Malalignment	3	4.0
9	Poly liner wear	1	1.3

Table 513. Reasons for First Revision in the First 90 Days Following Primary THA for Tri-Lock BPS/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	11	57.9
2	Aseptic Loosening	3	15.8
3	Dislocation/Instability	3	15.8
4	Joint Infection	1	5.3
5	Malalignment	1	5.3

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Table 514. Reasons for First Revision Between 91 and 365 days Following Primary THA for Tri-Lock BPS/Pinnacle Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	6	50.0
2	Aseptic Loosening	4	33.3
3	Dislocation/Instability	2	16.7

Table 515. Descriptive Statistics of Cases Receiving the Tri-Lock BPS/Pinnacle Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,239	52.14	
Age (years)	4,294	64.64 (10.16)	65.00 (13.00)
Height (cm)	4,269	170.74 (10.21)	170.10 (15.00)
Weight (kg)	4,270	89.56 (19.88)	88.00 (27.10)
BMI(kg/m^2)	4,269	30.61 (5.75)	30.04 (7.98)
Smoker - Never (%)	2,080	48.44	
Smoker - Previous (%)	1,629	37.94	
Smoker - Current (%)	572	13.32	
Smoker - Unknown (%)	13	0.3	

Table 516. Distribution of Approach Used for Tri-Lock BPS/Pinnacle Combination in Primary THA Cases

Approach	N	Percent
Anterior	2,055	47.9
Anterolateral	869	20.2
Posterior	1,328	30.9
Transtrochanteric	14	0.3
Missing/unknown/other	28	0.7

Table 517. Distribution of Head Size for Tri-Lock BPS/Pinnacle Combination in Primary THA Cases

Size (mm)	N	Percent
28	21	0.5
32	1,323	31.1
36	2,573	60.6
40	315	7.4
Missing/unknown/other	16	0.4

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Table 518. Distribution of Bearing Surface for Tri-Lock BPS/Pinnacle Combination in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,496	34.8
Ceramic-on-plastic	2,685	62.5
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	24	0.6
Missing/unknown/other	89	2.1

Table 519. Distribution of Polyethylene Used for Tri-Lock BPS/Pinnacle Combination Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	24	0.6
XLPE	4,197	99.4
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 520. Volume of Cases by Surgeon and Site for the Tri-Lock BPS/Pinnacle Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	84 (219)	8 (76)
Cases per site	138 (417)	13 (141)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

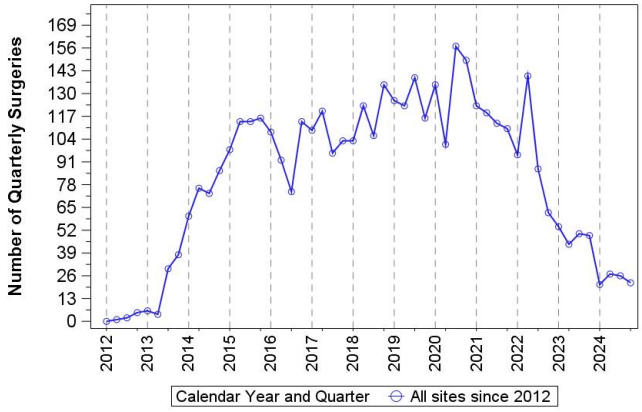


Figure 198. Utilization of the Tri-Lock BPS/Pinnacle Combination in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

101204040	101204070	101204005
101204050	101214070	101214100
101204030	101204080	101214005
101204060	101214080	101204100
101214050	101214020	101204110
101214040	101204010	101214110
101214060	101214010	101204120
101204020	101214090	101214120
101214030	101204090	

Catalog numbers of Acetabular Cups Used in the Analysis

121732052	121703050	121731056
121732054	121703048	121720044
121732056	121701050	121722064
121732050	121701056	121730048
121732058	121701048	121730054
121722052	121701054	121730058
121732048	121722062	121731058
121722054	121703058	121701064
121732060	121720046	121703062
121722056	121730056	121730050
121722050	121732064	121730062
121722058	121730052	121730066
121703052	121701058	121730068
121722048	121703060	121731046
121732062	121730046	121731060
121701052	121731048	121732066
121703054	121731052	
121703056	121731050	
121722060	121731054	

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3.2 Conventional THA Stems

The discrepancy between the number of cases listed at the beginning of an implant and N at year 0 in the table following the CPR figures is due to deaths. The former number is the total number of cases; the latter is the number of cases used to estimate the CPR considering deaths as censored events.

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3.2.1 Accolade C

N = 1,503 primary cases were used for this analysis. Distribution of utilization: 73 surgeons across 40 sites used this implant in primary THA cases.

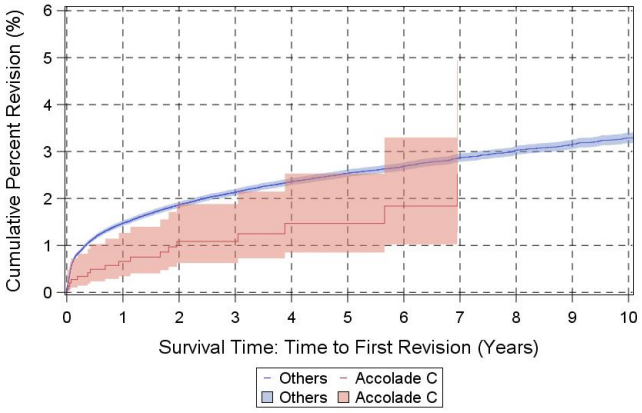


Figure 199. Cumulative Percent Revision Curve for the Accolade C Stem, Compared to All Other Femoral Components in Primary THA Cases

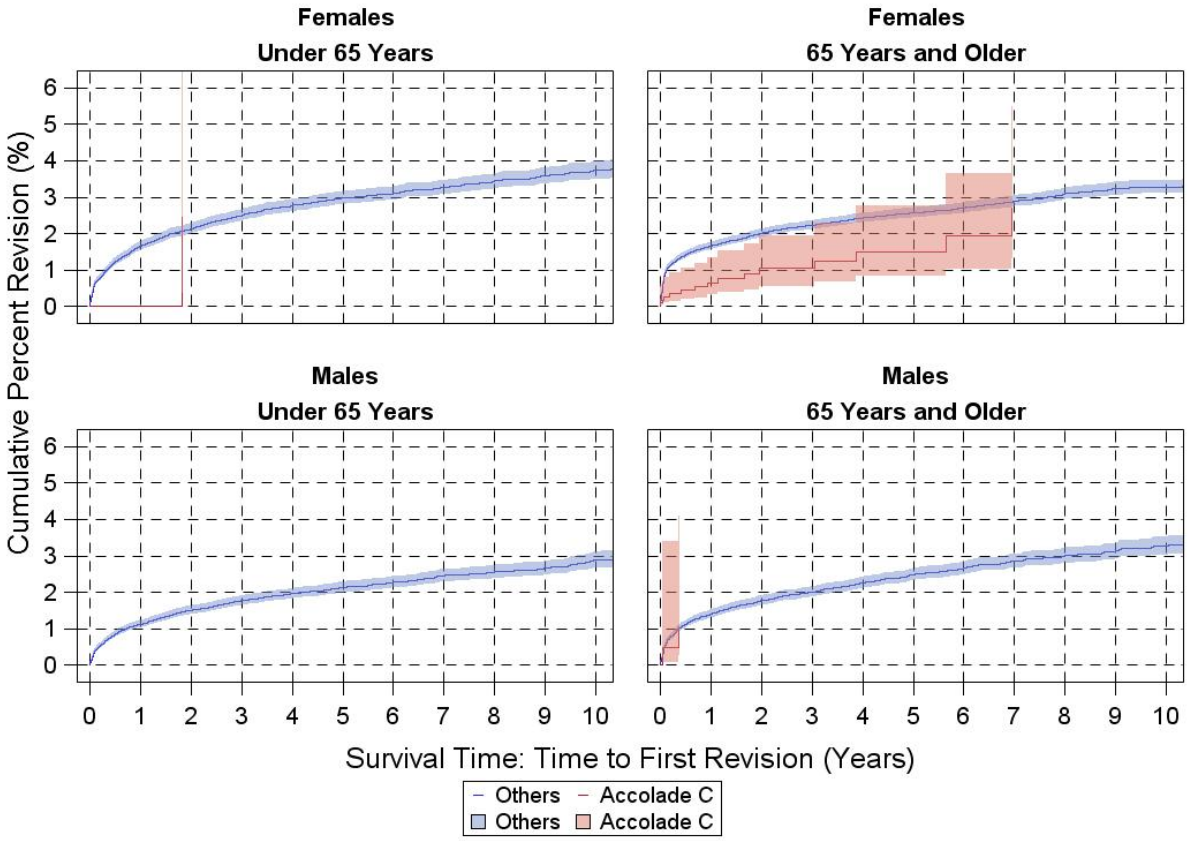


Figure 200. Cumulative Percent Revision Curve for the Accolade C Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 521. Cumulative Percent Revision and Number at Risk for the Accolade C Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,478	0.00 (0.00,0.00)	70	0.00 (0.00,0.00)	1,189	0.00 (0.00,0.00)	12	0.00 (0.00,0.00)	207	0.00 (0.00,0.00)
1	1,122	0.66 (0.34,1.27)	48	0.00 (0.00,0.00)	903	0.64 (0.31,1.34)	*	0.00 (0.00,0.00)	161	1.03 (0.26,4.08)
2	842	1.09 (0.62,1.88)	40	2.44 (0.35,16.08)	677	1.03 (0.55,1.94)	*	0.00 (0.00,0.00)	118	1.03 (0.26,4.08)
3	610	1.09 (0.62,1.88)	31	2.44 (0.35,16.08)	495	1.03 (0.55,1.94)	*	0.00 (0.00,0.00)	79	1.03 (0.26,4.08)
4	437	1.47 (0.85,2.53)	19	2.44 (0.35,16.08)	359	1.50 (0.81,2.76)	*	0.00 (0.00,0.00)	54	1.03 (0.26,4.08)
5	325	1.47 (0.85,2.53)	12	2.44 (0.35,16.08)	275	1.50 (0.81,2.76)	*	0.00 (0.00,0.00)	35	1.03 (0.26,4.08)
6	230	1.84 (1.02,3.30)	*	2.44 (0.35,16.08)	202	1.93 (1.01,3.66)	*	0.00 (0.00,0.00)	17	1.03 (0.26,4.08)
7	138	2.52 (1.28,4.95)	*	2.44 (0.35,16.08)	122	2.70 (1.31,5.50)	*	0.00 (0.00,0.00)	*	1.03 (0.26,4.08)
8	68	2.52 (1.28,4.95)	*	2.44 (0.35,16.08)	57	2.70 (1.31,5.50)	*	0.00 (0.00,0.00)	*	1.03 (0.26,4.08)
9	43	2.52 (1.28,4.95)	*	2.44 (0.35,16.08)	33	2.70 (1.31,5.50)	*	0.00 (0.00,0.00)	*	1.03 (0.26,4.08)
10	32	2.52 (1.28,4.95)	*	2.44 (0.35,16.08)	25	2.70 (1.31,5.50)	*	0.00 (0.00,0.00)	*	1.03 (0.26,4.08)

* Denotes that the number of cases is between 1 and 10.

Table 522. Reasons for First Revision Following Primary THA for Accolade C Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	5	29.4
2	Aseptic Loosening	4	23.5
3	Dislocation/Instability	4	23.5
4	Poly liner wear	1	5.9
5	Peri-prosthetic fracture - Acetabulum	1	5.9
6	Peri-prosthetic fracture - Femur	1	5.9
7	Malalignment	1	5.9

Table 523. Reasons for First Revision in the First 90 Days Following Primary THA for Accolade C Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	2	40.0
2	Aseptic Loosening	1	20.0
3	Joint Infection	1	20.0
4	Peri-prosthetic fracture - Acetabulum	1	20.0

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Table 524. Reasons for First Revision Between 91 and 365 days Following Primary THA for Accolade C Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	3	75.0
2	Dislocation/Instability	1	25.0

Table 525. Descriptive Statistics of Cases Receiving the Accolade C Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,280	85.16	
Age (years)	1,503	77.64 (7.94)	78.00 (10.00)
Height (cm)	1,503	162.69 (8.81)	162.56 (10.64)
Weight (kg)	1,503	74.75 (17.60)	72.40 (23.80)
BMI(kg/m^2)	1,503	28.21 (6.20)	27.30 (8.11)
Smoker - Never (%)	837	55.69	
Smoker - Previous (%)	561	37.33	
Smoker - Current (%)	92	6.12	
Smoker - Unknown (%)	13	0.86	

Table 526. Distribution of Approach Used for Accolade C Stem in Primary THA Cases

Approach	N	Percent
Anterior	427	28.4
Anterolateral	196	13.0
Posterior	875	58.2
Transtrochanteric	1	0.1
Missing/unknown/other	4	0.3

Table 527. Distribution of Head Size for Accolade C Stem in Primary THA Cases

Size (mm)	N	Percent
22	3	0.3
28	5	0.4
32	78	6.6
36	999	85.0
40	79	6.7
44	4	0.3
Missing/unknown/other	8	0.7

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Table 528. Distribution of Bearing Surface for Accolade C Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	208	13.8
Ceramic-on-plastic	967	64.3
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	299	19.9
Missing/unknown/other	29	1.9

Table 529. Distribution of Polyethylene Used for Accolade C Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	3	0.2
XLPE	1,433	98.8
Antioxidant XLPE	8	0.6
Missing/unknown/other	6	0.4

Table 530. Volume of Cases by Surgeon and Site for the Accolade C Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	20 (26)	9 (27)
Cases per site	37 (50)	12 (54)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

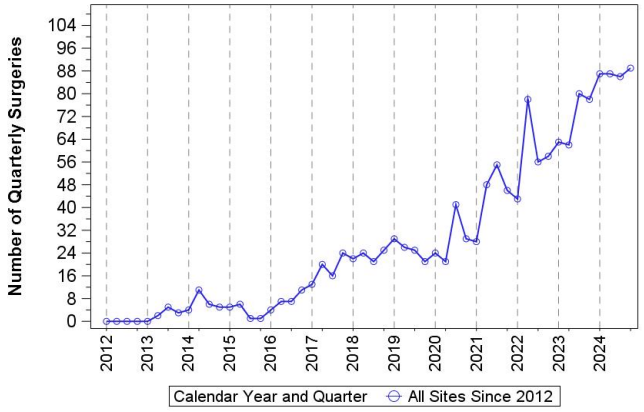


Figure 201. Utilization of the Accolade C Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

60570435D
60570537D
60570335D
60580435D
60580537D
60570637D
60580335D
60570740D
60580637D
60570230D
60580230D
60580740D

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3.2.2 Accolade II

N = 43,873 primary cases were used for this analysis. Distribution of utilization: 168 surgeons across 69 sites used this implant in primary THA cases.

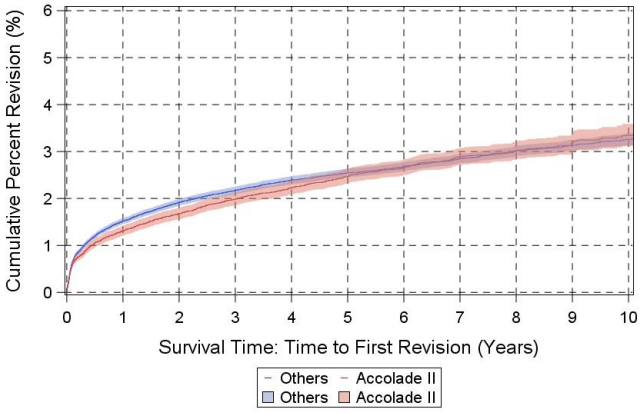


Figure 202. Cumulative Percent Revision Curve for the Accolade II Stem, Compared to All Other Femoral Components in Primary THA Cases

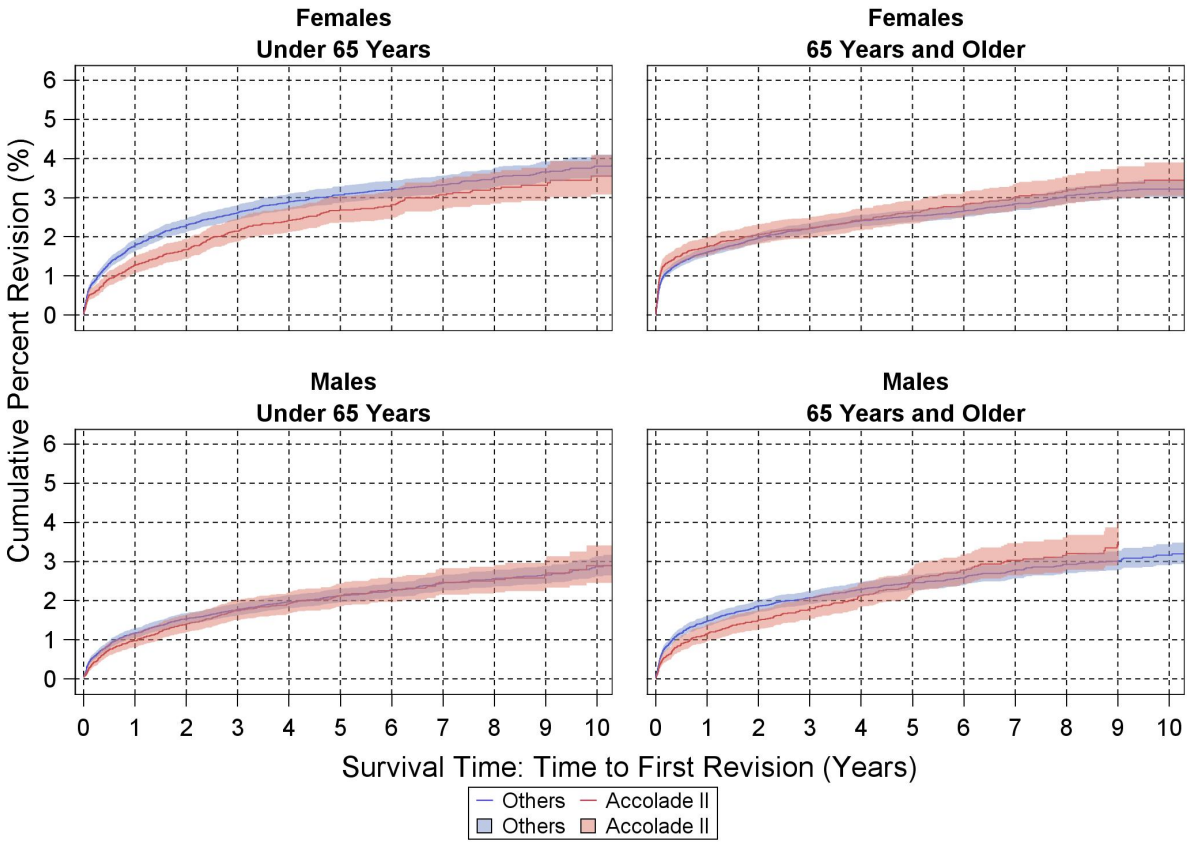


Figure 203. Cumulative Percent Revision Curve for the Accolade II Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 531. Cumulative Percent Revision and Number at Risk for the Accolade II Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	43,650	0.00 (0.00,0.00)	10,232	0.00 (0.00,0.00)	12,805	0.00 (0.00,0.00)	10,882	0.00 (0.00,0.00)	9,721	0.00 (0.00,0.00)
1	40,523	1.31 (1.21,1.43)	9,560	1.27 (1.07,1.51)	11,962	1.75 (1.54,2.00)	10,109	0.97 (0.80,1.18)	8,884	1.16 (0.96,1.39)
2	36,996	1.68 (1.56,1.81)	8,746	1.67 (1.44,1.94)	11,008	2.06 (1.83,2.33)	9,226	1.40 (1.19,1.65)	8,008	1.51 (1.28,1.78)
3	32,738	1.99 (1.86,2.13)	7,781	2.14 (1.87,2.45)	9,829	2.22 (1.97,2.49)	8,116	1.74 (1.50,2.02)	7,005	1.79 (1.54,2.09)
4	28,283	2.23 (2.09,2.38)	6,789	2.42 (2.13,2.75)	8,436	2.42 (2.16,2.71)	7,062	1.92 (1.67,2.21)	5,990	2.12 (1.83,2.45)
5	24,160	2.47 (2.32,2.63)	5,864	2.68 (2.37,3.04)	7,175	2.61 (2.33,2.92)	6,095	2.12 (1.84,2.43)	5,020	2.48 (2.16,2.85)
6	19,115	2.66 (2.50,2.84)	4,683	2.82 (2.49,3.19)	5,660	2.82 (2.53,3.15)	4,877	2.26 (1.97,2.58)	3,889	2.78 (2.42,3.18)
7	14,428	2.88 (2.71,3.07)	3,629	3.07 (2.71,3.47)	4,263	3.00 (2.69,3.35)	3,662	2.47 (2.15,2.83)	2,869	3.03 (2.64,3.47)
8	10,051	3.02 (2.84,3.22)	2,559	3.23 (2.85,3.66)	2,901	3.16 (2.83,3.54)	2,615	2.54 (2.21,2.91)	1,971	3.20 (2.79,3.68)
9	6,020	3.18 (2.97,3.40)	1,560	3.31 (2.92,3.76)	1,750	3.37 (3.00,3.80)	1,535	2.64 (2.29,3.05)	1,170	3.43 (2.95,3.98)
10	3,155	3.34 (3.11,3.59)	815	3.55 (3.08,4.09)	916	3.45 (3.05,3.90)	799	2.89 (2.45,3.41)	621	3.51 (3.01,4.09)

Table 532. Reasons for First Revision Following Primary THA for Accolade II Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	262	24.6
2	Aseptic Loosening	248	23.3
3	Joint Infection	230	21.6
4	Dislocation/Instability	151	14.2
5	Pain	43	4.0
6	Malalignment	37	3.5
7	Implant Failure	33	3.1
8	Metal Reaction/Metallosis	33	3.1
9	Peri-prosthetic fracture - Acetabulum	20	1.9
10	Osteolysis	4	0.4
	Unknown/missing/other	4	0.4

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Table 533. Reasons for First Revision in the First 90 Days Following Primary THA for Accolade II Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	184	54.1
2	Joint Infection	54	15.9
3	Dislocation/Instability	43	12.6
4	Aseptic Loosening	20	5.9
5	Implant Failure	15	4.4
6	Peri-prosthetic fracture - Acetabulum	9	2.6
7	Malalignment	9	2.6
8	Pain	5	1.5
9	Metal Reaction/Metallosis	1	0.3

Table 534. Reasons for First Revision Between 91 and 365 days Following Primary THA for Accolade II Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	69	32.7
2	Dislocation/Instability	46	21.8
3	Aseptic Loosening	39	18.5
4	Peri-prosthetic fracture - Femur	26	12.3
5	Pain	16	7.6
6	Malalignment	6	2.8
7	Implant Failure	3	1.4
8	Peri-prosthetic fracture - Acetabulum	3	1.4
9	Poly liner wear	2	1.0
10	Osteolysis	1	0.5

Table 535. Descriptive Statistics of Cases Receiving the Accolade II Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	23,134	52.73	
Age (years)	43,873	64.35 (10.80)	65.00 (14.00)
Height (cm)	43,873	170.39 (10.38)	170.18 (15.24)
Weight (kg)	43,873	89.11 (20.94)	87.30 (28.06)
BMI(kg/m^2)	43,873	30.58 (6.23)	29.83 (8.18)
Smoker - Never (%)	21,542	49.1	
Smoker - Previous (%)	15,925	36.3	
Smoker - Current (%)	6,266	14.28	
Smoker - Unknown (%)	140	0.32	

Table 536. Distribution of Approach Used for Accolade II Stem in Primary THA Cases

Approach	N	Percent
Anterior	14,112	32.2
Anterolateral	5016	11.4
Posterior	24,622	56.1
Transtrochanteric	31	0.1
Missing/unknown/other	92	0.2

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Table 537. Distribution of Head Size for Accolade II Stem in Primary THA Cases

Size (mm)	N	Percent
22	20	0.1
28	61	0.2
32	5,510	14.4
36	29,363	76.9
40	2,873	7.5
44	232	0.6
Missing/unknown/other	113	0.3

Table 538. Distribution of Bearing Surface for Accolade II Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	4,367	9.9
Ceramic-on-plastic	33,679	76.8
Ceramic-on-ceramic	16	0.0
Metal-on-metal	0	0.0
Dual mobility	5,283	12.0
Missing/unknown/other	528	1.2

Table 539. Distribution of Polyethylene Used for Accolade II Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	6	0.0
XLPE	43,310	99.9
Antioxidant XLPE	50	0.1
Missing/unknown/other	3	0.0

Table 540. Volume of Cases by Surgeon and Site for the Accolade II Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	261 (438)	81 (276)
Cases per site	635 (1023)	208 (889)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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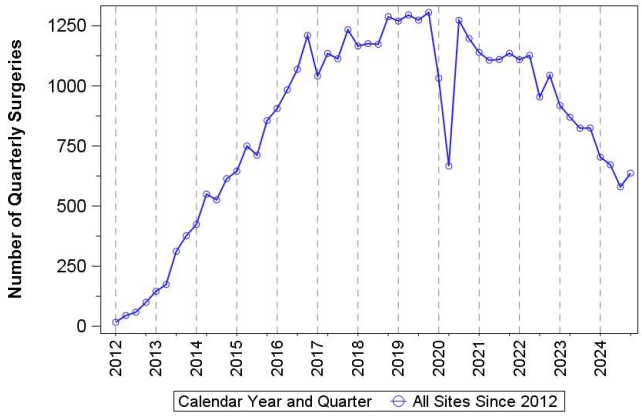


Figure 204. Utilization of the Accolade II Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

67210535	67200330	67201040
67210435	67200737	67211140
67210635	67210937	67200127
67210737	67210230	67210027
67200535	67200837	67201140
67210330	67200230	67200027
67200435	67211040	
67200635	67200937	
67210837	67210127	

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3.2.3 Accolade TMZF

N = 917 primary cases were used for this analysis. Distribution of utilization: 16 surgeons across 13 sites used this implant in primary THA cases.

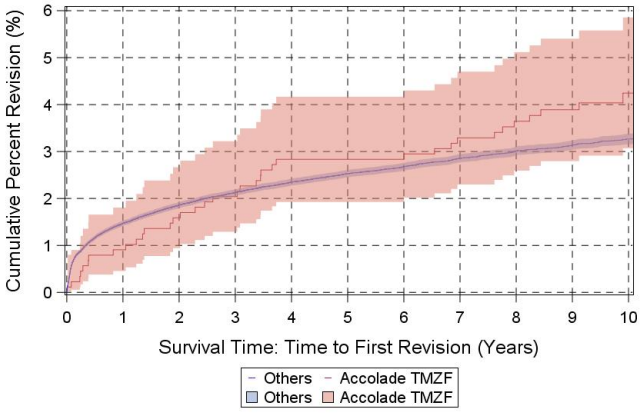


Figure 205. Cumulative Percent Revision Curve for the Accolade TMZF Stem, Compared to All Other Femoral Components in Primary THA Cases

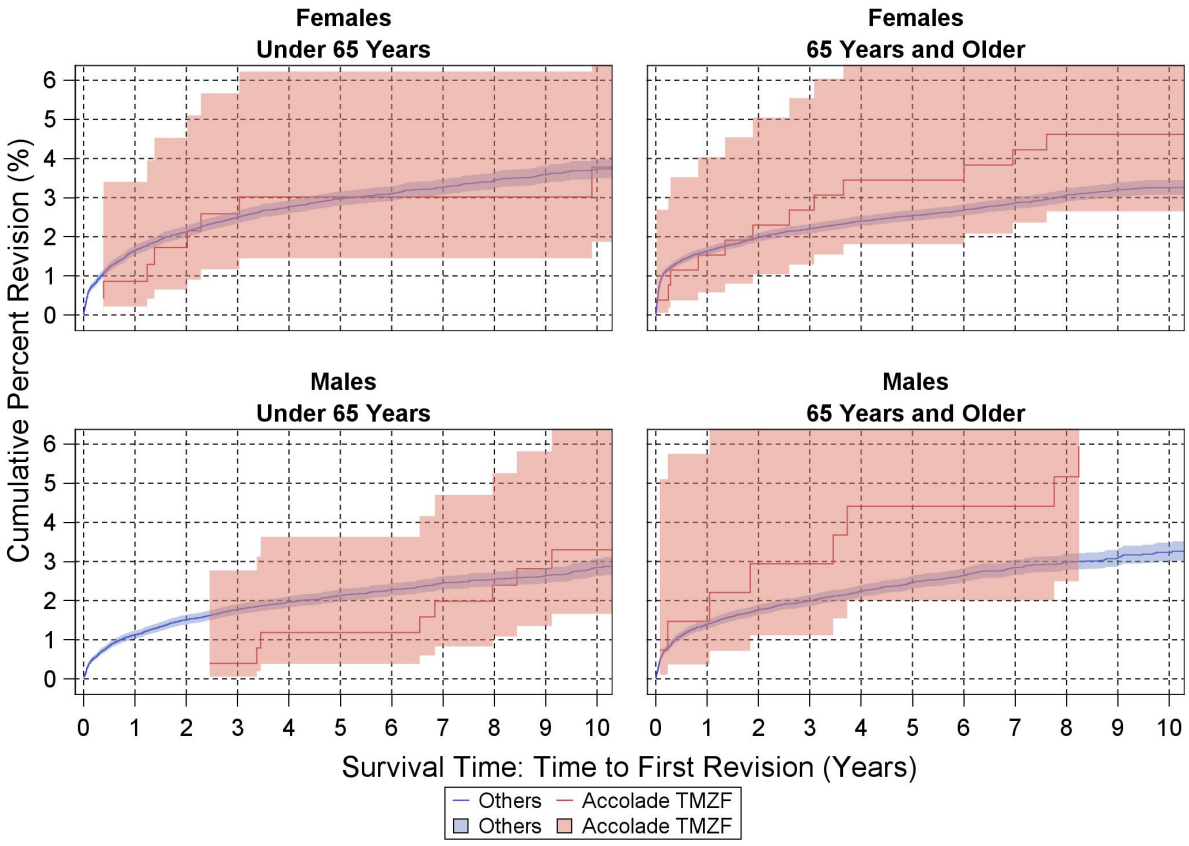


Figure 206. Cumulative Percent Revision Curve for the Accolade TMZF Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 541. Cumulative Percent Revision and Number at Risk for the Accolade TMZF Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	882	0.00 (0.00,0.00)	232	0.00 (0.00,0.00)	261	0.00 (0.00,0.00)	253	0.00 (0.00,0.00)	136	0.00 (0.00,0.00)
1	874	0.91 (0.45,1.81)	230	0.86 (0.22,3.40)	257	1.53 (0.58,4.03)	253	0.00 (0.00,0.00)	134	1.47 (0.37,5.75)
2	868	1.59 (0.94,2.67)	228	1.72 (0.65,4.53)	255	2.30 (1.04,5.05)	253	0.00 (0.00,0.00)	132	2.94 (1.11,7.65)
3	864	2.04 (1.29,3.22)	226	2.59 (1.17,5.67)	254	2.68 (1.29,5.54)	252	0.40 (0.06,2.77)	132	2.94 (1.11,7.65)
4	857	2.83 (1.92,4.17)	225	3.02 (1.45,6.22)	252	3.45 (1.81,6.52)	250	1.19 (0.38,3.63)	130	4.41 (2.01,9.56)
5	857	2.83 (1.92,4.17)	225	3.02 (1.45,6.22)	252	3.45 (1.81,6.52)	250	1.19 (0.38,3.63)	130	4.41 (2.01,9.56)
6	856	2.83 (1.92,4.17)	225	3.02 (1.45,6.22)	251	3.45 (1.81,6.52)	250	1.19 (0.38,3.63)	130	4.41 (2.01,9.56)
7	840	3.29 (2.30,4.70)	221	3.02 (1.45,6.22)	246	4.22 (2.36,7.49)	244	1.98 (0.83,4.70)	129	4.41 (2.01,9.56)
8	805	3.65 (2.59,5.12)	214	3.02 (1.45,6.22)	232	4.62 (2.65,7.99)	237	2.40 (1.08,5.26)	122	5.16 (2.50,10.53)
9	690	3.89 (2.80,5.40)	185	3.02 (1.45,6.22)	190	4.62 (2.65,7.99)	211	2.82 (1.35,5.82)	104	5.95 (3.02,11.55)
10	431	4.24 (3.07,5.86)	120	3.78 (1.87,7.56)	123	4.62 (2.65,7.99)	128	3.30 (1.66,6.50)	60	5.95 (3.02,11.55)

Table 542. Reasons for First Revision Following Primary THA for Accolade TMZF Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	11	33.3
2	Metal Reaction/Metallosis	8	24.2
3	Joint Infection	6	18.2
4	Dislocation/Instability	4	12.1
5	Peri-prosthetic fracture - Femur	3	9.1
6	Malalignment	1	3.0

Table 543. Reasons for First Revision in the First 90 Days Following Primary THA for Accolade TMZF Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	50.0
2	Peri-prosthetic fracture - Femur	1	50.0

Table 544. Reasons for First Revision Between 91 and 365 days Following Primary THA for Accolade TMZF Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	1	100.0

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Table 545. Descriptive Statistics of Cases Receiving the Accolade TMZF Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	508	55.4	
Age (years)	917	63.29 (11.19)	63.00 (16.00)
Height (cm)	917	169.96 (10.56)	170.00 (15.24)
Weight (kg)	917	90.31 (21.35)	89.55 (29.33)
BMI(kg/m^2)	917	31.11 (6.18)	30.49 (8.30)
Smoker - Never (%)	420	45.8	
Smoker - Previous (%)	353	38.5	
Smoker - Current (%)	128	13.96	
Smoker - Unknown (%)	16	1.74	

Table 546. Distribution of Approach Used for Accolade TMZF Stem in Primary THA Cases

Approach	N	Percent
Anterior	8	0.9
Anterolateral	138	15.1
Posterior	759	82.8
Transtrochanteric	3	0.3
Missing/unknown/other	9	1.0

Table 547. Distribution of Head Size for Accolade TMZF Stem in Primary THA Cases

Size (mm)	N	Percent
28	1	0.1
32	98	10.9
36	695	77.4
40	97	10.8
Missing/unknown/other	7	0.8

Table 548. Distribution of Bearing Surface for Accolade TMZF Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	499	54.4
Ceramic-on-plastic	389	42.4
Ceramic-on-ceramic	3	0.3
Metal-on-metal	0	0.0
Dual mobility	18	2.0
Missing/unknown/other	8	0.9

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Table 549. Distribution of Polyethylene Used for Accolade TMZF Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	909	99.9
Antioxidant XLPE	1	0.1
Missing/unknown/other	0	0.0

Table 550. Volume of Cases by Surgeon and Site for the Accolade TMZF Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	57 (135)	5 (14)
Cases per site	70 (105)	11 (122)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

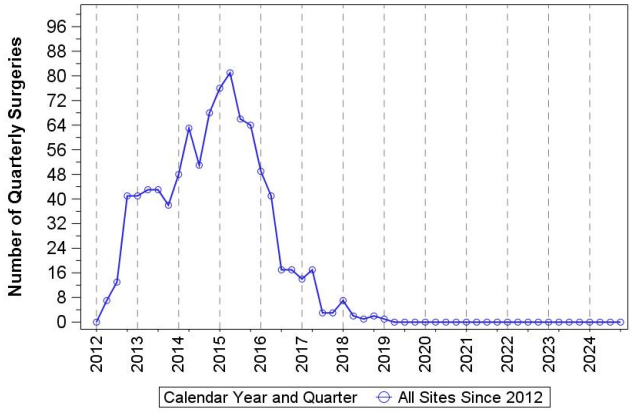


Figure 207. Utilization of the Accolade TMZF Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

60200335	60212530	60215537
60202530	60214535	60210130
60203535	60210435	60200637
60210335	60200537	60210637
60200435	60210537	60210740
60200230	60210230	60200030
60204535	60205537	60210030
60213535	60200130	

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3.2.4 Actis DuoFix

All Actis DuoFix implants included in this analysis are collared version. N = 10,786 primary cases were used for this analysis. Distribution of utilization: 71 surgeons across 42 sites used this implant in primary THA cases.

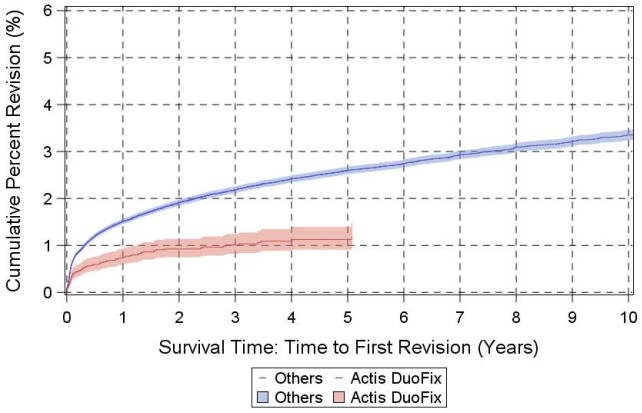


Figure 208. Cumulative Percent Revision Curve for the Actis DuoFix Stem, Compared to All Other Femoral Components in Primary THA Cases

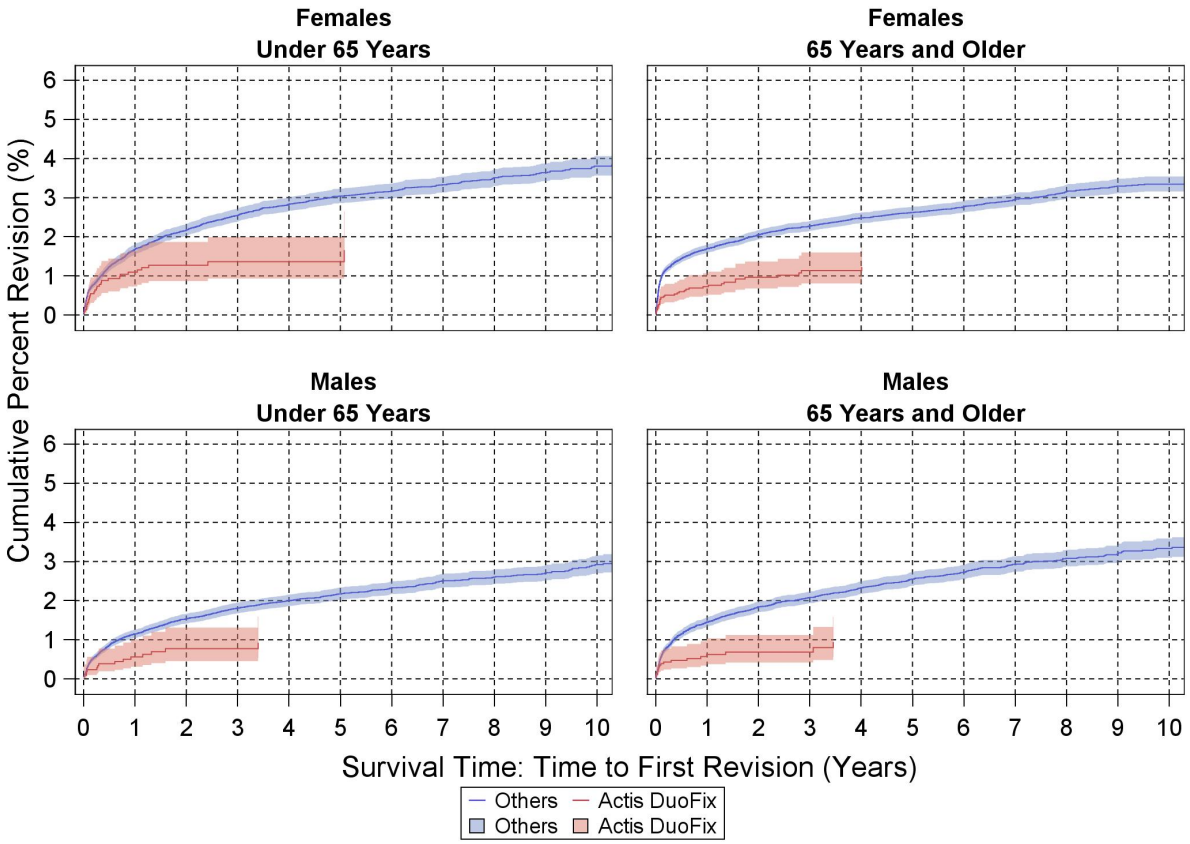


Figure 209. Cumulative Percent Revision Curve for the Actis DuoFix Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 551. Cumulative Percent Revision and Number at Risk for the Actis DuoFix Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	10,757	0.00 (0.00,0.00)	2,241	0.00 (0.00,0.00)	3,782	0.00 (0.00,0.00)	2,142	0.00 (0.00,0.00)	2,592	0.00 (0.00,0.00)
1	7,987	0.75 (0.59,0.93)	1,735	1.09 (0.73,1.64)	2,804	0.72 (0.49,1.06)	1,607	0.56 (0.31,1.01)	1,841	0.62 (0.38,1.04)
2	5,703	0.92 (0.75,1.14)	1,279	1.27 (0.87,1.87)	2,079	0.96 (0.68,1.37)	1,092	0.77 (0.45,1.31)	1,253	0.68 (0.42,1.12)
3	4,140	1.01 (0.82,1.24)	915	1.36 (0.93,1.99)	1,586	1.14 (0.81,1.60)	761	0.77 (0.45,1.31)	878	0.68 (0.42,1.12)
4	2,732	1.09 (0.88,1.35)	606	1.36 (0.93,1.99)	1,117	1.14 (0.81,1.60)	470	0.92 (0.53,1.59)	539	0.94 (0.56,1.58)
5	1,625	1.13 (0.91,1.39)	353	1.36 (0.93,1.99)	703	1.22 (0.86,1.73)	280	0.92 (0.53,1.59)	289	0.94 (0.56,1.58)
6	607	1.19 (0.95,1.49)	119	1.66 (1.04,2.65)	285	1.22 (0.86,1.73)	98	0.92 (0.53,1.59)	105	0.94 (0.56,1.58)
7	40	1.19 (0.95,1.49)	*	1.66 (1.04,2.65)	20	1.22 (0.86,1.73)	*	0.92 (0.53,1.59)	*	0.94 (0.56,1.58)
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 552. Reasons for First Revision Following Primary THA for Actis DuoFix Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	34	35.1
2	Dislocation/Instability	20	20.6
3	Peri-prosthetic fracture - Femur	12	12.4
4	Aseptic Loosening	8	8.2
5	Pain	7	7.2
6	Metal Reaction/Metallosis	5	5.2
7	Malalignment	4	4.1
8	Implant Failure	3	3.1
9	Peri-prosthetic fracture - Acetabulum	3	3.1
10	Poly liner wear	1	1.0

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Table 553. Reasons for First Revision in the First 90 Days Following Primary THA for Actis DuoFix Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	17	34.7
2	Dislocation/Instability	13	26.5
3	Peri-prosthetic fracture - Femur	9	18.4
4	Peri-prosthetic fracture - Acetabulum	3	6.1
5	Aseptic Loosening	2	4.1
6	Pain	2	4.1
7	Implant Failure	1	2.0
8	Metal Reaction/Metallosis	1	2.0
9	Malalignment	1	2.0

Table 554. Reasons for First Revision Between 91 and 365 days Following Primary THA for Actis DuoFix Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	9	34.6
2	Dislocation/Instability	5	19.2
3	Pain	4	15.4
4	Aseptic Loosening	2	7.7
5	Peri-prosthetic fracture - Femur	2	7.7
6	Malalignment	2	7.7
7	Implant Failure	1	3.8
8	Metal Reaction/Metallosis	1	3.8

Table 555. Descriptive Statistics of Cases Receiving the Actis DuoFix Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	6,037	55.97	
Age (years)	10,786	66.17 (10.01)	67.00 (13.00)
Height (cm)	10,786	169.77 (10.39)	170.00 (15.24)
Weight (kg)	10,786	89.33 (21.02)	87.54 (28.60)
BMI(kg/m^2)	10,786	30.87 (6.23)	30.13 (8.32)
Smoker - Never (%)	5,479	50.8	
Smoker - Previous (%)	3,894	36.1	
Smoker - Current (%)	1,401	12.99	
Smoker - Unknown (%)	12	0.11	

Table 556. Distribution of Approach Used for Actis DuoFix Stem in Primary THA Cases

Approach	N	Percent
Anterior	6,278	58.2
Anterolateral	1418	13.2
Posterior	3,089	28.6
Transtrochanteric	0	0.0
Missing/unknown/other	1	0.0

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Table 557. Distribution of Head Size for Actis DuoFix Stem in Primary THA Cases

Size (mm)	N	Percent
22	1	0.0
28	72	0.7
32	2,276	22.5
36	6,634	65.6
40	1,101	10.9
Missing/unknown/other	26	0.3

Table 558. Distribution of Bearing Surface for Actis DuoFix Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	989	9.2
Ceramic-on-plastic	9,088	84.3
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	81	0.8
Missing/unknown/other	628	5.8

Table 559. Distribution of Polyethylene Used for Actis DuoFix Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	70	0.7
XLPE	10,092	99.1
Antioxidant XLPE	22	0.2
Missing/unknown/other	0	0.0

Table 560. Volume of Cases by Surgeon and Site for the Actis DuoFix Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	151 (259)	43 (172)
Cases per site	256 (404)	89 (280)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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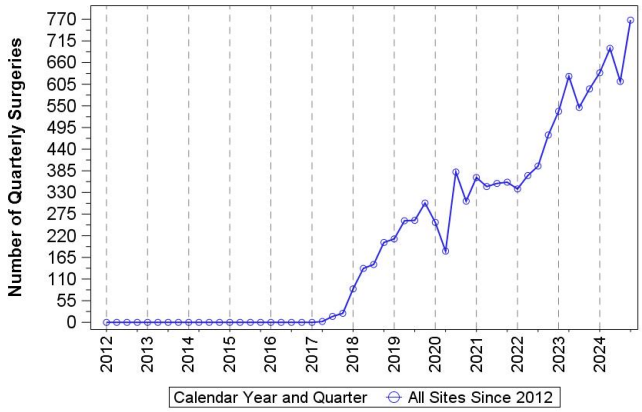


Figure 210. Utilization of the Actis DuoFix Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

101011060	101012040	101011010
101011050	101012080	101012010
101011040	101012030	101011110
101011070	101011090	101012110
101012060	101012090	101012120
101011030	101011020	101011120
101012070	101012020	101012005
101011080	101011100	
101012050	101012100	

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3.2.5 AML

N = 811 primary cases were used for this analysis. Distribution of utilization: 17 surgeons across 14 sites used this implant in primary THA cases.

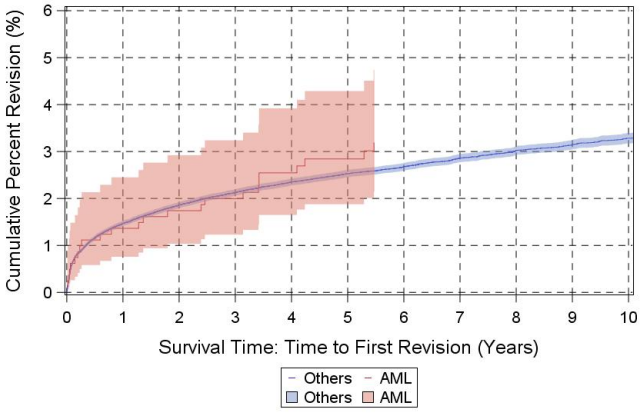


Figure 211. Cumulative Percent Revision Curve for the AML Stem, Compared to All Other Femoral Components in Primary THA Cases

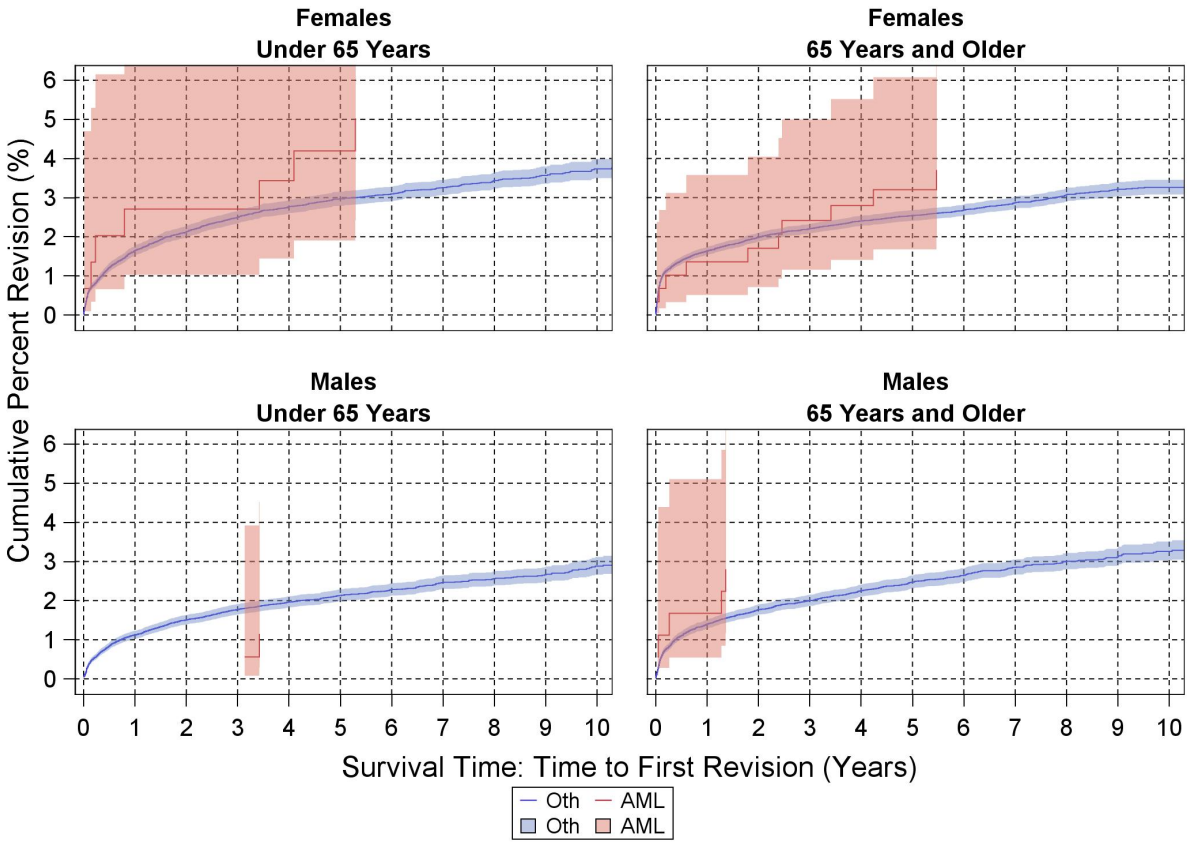


Figure 212. Cumulative Percent Revision Curve for the AML Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 561. Cumulative Percent Revision and Number at Risk for the AML Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	807	0.00 (0.00,0.00)	148	0.00 (0.00,0.00)	295	0.00 (0.00,0.00)	185	0.00 (0.00,0.00)	179	0.00 (0.00,0.00)
1	792	1.36 (0.76,2.45)	143	2.71 (1.02,7.05)	289	1.36 (0.51,3.58)	185	0.00 (0.00,0.00)	175	1.68 (0.54,5.11)
2	775	1.74 (1.03,2.92)	141	2.71 (1.02,7.05)	282	1.70 (0.71,4.05)	183	0.00 (0.00,0.00)	169	2.80 (1.18,6.60)
3	746	2.00 (1.23,3.24)	139	2.71 (1.02,7.05)	267	2.41 (1.16,5.00)	179	0.00 (0.00,0.00)	161	2.80 (1.18,6.60)
4	667	2.55 (1.65,3.92)	128	3.43 (1.44,8.06)	242	2.80 (1.41,5.52)	159	1.15 (0.29,4.52)	138	2.80 (1.18,6.60)
5	599	2.84 (1.88,4.29)	119	4.19 (1.90,9.11)	221	3.20 (1.68,6.08)	144	1.15 (0.29,4.52)	115	2.80 (1.18,6.60)
6	507	3.19 (2.15,4.74)	100	5.03 (2.42,10.28)	183	3.71 (2.00,6.82)	123	1.15 (0.29,4.52)	101	2.80 (1.18,6.60)
7	375	3.19 (2.15,4.74)	78	5.03 (2.42,10.28)	131	3.71 (2.00,6.82)	90	1.15 (0.29,4.52)	76	2.80 (1.18,6.60)
8	272	3.19 (2.15,4.74)	58	5.03 (2.42,10.28)	101	3.71 (2.00,6.82)	58	1.15 (0.29,4.52)	55	2.80 (1.18,6.60)
9	173	3.19 (2.15,4.74)	39	5.03 (2.42,10.28)	65	3.71 (2.00,6.82)	33	1.15 (0.29,4.52)	36	2.80 (1.18,6.60)
10	91	3.19 (2.15,4.74)	18	5.03 (2.42,10.28)	32	3.71 (2.00,6.82)	20	1.15 (0.29,4.52)	21	2.80 (1.18,6.60)

Table 562. Reasons for First Revision Following Primary THA for AML Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	9	37.5
2	Dislocation/Instability	7	29.2
3	Aseptic Loosening	3	12.5
4	Pain	2	8.3
5	Poly liner wear	1	4.2
6	Peri-prosthetic fracture - Acetabulum	1	4.2
7	Malalignment	1	4.2

Table 563. Reasons for First Revision in the First 90 Days Following Primary THA for AML Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	4	50.0
2	Joint Infection	2	25.0
3	Peri-prosthetic fracture - Acetabulum	1	12.5
4	Malalignment	1	12.5

Table 564. Reasons for First Revision Between 91 and 365 days Following Primary THA for AML Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	2	66.7
2	Dislocation/Instability	1	33.3

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Table 565. Descriptive Statistics of Cases Receiving the AML Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	446	54.99	
Age (years)	811	66.92 (10.63)	67.00 (15.00)
Height (cm)	811	169.82 (10.47)	170.00 (15.24)
Weight (kg)	811	89.75 (21.20)	87.80 (28.16)
BMI(kg/m^2)	811	31.03 (6.47)	30.42 (8.49)
Smoker - Never (%)	378	46.61	
Smoker - Previous (%)	297	36.62	
Smoker - Current (%)	136	16.77	
Smoker - Unknown (%)	0	0.0	

Table 566. Distribution of Approach Used for AML Stem in Primary THA Cases

Approach	N	Percent
Anterior	9	1.1
Anterolateral	637	78.5
Posterior	163	20.1
Transtrochanteric	0	0.0
Missing/unknown/other	2	0.2

Table 567. Distribution of Head Size for AML Stem in Primary THA Cases

Size (mm)	N	Percent
28	5	0.6
32	186	23.1
36	505	62.8
40	106	13.2
44	1	0.1
Missing/unknown/other	1	0.1

Table 568. Distribution of Bearing Surface for AML Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	699	86.2
Ceramic-on-plastic	103	12.7
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	1	0.1
Missing/unknown/other	8	1.0

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Table 569. Distribution of Polyethylene Used for AML Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.1
XLPE	803	99.9
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 570. Volume of Cases by Surgeon and Site for the AML Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	47 (110)	6 (18)
Cases per site	57 (138)	8 (55)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

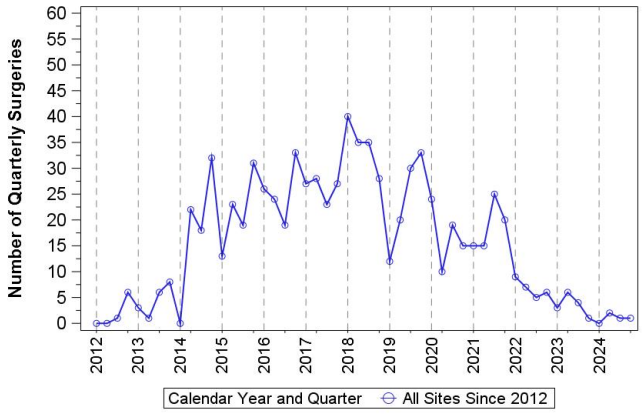


Figure 213. Utilization of the AML Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

155402135
155402121
155401121
155402150
155401135
155402165
155401106
155401150
155401165
155402106
155402180
155401180
155403135
155402195
155401195
155401210
155403150
155403165
155403180

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3.2.6 Anthology

N = 6,893 primary cases were used for this analysis. Distribution of utilization: 62 surgeons across 40 sites used this implant in primary THA cases.

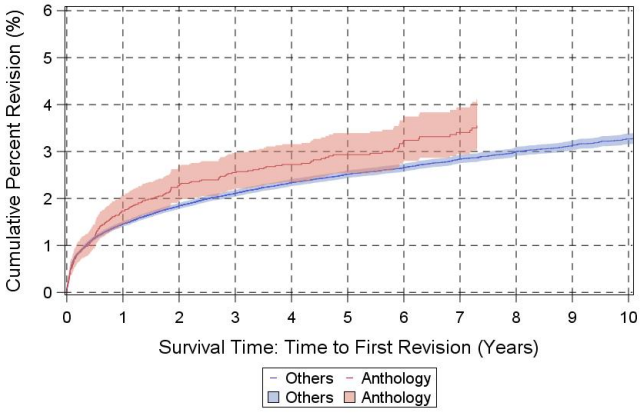


Figure 214. Cumulative Percent Revision Curve for the Anthology Stem, Compared to All Other Femoral Components in Primary THA Cases

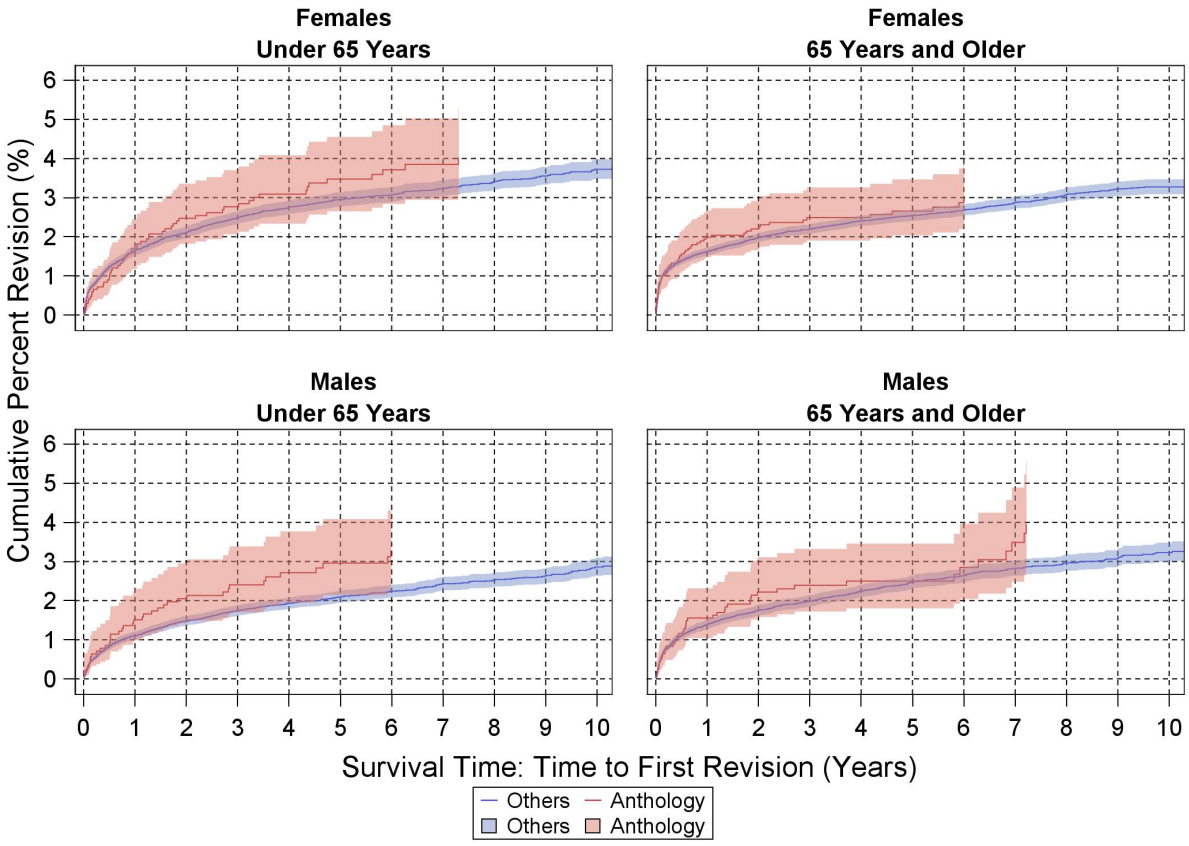


Figure 215. Cumulative Percent Revision Curve for the Anthology Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 571. Cumulative Percent Revision and Number at Risk for the Anthology Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	6,859	0.00 (0.00,0.00)	1,676	0.00 (0.00,0.00)	2,197	0.00 (0.00,0.00)	1,412	0.00 (0.00,0.00)	1,570	0.00 (0.00,0.00)
1	6,370	1.73 (1.45,2.07)	1,582	1.69 (1.17,2.44)	2,011	1.99 (1.48,2.67)	1,334	1.51 (0.99,2.31)	1,440	1.56 (1.05,2.31)
2	5,665	2.27 (1.94,2.66)	1,418	2.47 (1.82,3.36)	1,794	2.20 (1.66,2.92)	1,203	2.05 (1.42,2.96)	1,248	2.22 (1.58,3.11)
3	4,822	2.55 (2.19,2.97)	1,241	2.77 (2.06,3.70)	1,513	2.49 (1.90,3.26)	1,032	2.40 (1.70,3.39)	1,035	2.39 (1.72,3.32)
4	4,137	2.72 (2.35,3.16)	1,084	3.09 (2.33,4.08)	1,299	2.49 (1.90,3.26)	878	2.71 (1.95,3.77)	876	2.50 (1.80,3.46)
5	3,397	2.93 (2.53,3.39)	921	3.47 (2.65,4.55)	1,041	2.66 (2.03,3.47)	736	2.96 (2.14,4.08)	699	2.50 (1.80,3.46)
6	2,718	3.24 (2.80,3.75)	767	3.71 (2.84,4.85)	828	2.99 (2.29,3.90)	589	3.29 (2.38,4.52)	534	2.85 (2.04,3.96)
7	2,111	3.41 (2.94,3.94)	586	3.85 (2.94,5.02)	625	2.99 (2.29,3.90)	473	3.29 (2.38,4.52)	427	3.49 (2.48,4.89)
8	1,598	3.55 (3.06,4.12)	443	4.03 (3.07,5.27)	464	2.99 (2.29,3.90)	371	3.29 (2.38,4.52)	320	3.96 (2.82,5.56)
9	985	3.55 (3.06,4.12)	264	4.03 (3.07,5.27)	258	2.99 (2.29,3.90)	259	3.29 (2.38,4.52)	204	3.96 (2.82,5.56)
10	471	3.55 (3.06,4.12)	123	4.03 (3.07,5.27)	125	2.99 (2.29,3.90)	139	3.29 (2.38,4.52)	84	3.96 (2.82,5.56)

Table 572. Reasons for First Revision Following Primary THA for Anthology Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	48	25.0
2	Dislocation/Instability	40	20.8
3	Joint Infection	37	19.3
4	Peri-prosthetic fracture - Femur	30	15.6
5	Malalignment	14	7.3
6	Implant Failure	10	5.2
7	Pain	7	3.6
8	Peri-prosthetic fracture - Acetabulum	4	2.1
9	Metal Reaction/Metallosis	2	1.0

Table 573. Reasons for First Revision in the First 90 Days Following Primary THA for Anthology Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	23	39.0
2	Dislocation/Instability	11	18.6
3	Joint Infection	10	17.0
4	Aseptic Loosening	4	6.8
5	Implant Failure	4	6.8
6	Peri-prosthetic fracture - Acetabulum	4	6.8
7	Malalignment	3	5.1

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Table 574. Reasons for First Revision Between 91 and 365 days Following Primary THA for Anthology Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	16	30.2
2	Joint Infection	14	26.4
3	Aseptic Loosening	12	22.6
4	Pain	5	9.4
5	Peri-prosthetic fracture - Femur	3	5.7
6	Malalignment	2	3.8
7	Implant Failure	1	1.9

Table 575. Descriptive Statistics of Cases Receiving the Anthology Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	3,891	56.45	
Age (years)	6,893	65.14 (10.54)	66.00 (13.00)
Height (cm)	6,893	169.52 (10.11)	168.00 (15.24)
Weight (kg)	6,893	90.28 (22.11)	88.00 (28.61)
BMI(kg/m^2)	6,893	31.32 (6.80)	30.45 (8.87)
Smoker - Never (%)	3,385	49.11	
Smoker - Previous (%)	2,598	37.69	
Smoker - Current (%)	898	13.03	
Smoker - Unknown (%)	12	0.17	

Table 576. Distribution of Approach Used for Anthology Stem in Primary THA Cases

Approach	N	Percent
Anterior	3,472	50.4
Anterolateral	2546	36.9
Posterior	786	11.4
Transtrochanteric	85	1.2
Missing/unknown/other	4	0.1

Table 577. Distribution of Head Size for Anthology Stem in Primary THA Cases

Size (mm)	N	Percent
22	4	0.1
28	31	0.5
32	1,363	22.4
36	4,236	69.8
40	395	6.5
44	17	0.3
Missing/unknown/other	24	0.4

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Table 578. Distribution of Bearing Surface for Anthology Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,223	17.7
Ceramic-on-plastic	4,822	70.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	803	11.7
Missing/unknown/other	45	0.7

Table 579. Distribution of Polyethylene Used for Anthology Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	4	0.1
XLPE	6,847	99.9
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 580. Volume of Cases by Surgeon and Site for the Anthology Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	111 (226)	14 (74)
Cases per site	172 (263)	51 (227)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

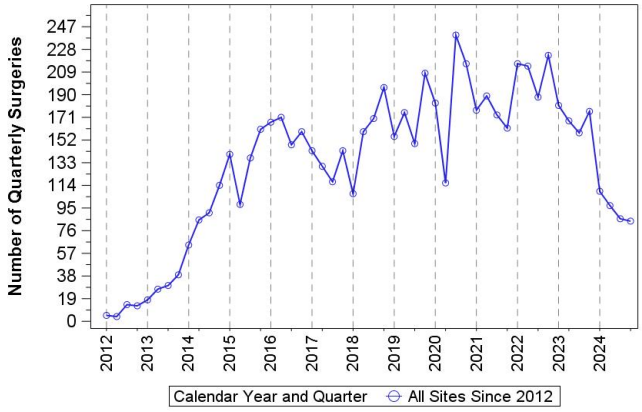


Figure 216. Utilization of the Anthology Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

71356006	71357107	71357111
71356007	71357108	71356001
71356005	71356103	71357104
71356008	71356111	71357103
71356106	71357106	71357112
71356108	71356002	71357011
71356107	71356011	71357002
71356004	71357005	71356113
71356105	71357109	71357012
71356003	71357004	71356013
71356009	71357105	71356101
71356010	71357009	71356114
71356109	71357110	71357102
71356110	71357003	71357001
71356104	71356112	71357101
71357006	71357010	71356014
71357007	71356012	
71357008	71356102	

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3.2.7 Avenir (Cemented)

N = 2,226 primary cases were used for this analysis. Distribution of utilization: 71 surgeons across 46 sites used this implant in primary THA cases.

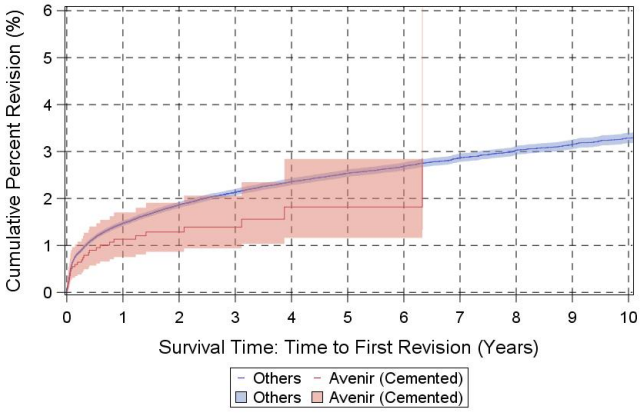


Figure 217. Cumulative Percent Revision Curve for the Avenir (Cemented) Stem, Compared to All Other Femoral Components in Primary THA Cases

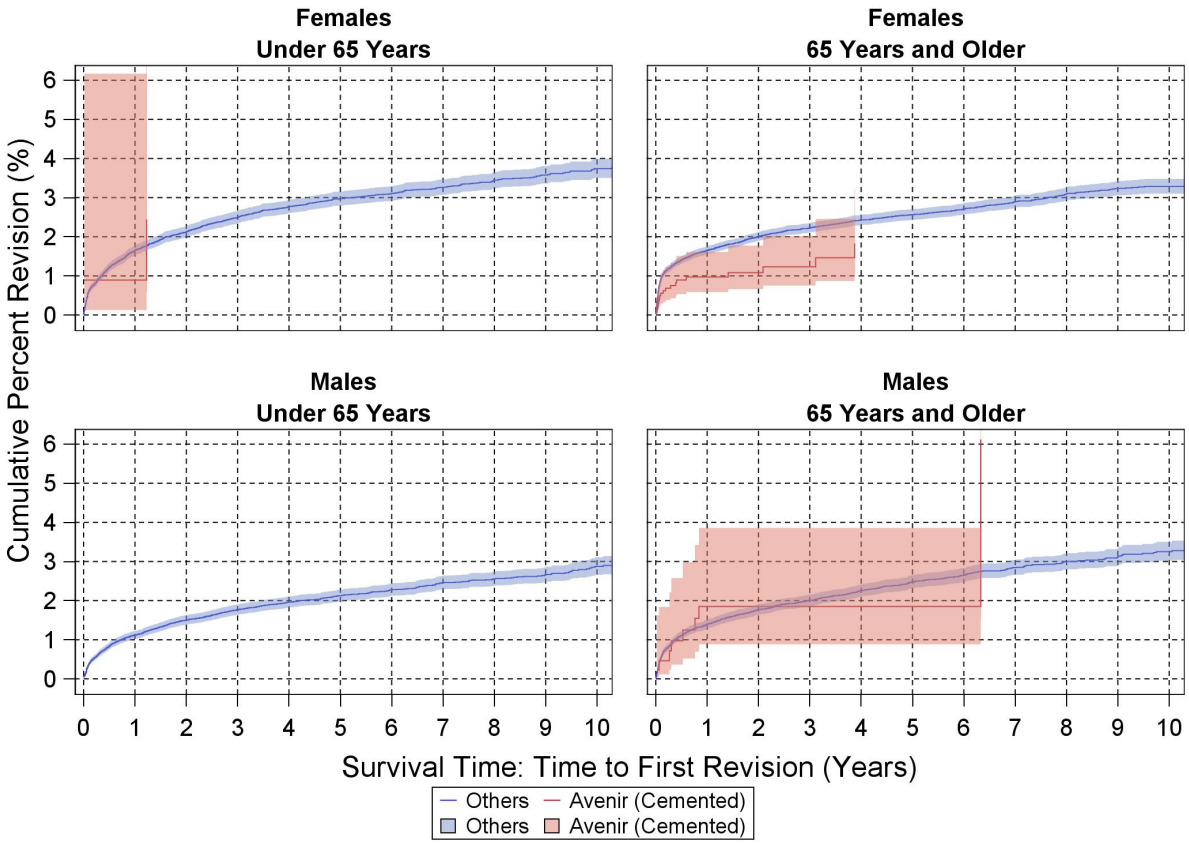


Figure 218. Cumulative Percent Revision Curve for the Avenir (Cemented) Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 581. Cumulative Percent Revision and Number at Risk for the Avenir (Cemented) Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	2,215	0.00 (0.00,0.00)	113	0.00 (0.00,0.00)	1,635	0.00 (0.00,0.00)	30	0.00 (0.00,0.00)	436	0.00 (0.00,0.00)
1	1,457	1.13 (0.75,1.70)	68	0.89 (0.13,6.17)	1,059	0.97 (0.59,1.61)	25	0.00 (0.00,0.00)	304	1.85 (0.88,3.86)
2	968	1.29 (0.87,1.91)	48	2.44 (0.59,9.88)	690	1.08 (0.66,1.78)	17	0.00 (0.00,0.00)	212	1.85 (0.88,3.86)
3	607	1.39 (0.94,2.06)	25	2.44 (0.59,9.88)	436	1.23 (0.75,2.02)	12	0.00 (0.00,0.00)	134	1.85 (0.88,3.86)
4	364	1.82 (1.16,2.84)	15	2.44 (0.59,9.88)	260	1.83 (1.03,3.22)	*	0.00 (0.00,0.00)	81	1.85 (0.88,3.86)
5	238	1.82 (1.16,2.84)	12	2.44 (0.59,9.88)	166	1.83 (1.03,3.22)	*	0.00 (0.00,0.00)	54	1.85 (0.88,3.86)
6	118	1.82 (1.16,2.84)	*	2.44 (0.59,9.88)	82	1.83 (1.03,3.22)	*	0.00 (0.00,0.00)	28	1.85 (0.88,3.86)
7	61	2.85 (1.33,6.07)	*	2.44 (0.59,9.88)	44	1.83 (1.03,3.22)	*	0.00 (0.00,0.00)	11	6.12 (1.55,22.54)
8	19	2.85 (1.33,6.07)	*	2.44 (0.59,9.88)	18	1.83 (1.03,3.22)	0	N/A	0	N/A
9	*	2.85 (1.33,6.07)	*	2.44 (0.59,9.88)	*	1.83 (1.03,3.22)	0	N/A	0	N/A
10	*	2.85 (1.33,6.07)	0	N/A	*	1.83 (1.03,3.22)	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 582. Reasons for First Revision Following Primary THA for Avenir (Cemented) Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	11	37.9
2	Dislocation/Instability	9	31.0
3	Peri-prosthetic fracture - Femur	3	10.3
4	Aseptic Loosening	2	6.9
5	Peri-prosthetic fracture - Acetabulum	2	6.9
6	Implant Failure	1	3.4
7	Metal Reaction/Metallosis	1	3.4

Table 583. Reasons for First Revision in the First 90 Days Following Primary THA for Avenir (Cemented) Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	7	50.0
2	Dislocation/Instability	4	28.6
3	Peri-prosthetic fracture - Acetabulum	2	14.3
4	Peri-prosthetic fracture - Femur	1	7.1

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Table 584. Reasons for First Revision Between 91 and 365 days Following Primary THA for Avenir (Cemented) Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	4	44.4
2	Dislocation/Instability	3	33.3
3	Aseptic Loosening	2	22.2

Table 585. Descriptive Statistics of Cases Receiving the Avenir (Cemented) Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,756	78.89	
Age (years)	2,226	76.46 (7.66)	77.00 (10.00)
Height (cm)	2,209	164.73 (9.43)	163.80 (12.70)
Weight (kg)	2,209	77.50 (17.48)	76.00 (25.20)
BMI(kg/m^2)	2,209	28.49 (5.64)	27.99 (7.55)
Smoker - Never (%)	1,182	53.1	
Smoker - Previous (%)	907	40.75	
Smoker - Current (%)	125	5.62	
Smoker - Unknown (%)	12	0.54	

Table 586. Distribution of Approach Used for Avenir (Cemented) Stem in Primary THA Cases

Approach	N	Percent
Anterior	1,293	58.1
Anterolateral	183	8.2
Posterior	725	32.6
Transtrochanteric	4	0.2
Missing/unknown/other	21	0.9

Table 587. Distribution of Head Size for Avenir (Cemented) Stem in Primary THA Cases

Size (mm)	N	Percent
28	4	0.2
32	259	15.5
36	1,228	73.5
40	143	8.6
Missing/unknown/other	36	2.2

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Table 588. Distribution of Bearing Surface for Avenir (Cemented) Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	261	11.7
Ceramic-on-plastic	1,373	61.7
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	510	22.9
Missing/unknown/other	82	3.7

Table 589. Distribution of Polyethylene Used for Avenir (Cemented) Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.1
XLPE	1,299	60.2
Antioxidant XLPE	856	39.7
Missing/unknown/other	0	0.0

Table 590. Volume of Cases by Surgeon and Site for the Avenir (Cemented) Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	31 (53)	7 (35)
Cases per site	48 (73)	15 (64)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

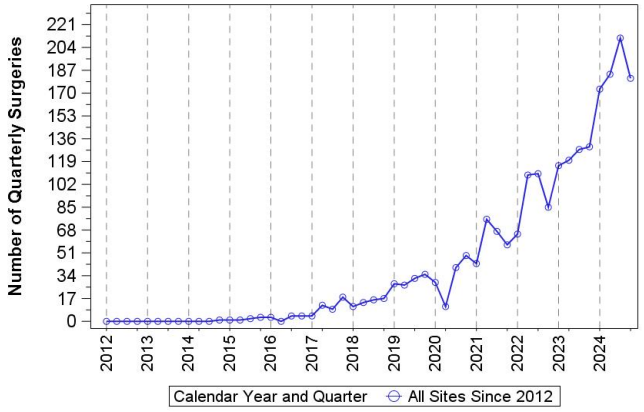


Figure 219. Utilization of the Avenir (Cemented) Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

106010204	106010201	106010301
106010203	106010206	106010307
106010205	106010306	106010308
106010202	106010303	106010208
106010304	106010302	
106010305	106010207	

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3.2.8 Avenir (Cementless)

N = 1,384 primary cases were used for this analysis. Distribution of utilization: 39 surgeons across 24 sites used this implant in primary THA cases.

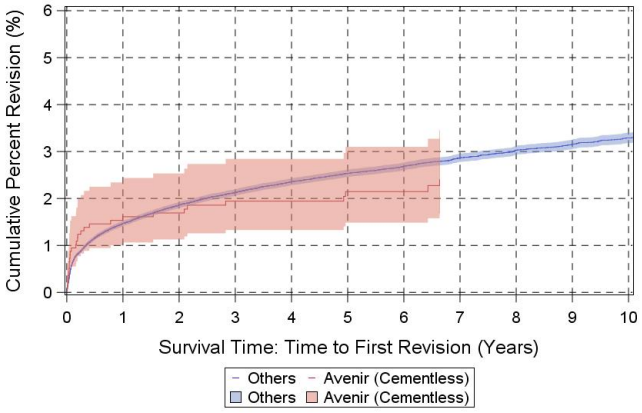


Figure 220. Cumulative Percent Revision Curve for the Avenir (Cementless) Stem, Compared to All Other Femoral Components in Primary THA Cases

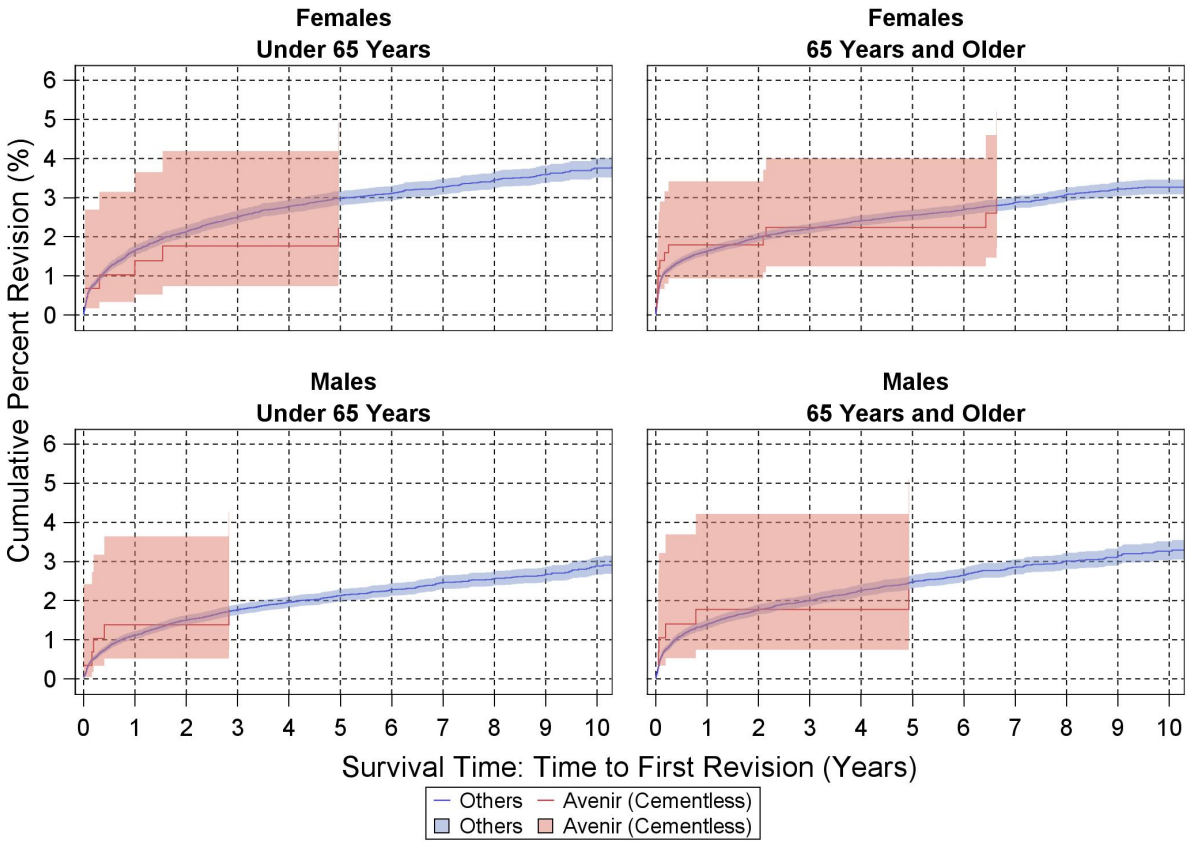


Figure 221. Cumulative Percent Revision Curve for the Avenir (Cementless) Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 591. Cumulative Percent Revision and Number at Risk for the Avenir (Cementless) Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,376	0.00 (0.00,0.00)	294	0.00 (0.00,0.00)	503	0.00 (0.00,0.00)	290	0.00 (0.00,0.00)	287	0.00 (0.00,0.00)
1	1,283	1.61 (1.06,2.44)	274	1.39 (0.52,3.65)	478	1.79 (0.94,3.42)	270	1.38 (0.52,3.64)	259	1.78 (0.74,4.22)
2	1,198	1.69 (1.13,2.53)	251	1.76 (0.74,4.19)	445	1.79 (0.94,3.42)	259	1.38 (0.52,3.64)	241	1.78 (0.74,4.22)
3	1,102	1.94 (1.33,2.84)	232	1.76 (0.74,4.19)	410	2.24 (1.24,4.00)	238	1.79 (0.75,4.26)	220	1.78 (0.74,4.22)
4	1,025	1.94 (1.33,2.84)	218	1.76 (0.74,4.19)	377	2.24 (1.24,4.00)	226	1.79 (0.75,4.26)	202	1.78 (0.74,4.22)
5	960	2.15 (1.48,3.10)	208	2.23 (1.00,4.92)	350	2.24 (1.24,4.00)	212	1.79 (0.75,4.26)	188	2.30 (1.03,5.09)
6	815	2.15 (1.48,3.10)	183	2.23 (1.00,4.92)	285	2.24 (1.24,4.00)	184	1.79 (0.75,4.26)	163	2.30 (1.03,5.09)
7	682	2.41 (1.68,3.45)	157	2.23 (1.00,4.92)	231	2.99 (1.71,5.20)	153	1.79 (0.75,4.26)	141	2.30 (1.03,5.09)
8	508	2.41 (1.68,3.45)	118	2.23 (1.00,4.92)	170	2.99 (1.71,5.20)	113	1.79 (0.75,4.26)	107	2.30 (1.03,5.09)
9	326	2.41 (1.68,3.45)	81	2.23 (1.00,4.92)	110	2.99 (1.71,5.20)	77	1.79 (0.75,4.26)	58	2.30 (1.03,5.09)
10	192	2.41 (1.68,3.45)	43	2.23 (1.00,4.92)	59	2.99 (1.71,5.20)	53	1.79 (0.75,4.26)	37	2.30 (1.03,5.09)

Table 592. Reasons for First Revision Following Primary THA for Avenir (Cementless) Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	10	35.7
2	Aseptic Loosening	7	25.0
3	Dislocation/Instability	7	25.0
4	Joint Infection	2	7.1
5	Pain	2	7.1

Table 593. Reasons for First Revision in the First 90 Days Following Primary THA for Avenir (Cementless) Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	7	41.2
2	Aseptic Loosening	6	35.3
3	Dislocation/Instability	3	17.6
4	Joint Infection	1	5.9

Table 594. Reasons for First Revision Between 91 and 365 days Following Primary THA for Avenir (Cementless) Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	33.3
2	Joint Infection	1	33.3
3	Pain	1	33.3

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Table 595. Descriptive Statistics of Cases Receiving the Avenir (Cementless) Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	801	57.88	
Age (years)	1,384	65.93 (10.73)	66.00 (13.00)
Height (cm)	1,206	169.19 (10.10)	168.00 (14.64)
Weight (kg)	1,206	85.47 (19.40)	83.65 (26.40)
BMI(kg/m^2)	1,206	29.70 (5.46)	29.14 (7.35)
Smoker - Never (%)	679	49.06	
Smoker - Previous (%)	552	39.88	
Smoker - Current (%)	153	11.05	
Smoker - Unknown (%)	0	0.0	

Table 596. Distribution of Approach Used for Avenir (Cementless) Stem in Primary THA Cases

Approach	N	Percent
Anterior	477	34.5
Anterolateral	167	12.1
Posterior	562	40.6
Transtrochanteric	0	0.0
Missing/unknown/other	178	12.9

Table 597. Distribution of Head Size for Avenir (Cementless) Stem in Primary THA Cases

Size (mm)	N	Percent
28	3	0.2
32	168	14.1
36	914	76.5
40	105	8.8
Missing/unknown/other	5	0.4

Table 598. Distribution of Bearing Surface for Avenir (Cementless) Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	390	28.2
Ceramic-on-plastic	800	57.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	183	13.2
Missing/unknown/other	11	0.8

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Table 599. Distribution of Polyethylene Used for Avenir (Cementless) Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	972	70.7
Antioxidant XLPE	403	29.3
Missing/unknown/other	0	0.0

Table 600. Volume of Cases by Surgeon and Site for the Avenir (Cementless) Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	35 (85)	3 (30)
Cases per site	57 (117)	8 (68)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

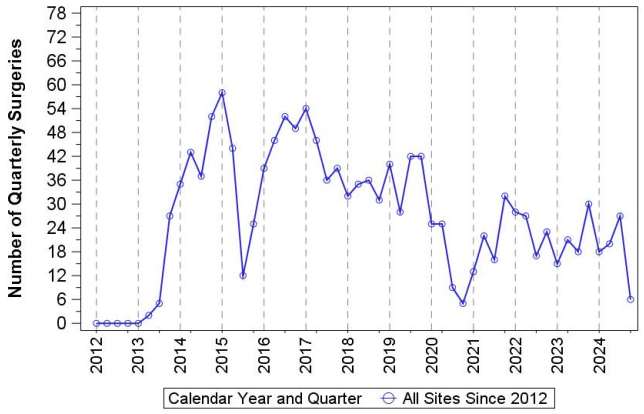


Figure 222. Utilization of the Avenir (Cementless) Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

106010004
106010005
106010002
106010003
106010006
106010105
106010104
106010106
106010103
106010107
106010001
106010007
106010102
106010008
106010101
106010108
106010109
106010009

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3.2.9 Avenir Complete

N = 9,248 primary cases were used for this analysis. Distribution of utilization: 92 surgeons across 56 sites used this implant in primary THA cases.

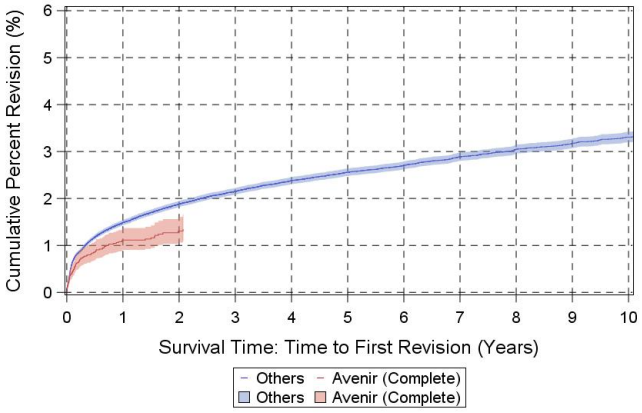


Figure 223. Cumulative Percent Revision Curve for the Avenir Complete Stem, Compared to All Other Femoral Components in Primary THA Cases

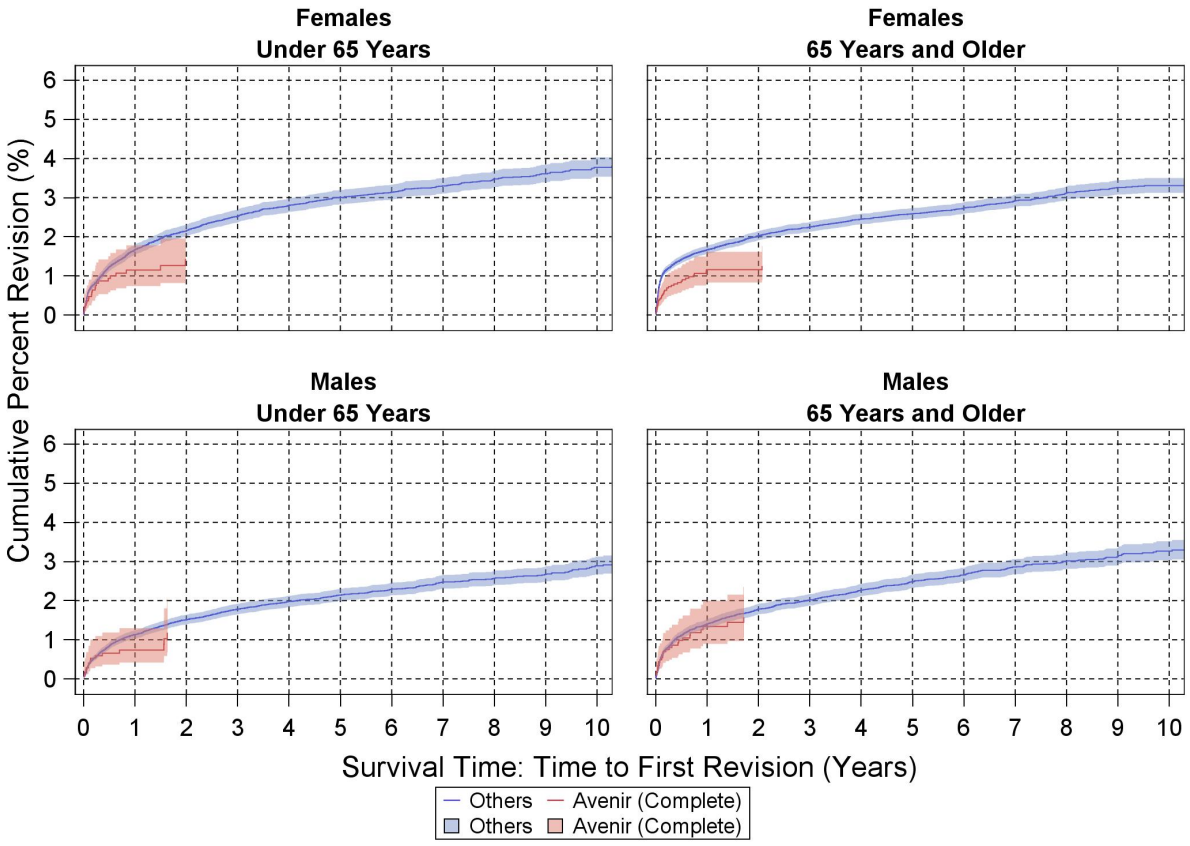


Figure 224. Cumulative Percent Revision Curve for the Avenir Complete Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 601. Cumulative Percent Revision and Number at Risk for the Avenir Complete Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	9,227	0.00 (0.00,0.00)	1,955	0.00 (0.00,0.00)	3,422	0.00 (0.00,0.00)	1,772	0.00 (0.00,0.00)	2,075	0.00 (0.00,0.00)
1	5,450	1.11 (0.91,1.37)	1,152	1.15 (0.74,1.78)	2,078	1.16 (0.83,1.61)	1,030	0.74 (0.42,1.30)	1,188	1.34 (0.89,2.00)
2	2,685	1.31 (1.06,1.61)	565	1.44 (0.92,2.25)	1,065	1.16 (0.83,1.61)	474	1.18 (0.68,2.05)	580	1.58 (1.05,2.35)
3	957	1.35 (1.09,1.66)	214	1.44 (0.92,2.25)	405	1.25 (0.89,1.76)	150	1.18 (0.68,2.05)	187	1.58 (1.05,2.35)
4	176	1.35 (1.09,1.66)	42	1.44 (0.92,2.25)	85	1.25 (0.89,1.76)	24	1.18 (0.68,2.05)	25	1.58 (1.05,2.35)
5	11	1.35 (1.09,1.66)	*	1.44 (0.92,2.25)	*	1.25 (0.89,1.76)	*	1.18 (0.68,2.05)	*	1.58 (1.05,2.35)
6	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
7	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 602. Reasons for First Revision Following Primary THA for Avenir Complete Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	29	29.3
2	Peri-prosthetic fracture - Femur	27	27.3
3	Dislocation/Instability	19	19.2
4	Aseptic Loosening	18	18.2
5	Poly liner wear	2	2.0
6	Malalignment	2	2.0
7	Implant Failure	1	1.0
8	Pain	1	1.0

Table 603. Reasons for First Revision in the First 90 Days Following Primary THA for Avenir Complete Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	25	39.1
2	Joint Infection	14	21.9
3	Dislocation/Instability	12	18.8
4	Aseptic Loosening	9	14.1
5	Malalignment	2	3.1
6	Poly liner wear	1	1.6
7	Implant Failure	1	1.6

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Table 604. Reasons for First Revision Between 91 and 365 days Following Primary THA for Avenir Complete Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	11	40.7
2	Aseptic Loosening	7	25.9
3	Dislocation/Instability	6	22.2
4	Peri-prosthetic fracture - Femur	2	7.4
5	Poly liner wear	1	3.7

Table 605. Descriptive Statistics of Cases Receiving the Avenir Complete Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	5,387	58.25	
Age (years)	9,248	66.03 (10.86)	67.00 (14.00)
Height (cm)	9,248	169.38 (10.25)	168.00 (15.24)
Weight (kg)	9,248	86.61 (20.44)	84.50 (27.79)
BMI(kg/m^2)	9,248	30.06 (6.05)	29.41 (8.12)
Smoker - Never (%)	4,756	51.43	
Smoker - Previous (%)	3,259	35.24	
Smoker - Current (%)	1,215	13.14	
Smoker - Unknown (%)	18	0.19	

Table 606. Distribution of Approach Used for Avenir Complete Stem in Primary THA Cases

Approach	N	Percent
Anterior	7,197	77.8
Anterolateral	394	4.3
Posterior	1,636	17.7
Transtrochanteric	9	0.1
Missing/unknown/other	12	0.1

Table 607. Distribution of Head Size for Avenir Complete Stem in Primary THA Cases

Size (mm)	N	Percent
28	4	0.1
32	1,068	12.5
36	6,145	71.8
40	1,283	15.0
Missing/unknown/other	53	0.6

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Table 608. Distribution of Bearing Surface for Avenir Complete Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	525	5.7
Ceramic-on-plastic	7,975	86.2
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	602	6.5
Missing/unknown/other	146	1.6

Table 609. Distribution of Polyethylene Used for Avenir Complete Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	3,540	38.8
Antioxidant XLPE	5,578	61.2
Missing/unknown/other	0	0.0

Table 610. Volume of Cases by Surgeon and Site for the Avenir Complete Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	100 (211)	29 (78)
Cases per site	165 (232)	86 (171)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

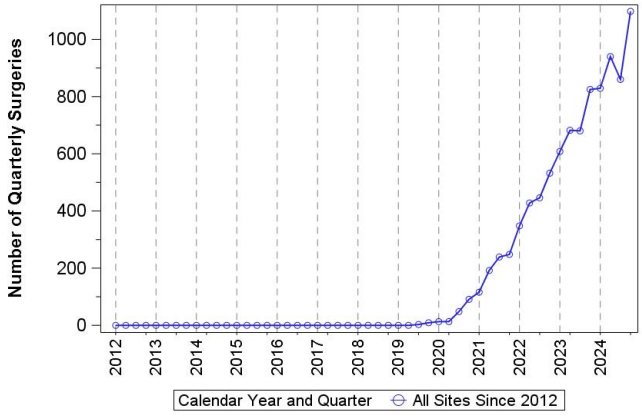


Figure 225. Utilization of the Avenir Complete Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

574202050	574201010	574201075
574202040	574203060	574203000
574202060	574102030	574101010
574202030	574101040	574103030
574201040	574101020	574203070
574201050	574202010	574102075
574201030	574101030	574103020
574201020	574101050	574102010
574202065	574201065	574101065
574202020	574102065	574101000
574201060	574202080	574101070
574203050	574102020	574201080
574202070	574203010	574102000
574203040	574101060	574102080
574203030	574103040	574101075
574203020	574201070	574101085
574102050	574102070	574102085
574102060	574201000	574101080
574202075	574203065	574101090
574102040	574103050	

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3.2.10 Corail

N = 4,212 primary cases were used for this analysis. Distribution of utilization: 50 surgeons across 34 sites used this implant in primary THA cases.

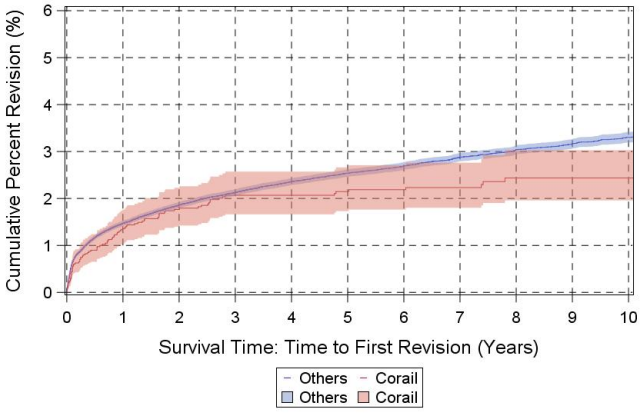


Figure 226. Cumulative Percent Revision Curve for the Corail Stem, Compared to All Other Femoral Components in Primary THA Cases

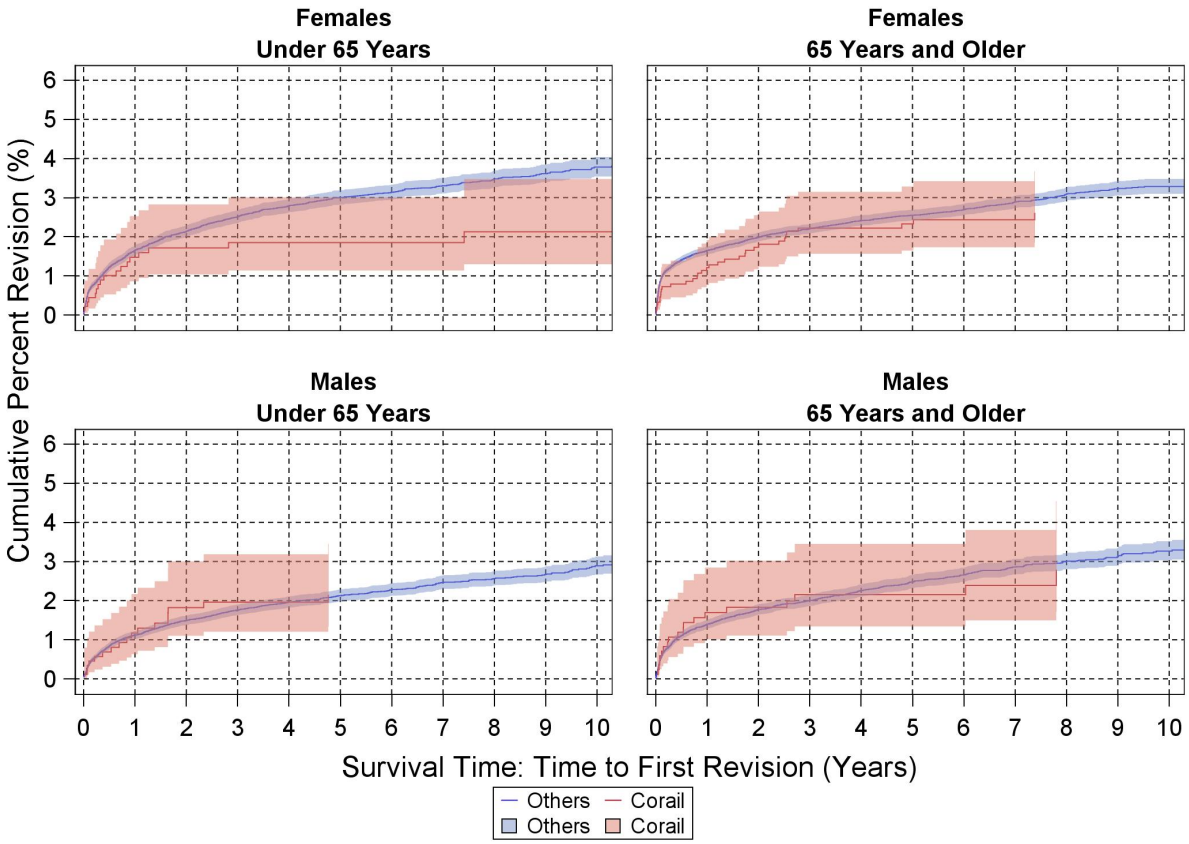


Figure 227. Cumulative Percent Revision Curve for the Corail Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 611. Cumulative Percent Revision and Number at Risk for the Corail Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	4,161	0.00 (0.00,0.00)	905	0.00 (0.00,0.00)	1,522	0.00 (0.00,0.00)	883	0.00 (0.00,0.00)	851	0.00 (0.00,0.00)
1	3,795	1.36 (1.04,1.77)	835	1.47 (0.86,2.53)	1,400	1.21 (0.76,1.91)	799	1.17 (0.63,2.17)	761	1.69 (1.01,2.84)
2	3,453	1.77 (1.40,2.23)	777	1.71 (1.04,2.83)	1,273	1.73 (1.17,2.55)	728	1.82 (1.10,3.00)	675	1.83 (1.11,3.02)
3	3,059	2.07 (1.66,2.57)	699	1.85 (1.14,3.01)	1,130	2.22 (1.56,3.15)	645	1.96 (1.20,3.18)	585	2.15 (1.34,3.45)
4	2,688	2.07 (1.66,2.57)	635	1.85 (1.14,3.01)	987	2.22 (1.56,3.15)	562	1.96 (1.20,3.18)	504	2.15 (1.34,3.45)
5	2,454	2.15 (1.73,2.66)	579	1.85 (1.14,3.01)	902	2.33 (1.65,3.28)	513	2.15 (1.33,3.45)	460	2.15 (1.34,3.45)
6	2,185	2.19 (1.76,2.71)	517	1.85 (1.14,3.01)	793	2.44 (1.73,3.42)	462	2.15 (1.33,3.45)	413	2.15 (1.34,3.45)
7	1,756	2.23 (1.80,2.76)	412	1.85 (1.14,3.01)	639	2.44 (1.73,3.42)	371	2.15 (1.33,3.45)	334	2.39 (1.50,3.81)
8	1,158	2.44 (1.96,3.03)	274	2.13 (1.30,3.48)	409	2.61 (1.85,3.68)	256	2.15 (1.33,3.45)	219	2.79 (1.71,4.54)
9	684	2.44 (1.96,3.03)	171	2.13 (1.30,3.48)	223	2.61 (1.85,3.68)	158	2.15 (1.33,3.45)	132	2.79 (1.71,4.54)
10	348	2.44 (1.96,3.03)	93	2.13 (1.30,3.48)	111	2.61 (1.85,3.68)	77	2.15 (1.33,3.45)	67	2.79 (1.71,4.54)

Table 612. Reasons for First Revision Following Primary THA for Corail Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	25	28.4
2	Aseptic Loosening	21	23.9
3	Dislocation/Instability	18	20.5
4	Peri-prosthetic fracture - Femur	10	11.4
5	Implant Failure	5	5.7
6	Pain	4	4.5
7	Malalignment	4	4.5
8	Peri-prosthetic fracture - Acetabulum	1	1.1

Table 613. Reasons for First Revision in the First 90 Days Following Primary THA for Corail Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	8	26.7
2	Dislocation/Instability	7	23.3
3	Aseptic Loosening	6	20.0
4	Joint Infection	5	16.7
5	Implant Failure	2	6.7
6	Peri-prosthetic fracture - Acetabulum	1	3.3
7	Pain	1	3.3

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Table 614. Reasons for First Revision Between 91 and 365 days Following Primary THA for Corail Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	8	32.0
2	Joint Infection	8	32.0
3	Aseptic Loosening	4	16.0
4	Pain	2	8.0
5	Malalignment	2	8.0
6	Implant Failure	1	4.0

Table 615. Descriptive Statistics of Cases Receiving the Corail Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,456	58.31	
Age (years)	4,212	65.88 (10.25)	66.00 (14.00)
Height (cm)	4,056	169.41 (10.45)	168.00 (15.24)
Weight (kg)	4,056	88.55 (20.59)	86.36 (28.12)
BMI(kg/m^2)	4,056	30.77 (6.73)	29.92 (8.17)
Smoker - Never (%)	1,977	46.94	
Smoker - Previous (%)	1,611	38.25	
Smoker - Current (%)	618	14.67	
Smoker - Unknown (%)	6	0.14	

Table 616. Distribution of Approach Used for Corail Stem in Primary THA Cases

Approach	N	Percent
Anterior	2,345	55.7
Anterolateral	931	22.1
Posterior	767	18.2
Transtrochanteric	7	0.2
Missing/unknown/other	162	3.9

Table 617. Distribution of Head Size for Corail Stem in Primary THA Cases

Size (mm)	N	Percent
28	11	0.3
32	829	20.0
36	2,892	69.6
40	393	9.5
44	16	0.4
Missing/unknown/other	13	0.3

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Table 618. Distribution of Bearing Surface for Corail Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,308	31.1
Ceramic-on-plastic	2,825	67.1
Ceramic-on-ceramic	0	0.0
Metal-on-metal	1	0.0
Dual mobility	16	0.4
Missing/unknown/other	62	1.5

Table 619. Distribution of Polyethylene Used for Corail Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	14	0.3
XLPE	4,146	99.6
Antioxidant XLPE	1	0.0
Missing/unknown/other	0	0.0

Table 620. Volume of Cases by Surgeon and Site for the Corail Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	84 (136)	7 (111)
Cases per site	123 (226)	23 (143)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

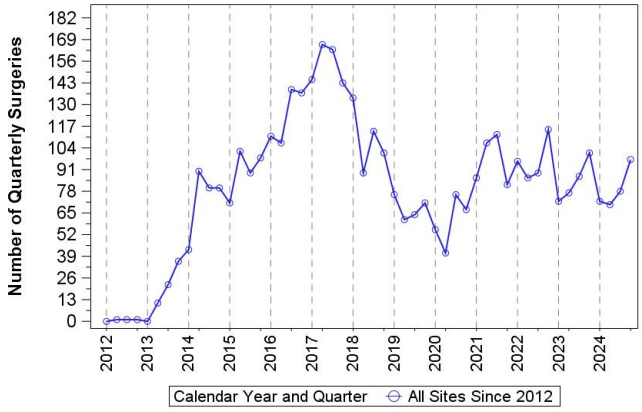


Figure 228. Utilization of the Corail Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

3L92502	3L92510	L971208
3L92501	L20311	L971310
3L92503	L20315	L20309
3L92500	3L92514	L971308
3L92504	L971109	3L92521
3L92505	L971210	L98112
L971112	L971116	L98115
3L92499	3L92515	L98120
L971111	L20316	L98015
3L92512	3L92508	L98016
3L92511	3L92509	L98018
L971113	L20310	3L92518
3L92513	L971209	L20320
L971110	3L92507	L98010
L20312	3L92516	L98020
3L92498	L971118	L98113
L971114	L20318	L98114
L20313	L98013	L98116
3L92506	L98014	
L20314	L98011	
L971115	L98012	

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3.2.11 Corail Coxa Vara

N = 898 primary cases were used for this analysis. Distribution of utilization: 32 surgeons across 28 sites used this implant in primary THA cases.

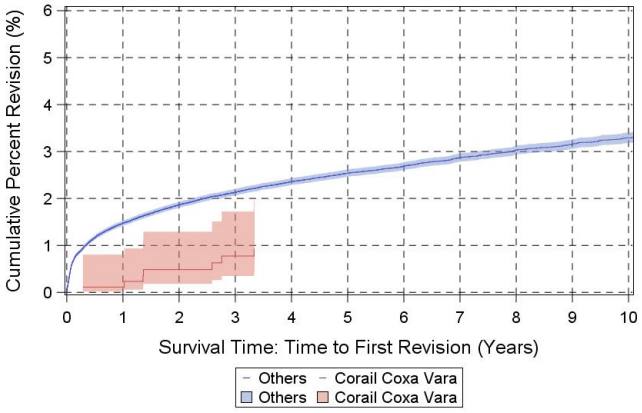


Figure 229. Cumulative Percent Revision Curve for the Corail Coxa Vara Stem, Compared to All Other Femoral Components in Primary THA Cases

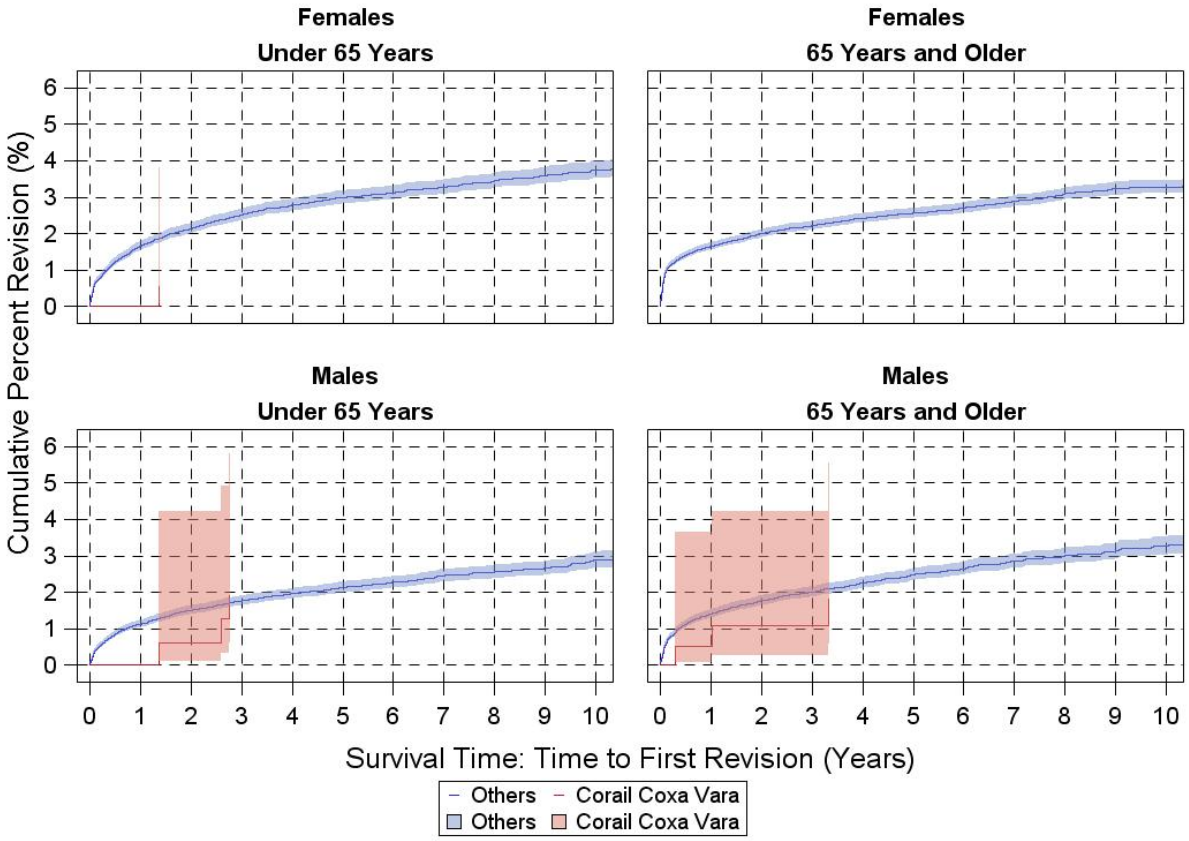


Figure 230. Cumulative Percent Revision Curve for the Corail Coxa Vara Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 621. Cumulative Percent Revision and Number at Risk for the Corail Coxa Vara Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	894	0.00 (0.00,0.00)	205	0.00 (0.00,0.00)	313	0.00 (0.00,0.00)	182	0.00 (0.00,0.00)	194	0.00 (0.00,0.00)
1	827	0.11 (0.02,0.81)	191	0.00 (0.00,0.00)	285	0.00 (0.00,0.00)	171	0.00 (0.00,0.00)	180	0.52 (0.07,3.66)
2	756	0.49 (0.18,1.29)	175	0.55 (0.08,3.82)	264	0.00 (0.00,0.00)	157	0.61 (0.09,4.22)	160	1.08 (0.27,4.24)
3	662	0.77 (0.35,1.72)	156	0.55 (0.08,3.82)	221	0.00 (0.00,0.00)	144	1.91 (0.62,5.82)	141	1.08 (0.27,4.24)
4	590	0.93 (0.44,1.95)	139	0.55 (0.08,3.82)	198	0.00 (0.00,0.00)	128	1.91 (0.62,5.82)	125	1.80 (0.58,5.56)
5	528	0.93 (0.44,1.95)	127	0.55 (0.08,3.82)	172	0.00 (0.00,0.00)	116	1.91 (0.62,5.82)	113	1.80 (0.58,5.56)
6	435	0.93 (0.44,1.95)	109	0.55 (0.08,3.82)	137	0.00 (0.00,0.00)	99	1.91 (0.62,5.82)	90	1.80 (0.58,5.56)
7	344	0.93 (0.44,1.95)	83	0.55 (0.08,3.82)	102	0.00 (0.00,0.00)	84	1.91 (0.62,5.82)	75	1.80 (0.58,5.56)
8	225	0.93 (0.44,1.95)	54	0.55 (0.08,3.82)	53	0.00 (0.00,0.00)	67	1.91 (0.62,5.82)	51	1.80 (0.58,5.56)
9	134	0.93 (0.44,1.95)	32	0.55 (0.08,3.82)	31	0.00 (0.00,0.00)	42	1.91 (0.62,5.82)	29	1.80 (0.58,5.56)
10	63	0.93 (0.44,1.95)	16	0.55 (0.08,3.82)	18	0.00 (0.00,0.00)	14	1.91 (0.62,5.82)	15	1.80 (0.58,5.56)

Table 622. Reasons for First Revision Following Primary THA for Corail Coxa Vara Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	6	85.7
2	Dislocation/Instability	1	14.3

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 623. Reasons for First Revision Between 91 and 365 days Following Primary THA for Corail Coxa Vara Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	100.0

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Table 624. Descriptive Statistics of Cases Receiving the Corail Coxa Vara Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	520	57.91	
Age (years)	898	65.43 (9.96)	66.00 (13.00)
Height (cm)	895	169.76 (10.18)	170.00 (15.24)
Weight (kg)	895	88.25 (19.71)	86.80 (25.19)
BMI(kg/m^2)	895	30.52 (5.74)	29.73 (7.84)
Smoker - Never (%)	415	46.21	
Smoker - Previous (%)	358	39.87	
Smoker - Current (%)	124	13.81	
Smoker - Unknown (%)	1	0.11	

Table 625. Distribution of Approach Used for Corail Coxa Vara Stem in Primary THA Cases

Approach	N	Percent
Anterior	559	62.2
Anterolateral	183	20.4
Posterior	151	16.8
Transtrochanteric	0	0.0
Missing/unknown/other	5	0.6

Table 626. Distribution of Head Size for Corail Coxa Vara Stem in Primary THA Cases

Size (mm)	N	Percent
28	11	1.2
32	220	25.1
36	608	69.2
40	32	3.6
44	1	0.1
Missing/unknown/other	6	0.7

Table 627. Distribution of Bearing Surface for Corail Coxa Vara Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	223	24.8
Ceramic-on-plastic	646	71.9
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	6	0.7
Missing/unknown/other	23	2.6

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Table 628. Distribution of Polyethylene Used for Corail Coxa Vara Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	4	0.5
XLPE	873	99.1
Antioxidant XLPE	4	0.5
Missing/unknown/other	0	0.0

Table 629. Volume of Cases by Surgeon and Site for the Corail Coxa Vara Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	28 (37)	8 (44)
Cases per site	32 (48)	9 (42)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

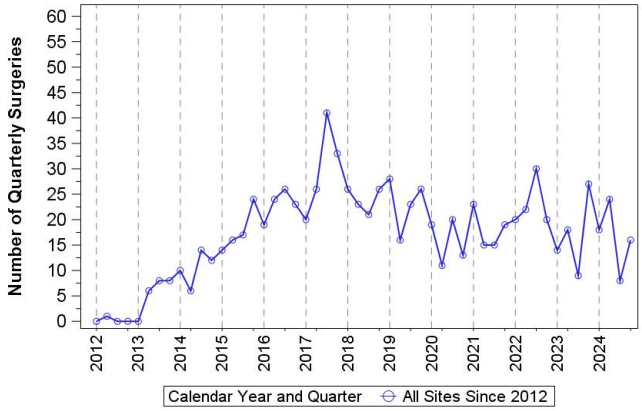


Figure 231. Utilization of the Corail Coxa Vara Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

3L93712	3L93714	3L93718
3L93711	3L93715	
3L93713	3L93709	
3L93710	3L93716	

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3.2.12 C-Stem AMT

N = 580 primary cases were used for this analysis. Distribution of utilization: 10 surgeons used this implant at fewer than 10 sites in primary THA cases.

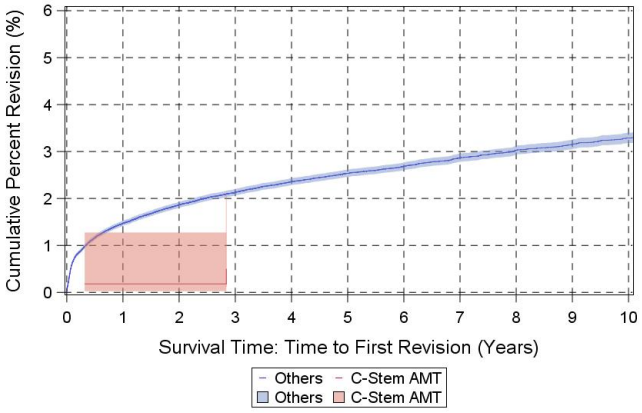


Figure 232. Cumulative Percent Revision Curve for the C-Stem AMT Stem, Compared to All Other Femoral Components in Primary THA Cases

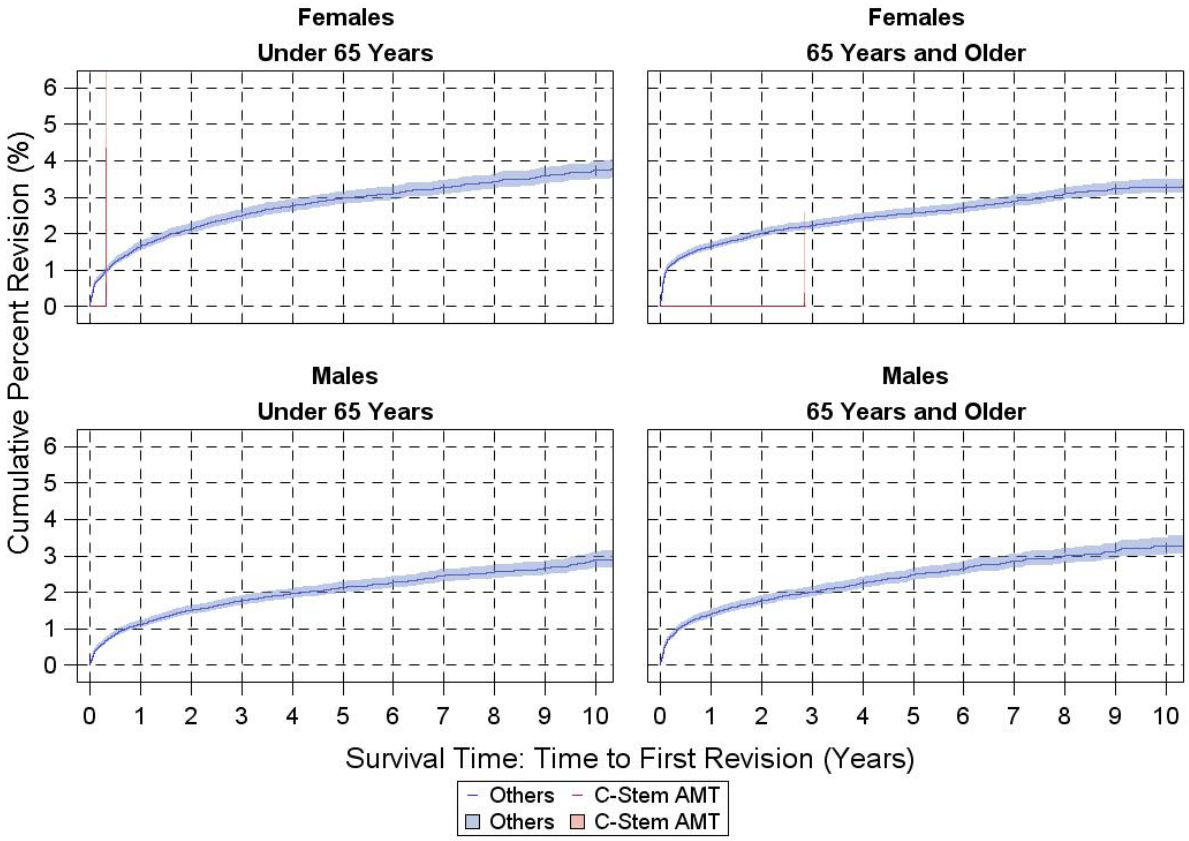


Figure 233. Cumulative Percent Revision Curve for the C-Stem AMT Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 630. Cumulative Percent Revision and Number at Risk for the C-Stem AMT Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	573	0.00 (0.00,0.00)	23	0.00 (0.00,0.00)	502	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	41	0.00 (0.00,0.00)
1	489	0.18 (0.03,1.28)	17	4.35 (0.62,27.07)	431	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	37	0.00 (0.00,0.00)
2	396	0.18 (0.03,1.28)	11	4.35 (0.62,27.07)	348	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	34	0.00 (0.00,0.00)
3	300	0.50 (0.12,2.10)	*	4.35 (0.62,27.07)	264	0.36 (0.05,2.56)	*	0.00 (0.00,0.00)	28	0.00 (0.00,0.00)
4	230	0.50 (0.12,2.10)	*	4.35 (0.62,27.07)	199	0.36 (0.05,2.56)	*	0.00 (0.00,0.00)	23	0.00 (0.00,0.00)
5	179	0.50 (0.12,2.10)	*	4.35 (0.62,27.07)	157	0.36 (0.05,2.56)	*	0.00 (0.00,0.00)	16	0.00 (0.00,0.00)
6	135	0.50 (0.12,2.10)	*	4.35 (0.62,27.07)	120	0.36 (0.05,2.56)	0	N/A	*	0.00 (0.00,0.00)
7	100	0.50 (0.12,2.10)	*	4.35 (0.62,27.07)	89	0.36 (0.05,2.56)	0	N/A	*	0.00 (0.00,0.00)
8	64	0.50 (0.12,2.10)	*	4.35 (0.62,27.07)	53	0.36 (0.05,2.56)	0	N/A	*	0.00 (0.00,0.00)
9	30	0.50 (0.12,2.10)	*	4.35 (0.62,27.07)	25	0.36 (0.05,2.56)	0	N/A	*	0.00 (0.00,0.00)
10	*	0.50 (0.12,2.10)	*	4.35 (0.62,27.07)	*	0.36 (0.05,2.56)	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 631. Reasons for First Revision Following Primary THA for C-Stem AMT Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	50.0
2	Peri-prosthetic fracture - Femur	1	50.0

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 632. Reasons for First Revision Between 91 and 365 days Following Primary THA for C-Stem AMT Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	100.0

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Table 633. Descriptive Statistics of Cases Receiving the C-Stem AMT Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	529	91.21	
Age (years)	580	77.79 (7.63)	78.00 (10.00)
Height (cm)	580	162.46 (7.69)	162.60 (11.00)
Weight (kg)	580	72.48 (15.30)	70.00 (20.45)
BMI(kg/m^2)	580	27.41 (5.18)	27.05 (7.41)
Smoker - Never (%)	290	50	
Smoker - Previous (%)	249	42.93	
Smoker - Current (%)	40	6.9	
Smoker - Unknown (%)	1	0.17	

Table 634. Distribution of Approach Used for C-Stem AMT Stem in Primary THA Cases

Approach	N	Percent
Anterior	311	53.6
Anterolateral	138	23.8
Posterior	131	22.6
Transtrochanteric	0	0.0
Missing/unknown/other	0	0.0

Table 635. Distribution of Head Size for C-Stem AMT Stem in Primary THA Cases

Size (mm)	N	Percent
28	8	1.4
32	293	53.2
36	237	43.0
40	11	2.0
Missing/unknown/other	2	0.4

Table 636. Distribution of Bearing Surface for C-Stem AMT Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	389	67.1
Ceramic-on-plastic	160	27.6
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	18	3.1
Missing/unknown/other	13	2.2

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Table 637. Distribution of Polyethylene Used for C-Stem AMT Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	11	1.9
XLPE	556	98.1
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 638. Volume of Cases by Surgeon and Site for the C-Stem AMT Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	58 (90)	5 (125)
Cases per site	64 (145)	4 (18)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

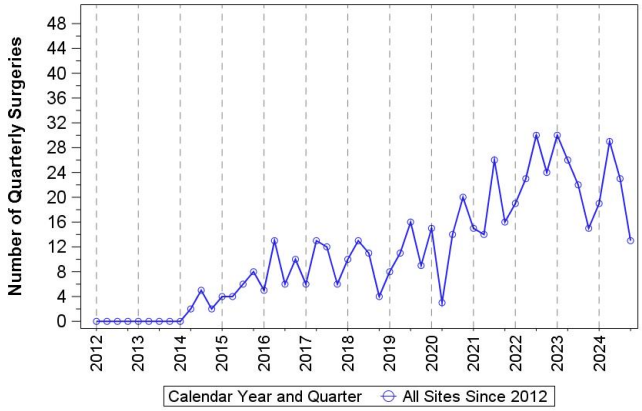


Figure 234. Utilization of the C-Stem AMT Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

157004085
157004070
157004090
157014085
157014090
157004100
157014070
157014100
157004110
157014110
157004120

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3.2.13 Echelon

N = 511 primary cases were used for this analysis. Distribution of utilization: 16 surgeons across 12 sites used this implant in primary THA cases.

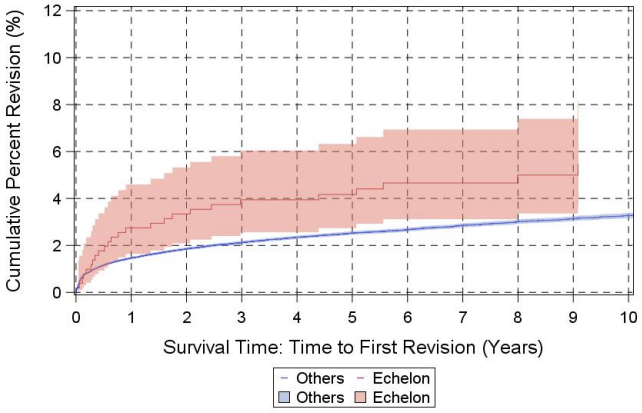


Figure 235. Cumulative Percent Revision Curve for the Echelon Stem, Compared to All Other Femoral Components in Primary THA Cases

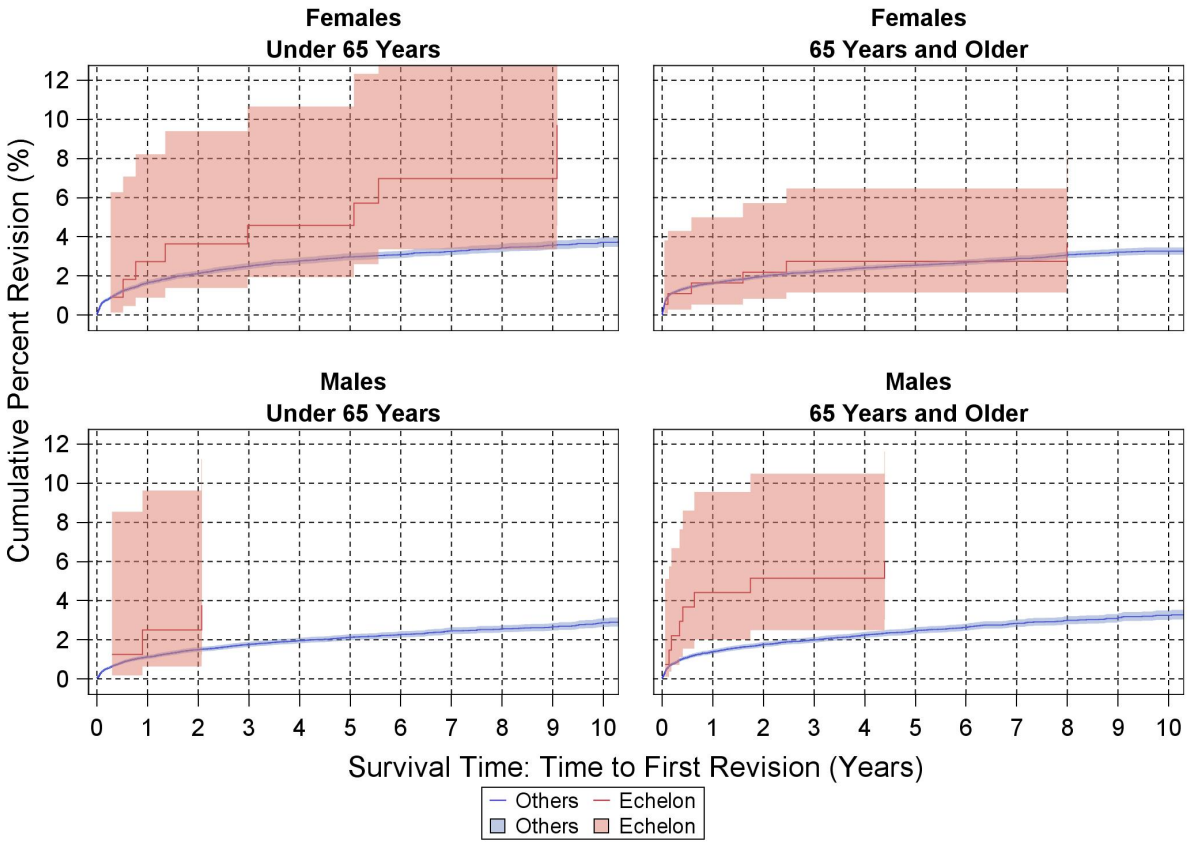


Figure 236. Cumulative Percent Revision Curve for the Echelon Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 639. Cumulative Percent Revision and Number at Risk for the Echelon Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	509	0.00 (0.00,0.00)	110	0.00 (0.00,0.00)	183	0.00 (0.00,0.00)	80	0.00 (0.00,0.00)	136	0.00 (0.00,0.00)
1	495	2.75 (1.64,4.60)	107	2.73 (0.89,8.22)	180	1.64 (0.53,5.00)	78	2.50 (0.63,9.63)	130	4.41 (2.01,9.56)
2	490	3.34 (2.09,5.32)	106	3.64 (1.38,9.40)	178	2.19 (0.83,5.72)	77	2.50 (0.63,9.63)	129	5.15 (2.49,10.49)
3	466	3.94 (2.56,6.05)	101	4.58 (1.93,10.66)	168	2.74 (1.15,6.47)	75	3.77 (1.23,11.22)	122	5.15 (2.49,10.49)
4	438	3.94 (2.56,6.05)	94	4.58 (1.93,10.66)	157	2.74 (1.15,6.47)	72	3.77 (1.23,11.22)	115	5.15 (2.49,10.49)
5	408	4.17 (2.74,6.32)	84	4.58 (1.93,10.66)	146	2.74 (1.15,6.47)	70	3.77 (1.23,11.22)	108	5.99 (3.04,11.63)
6	352	4.66 (3.12,6.94)	68	6.97 (3.36,14.18)	127	2.74 (1.15,6.47)	66	3.77 (1.23,11.22)	91	5.99 (3.04,11.63)
7	307	4.66 (3.12,6.94)	55	6.97 (3.36,14.18)	118	2.74 (1.15,6.47)	58	3.77 (1.23,11.22)	76	5.99 (3.04,11.63)
8	281	5.00 (3.36,7.40)	51	6.97 (3.36,14.18)	105	3.66 (1.63,8.14)	53	3.77 (1.23,11.22)	72	5.99 (3.04,11.63)
9	199	5.00 (3.36,7.40)	35	6.97 (3.36,14.18)	80	3.66 (1.63,8.14)	28	3.77 (1.23,11.22)	56	5.99 (3.04,11.63)
10	111	5.48 (3.67,8.12)	23	9.71 (4.57,19.99)	45	3.66 (1.63,8.14)	12	3.77 (1.23,11.22)	31	5.99 (3.04,11.63)

Table 640. Reasons for First Revision Following Primary THA for Echelon Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	8	33.3
2	Joint Infection	4	16.7
3	Pain	4	16.7
4	Aseptic Loosening	3	12.5
5	Implant Failure	2	8.3
6	Poly liner wear	1	4.2
7	Metal Reaction/Metallosis	1	4.2
8	Malalignment	1	4.2

Table 641. Reasons for First Revision in the First 90 Days Following Primary THA for Echelon Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	2	40.0
2	Aseptic Loosening	1	20.0
3	Implant Failure	1	20.0
4	Malalignment	1	20.0

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Table 642. Reasons for First Revision Between 91 and 365 days Following Primary THA for Echelon Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	4	50.0
2	Joint Infection	2	25.0
3	Pain	2	25.0

Table 643. Descriptive Statistics of Cases Receiving the Echelon Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	294	57.53	
Age (years)	511	67.70 (10.71)	68.00 (15.00)
Height (cm)	511	169.02 (10.83)	167.64 (17.78)
Weight (kg)	511	90.49 (22.79)	88.00 (32.40)
BMI(kg/m^2)	511	31.53 (6.76)	30.73 (8.90)
Smoker - Never (%)	267	52.25	
Smoker - Previous (%)	188	36.79	
Smoker - Current (%)	54	10.57	
Smoker - Unknown (%)	2	0.39	

Table 644. Distribution of Approach Used for Echelon Stem in Primary THA Cases

Approach	N	Percent
Anterior	3	0.6
Anterolateral	24	4.7
Posterior	482	94.3
Transtrochanteric	0	0.0
Missing/unknown/other	2	0.4

Table 645. Distribution of Head Size for Echelon Stem in Primary THA Cases

Size (mm)	N	Percent
28	16	3.2
32	237	47.2
36	240	47.8
40	2	0.4
Missing/unknown/other	7	1.4

Table 646. Distribution of Bearing Surface for Echelon Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	250	48.9
Ceramic-on-plastic	245	48.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	3	0.6
Missing/unknown/other	13	2.5

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Table 647. Distribution of Polyethylene Used for Echelon Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	389	77.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	116	23.0

Table 648. Volume of Cases by Surgeon and Site for the Echelon Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	31 (53)	1 (42)
Cases per site	42 (80)	1 (42)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

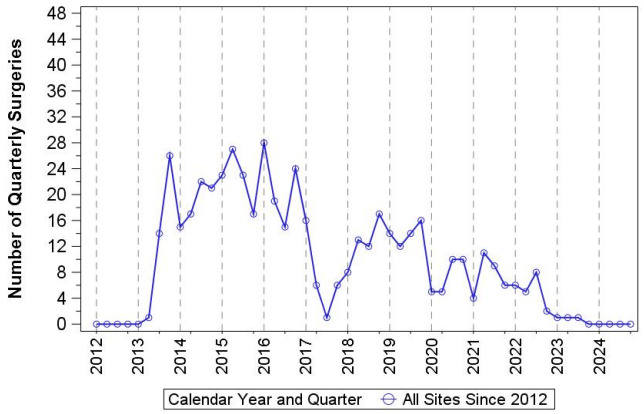


Figure 237. Utilization of the Echelon Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

71341012	71341011	71310414
71341013	71341025	71340114
71341014	71341026	71340612
71341015	71341017	71341018
71341023	71341027	71341029
71341022	71340115	
71341024	71341028	
71341016	71310116	

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3.2.14 Echo Bi-Metric

N = 2,021 primary cases were used for this analysis. Distribution of utilization: 42 surgeons across 34 sites used this implant in primary THA cases.

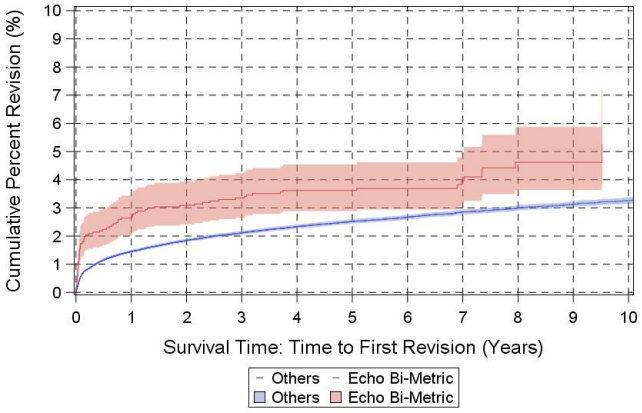


Figure 238. Cumulative Percent Revision Curve for the Echo Bi-Metric Stem, Compared to All Other Femoral Components in Primary THA Cases

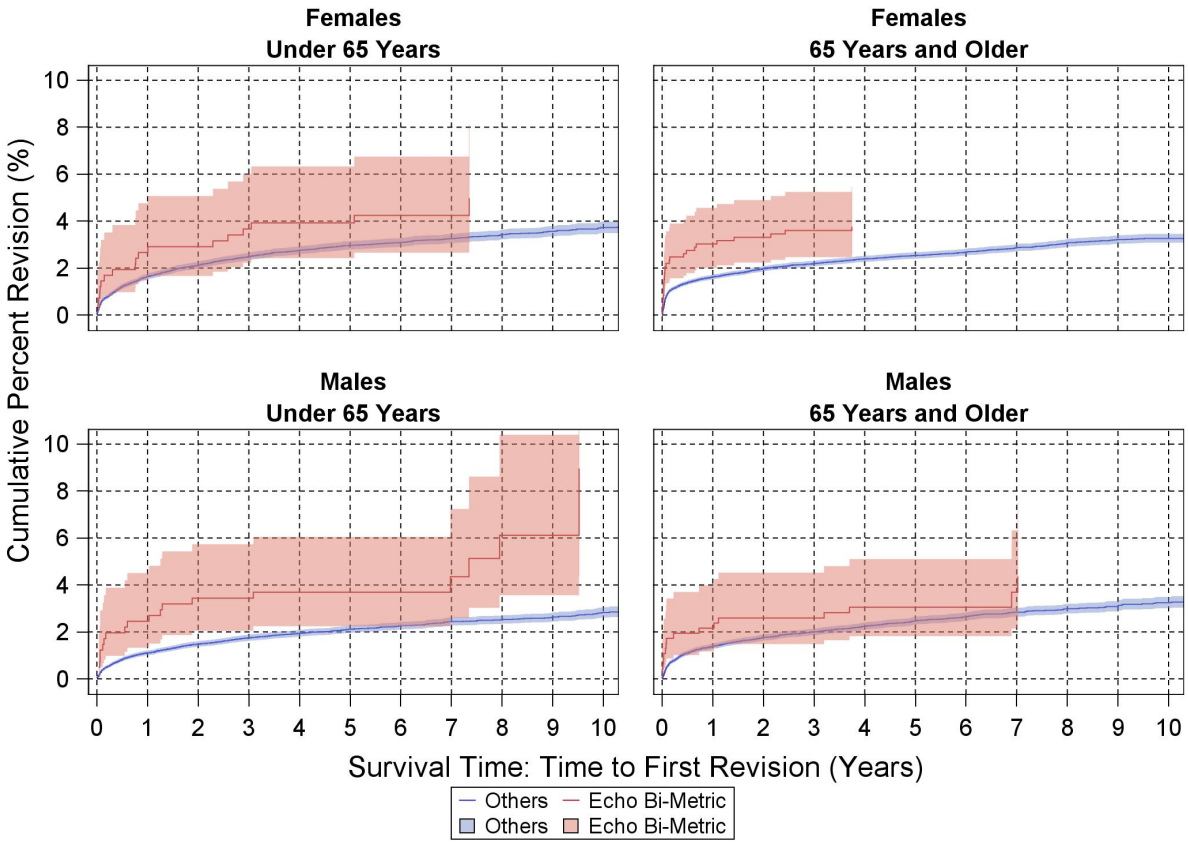


Figure 239. Cumulative Percent Revision Curve for the Echo Bi-Metric Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 649. Cumulative Percent Revision and Number at Risk for the Echo Bi-Metric Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	2,013	0.00 (0.00,0.00)	414	0.00 (0.00,0.00)	728	0.00 (0.00,0.00)	408	0.00 (0.00,0.00)	463	0.00 (0.00,0.00)
1	1,938	2.64 (2.02,3.44)	397	2.66 (1.48,4.76)	693	3.03 (2.00,4.56)	397	2.45 (1.33,4.51)	451	2.16 (1.17,3.98)
2	1,904	3.09 (2.42,3.95)	392	2.91 (1.66,5.07)	675	3.31 (2.23,4.90)	390	3.44 (2.05,5.74)	447	2.59 (1.48,4.52)
3	1,823	3.35 (2.64,4.24)	374	3.66 (2.23,6.01)	630	3.60 (2.46,5.24)	382	3.44 (2.05,5.74)	437	2.59 (1.48,4.52)
4	1,679	3.62 (2.88,4.54)	349	3.92 (2.42,6.33)	580	3.76 (2.59,5.44)	357	3.69 (2.24,6.05)	393	3.05 (1.82,5.10)
5	1,462	3.62 (2.88,4.54)	308	3.92 (2.42,6.33)	509	3.76 (2.59,5.44)	320	3.69 (2.24,6.05)	325	3.05 (1.82,5.10)
6	1,073	3.69 (2.94,4.62)	235	4.24 (2.65,6.75)	375	3.76 (2.59,5.44)	234	3.69 (2.24,6.05)	229	3.05 (1.82,5.10)
7	688	3.96 (3.14,4.98)	149	4.24 (2.65,6.75)	251	3.76 (2.59,5.44)	144	4.35 (2.60,7.24)	144	3.69 (2.14,6.33)
8	467	4.62 (3.63,5.87)	98	4.98 (3.04,8.09)	180	3.76 (2.59,5.44)	94	6.12 (3.56,10.40)	95	4.36 (2.52,7.49)
9	225	4.62 (3.63,5.87)	55	4.98 (3.04,8.09)	82	3.76 (2.59,5.44)	46	6.12 (3.56,10.40)	42	4.36 (2.52,7.49)
10	72	5.26 (3.82,7.21)	21	4.98 (3.04,8.09)	22	3.76 (2.59,5.44)	17	8.96 (4.37,17.90)	12	4.36 (2.52,7.49)

Table 650. Reasons for First Revision Following Primary THA for Echo Bi-Metric Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	28	35.0
2	Joint Infection	18	22.5
3	Dislocation/Instability	16	20.0
4	Aseptic Loosening	10	12.5
5	Implant Failure	4	5.0
6	Malalignment	2	2.5
7	Peri-prosthetic fracture - Acetabulum	1	1.2
8	Pain	1	1.2

Table 651. Reasons for First Revision in the First 90 Days Following Primary THA for Echo Bi-Metric Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	23	54.8
2	Aseptic Loosening	6	14.3
3	Dislocation/Instability	5	11.9
4	Joint Infection	4	9.5
5	Malalignment	2	4.8
6	Implant Failure	1	2.4
7	Peri-prosthetic fracture - Acetabulum	1	2.4

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Table 652. Reasons for First Revision Between 91 and 365 days Following Primary THA for Echo Bi-Metric Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	3	27.3
2	Dislocation/Instability	3	27.3
3	Joint Infection	2	18.2
4	Implant Failure	2	18.2
5	Peri-prosthetic fracture - Femur	1	9.1

Table 653. Descriptive Statistics of Cases Receiving the Echo Bi-Metric Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,144	56.61	
Age (years)	2,021	66.45 (11.08)	67.00 (14.00)
Height (cm)	2,021	169.48 (10.47)	168.90 (15.80)
Weight (kg)	2,021	89.17 (22.43)	86.80 (29.63)
BMI(kg/m^2)	2,021	30.91 (6.76)	29.94 (8.89)
Smoker - Never (%)	943	46.66	
Smoker - Previous (%)	754	37.31	
Smoker - Current (%)	319	15.78	
Smoker - Unknown (%)	5	0.25	

Table 654. Distribution of Approach Used for Echo Bi-Metric Stem in Primary THA Cases

Approach	N	Percent
Anterior	137	6.8
Anterolateral	64	3.2
Posterior	1,813	89.7
Transtrochanteric	1	0.1
Missing/unknown/other	6	0.3

Table 655. Distribution of Head Size for Echo Bi-Metric Stem in Primary THA Cases

Size (mm)	N	Percent
28	8	0.4
32	289	16.1
36	936	52.1
40	554	30.8
Missing/unknown/other	11	0.6

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Table 656. Distribution of Bearing Surface for Echo Bi-Metric Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	320	15.8
Ceramic-on-plastic	1,467	72.6
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	216	10.7
Missing/unknown/other	18	0.9

Table 657. Distribution of Polyethylene Used for Echo Bi-Metric Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	6	0.3
XLPE	1,280	63.6
Antioxidant XLPE	725	36.0
Missing/unknown/other	0	0.0

Table 658. Volume of Cases by Surgeon and Site for the Echo Bi-Metric Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	48 (125)	5 (48)
Cases per site	59 (147)	12 (54)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

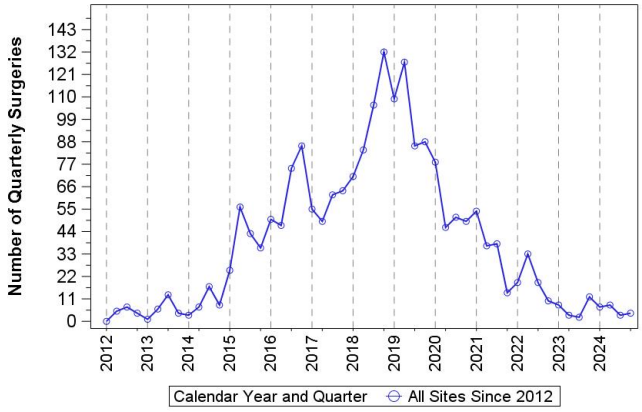


Figure 240. Utilization of the Echo Bi-Metric Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

192010	192412	192514
192012	192509	192017
192011	192413	192007
192113	192512	192107
192112	192510	192118
192111	192008	192515
192110	192116	192018
192114	192016	192416
192013	192414	192417
192014	192511	192516
192009	192108	192019
192411	192513	192020
192015	192407	192119
192109	192408	192517
192410	192508	192518
192115	192415	
192409	192117	

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3.2.15 Echo Bi-Metric Microplasty

N = 2,315 primary cases were used for this analysis. Distribution of utilization: 27 surgeons across 28 sites used this implant in primary THA cases.

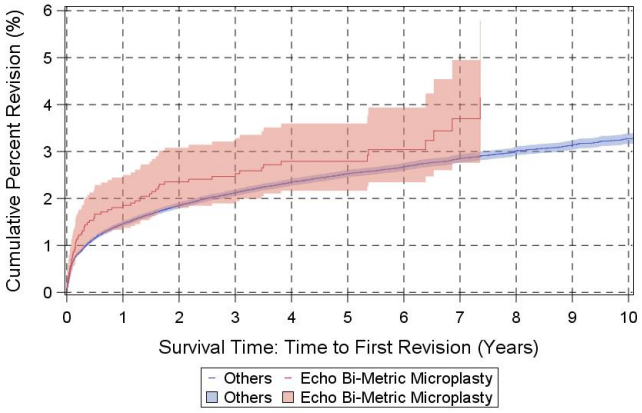


Figure 241. Cumulative Percent Revision Curve for the Echo Bi-Metric Microplasty Stem, Compared to All Other Femoral Components in Primary THA Cases

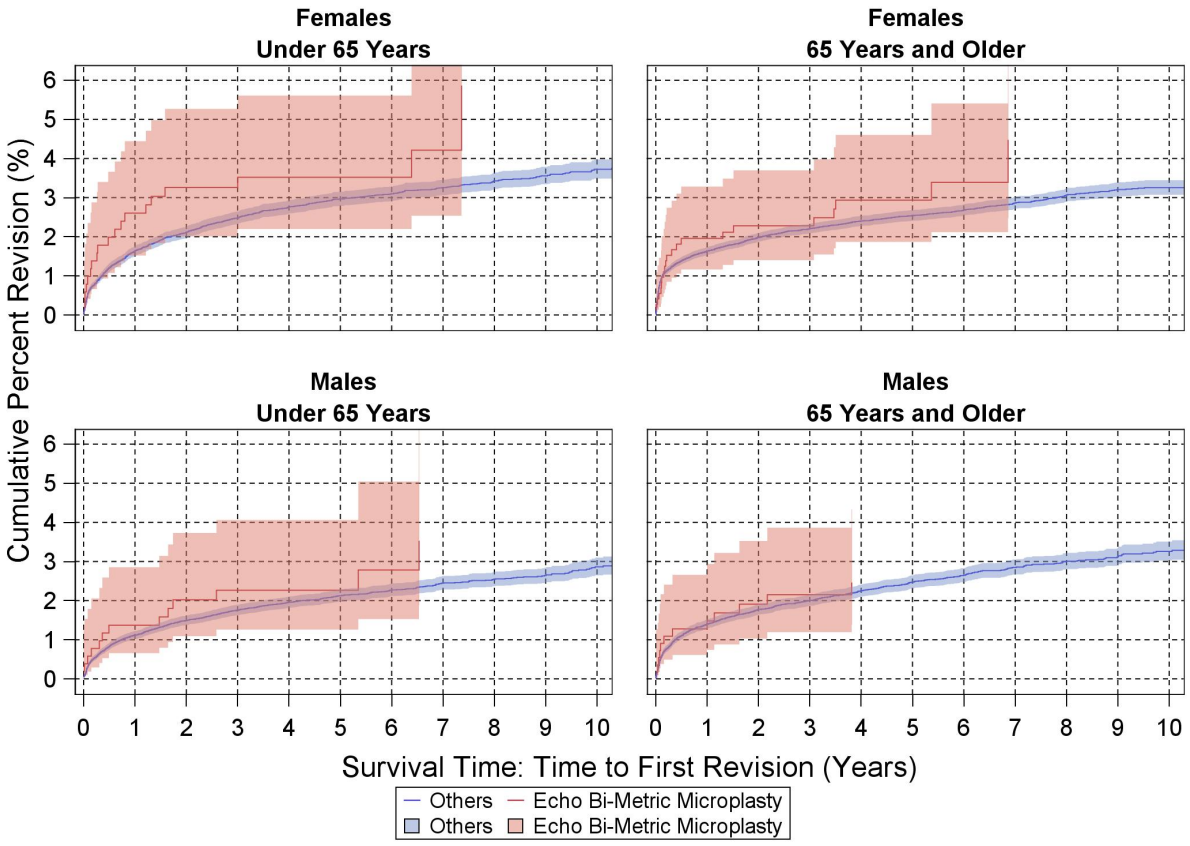


Figure 242. Cumulative Percent Revision Curve for the Echo Bi-Metric Microplasty Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 659. Cumulative Percent Revision and Number at Risk for the Echo Bi-Metric Microplasty Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	2,310	0.00 (0.00,0.00)	508	0.00 (0.00,0.00)	728	0.00 (0.00,0.00)	518	0.00 (0.00,0.00)	555	0.00 (0.00,0.00)
1	2,072	1.85 (1.37,2.50)	467	2.60 (1.52,4.44)	638	1.96 (1.16,3.28)	481	1.37 (0.66,2.86)	485	1.48 (0.74,2.94)
2	1,806	2.36 (1.80,3.08)	405	3.26 (2.01,5.27)	554	2.28 (1.40,3.70)	431	2.02 (1.09,3.73)	415	1.91 (1.03,3.52)
3	1,617	2.47 (1.89,3.21)	373	3.26 (2.01,5.27)	480	2.28 (1.40,3.70)	392	2.27 (1.26,4.06)	371	2.15 (1.19,3.86)
4	1,309	2.79 (2.16,3.60)	308	3.52 (2.20,5.61)	361	2.94 (1.87,4.60)	337	2.27 (1.26,4.06)	303	2.46 (1.39,4.34)
5	922	2.79 (2.16,3.60)	223	3.52 (2.20,5.61)	255	2.94 (1.87,4.60)	227	2.27 (1.26,4.06)	217	2.46 (1.39,4.34)
6	582	3.04 (2.35,3.94)	160	3.52 (2.20,5.61)	153	3.39 (2.12,5.41)	151	2.78 (1.53,5.04)	118	2.46 (1.39,4.34)
7	326	3.70 (2.76,4.95)	97	4.21 (2.54,6.95)	80	4.48 (2.48,8.02)	81	3.53 (1.89,6.56)	68	2.46 (1.39,4.34)
8	84	4.15 (2.96,5.79)	26	5.86 (3.04,11.17)	16	4.48 (2.48,8.02)	26	3.53 (1.89,6.56)	16	2.46 (1.39,4.34)
9	*	4.15 (2.96,5.79)	0	N/A	*	4.48 (2.48,8.02)	*	3.53 (1.89,6.56)	*	2.46 (1.39,4.34)
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 660. Reasons for First Revision Following Primary THA for Echo Bi-Metric Microplasty Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	25	38.5
2	Aseptic Loosening	11	16.9
3	Dislocation/Instability	11	16.9
4	Joint Infection	8	12.3
5	Pain	4	6.2
6	Malalignment	4	6.2
7	Implant Failure	2	3.1

Table 661. Reasons for First Revision in the First 90 Days Following Primary THA for Echo Bi-Metric Microplasty Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	20	71.4
2	Aseptic Loosening	3	10.7
3	Dislocation/Instability	3	10.7
4	Pain	1	3.6
5	Malalignment	1	3.6

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Table 662. Reasons for First Revision Between 91 and 365 days Following Primary THA for Echo Bi-Metric Microplasty Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	4	28.6
2	Aseptic Loosening	3	21.4
3	Joint Infection	3	21.4
4	Implant Failure	2	14.3
5	Pain	1	7.1
6	Malalignment	1	7.1

Table 663. Descriptive Statistics of Cases Receiving the Echo Bi-Metric Microplasty Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,237	53.43	
Age (years)	2,315	65.54 (10.33)	66.00 (14.00)
Height (cm)	2,315	169.95 (10.62)	170.18 (15.24)
Weight (kg)	2,315	88.18 (19.86)	87.65 (26.00)
BMI(kg/m^2)	2,315	30.50 (7.23)	29.99 (7.93)
Smoker - Never (%)	1,157	49.98	
Smoker - Previous (%)	813	35.12	
Smoker - Current (%)	340	14.69	
Smoker - Unknown (%)	5	0.22	

Table 664. Distribution of Approach Used for Echo Bi-Metric Microplasty Stem in Primary THA Cases

Approach	N	Percent
Anterior	1,705	73.7
Anterolateral	102	4.4
Posterior	504	21.8
Transtrochanteric	3	0.1
Missing/unknown/other	1	0.0

Table 665. Distribution of Head Size for Echo Bi-Metric Microplasty Stem in Primary THA Cases

Size (mm)	N	Percent
28	1	0.1
32	305	14.5
36	1,465	69.6
40	323	15.3
Missing/unknown/other	10	0.5

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Table 666. Distribution of Bearing Surface for Echo Bi-Metric Microplasty Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	292	12.6
Ceramic-on-plastic	1,802	77.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	180	7.8
Missing/unknown/other	41	1.8

Table 667. Distribution of Polyethylene Used for Echo Bi-Metric Microplasty Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,511	66.2
Antioxidant XLPE	772	33.8
Missing/unknown/other	0	0.0

Table 668. Volume of Cases by Surgeon and Site for the Echo Bi-Metric Microplasty Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	85 (131)	7 (163)
Cases per site	82 (122)	15 (113)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

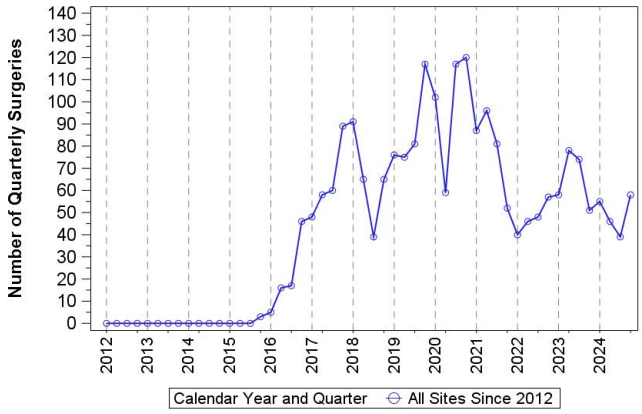


Figure 243. Utilization of the Echo Bi-Metric Microplasty Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

193012	193009	192807
193112	193109	193007
193111	193115	193118
193113	193015	193018
193010	193108	193107
193011	193008	192907
193013	193116	192908
193014	193016	193019
193110	193117	193119
193114	193017	

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3.2.16 Echo FX

N = 528 primary cases were used for this analysis. Distribution of utilization: 36 surgeons across 23 sites used this implant in primary THA cases.

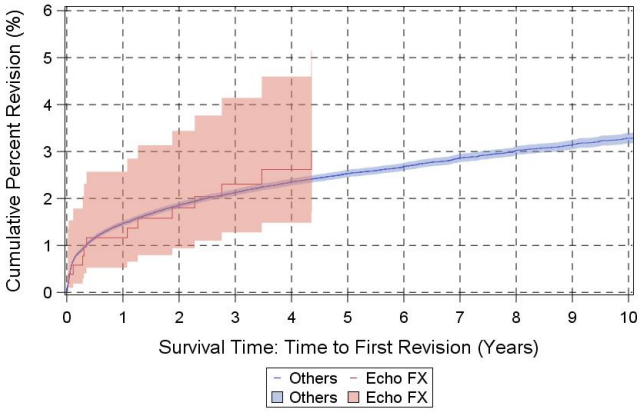


Figure 244. Cumulative Percent Revision Curve for the Echo FX Stem, Compared to All Other Femoral Components in Primary THA Cases

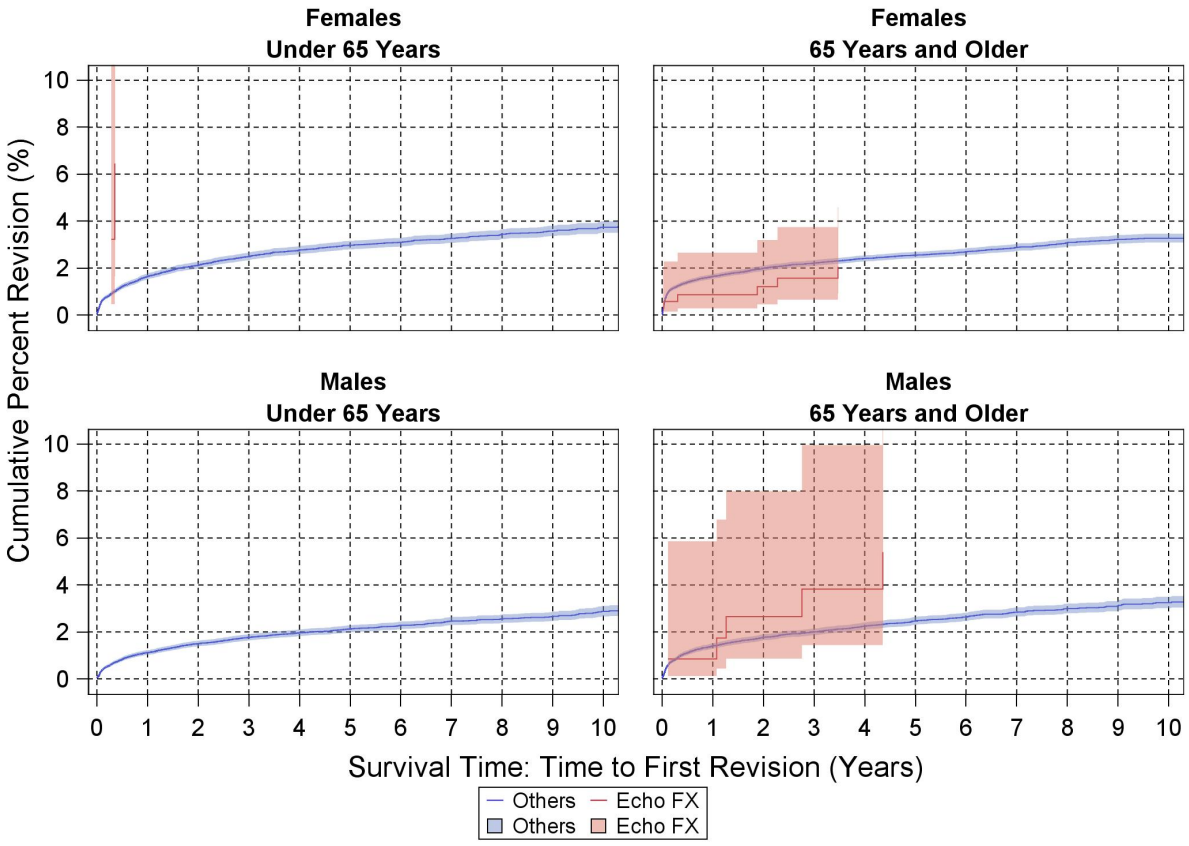


Figure 245. Cumulative Percent Revision Curve for the Echo FX Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 669. Cumulative Percent Revision and Number at Risk for the Echo FX Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	519	0.00 (0.00,0.00)	31	0.00 (0.00,0.00)	348	0.00 (0.00,0.00)	20	0.00 (0.00,0.00)	120	0.00 (0.00,0.00)
1	484	1.16 (0.52,2.57)	29	6.45 (1.65,23.41)	324	0.86 (0.28,2.65)	20	0.00 (0.00,0.00)	111	0.85 (0.12,5.86)
2	428	1.80 (0.94,3.44)	28	6.45 (1.65,23.41)	281	1.21 (0.45,3.19)	20	0.00 (0.00,0.00)	99	2.65 (0.86,8.00)
3	347	2.31 (1.28,4.14)	24	6.45 (1.65,23.41)	231	1.57 (0.65,3.75)	20	0.00 (0.00,0.00)	72	3.82 (1.44,9.96)
4	284	2.62 (1.48,4.60)	22	6.45 (1.65,23.41)	179	2.05 (0.91,4.59)	18	0.00 (0.00,0.00)	65	3.82 (1.44,9.96)
5	243	2.98 (1.72,5.15)	20	6.45 (1.65,23.41)	153	2.05 (0.91,4.59)	18	0.00 (0.00,0.00)	52	5.40 (2.21,12.86)
6	187	2.98 (1.72,5.15)	17	6.45 (1.65,23.41)	109	2.05 (0.91,4.59)	15	0.00 (0.00,0.00)	46	5.40 (2.21,12.86)
7	111	2.98 (1.72,5.15)	11	6.45 (1.65,23.41)	62	2.05 (0.91,4.59)	11	0.00 (0.00,0.00)	27	5.40 (2.21,12.86)
8	62	2.98 (1.72,5.15)	*	6.45 (1.65,23.41)	35	2.05 (0.91,4.59)	*	0.00 (0.00,0.00)	13	5.40 (2.21,12.86)
9	21	2.98 (1.72,5.15)	*	6.45 (1.65,23.41)	*	2.05 (0.91,4.59)	*	0.00 (0.00,0.00)	*	5.40 (2.21,12.86)
10	*	2.98 (1.72,5.15)	0	N/A	*	2.05 (0.91,4.59)	0	N/A	*	5.40 (2.21,12.86)

* Denotes that the number of cases is between 1 and 10.

Table 670. Reasons for First Revision Following Primary THA for Echo FX Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	5	38.5
2	Dislocation/Instability	4	30.8
3	Joint Infection	1	7.7
4	Implant Failure	1	7.7
5	Peri-prosthetic fracture - Femur	1	7.7
6	Pain	1	7.7

Table 671. Reasons for First Revision in the First 90 Days Following Primary THA for Echo FX Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	2	66.7
2	Peri-prosthetic fracture - Femur	1	33.3

Table 672. Reasons for First Revision Between 91 and 365 days Following Primary THA for Echo FX Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	2	66.7
2	Implant Failure	1	33.3

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Table 673. Descriptive Statistics of Cases Receiving the Echo FX Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	385	72.92	
Age (years)	528	76.18 (9.08)	77.00 (12.00)
Height (cm)	528	164.33 (10.01)	162.60 (12.72)
Weight (kg)	528	79.94 (20.58)	77.58 (28.35)
BMI(kg/m^2)	528	29.49 (6.67)	28.63 (9.17)
Smoker - Never (%)	269	50.95	
Smoker - Previous (%)	197	37.31	
Smoker - Current (%)	62	11.74	
Smoker - Unknown (%)	0	0.0	

Table 674. Distribution of Approach Used for Echo FX Stem in Primary THA Cases

Approach	N	Percent
Anterior	33	6.2
Anterolateral	356	67.4
Posterior	136	25.8
Transtrochanteric	0	0.0
Missing/unknown/other	3	0.6

Table 675. Distribution of Head Size for Echo FX Stem in Primary THA Cases

Size (mm)	N	Percent
32	15	3.2
36	378	79.9
40	75	15.9
Missing/unknown/other	5	1.1

Table 676. Distribution of Bearing Surface for Echo FX Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	155	29.4
Ceramic-on-plastic	313	59.3
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	49	9.3
Missing/unknown/other	11	2.1

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Table 677. Distribution of Polyethylene Used for Echo FX Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.2
XLPE	82	15.8
Antioxidant XLPE	437	84.0
Missing/unknown/other	0	0.0

Table 678. Volume of Cases by Surgeon and Site for the Echo FX Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	14 (53)	3 (4)
Cases per site	23 (70)	5 (9)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

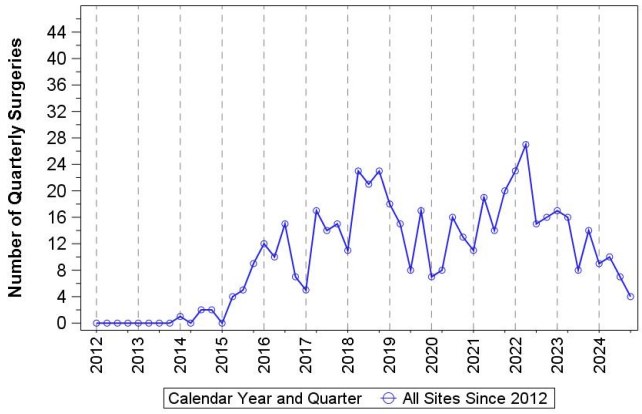


Figure 246. Utilization of the Echo FX Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

12151307
12151409
12151309
12151311
12151411
12151313
12151413
12151315

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3.2.17 Fitmore

N = 6,343 primary cases were used for this analysis. Distribution of utilization: 56 surgeons across 32 sites used this implant in primary THA cases.

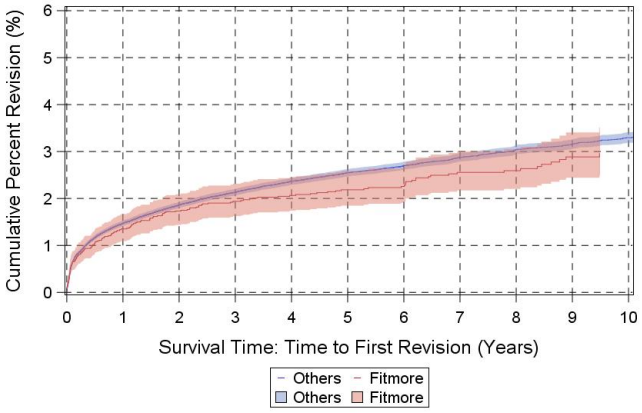


Figure 247. Cumulative Percent Revision Curve for the Fitmore Stem, Compared to All Other Femoral Components in Primary THA Cases

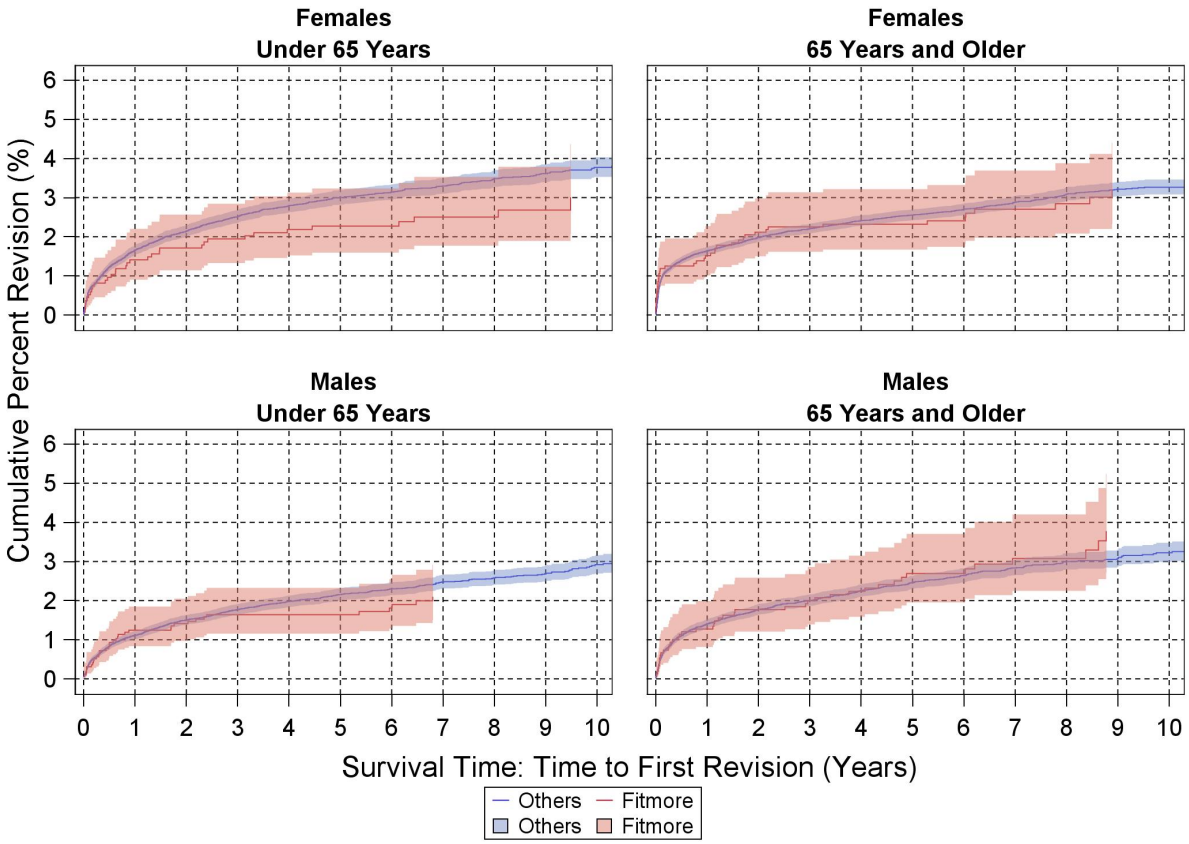


Figure 248. Cumulative Percent Revision Curve for the Fitmore Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 679. Cumulative Percent Revision and Number at Risk for the Fitmore Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	6,312	0.00 (0.00,0.00)	1,351	0.00 (0.00,0.00)	1,517	0.00 (0.00,0.00)	1,946	0.00 (0.00,0.00)	1,498	0.00 (0.00,0.00)
1	6,091	1.35 (1.09,1.67)	1,316	1.41 (0.90,2.20)	1,493	1.52 (1.01,2.27)	1,946	0.00 (0.00,0.00)	1,426	1.27 (0.81,1.99)
2	5,797	1.73 (1.44,2.09)	1,282	1.71 (1.14,2.57)	1,448	2.12 (1.50,2.98)	1,856	1.24 (0.84,1.85)	1,334	1.77 (1.21,2.59)
3	5,563	1.94 (1.62,2.31)	1,248	1.94 (1.33,2.84)	1,417	2.25 (1.61,3.14)	1,733	1.41 (0.97,2.05)	1,275	2.00 (1.39,2.86)
4	5,203	2.06 (1.74,2.45)	1,187	2.18 (1.52,3.13)	1,356	2.32 (1.67,3.22)	1,623	1.64 (1.16,2.33)	1,172	2.24 (1.59,3.15)
5	4,569	2.19 (1.85,2.59)	1,054	2.27 (1.59,3.23)	1,194	2.32 (1.67,3.22)	1,488	1.64 (1.16,2.33)	999	2.69 (1.95,3.70)
6	3,823	2.26 (1.91,2.67)	892	2.27 (1.59,3.23)	1,002	2.41 (1.74,3.32)	1,322	1.64 (1.16,2.33)	823	2.69 (1.95,3.70)
7	3,145	2.56 (2.17,3.00)	732	2.50 (1.77,3.53)	826	2.70 (1.98,3.69)	1,106	1.81 (1.28,2.54)	673	3.08 (2.25,4.20)
8	2,398	2.59 (2.20,3.05)	563	2.50 (1.77,3.53)	660	2.84 (2.08,3.88)	914	2.10 (1.50,2.92)	509	3.08 (2.25,4.20)
9	1,650	2.89 (2.44,3.41)	397	2.68 (1.89,3.79)	466	3.21 (2.33,4.40)	666	2.10 (1.50,2.92)	343	3.78 (2.72,5.24)
10	922	2.96 (2.50,3.51)	207	3.01 (2.07,4.37)	282	3.21 (2.33,4.40)	444	2.10 (1.50,2.92)	200	3.78 (2.72,5.24)

Table 680. Reasons for First Revision Following Primary THA for Fitmore Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	43	28.5
2	Dislocation/Instability	31	20.5
3	Aseptic Loosening	26	17.2
4	Joint Infection	25	16.6
5	Implant Failure	9	6.0
6	Pain	9	6.0
7	Malalignment	7	4.6
8	Peri-prosthetic fracture - Acetabulum	1	0.7

Table 681. Reasons for First Revision in the First 90 Days Following Primary THA for Fitmore Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	28	54.9
2	Dislocation/Instability	13	25.5
3	Implant Failure	5	9.8
4	Joint Infection	2	3.9
5	Malalignment	2	3.9
6	Peri-prosthetic fracture - Acetabulum	1	2.0

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Table 682. Reasons for First Revision Between 91 and 365 days Following Primary THA for Fitmore Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	8	24.2
2	Dislocation/Instability	7	21.2
3	Pain	5	15.2
4	Joint Infection	4	12.1
5	Implant Failure	3	9.1
6	Peri-prosthetic fracture - Femur	3	9.1
7	Malalignment	3	9.1

Table 683. Descriptive Statistics of Cases Receiving the Fitmore Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,880	45.4	
Age (years)	6,343	63.72 (10.17)	64.00 (13.00)
Height (cm)	6,213	171.73 (10.37)	172.70 (16.49)
Weight (kg)	6,213	90.19 (20.90)	88.45 (28.30)
BMI(kg/m^2)	6,213	30.45 (6.02)	29.65 (7.85)
Smoker - Never (%)	3,130	49.35	
Smoker - Previous (%)	2,427	38.26	
Smoker - Current (%)	776	12.23	
Smoker - Unknown (%)	10	0.16	

Table 684. Distribution of Approach Used for Fitmore Stem in Primary THA Cases

Approach	N	Percent
Anterior	5,019	79.1
Anterolateral	52	0.8
Posterior	1,136	17.9
Transtrochanteric	4	0.1
Missing/unknown/other	132	2.1

Table 685. Distribution of Head Size for Fitmore Stem in Primary THA Cases

Size (mm)	N	Percent
22	1	0.0
28	8	0.1
32	805	13.1
36	4,458	72.7
40	813	13.2
Missing/unknown/other	50	0.8

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Table 686. Distribution of Bearing Surface for Fitmore Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,159	18.3
Ceramic-on-plastic	4,926	77.7
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	144	2.3
Missing/unknown/other	114	1.8

Table 687. Distribution of Polyethylene Used for Fitmore Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	2	0.0
XLPE	2,090	33.3
Antioxidant XLPE	4,184	66.7
Missing/unknown/other	0	0.0

Table 688. Volume of Cases by Surgeon and Site for the Fitmore Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	113 (370)	8 (50)
Cases per site	198 (421)	29 (162)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

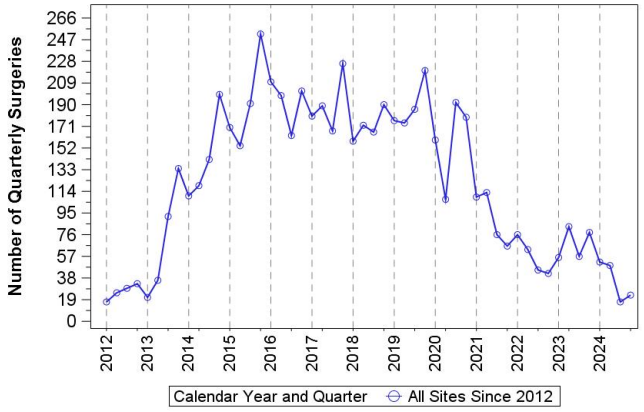


Figure 249. Utilization of the Fitmore Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

100551306	100551207	100551102
100551305	100551409	100551106
100551304	100551301	100551313
100551307	100551403	100551412
100551308	100551203	100551212
100551303	100551208	100551103
100551309	100551401	100551104
100551407	100551410	100551108
100551406	100551311	100551314
100551405	100551402	100551105
100551408	100551201	100551107
100551302	100551202	100551110
100551310	100551210	100551109
100551206	100551209	100551213
100551404	100551312	
100551205	100551411	
100551204	100551211	

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3.2.18 Insignia

N = 6,236 primary cases were used for this analysis. Distribution of utilization: 86 surgeons across 53 sites used this implant in primary THA cases.

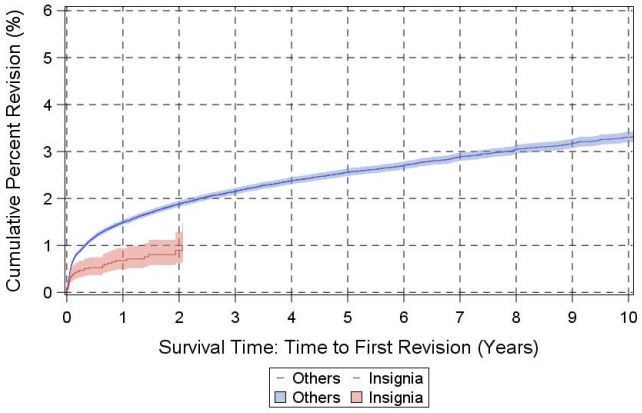


Figure 250. Cumulative Percent Revision Curve for the Insignia Stem, Compared to All Other Femoral Components in Primary THA Cases

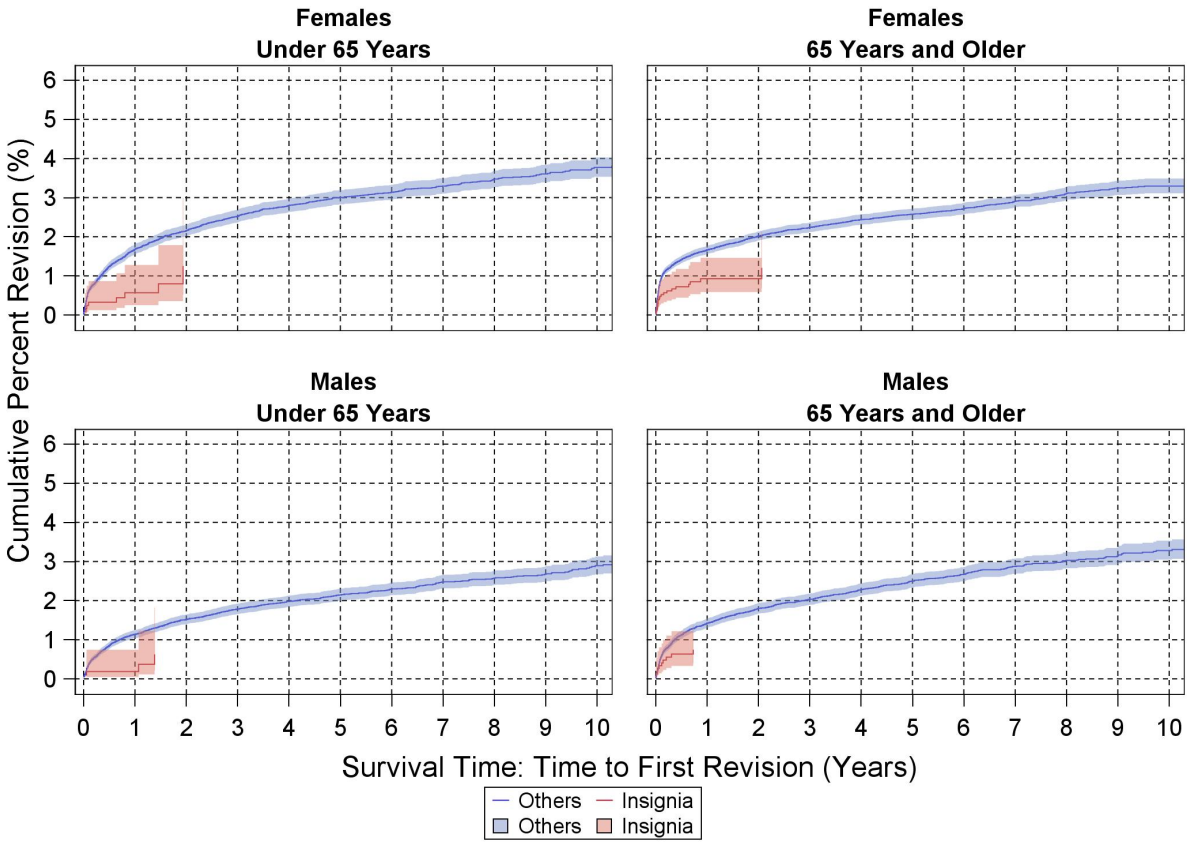


Figure 251. Cumulative Percent Revision Curve for the Insignia Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 689. Cumulative Percent Revision and Number at Risk for the Insignia Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	6,220	0.00 (0.00,0.00)	1,270	0.00 (0.00,0.00)	2,336	0.00 (0.00,0.00)	1,104	0.00 (0.00,0.00)	1,510	0.00 (0.00,0.00)
1	3,148	0.68 (0.49,0.94)	663	0.57 (0.25,1.28)	1,179	0.93 (0.59,1.46)	574	0.19 (0.05,0.74)	732	0.74 (0.40,1.39)
2	1,002	0.90 (0.63,1.28)	206	1.25 (0.52,3.00)	378	0.93 (0.59,1.46)	173	0.63 (0.22,1.82)	245	0.74 (0.40,1.39)
3	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
4	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
5	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
6	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
7	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

Table 690. Reasons for First Revision Following Primary THA for Insignia Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	11	26.2
2	Peri-prosthetic fracture - Femur	10	23.8
3	Joint Infection	9	21.4
4	Aseptic Loosening	8	19.0
5	Malalignment	2	4.8
6	Implant Failure	1	2.4
7	Peri-prosthetic fracture - Acetabulum	1	2.4

Table 691. Reasons for First Revision in the First 90 Days Following Primary THA for Insignia Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	10	35.7
2	Dislocation/Instability	7	25.0
3	Aseptic Loosening	5	17.9
4	Joint Infection	4	14.3
5	Implant Failure	1	3.6
6	Peri-prosthetic fracture - Acetabulum	1	3.6

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Table 692. Reasons for First Revision Between 91 and 365 days Following Primary THA for Insignia Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	4	44.4
2	Joint Infection	3	33.3
3	Aseptic Loosening	1	11.1
4	Malalignment	1	11.1

Table 693. Descriptive Statistics of Cases Receiving the Insignia Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	3,614	57.95	
Age (years)	6,236	66.29 (10.42)	67.00 (13.00)
Height (cm)	6,236	169.33 (10.02)	168.91 (15.30)
Weight (kg)	6,236	88.38 (21.08)	86.60 (28.81)
BMI(kg/m^2)	6,236	30.69 (6.22)	30.02 (8.35)
Smoker - Never (%)	3,280	52.6	
Smoker - Previous (%)	2,216	35.54	
Smoker - Current (%)	722	11.58	
Smoker - Unknown (%)	18	0.29	

Table 694. Distribution of Approach Used for Insignia Stem in Primary THA Cases

Approach	N	Percent
Anterior	3,944	63.2
Anterolateral	475	7.6
Posterior	1,816	29.1
Transtrochanteric	0	0.0
Missing/unknown/other	1	0.0

Table 695. Distribution of Head Size for Insignia Stem in Primary THA Cases

Size (mm)	N	Percent
22	1	0.0
32	312	5.7
36	4,554	83.3
40	581	10.6
44	8	0.1
Missing/unknown/other	12	0.2

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Table 696. Distribution of Bearing Surface for Insignia Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	90	1.4
Ceramic-on-plastic	5,366	86.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	712	11.4
Missing/unknown/other	68	1.1

Table 697. Distribution of Polyethylene Used for Insignia Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	6,101	99.9
Antioxidant XLPE	6	0.1
Missing/unknown/other	0	0.0

Table 698. Volume of Cases by Surgeon and Site for the Insignia Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	72 (133)	20 (73)
Cases per site	117 (185)	39 (143)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

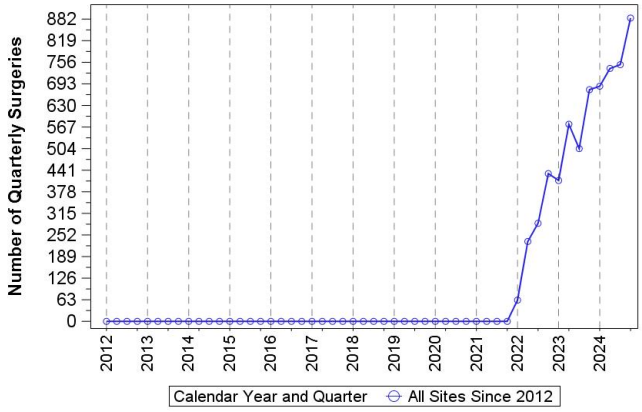


Figure 252. Utilization of the Insignia Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

70006605	70005504	70005502
70006604	70005506	70006601
70006606	70005503	70005508
70006603	70006602	
70005505	70005507	
70006607	70006608	

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3.2.19 Integral X

N = 598 primary cases were used for this analysis. Distribution of utilization: 10 surgeons used this implant at fewer than 10 sites in primary THA cases.

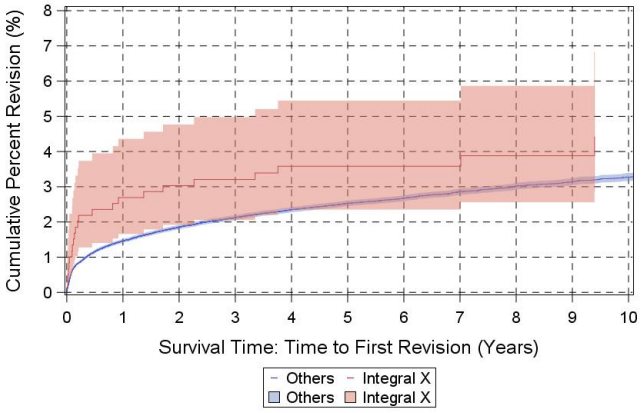


Figure 253. Cumulative Percent Revision Curve for the Integral X Stem, Compared to All Other Femoral Components in Primary THA Cases

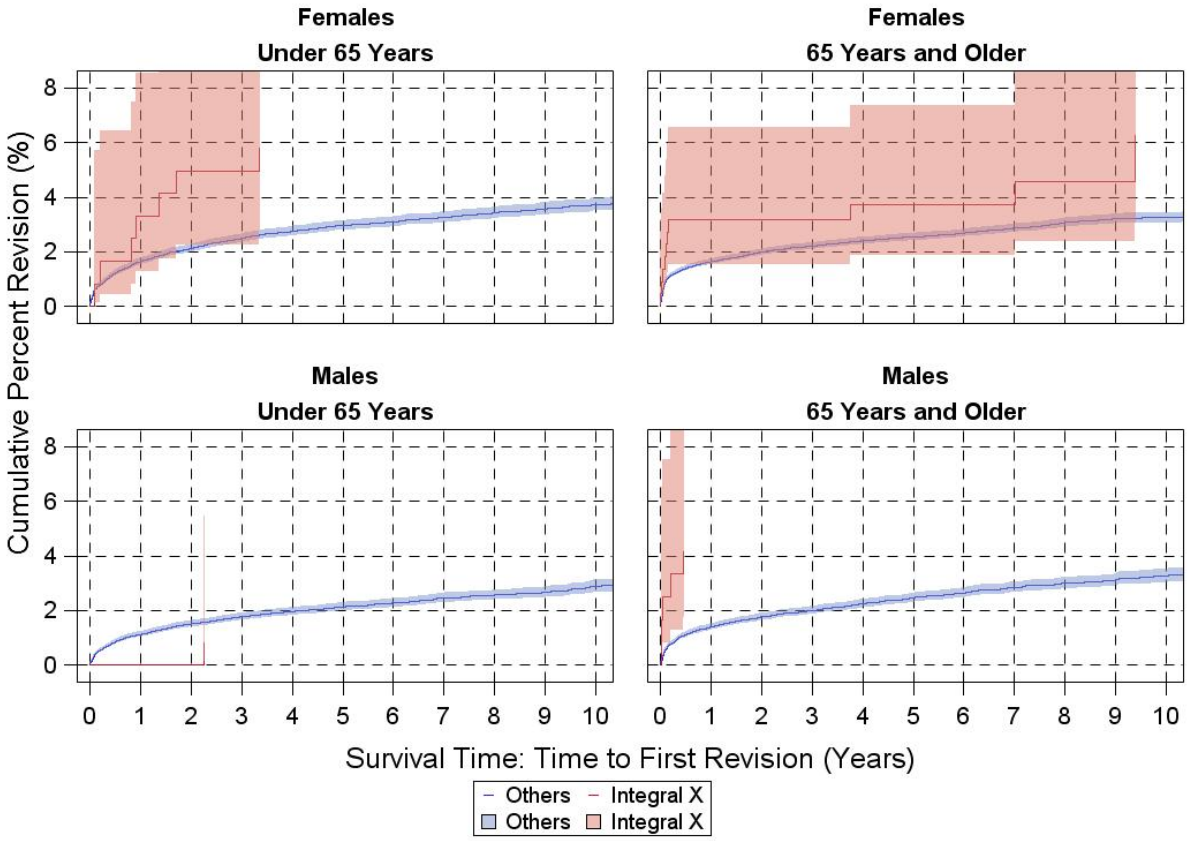


Figure 254. Cumulative Percent Revision Curve for the Integral X Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 699. Cumulative Percent Revision and Number at Risk for the Integral X Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	594	0.00 (0.00,0.00)	121	0.00 (0.00,0.00)	220	0.00 (0.00,0.00)	133	0.00 (0.00,0.00)	120	0.00 (0.00,0.00)
1	578	2.69 (1.66,4.36)	117	3.31 (1.25,8.57)	213	3.18 (1.53,6.56)	133	0.00 (0.00,0.00)	115	4.17 (1.76,9.72)
2	566	3.03 (1.92,4.77)	115	4.96 (2.26,10.70)	208	3.18 (1.53,6.56)	131	0.00 (0.00,0.00)	112	4.17 (1.76,9.72)
3	534	3.20 (2.06,4.98)	114	4.96 (2.26,10.70)	190	3.18 (1.53,6.56)	124	0.79 (0.11,5.46)	106	4.17 (1.76,9.72)
4	489	3.58 (2.35,5.45)	106	5.81 (2.81,11.80)	170	3.74 (1.88,7.35)	114	0.79 (0.11,5.46)	99	4.17 (1.76,9.72)
5	450	3.58 (2.35,5.45)	95	5.81 (2.81,11.80)	160	3.74 (1.88,7.35)	107	0.79 (0.11,5.46)	88	4.17 (1.76,9.72)
6	399	3.58 (2.35,5.45)	80	5.81 (2.81,11.80)	137	3.74 (1.88,7.35)	103	0.79 (0.11,5.46)	79	4.17 (1.76,9.72)
7	326	3.58 (2.35,5.45)	66	5.81 (2.81,11.80)	117	3.74 (1.88,7.35)	81	0.79 (0.11,5.46)	62	4.17 (1.76,9.72)
8	257	3.88 (2.56,5.86)	58	5.81 (2.81,11.80)	90	4.56 (2.36,8.74)	59	0.79 (0.11,5.46)	50	4.17 (1.76,9.72)
9	209	3.88 (2.56,5.86)	51	5.81 (2.81,11.80)	67	4.56 (2.36,8.74)	47	0.79 (0.11,5.46)	44	4.17 (1.76,9.72)
10	136	4.43 (2.86,6.83)	35	5.81 (2.81,11.80)	41	6.27 (3.07,12.57)	33	0.79 (0.11,5.46)	27	4.17 (1.76,9.72)

Table 700. Reasons for First Revision Following Primary THA for Integral X Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	8	36.4
2	Peri-prosthetic fracture - Femur	7	31.8
3	Pain	3	13.6
4	Aseptic Loosening	2	9.1
5	Joint Infection	1	4.5
6	Implant Failure	1	4.5

Table 701. Reasons for First Revision in the First 90 Days Following Primary THA for Integral X Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	6	50.0
2	Dislocation/Instability	4	33.3
3	Pain	2	16.7

Table 702. Reasons for First Revision Between 91 and 365 days Following Primary THA for Integral X Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	33.3
2	Joint Infection	1	33.3
3	Pain	1	33.3

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Table 703. Descriptive Statistics of Cases Receiving the Integral X Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	342	57.19	
Age (years)	598	66.44 (10.59)	67.00 (15.00)
Height (cm)	598	169.29 (10.90)	170.18 (17.78)
Weight (kg)	598	87.19 (18.51)	86.50 (24.75)
BMI(kg/m^2)	598	30.36 (5.54)	30.01 (7.24)
Smoker - Never (%)	240	40.13	
Smoker - Previous (%)	251	41.97	
Smoker - Current (%)	107	17.89	
Smoker - Unknown (%)	0	0.0	

Table 704. Distribution of Approach Used for Integral X Stem in Primary THA Cases

Approach	N	Percent
Anterior	3	0.5
Anterolateral	68	11.4
Posterior	523	87.5
Transtrochanteric	2	0.3
Missing/unknown/other	2	0.3

Table 705. Distribution of Head Size for Integral X Stem in Primary THA Cases

Size (mm)	N	Percent
28	4	0.7
32	60	10.2
36	475	80.5
40	49	8.3
Missing/unknown/other	2	0.3

Table 706. Distribution of Bearing Surface for Integral X Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	321	53.7
Ceramic-on-plastic	267	44.6
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	6	1.0
Missing/unknown/other	4	0.7

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Table 707. Distribution of Polyethylene Used for Integral X Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	2	0.3
XLPE	45	7.5
Antioxidant XLPE	549	92.1
Missing/unknown/other	0	0.0

Table 708. Volume of Cases by Surgeon and Site for the Integral X Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	59 (153)	4 (18)
Cases per site	85 (182)	14 (58)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

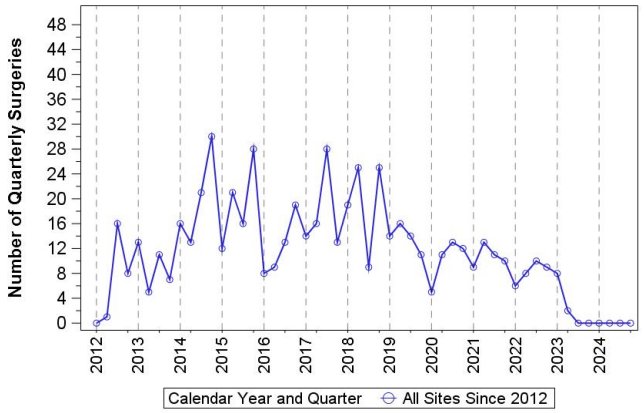


Figure 255. Utilization of the Integral X Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

X11170310
X11170311
X11170312
X11170309
X11170308
X11170313
X170307
X12171310
X170310
X170311
X170312
X12171308
X12171309
X12171312
X11170314
X12171311
X170313
X170309
X12171313
X170314
X12171307
X170308
X170315
X11170315
X170316
X170317

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3.2.20 LCU

N = 502 primary cases were used for this analysis. Fewer than ten surgeons used this implant at fewer than ten sites in primary THA cases.

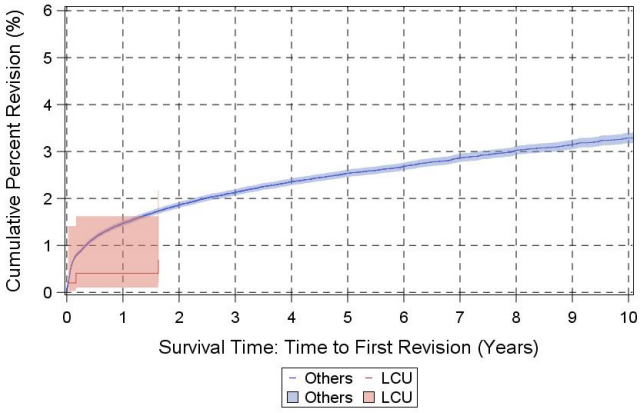


Figure 256. Cumulative Percent Revision Curve for the LCU Stem, Compared to All Other Femoral Components in Primary THA Cases

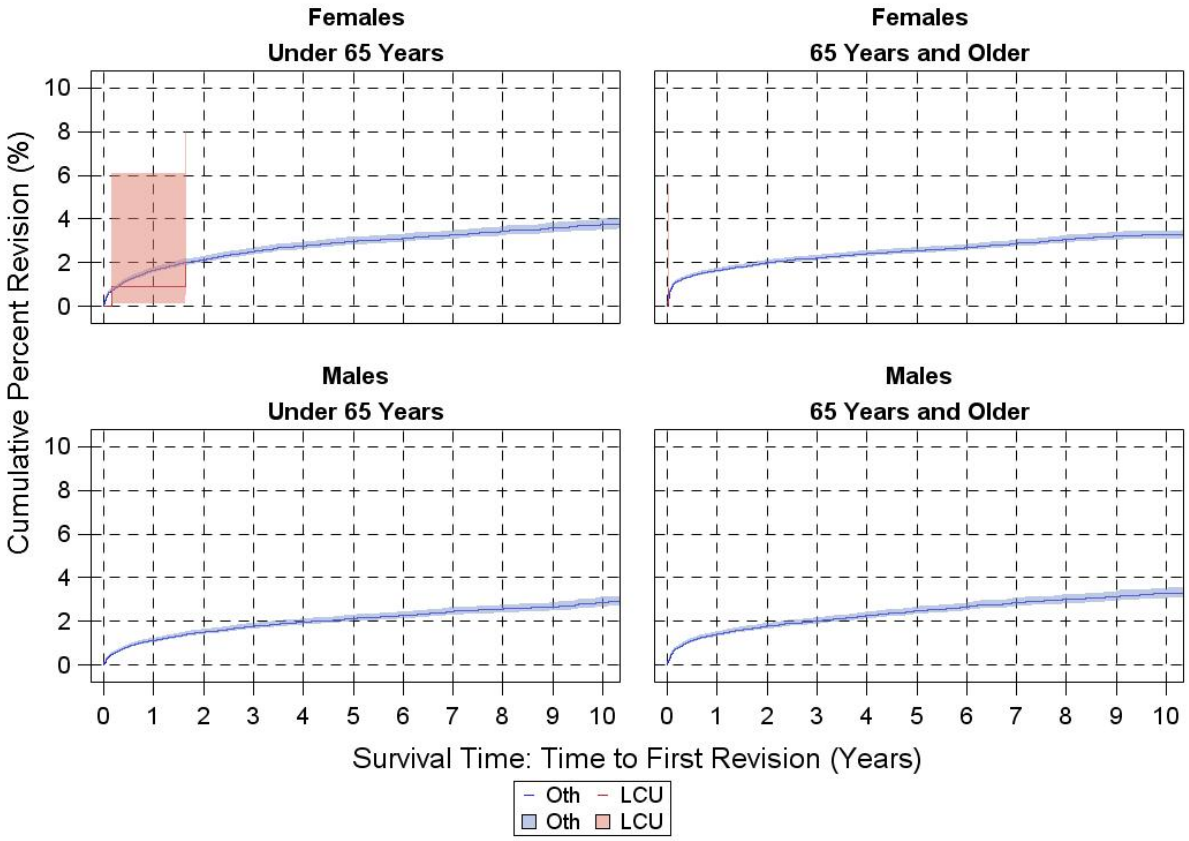


Figure 257. Cumulative Percent Revision Curve for the LCU Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 709. Cumulative Percent Revision and Number at Risk for the LCU Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	501	0.00 (0.00,0.00)	119	0.00 (0.00,0.00)	123	0.00 (0.00,0.00)	120	0.00 (0.00,0.00)	139	0.00 (0.00,0.00)
1	407	0.41 (0.10,1.62)	96	0.88 (0.12,6.06)	107	0.81 (0.11,5.63)	96	0.00 (0.00,0.00)	108	0.00 (0.00,0.00)
2	319	0.69 (0.22,2.17)	80	2.03 (0.50,7.98)	89	0.81 (0.11,5.63)	69	0.00 (0.00,0.00)	81	0.00 (0.00,0.00)
3	247	0.69 (0.22,2.17)	61	2.03 (0.50,7.98)	75	0.81 (0.11,5.63)	51	0.00 (0.00,0.00)	60	0.00 (0.00,0.00)
4	142	0.69 (0.22,2.17)	37	2.03 (0.50,7.98)	42	0.81 (0.11,5.63)	25	0.00 (0.00,0.00)	38	0.00 (0.00,0.00)
5	70	0.69 (0.22,2.17)	14	2.03 (0.50,7.98)	24	0.81 (0.11,5.63)	13	0.00 (0.00,0.00)	19	0.00 (0.00,0.00)
6	*	0.69 (0.22,2.17)	*	2.03 (0.50,7.98)	*	0.81 (0.11,5.63)	*	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)
7	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 710. Reasons for First Revision Following Primary THA for LCU Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Acetabulum	2	66.7
2	Malalignment	1	33.3

Table 711. Reasons for First Revision in the First 90 Days Following Primary THA for LCU Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Acetabulum	2	100.0

There were no reasons for revision recorded between day 91 and day 365, so no table of reasons for revisions during this time period is included.

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Table 712. Descriptive Statistics of Cases Receiving the LCU Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	242	48.21	
Age (years)	502	64.55 (10.43)	65.00 (14.00)
Height (cm)	502	170.96 (10.02)	170.20 (15.20)
Weight (kg)	502	95.56 (21.32)	93.60 (30.40)
BMI(kg/m^2)	502	32.66 (6.70)	31.78 (9.52)
Smoker - Never (%)	256	51	
Smoker - Previous (%)	207	41.24	
Smoker - Current (%)	39	7.77	
Smoker - Unknown (%)	0	0.0	

Table 713. Distribution of Approach Used for LCU Stem in Primary THA Cases

Approach	N	Percent
Anterior	0	0.0
Anterolateral	0	0.0
Posterior	502	100.0
Transtrochanteric	0	0.0
Missing/unknown/other	0	0.0

Table 714. Distribution of Bearing Surface for LCU Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	0	0.0
Ceramic-on-plastic	0	0.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	287	57.2
Missing/unknown/other	215	42.8

Table 715. Distribution of Polyethylene Used for LCU Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	287	100.0
XLPE	0	0.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 716. Volume of Cases by Surgeon and Site for the LCU Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	-999 (-999)	-999 (-999)
Cases per site	-999 (-999)	-999 (-999)

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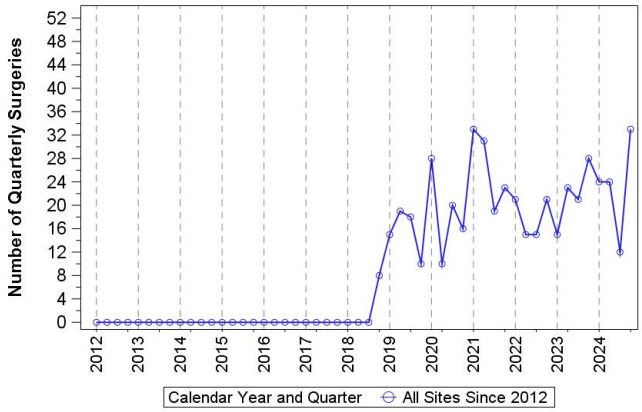


Figure 258. Utilization of the LCU Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

165015/26	165116/26	165117/26
165014/26	165115/26	165019/26
165016/26	165012/26	165020/26
165018/26	165114/26	
165017/26	165013/26	

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3.2.21 M/L Taper

This analysis excludes M/L Taper Kinectiv. N = 17,384 primary cases were used for this analysis. Distribution of utilization: 85 surgeons across 44 sites used this implant in primary THA cases.

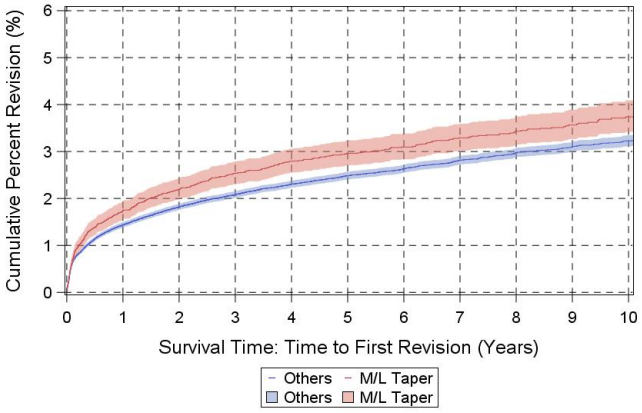


Figure 259. Cumulative Percent Revision Curve for the M/L Taper Stem, Compared to All Other Femoral Components in Primary THA Cases

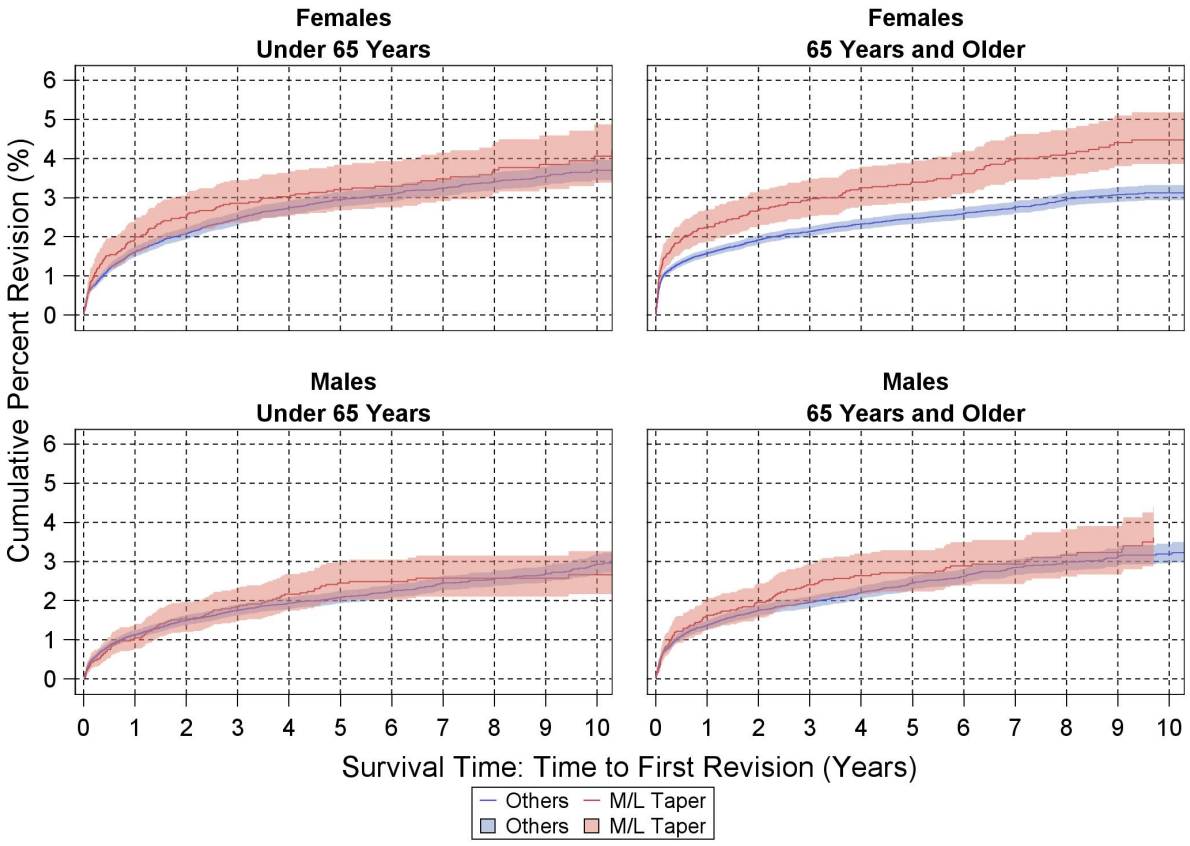


Figure 260. Cumulative Percent Revision Curve for the M/L Taper Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 717. Cumulative Percent Revision and Number at Risk for the M/L Taper Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	17,231	0.00 (0.00,0.00)	3,857	0.00 (0.00,0.00)	5,125	0.00 (0.00,0.00)	4,185	0.00 (0.00,0.00)	4,064	0.00 (0.00,0.00)
1	16,148	1.74 (1.56,1.95)	3,622	1.97 (1.57,2.46)	4,841	2.24 (1.86,2.68)	3,919	1.05 (0.78,1.41)	3,766	1.63 (1.28,2.07)
2	14,905	2.19 (1.98,2.42)	3,361	2.50 (2.04,3.05)	4,464	2.67 (2.26,3.16)	3,632	1.54 (1.20,1.97)	3,448	1.96 (1.57,2.44)
3	13,470	2.54 (2.31,2.79)	3,059	2.86 (2.37,3.45)	4,044	2.97 (2.53,3.48)	3,291	1.85 (1.47,2.32)	3,076	2.40 (1.96,2.94)
4	12,111	2.79 (2.55,3.06)	2,741	3.02 (2.51,3.63)	3,660	3.25 (2.79,3.79)	2,971	2.17 (1.75,2.68)	2,739	2.64 (2.17,3.21)
5	10,883	2.96 (2.71,3.24)	2,484	3.21 (2.68,3.84)	3,327	3.39 (2.92,3.95)	2,654	2.45 (1.99,3.00)	2,418	2.71 (2.23,3.29)
6	9,583	3.10 (2.83,3.38)	2,203	3.29 (2.75,3.93)	2,945	3.61 (3.11,4.19)	2,338	2.49 (2.03,3.05)	2,097	2.89 (2.38,3.49)
7	8,307	3.29 (3.02,3.59)	1,912	3.48 (2.91,4.15)	2,543	4.00 (3.46,4.63)	2,017	2.57 (2.10,3.15)	1,835	2.93 (2.42,3.55)
8	6,898	3.43 (3.15,3.75)	1,597	3.71 (3.11,4.42)	2,096	4.13 (3.57,4.78)	1,682	2.57 (2.10,3.15)	1,523	3.16 (2.61,3.82)
9	5,175	3.56 (3.27,3.89)	1,197	3.85 (3.22,4.59)	1,537	4.41 (3.80,5.10)	1,290	2.57 (2.10,3.15)	1,151	3.23 (2.67,3.91)
10	3,503	3.74 (3.42,4.09)	792	4.06 (3.38,4.87)	1,033	4.47 (3.86,5.18)	910	2.66 (2.17,3.27)	768	3.61 (2.96,4.40)

Table 718. Reasons for First Revision Following Primary THA for M/L Taper Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	135	26.8
2	Dislocation/Instability	131	26.0
3	Aseptic Loosening	88	17.5
4	Joint Infection	68	13.5
5	Implant Failure	24	4.8
6	Malalignment	21	4.2
7	Pain	16	3.2
8	Metal Reaction/Metallosis	13	2.6
9	Peri-prosthetic fracture - Acetabulum	6	1.2
10	Poly liner wear	2	0.4

Table 719. Reasons for First Revision in the First 90 Days Following Primary THA for M/L Taper Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	97	55.8
2	Dislocation/Instability	41	23.6
3	Aseptic Loosening	12	6.9
4	Joint Infection	9	5.2
5	Implant Failure	7	4.0
6	Peri-prosthetic fracture - Acetabulum	4	2.3
7	Malalignment	4	2.3

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Table 720. Reasons for First Revision Between 91 and 365 days Following Primary THA for M/L Taper Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	28	29.5
2	Joint Infection	24	25.3
3	Aseptic Loosening	16	16.8
4	Peri-prosthetic fracture - Femur	12	12.6
5	Implant Failure	6	6.3
6	Pain	6	6.3
7	Poly liner wear	1	1.0
8	Peri-prosthetic fracture - Acetabulum	1	1.0
9	Malalignment	1	1.0

Table 721. Descriptive Statistics of Cases Receiving the M/L Taper Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	9,058	52.11	
Age (years)	17,384	64.87 (10.47)	65.00 (14.00)
Height (cm)	17,375	170.38 (10.42)	170.18 (15.20)
Weight (kg)	17,373	88.37 (20.08)	86.80 (27.50)
BMI(kg/m^2)	17,373	30.34 (6.05)	29.69 (7.93)
Smoker - Never (%)	8,515	48.98	
Smoker - Previous (%)	6,652	38.27	
Smoker - Current (%)	2,192	12.61	
Smoker - Unknown (%)	25	0.14	

Table 722. Distribution of Approach Used for M/L Taper Stem in Primary THA Cases

Approach	N	Percent
Anterior	3,129	18.0
Anterolateral	3254	18.7
Posterior	10,836	62.3
Transtrochanteric	118	0.7
Missing/unknown/other	47	0.3

Table 723. Distribution of Head Size for M/L Taper Stem in Primary THA Cases

Size (mm)	N	Percent
28	73	0.4
32	3,626	21.3
36	11,314	66.5
40	1,842	10.8
44	1	0.0
Missing/unknown/other	171	1.0

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Table 724. Distribution of Bearing Surface for M/L Taper Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	4,503	25.9
Ceramic-on-plastic	12,381	71.2
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	229	1.3
Missing/unknown/other	271	1.6

Table 725. Distribution of Polyethylene Used for M/L Taper Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	10,655	61.9
Antioxidant XLPE	6,572	38.1
Missing/unknown/other	0	0.0

Table 726. Volume of Cases by Surgeon and Site for the M/L Taper Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	204 (381)	38 (191)
Cases per site	395 (755)	84 (331)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

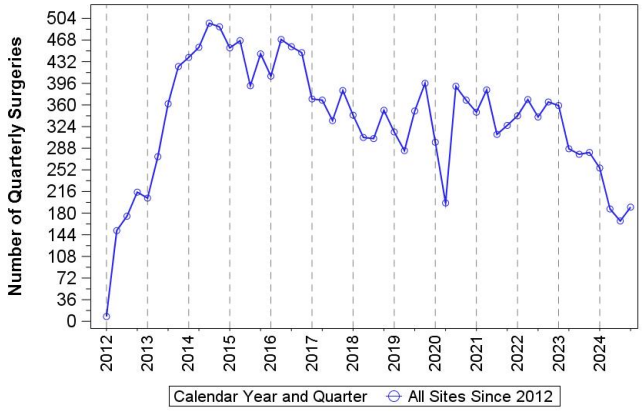


Figure 261. Utilization of the M/L Taper Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

771100900	771100920	771100620
771101220	771101300	771100540
771101320	771100910	771101720
771100940	771100710	771100410
771100700	771100720	771101600
771101100	771100600	771100510
771101200	771100640	771100520
771101000	771101010	771101700
771101120	771101500	771102020
771100740	771101620	771102000
771101240	771101110	771102220
771101520	771101210	771102200
771101040	771100440	
771101140	771100610	
771101020	771100500	

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3.2.22 M/L Taper Kinectiv

N = 1,002 primary cases were used for this analysis. Distribution of utilization: 13 surgeons across 12 sites used this implant in primary THA cases.

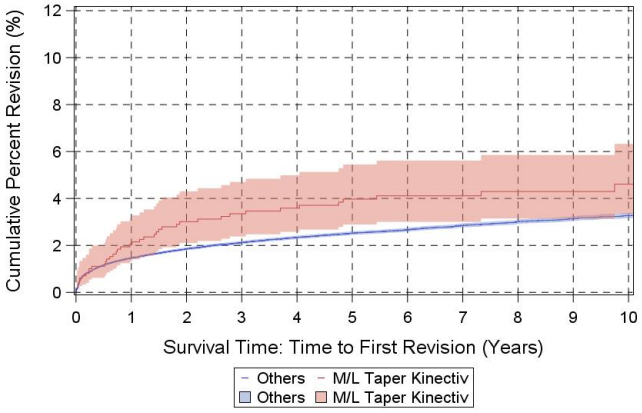


Figure 262. Cumulative Percent Revision Curve for the M/L Taper Kinectiv Stem, Compared to All Other Femoral Components in Primary THA Cases

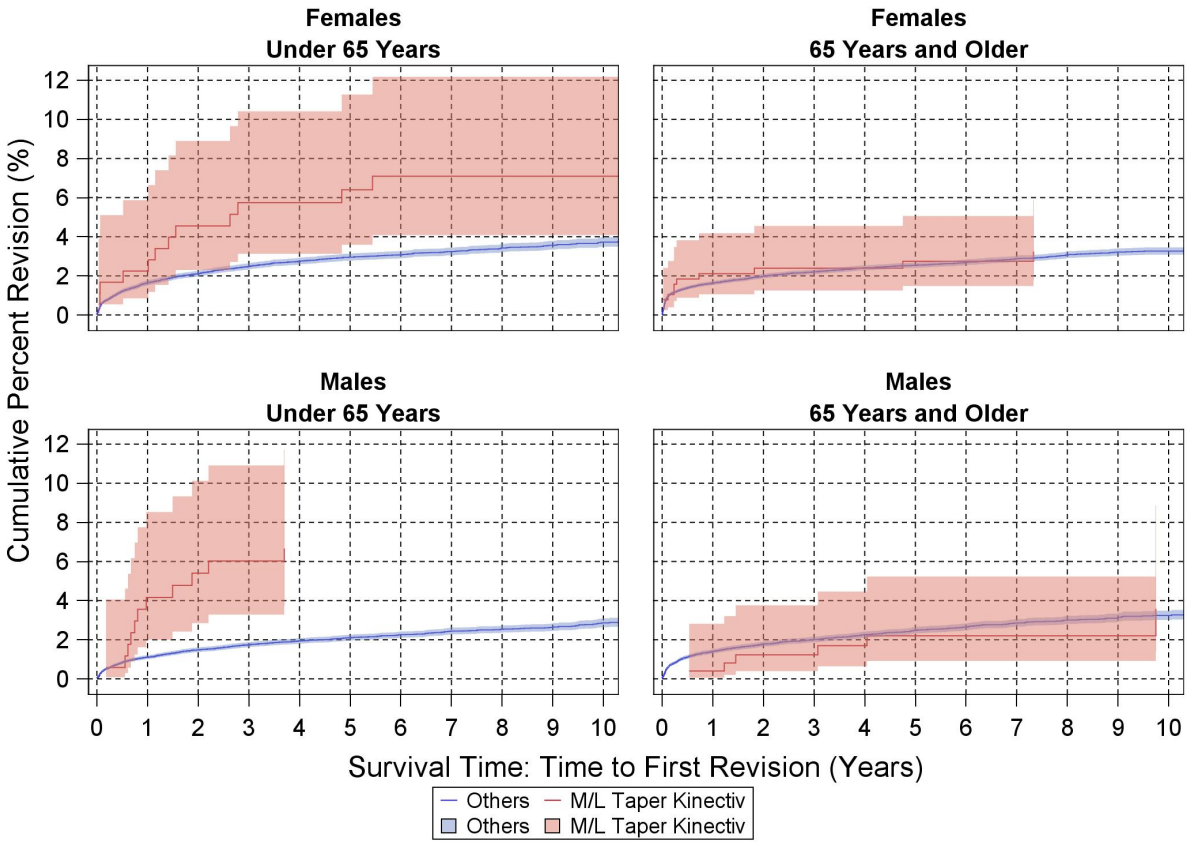


Figure 263. Cumulative Percent Revision Curve for the M/L Taper Kinectiv Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 727. Cumulative Percent Revision and Number at Risk for the M/L Taper Kinectiv Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	995	0.00 (0.00,0.00)	179	0.00 (0.00,0.00)	383	0.00 (0.00,0.00)	176	0.00 (0.00,0.00)	257	0.00 (0.00,0.00)
1	931	2.05 (1.33,3.16)	170	2.24 (0.85,5.87)	359	2.11 (1.06,4.18)	158	4.16 (2.01,8.53)	244	0.40 (0.06,2.82)
2	879	3.01 (2.10,4.30)	165	4.55 (2.30,8.90)	337	2.39 (1.25,4.55)	152	5.40 (2.85,10.13)	225	1.23 (0.40,3.76)
3	834	3.35 (2.38,4.71)	156	5.74 (3.13,10.41)	314	2.39 (1.25,4.55)	150	6.02 (3.29,10.91)	214	1.23 (0.40,3.76)
4	783	3.59 (2.58,4.99)	149	5.74 (3.13,10.41)	295	2.39 (1.25,4.55)	145	6.66 (3.74,11.71)	194	1.70 (0.64,4.47)
5	723	3.97 (2.89,5.45)	139	6.40 (3.59,11.27)	271	2.75 (1.48,5.06)	137	6.66 (3.74,11.71)	176	2.20 (0.92,5.23)
6	637	4.11 (3.00,5.61)	124	7.09 (4.08,12.18)	233	2.75 (1.48,5.06)	122	6.66 (3.74,11.71)	158	2.20 (0.92,5.23)
7	550	4.11 (3.00,5.61)	111	7.09 (4.08,12.18)	203	2.75 (1.48,5.06)	107	6.66 (3.74,11.71)	129	2.20 (0.92,5.23)
8	470	4.30 (3.15,5.85)	98	7.09 (4.08,12.18)	173	3.24 (1.78,5.88)	87	6.66 (3.74,11.71)	112	2.20 (0.92,5.23)
9	385	4.30 (3.15,5.85)	84	7.09 (4.08,12.18)	135	3.24 (1.78,5.88)	76	6.66 (3.74,11.71)	90	2.20 (0.92,5.23)
10	276	4.61 (3.35,6.33)	61	7.09 (4.08,12.18)	96	3.24 (1.78,5.88)	54	6.66 (3.74,11.71)	65	3.58 (1.42,8.85)

Table 728. Reasons for First Revision Following Primary THA for M/L Taper Kinectiv Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	9	23.7
2	Peri-prosthetic fracture - Femur	7	18.4
3	Aseptic Loosening	6	15.8
4	Malalignment	5	13.2
5	Dislocation/Instability	4	10.5
6	Pain	3	7.9
7	Metal Reaction/Metallosis	2	5.3
8	Osteolysis	1	2.6
9	Implant Failure	1	2.6

Table 729. Reasons for First Revision in the First 90 Days Following Primary THA for M/L Taper Kinectiv Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	3	33.3
2	Joint Infection	2	22.2
3	Aseptic Loosening	1	11.1
4	Dislocation/Instability	1	11.1
5	Implant Failure	1	11.1
6	Malalignment	1	11.1

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Table 730. Reasons for First Revision Between 91 and 365 days Following Primary THA for M/L Taper Kinectiv Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	4	44.4
2	Aseptic Loosening	2	22.2
3	Malalignment	2	22.2
4	Peri-prosthetic fracture - Femur	1	11.1

Table 731. Descriptive Statistics of Cases Receiving the M/L Taper Kinectiv Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	567	56.59	
Age (years)	1,002	67.92 (10.13)	68.00 (14.00)
Height (cm)	1,002	168.81 (10.54)	167.64 (17.80)
Weight (kg)	1,002	87.82 (20.08)	86.19 (26.37)
BMI(kg/m^2)	1,002	30.69 (5.94)	30.12 (8.05)
Smoker - Never (%)	430	42.91	
Smoker - Previous (%)	438	43.71	
Smoker - Current (%)	133	13.27	
Smoker - Unknown (%)	1	0.1	

Table 732. Distribution of Approach Used for M/L Taper Kinectiv Stem in Primary THA Cases

Approach	N	Percent
Anterior	27	2.7
Anterolateral	890	88.8
Posterior	21	2.1
Transtrochanteric	55	5.5
Missing/unknown/other	9	0.9

Table 733. Distribution of Head Size for M/L Taper Kinectiv Stem in Primary THA Cases

Size (mm)	N	Percent
28	2	0.2
32	224	22.8
36	351	35.7
40	376	38.2
Missing/unknown/other	30	3.0

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Table 734. Distribution of Bearing Surface for M/L Taper Kinectiv Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	359	35.8
Ceramic-on-plastic	615	61.4
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	2	0.2
Missing/unknown/other	26	2.6

Table 735. Distribution of Polyethylene Used for M/L Taper Kinectiv Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	522	53.0
Antioxidant XLPE	463	47.0
Missing/unknown/other	0	0.0

Table 736. Volume of Cases by Surgeon and Site for the M/L Taper Kinectiv Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	77 (114)	11 (102)
Cases per site	83 (142)	9 (104)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

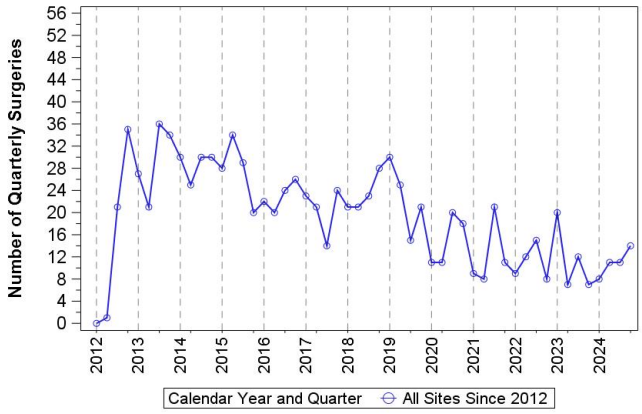


Figure 264. Utilization of the M/L Taper Kinectiv Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

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771301100	771301300	771301700
771301200	771301500	771302000
771301000	771300600	
771300900	771301600	
771300700	771300500	

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3.2.23 Polarstem

N = 3,932 primary cases were used for this analysis. Distribution of utilization: 50 surgeons across 34 sites used this implant in primary THA cases.

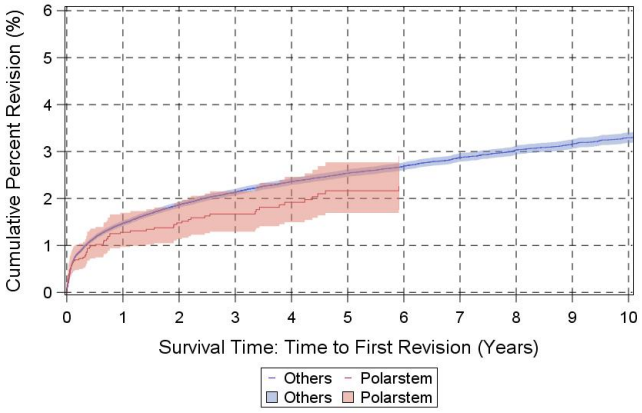


Figure 265. Cumulative Percent Revision Curve for the Polarstem Stem, Compared to All Other Femoral Components in Primary THA Cases

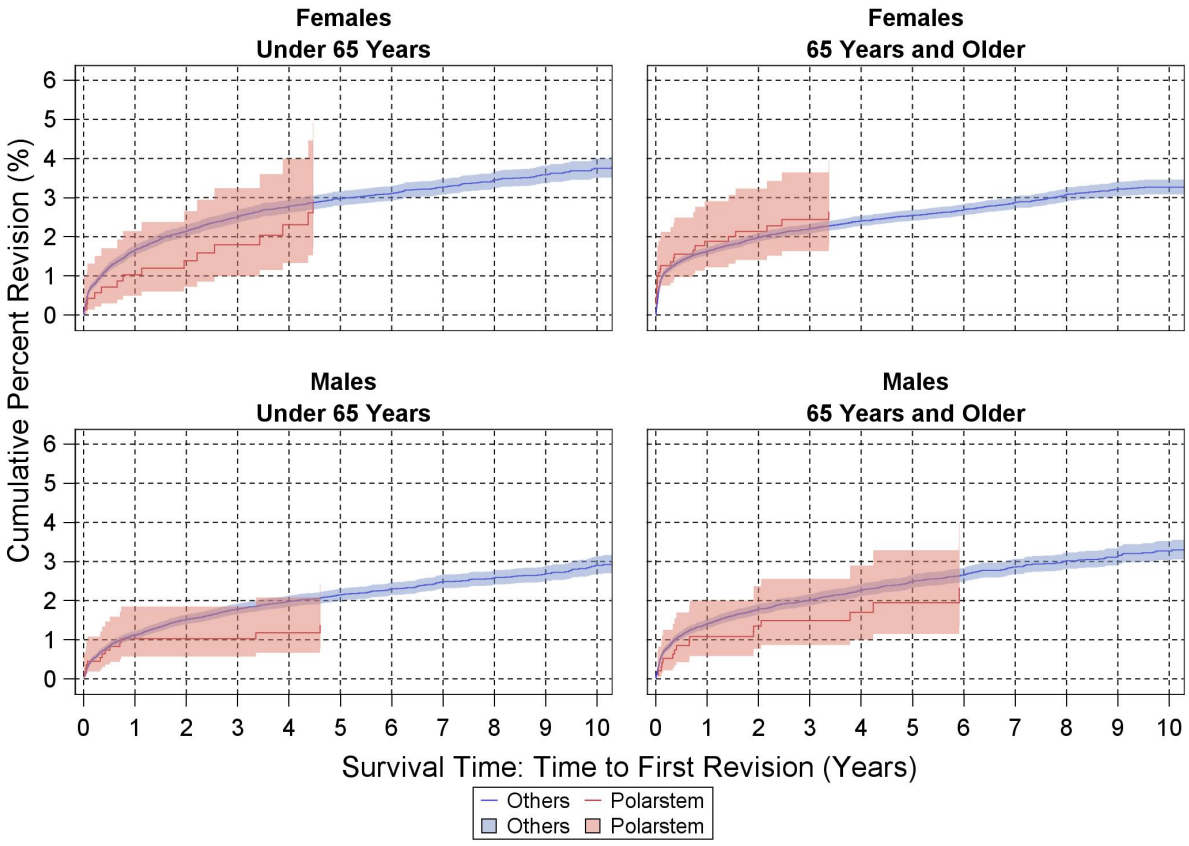


Figure 266. Cumulative Percent Revision Curve for the Polarstem Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 737. Cumulative Percent Revision and Number at Risk for the Polarstem Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	3,916	0.00 (0.00,0.00)	711	0.00 (0.00,0.00)	1,112	0.00 (0.00,0.00)	1,114	0.00 (0.00,0.00)	972	0.00 (0.00,0.00)
1	3,260	1.28 (0.97,1.70)	605	1.03 (0.49,2.15)	866	1.88 (1.22,2.91)	974	1.03 (0.57,1.85)	809	1.08 (0.58,2.00)
2	2,796	1.48 (1.13,1.93)	516	1.39 (0.72,2.65)	695	2.13 (1.41,3.23)	862	1.03 (0.57,1.85)	720	1.35 (0.77,2.37)
3	2,240	1.67 (1.29,2.15)	435	1.80 (0.99,3.24)	533	2.44 (1.63,3.65)	717	1.03 (0.57,1.85)	555	1.49 (0.86,2.56)
4	1,785	1.92 (1.49,2.46)	350	2.31 (1.33,4.00)	412	2.64 (1.77,3.94)	588	1.18 (0.67,2.08)	435	1.70 (1.00,2.90)
5	1,427	2.17 (1.69,2.77)	288	2.92 (1.73,4.91)	323	2.64 (1.77,3.94)	468	1.38 (0.78,2.42)	348	1.95 (1.15,3.29)
6	983	2.26 (1.76,2.91)	190	2.92 (1.73,4.91)	216	2.64 (1.77,3.94)	328	1.38 (0.78,2.42)	249	2.33 (1.35,4.01)
7	609	2.26 (1.76,2.91)	121	2.92 (1.73,4.91)	130	2.64 (1.77,3.94)	199	1.38 (0.78,2.42)	159	2.33 (1.35,4.01)
8	324	2.26 (1.76,2.91)	72	2.92 (1.73,4.91)	79	2.64 (1.77,3.94)	105	1.38 (0.78,2.42)	68	2.33 (1.35,4.01)
9	54	2.26 (1.76,2.91)	21	2.92 (1.73,4.91)	11	2.64 (1.77,3.94)	14	1.38 (0.78,2.42)	*	2.33 (1.35,4.01)
10	*	2.26 (1.76,2.91)	*	2.92 (1.73,4.91)	*	2.64 (1.77,3.94)	*	1.38 (0.78,2.42)	*	2.33 (1.35,4.01)

* Denotes that the number of cases is between 1 and 10.

Table 738. Reasons for First Revision Following Primary THA for Polarstem Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	23	33.3
2	Joint Infection	16	23.2
3	Aseptic Loosening	12	17.4
4	Dislocation/Instability	12	17.4
5	Pain	3	4.3
6	Poly liner wear	1	1.4
7	Implant Failure	1	1.4
8	Malalignment	1	1.4

Table 739. Reasons for First Revision in the First 90 Days Following Primary THA for Polarstem Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	18	64.3
2	Dislocation/Instability	6	21.4
3	Joint Infection	3	10.7
4	Aseptic Loosening	1	3.6

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Table 740. Reasons for First Revision Between 91 and 365 days Following Primary THA for Polarstem Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	8	40.0
2	Aseptic Loosening	5	25.0
3	Dislocation/Instability	3	15.0
4	Peri-prosthetic fracture - Femur	2	10.0
5	Pain	1	5.0
6	Malalignment	1	5.0

Table 741. Descriptive Statistics of Cases Receiving the Polarstem Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,828	46.49	
Age (years)	3,932	65.10 (10.95)	65.00 (15.00)
Height (cm)	3,932	171.16 (10.60)	170.20 (15.44)
Weight (kg)	3,932	91.10 (21.62)	89.00 (28.20)
BMI(kg/m^2)	3,932	30.98 (6.30)	30.30 (8.24)
Smoker - Never (%)	1,773	45.09	
Smoker - Previous (%)	1,483	37.72	
Smoker - Current (%)	663	16.86	
Smoker - Unknown (%)	13	0.33	

Table 742. Distribution of Approach Used for Polarstem Stem in Primary THA Cases

Approach	N	Percent
Anterior	3,098	78.8
Anterolateral	381	9.7
Posterior	450	11.4
Transtrochanteric	2	0.1
Missing/unknown/other	1	0.0

Table 743. Distribution of Head Size for Polarstem Stem in Primary THA Cases

Size (mm)	N	Percent
22	1	0.0
28	6	0.2
32	564	17.0
36	2,527	76.0
40	215	6.5
Missing/unknown/other	11	0.3

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Table 744. Distribution of Bearing Surface for Polarstem Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	120	3.0
Ceramic-on-plastic	3,195	81.3
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	545	13.9
Missing/unknown/other	72	1.8

Table 745. Distribution of Polyethylene Used for Polarstem Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.0
XLPE	3,763	99.8
Antioxidant XLPE	6	0.2
Missing/unknown/other	1	0.0

Table 746. Volume of Cases by Surgeon and Site for the Polarstem Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	78 (195)	12 (64)
Cases per site	115 (234)	24 (110)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

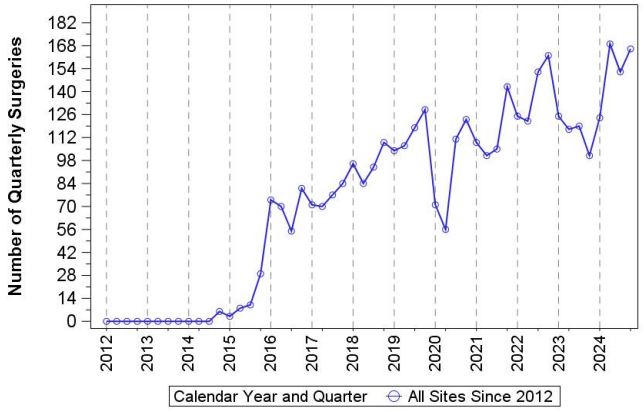


Figure 267. Utilization of the Polarstem Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

75100466	75100478	75102250
75100465	75018413	75102252
75100467	75100479	75102246
75100468	75018407	75102251
75100464	75018400	75102211
75018402	75018419	75102244
75018403	75100476	75102255
75100469	75100480	75102256
75018404	75100475	75100483
75018416	75100471	75102245
75018417	75102209	75102257
75100463	75100481	75102258
75018405	75100474	75100473
75018415	75018408	75102074
75018401	75100472	75102248
75100470	75102253	75102249
75018406	75102210	75102076
75018414	75102254	75102259
75018418	75018409	
75100477	75100482	

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3.2.24 ProFemur Gladiator

N = 956 primary cases were used for this analysis. Fewer than ten surgeons used this implant at fewer than ten sites in primary THA cases.

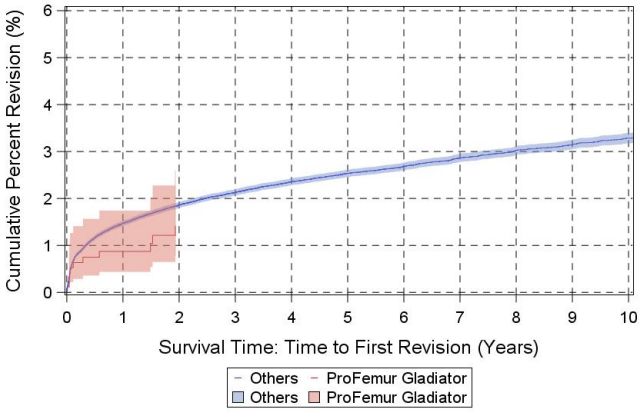


Figure 268. Cumulative Percent Revision Curve for the ProFemur Gladiator Stem, Compared to All Other Femoral Components in Primary THA Cases

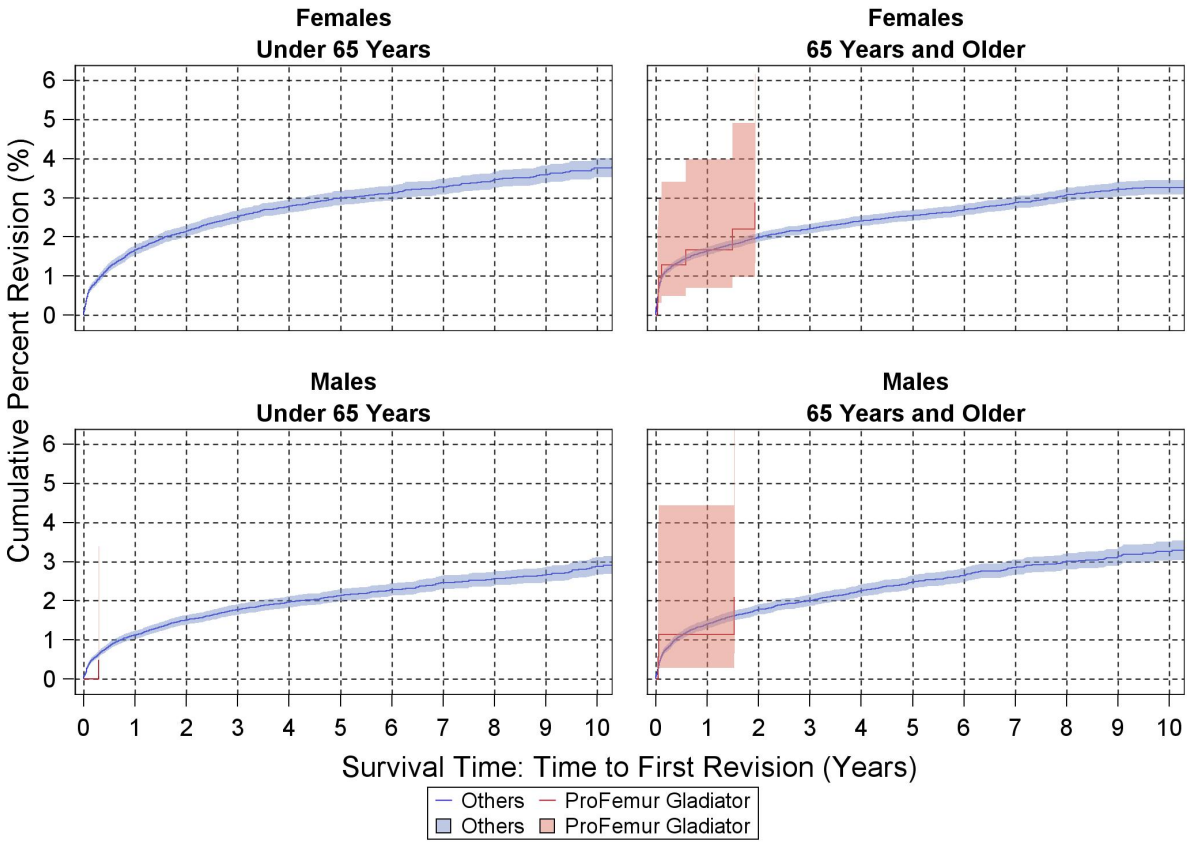


Figure 269. Cumulative Percent Revision Curve for the ProFemur Gladiator Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 747. Cumulative Percent Revision and Number at Risk for the ProFemur Gladiator Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	953	0.00 (0.00,0.00)	235	0.00 (0.00,0.00)	312	0.00 (0.00,0.00)	226	0.00 (0.00,0.00)	180	0.00 (0.00,0.00)
1	717	0.87 (0.44,1.74)	191	0.00 (0.00,0.00)	227	1.67 (0.70,3.98)	170	0.49 (0.07,3.40)	129	1.13 (0.28,4.44)
2	462	1.42 (0.77,2.60)	132	0.00 (0.00,0.00)	140	2.88 (1.33,6.16)	113	0.49 (0.07,3.40)	77	2.10 (0.65,6.64)
3	232	1.42 (0.77,2.60)	58	0.00 (0.00,0.00)	70	2.88 (1.33,6.16)	65	0.49 (0.07,3.40)	39	2.10 (0.65,6.64)
4	49	1.42 (0.77,2.60)	18	0.00 (0.00,0.00)	14	2.88 (1.33,6.16)	11	0.49 (0.07,3.40)	*	2.10 (0.65,6.64)
5	22	1.42 (0.77,2.60)	*	0.00 (0.00,0.00)	*	2.88 (1.33,6.16)	*	0.49 (0.07,3.40)	*	2.10 (0.65,6.64)
6	14	1.42 (0.77,2.60)	*	0.00 (0.00,0.00)	*	2.88 (1.33,6.16)	*	0.49 (0.07,3.40)	*	2.10 (0.65,6.64)
7	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 748. Reasons for First Revision Following Primary THA for ProFemur Gladiator Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	4	36.4
2	Dislocation/Instability	4	36.4
3	Peri-prosthetic fracture - Femur	2	18.2
4	Peri-prosthetic fracture - Acetabulum	1	9.1

Table 749. Reasons for First Revision in the First 90 Days Following Primary THA for ProFemur Gladiator Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	6	33.3
2	Peri-prosthetic fracture - Acetabulum	4	22.2
3	Peri-prosthetic fracture - Femur	4	22.2
4	Malalignment	2	11.1
5	Aseptic Loosening	1	5.6
6	Joint Infection	1	5.6

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Table 750. Reasons for First Revision Between 91 and 365 days Following Primary THA for ProFemur Gladiator Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	5	50.0
2	Aseptic Loosening	3	30.0
3	Dislocation/Instability	1	10.0
4	Malalignment	1	10.0

Table 751. Descriptive Statistics of Cases Receiving the ProFemur Gladiator Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	550	57.53	
Age (years)	956	64.09 (10.81)	65.00 (15.00)
Height (cm)	956	169.17 (10.22)	167.64 (16.56)
Weight (kg)	956	88.48 (20.52)	86.40 (26.09)
BMI(kg/m^2)	956	30.82 (6.26)	29.84 (7.98)
Smoker - Never (%)	455	47.59	
Smoker - Previous (%)	346	36.19	
Smoker - Current (%)	154	16.11	
Smoker - Unknown (%)	1	0.1	

Table 752. Distribution of Approach Used for ProFemur Gladiator Stem in Primary THA Cases

Approach	N	Percent
Anterior	941	98.4
Anterolateral	12	1.3
Posterior	3	0.3
Transtrochanteric	0	0.0
Missing/unknown/other	0	0.0

Table 753. Distribution of Head Size for ProFemur Gladiator Stem in Primary THA Cases

Size (mm)	N	Percent
32	26	2.8
36	587	63.4
40	132	14.2
Missing/unknown/other	181	19.6

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Table 754. Distribution of Bearing Surface for ProFemur Gladiator Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	0	0.0
Ceramic-on-plastic	745	77.9
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	211	22.1

Table 755. Distribution of Polyethylene Used for ProFemur Gladiator Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	32	3.5
Antioxidant XLPE	894	96.5
Missing/unknown/other	0	0.0

Table 756. Volume of Cases by Surgeon and Site for the ProFemur Gladiator Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	159 (262)	12 (270)
Cases per site	106 (136)	13 (269)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

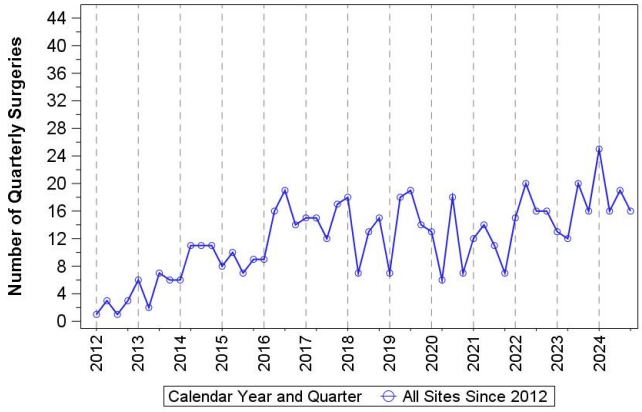


Figure 270. Utilization of the ProFemur Gladiator Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

PRGLCLE5	PRGLCLS3	PRGLCLS1
PRGLCLE6	PRGLCLE7	PRGLCLE2
PRGLCLE4	PRGLCLS6	PRGLCLE1
PRGLCLS5	PRGLCLE8	PRGLCLE9
PRGLCLS4	PRGLCLS2	
PRGLCLE3	PRGLCLS7	

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3.2.25 Restoration Modular

N = 622 primary cases were used for this analysis. Distribution of utilization: 111 surgeons across 41 sites used this implant in primary THA cases.

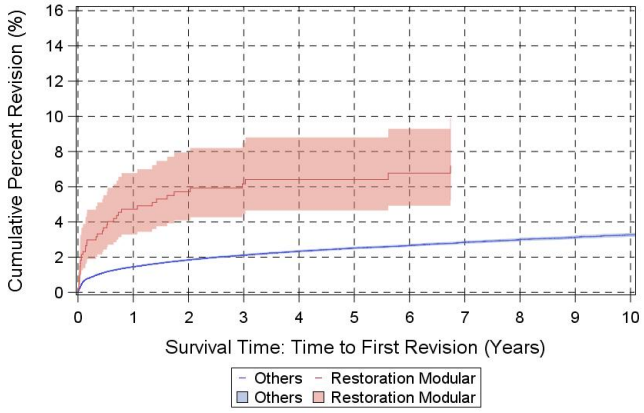


Figure 271. Cumulative Percent Revision Curve for the Restoration Modular Stem, Compared to All Other Femoral Components in Primary THA Cases

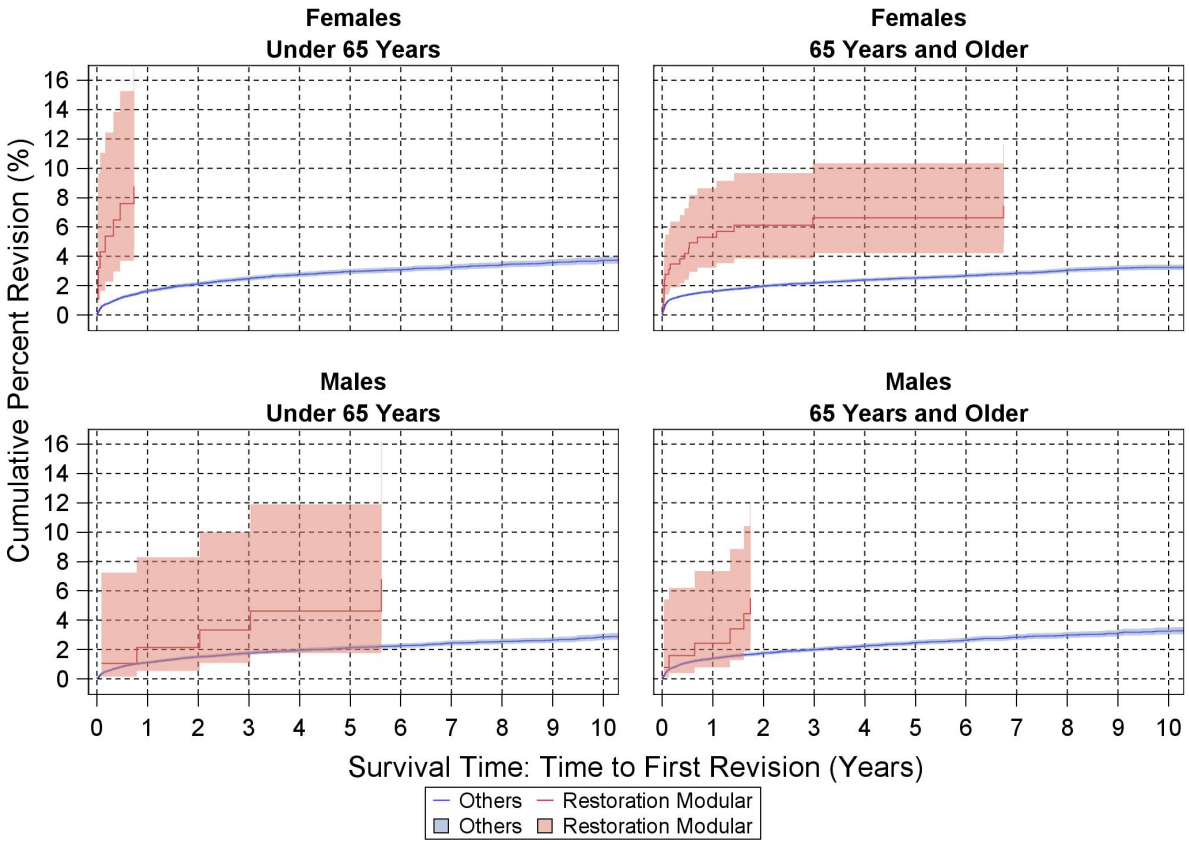


Figure 272. Cumulative Percent Revision Curve for the Restoration Modular Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 757. Cumulative Percent Revision and Number at Risk for the Restoration Modular Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	607	0.00 (0.00,0.00)	93	0.00 (0.00,0.00)	290	0.00 (0.00,0.00)	95	0.00 (0.00,0.00)	128	0.00 (0.00,0.00)
1	510	4.73 (3.29,6.77)	77	8.76 (4.48,16.76)	238	5.30 (3.23,8.64)	88	2.14 (0.54,8.29)	106	2.43 (0.79,7.35)
2	447	5.71 (4.09,7.95)	64	8.76 (4.48,16.76)	212	6.12 (3.84,9.67)	82	2.14 (0.54,8.29)	88	5.49 (2.49,11.90)
3	383	6.17 (4.46,8.50)	52	8.76 (4.48,16.76)	182	6.63 (4.21,10.34)	75	3.33 (1.09,10.00)	74	5.49 (2.49,11.90)
4	340	6.41 (4.65,8.80)	46	8.76 (4.48,16.76)	162	6.63 (4.21,10.34)	65	4.62 (1.75,11.89)	67	5.49 (2.49,11.90)
5	300	6.41 (4.65,8.80)	41	8.76 (4.48,16.76)	151	6.63 (4.21,10.34)	55	4.62 (1.75,11.89)	53	5.49 (2.49,11.90)
6	246	6.77 (4.92,9.29)	31	8.76 (4.48,16.76)	129	6.63 (4.21,10.34)	41	6.79 (2.76,16.20)	45	5.49 (2.49,11.90)
7	196	7.20 (5.22,9.89)	27	8.76 (4.48,16.76)	97	7.45 (4.73,11.65)	35	6.79 (2.76,16.20)	37	5.49 (2.49,11.90)
8	144	7.20 (5.22,9.89)	19	8.76 (4.48,16.76)	73	7.45 (4.73,11.65)	27	6.79 (2.76,16.20)	25	5.49 (2.49,11.90)
9	89	7.20 (5.22,9.89)	12	8.76 (4.48,16.76)	44	7.45 (4.73,11.65)	20	6.79 (2.76,16.20)	13	5.49 (2.49,11.90)
10	61	7.20 (5.22,9.89)	*	8.76 (4.48,16.76)	29	7.45 (4.73,11.65)	16	6.79 (2.76,16.20)	*	5.49 (2.49,11.90)

* Denotes that the number of cases is between 1 and 10.

Table 758. Reasons for First Revision Following Primary THA for Restoration Modular Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	11	28.9
2	Dislocation/Instability	8	21.1
3	Aseptic Loosening	6	15.8
4	Peri-prosthetic fracture - Acetabulum	4	10.5
5	Peri-prosthetic fracture - Femur	4	10.5
6	Malalignment	3	7.9
7	Metal Reaction/Metallosis	1	2.6
8	Pain	1	2.6

Table 759. Reasons for First Revision in the First 90 Days Following Primary THA for Restoration Modular Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	6	33.3
2	Peri-prosthetic fracture - Acetabulum	4	22.2
3	Peri-prosthetic fracture - Femur	4	22.2
4	Malalignment	2	11.1
5	Aseptic Loosening	1	5.6
6	Joint Infection	1	5.6

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Table 760. Reasons for First Revision Between 91 and 365 days Following Primary THA for Restoration Modular Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	5	50.0
2	Aseptic Loosening	3	30.0
3	Dislocation/Instability	1	10.0
4	Malalignment	1	10.0

Table 761. Descriptive Statistics of Cases Receiving the Restoration Modular Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	393	63.18	
Age (years)	622	69.18 (13.16)	71.00 (16.00)
Height (cm)	622	167.49 (11.06)	165.10 (15.30)
Weight (kg)	622	81.12 (23.12)	77.10 (32.50)
BMI(kg/m^2)	622	28.72 (7.00)	27.49 (8.91)
Smoker - Never (%)	272	43.73	
Smoker - Previous (%)	238	38.26	
Smoker - Current (%)	108	17.36	
Smoker - Unknown (%)	4	0.64	

Table 762. Distribution of Approach Used for Restoration Modular Stem in Primary THA Cases

Approach	N	Percent
Anterior	46	7.4
Anterolateral	163	26.2
Posterior	404	65.0
Transtrochanteric	0	0.0
Missing/unknown/other	9	1.4

Table 763. Distribution of Head Size for Restoration Modular Stem in Primary THA Cases

Size (mm)	N	Percent
22	2	0.5
28	5	1.3
32	31	8.0
36	292	75.1
40	46	11.8
44	6	1.5
Missing/unknown/other	7	1.8

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Table 764. Distribution of Bearing Surface for Restoration Modular Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	99	15.9
Ceramic-on-plastic	282	45.3
Ceramic-on-ceramic	1	0.2
Metal-on-metal	0	0.0
Dual mobility	214	34.4
Missing/unknown/other	26	4.2

Table 765. Distribution of Polyethylene Used for Restoration Modular Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	4	0.7
XLPE	583	98.5
Antioxidant XLPE	5	0.8
Missing/unknown/other	0	0.0

Table 766. Volume of Cases by Surgeon and Site for the Restoration Modular Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	5 (6)	3 (5)
Cases per site	15 (16)	11 (15)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

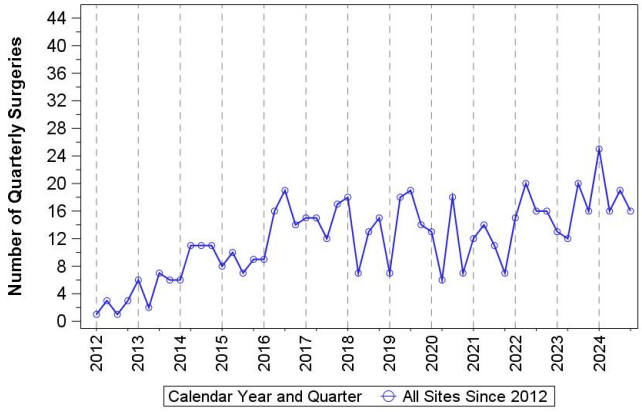


Figure 273. Utilization of the Restoration Modular Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

62761021	62761219	62767120
62761019	62761225	62767214
62761023	62761321	62767315
62761123	62767020	62767320
62761121	62767022	62761029
62761025	62761323	62761131
62761119	62767218	62761227
62767017	62761319	62761327
62767018	62764119	62764127
62767016	62767215	62765015
62761125	62767216	62765017
62767015	62767221	62767023
62767019	62761027	62767024
62761221	62761127	62767117
62767014	62761129	62767118
62761223	62761325	62767219
62767021	62767025	62767222
62767217	62767119	

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3.2.26 Secur-Fit

N = 2,053 primary cases were used for this analysis. Distribution of utilization: 49 surgeons across 29 sites used this implant in primary THA cases.

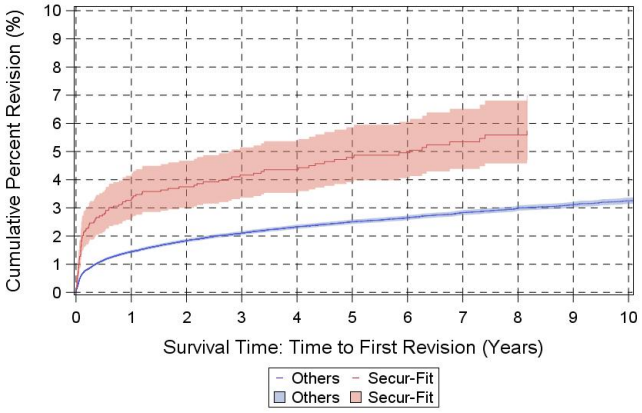


Figure 274. Cumulative Percent Revision Curve for the Secur-Fit Stem, Compared to All Other Femoral Components in Primary THA Cases

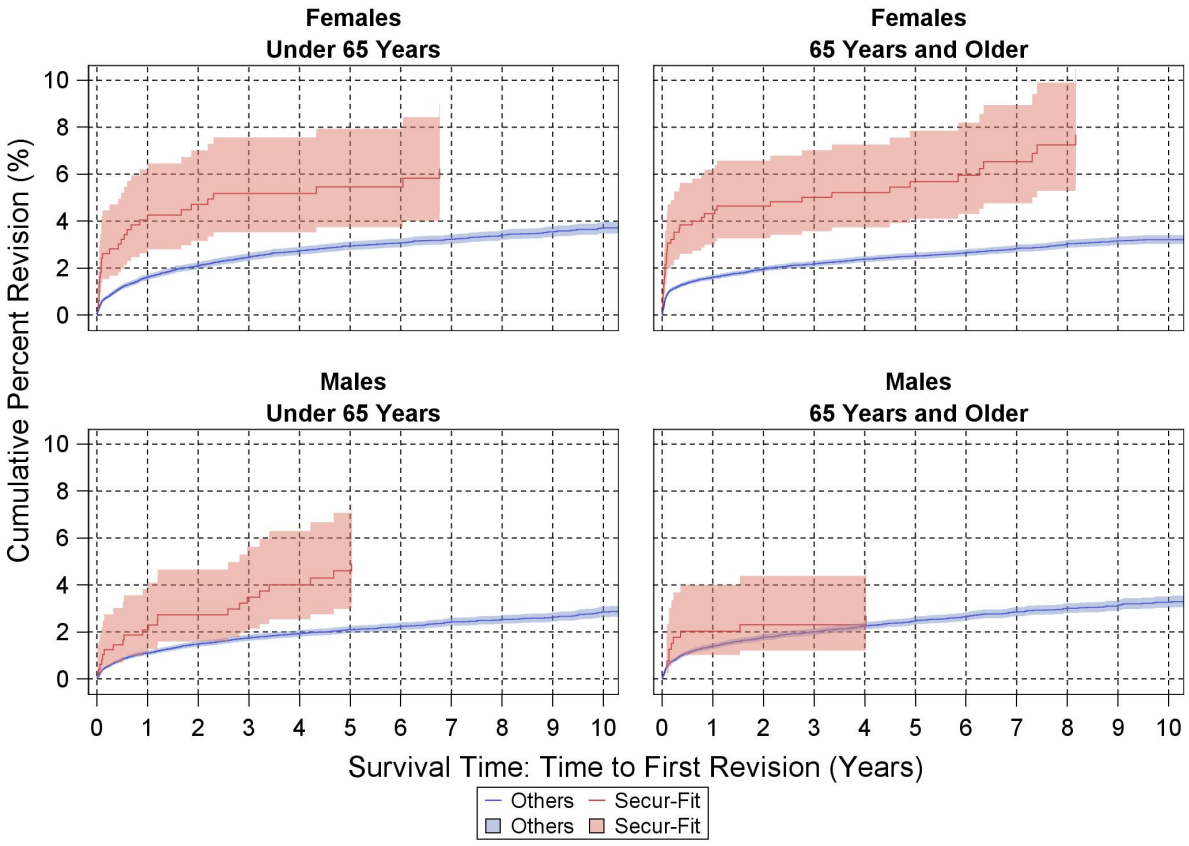


Figure 275. Cumulative Percent Revision Curve for the Secur-Fit Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 767. Cumulative Percent Revision and Number at Risk for the Secur-Fit Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	2,037	0.00 (0.00,0.00)	499	0.00 (0.00,0.00)	654	0.00 (0.00,0.00)	483	0.00 (0.00,0.00)	400	0.00 (0.00,0.00)
1	1,869	3.27 (2.58,4.14)	455	4.05 (2.63,6.20)	588	4.31 (3.00,6.19)	461	2.08 (1.13,3.83)	364	2.03 (1.02,4.01)
2	1,700	3.75 (3.00,4.68)	413	4.71 (3.15,7.01)	537	4.64 (3.27,6.57)	419	2.73 (1.59,4.65)	330	2.31 (1.21,4.38)
3	1,538	4.16 (3.37,5.15)	379	5.17 (3.52,7.57)	486	5.01 (3.57,7.02)	377	3.48 (2.14,5.63)	295	2.31 (1.21,4.38)
4	1,382	4.36 (3.53,5.36)	348	5.17 (3.52,7.57)	432	5.21 (3.73,7.26)	341	4.01 (2.54,6.30)	260	2.31 (1.21,4.38)
5	1,251	4.79 (3.91,5.86)	316	5.46 (3.74,7.93)	396	5.68 (4.10,7.85)	304	4.60 (2.98,7.07)	234	2.68 (1.44,4.96)
6	1,055	4.96 (4.05,6.05)	262	5.46 (3.74,7.93)	343	5.95 (4.31,8.19)	245	4.92 (3.22,7.48)	204	2.68 (1.44,4.96)
7	854	5.35 (4.38,6.52)	225	6.23 (4.30,8.98)	284	6.53 (4.75,8.94)	190	4.92 (3.22,7.48)	154	2.68 (1.44,4.96)
8	654	5.59 (4.58,6.81)	180	6.23 (4.30,8.98)	223	7.25 (5.28,9.90)	138	4.92 (3.22,7.48)	112	2.68 (1.44,4.96)
9	413	5.74 (4.70,7.00)	122	6.23 (4.30,8.98)	137	7.69 (5.60,10.51)	84	4.92 (3.22,7.48)	69	2.68 (1.44,4.96)
10	214	5.74 (4.70,7.00)	65	6.23 (4.30,8.98)	68	7.69 (5.60,10.51)	47	4.92 (3.22,7.48)	34	2.68 (1.44,4.96)

Table 768. Reasons for First Revision Following Primary THA for Secur-Fit Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	30	30.9
2	Aseptic Loosening	25	25.8
3	Joint Infection	14	14.4
4	Dislocation/Instability	13	13.4
5	Implant Failure	9	9.3
6	Malalignment	3	3.1
7	Peri-prosthetic fracture - Acetabulum	1	1.0
8	Metal Reaction/Metallosis	1	1.0
9	Pain	1	1.0

Table 769. Reasons for First Revision in the First 90 Days Following Primary THA for Secur-Fit Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	27	56.2
2	Dislocation/Instability	10	20.8
3	Joint Infection	4	8.3
4	Aseptic Loosening	3	6.2
5	Implant Failure	3	6.2
6	Malalignment	1	2.1

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Table 770. Reasons for First Revision Between 91 and 365 days Following Primary THA for Secur-Fit Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	6	40.0
2	Aseptic Loosening	4	26.7
3	Implant Failure	3	20.0
4	Dislocation/Instability	1	6.7
5	Malalignment	1	6.7

Table 771. Descriptive Statistics of Cases Receiving the Secur-Fit Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,161	56.55	
Age (years)	2,053	64.77 (10.57)	65.00 (13.00)
Height (cm)	2,053	169.78 (10.32)	170.10 (15.30)
Weight (kg)	2,053	91.32 (22.39)	88.50 (28.73)
BMI(kg/m^2)	2,053	31.59 (6.86)	30.67 (9.15)
Smoker - Never (%)	951	46.32	
Smoker - Previous (%)	710	34.58	
Smoker - Current (%)	380	18.51	
Smoker - Unknown (%)	12	0.58	

Table 772. Distribution of Approach Used for Secur-Fit Stem in Primary THA Cases

Approach	N	Percent
Anterior	6	0.3
Anterolateral	1249	60.8
Posterior	788	38.4
Transtrochanteric	1	0.1
Missing/unknown/other	9	0.4

Table 773. Distribution of Head Size for Secur-Fit Stem in Primary THA Cases

Size (mm)	N	Percent
28	2	0.1
32	233	14.9
36	943	60.3
40	374	23.9
Missing/unknown/other	12	0.8

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Table 774. Distribution of Bearing Surface for Secur-Fit Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	278	13.5
Ceramic-on-plastic	1,271	61.9
Ceramic-on-ceramic	3	0.1
Metal-on-metal	0	0.0
Dual mobility	479	23.3
Missing/unknown/other	22	1.1

Table 775. Distribution of Polyethylene Used for Secur-Fit Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	2,035	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 776. Volume of Cases by Surgeon and Site for the Secur-Fit Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	41 (103)	4 (21)
Cases per site	70 (129)	15 (73)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

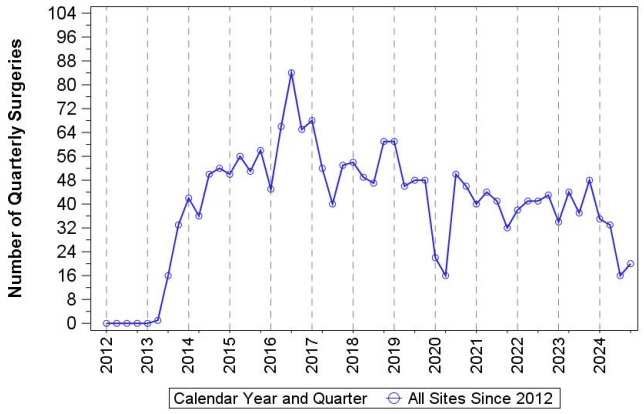


Figure 276. Utilization of the Secur-Fit Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

160108132	160110132	160111127
160107132	160110127	160112132
160108127	160106127	160112127
160109132	160106132	
160107127	160111132	
160109127	160105132	

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3.2.27 Secur-Fit Max

N = 3,283 primary cases were used for this analysis. Distribution of utilization: 59 surgeons across 27 sites used this implant in primary THA cases.

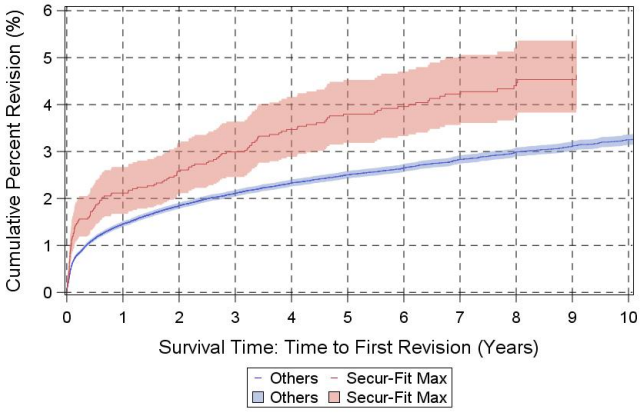


Figure 277. Cumulative Percent Revision Curve for the Secur-Fit Max Stem, Compared to All Other Femoral Components in Primary THA Cases

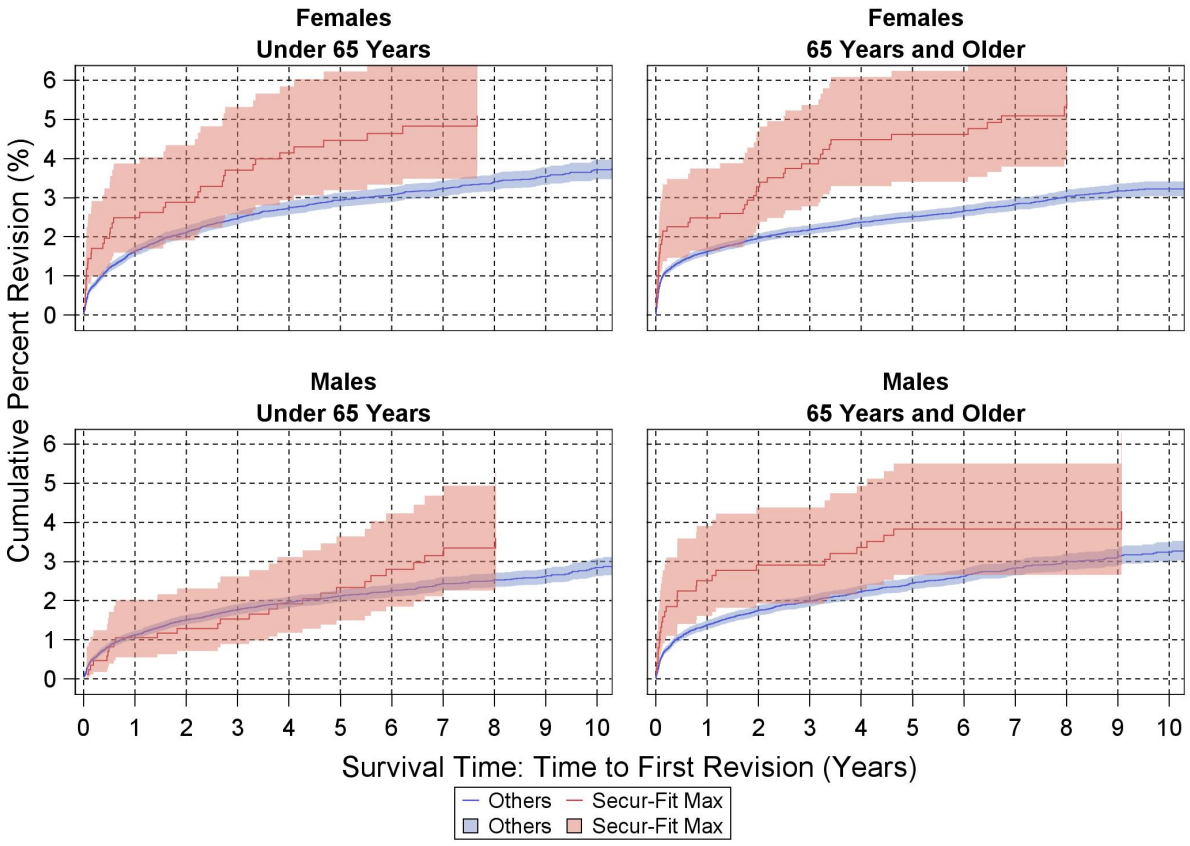


Figure 278. Cumulative Percent Revision Curve for the Secur-Fit Max Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 777. Cumulative Percent Revision and Number at Risk for the Secur-Fit Max Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	3,263	0.00 (0.00,0.00)	764	0.00 (0.00,0.00)	887	0.00 (0.00,0.00)	855	0.00 (0.00,0.00)	757	0.00 (0.00,0.00)
1	3,193	2.12 (1.67,2.67)	745	2.49 (1.59,3.87)	864	2.48 (1.64,3.74)	846	1.05 (0.55,2.01)	738	2.51 (1.61,3.91)
2	3,133	2.58 (2.09,3.18)	728	2.88 (1.91,4.34)	842	3.28 (2.29,4.68)	837	1.29 (0.71,2.31)	726	2.91 (1.92,4.38)
3	2,935	2.99 (2.46,3.64)	679	3.70 (2.57,5.32)	788	3.86 (2.78,5.37)	789	1.53 (0.89,2.62)	679	2.91 (1.92,4.38)
4	2,740	3.47 (2.89,4.16)	625	4.14 (2.93,5.84)	747	4.48 (3.29,6.08)	735	1.92 (1.18,3.11)	633	3.36 (2.28,4.93)
5	2,536	3.80 (3.18,4.53)	567	4.46 (3.19,6.22)	696	4.61 (3.40,6.24)	681	2.34 (1.49,3.64)	592	3.83 (2.66,5.50)
6	2,315	3.96 (3.33,4.70)	523	4.64 (3.33,6.44)	640	4.61 (3.40,6.24)	609	2.80 (1.85,4.23)	543	3.83 (2.66,5.50)
7	1,908	4.22 (3.56,5.00)	427	4.83 (3.48,6.67)	531	5.09 (3.79,6.81)	498	3.15 (2.11,4.68)	452	3.83 (2.66,5.50)
8	1,442	4.40 (3.72,5.21)	329	5.09 (3.68,7.03)	401	5.32 (3.97,7.12)	369	3.34 (2.26,4.94)	343	3.83 (2.66,5.50)
9	1,004	4.53 (3.83,5.36)	236	5.09 (3.68,7.03)	305	5.56 (4.15,7.43)	247	3.61 (2.44,5.31)	216	3.83 (2.66,5.50)
10	611	4.63 (3.91,5.49)	134	5.09 (3.68,7.03)	190	5.56 (4.15,7.43)	156	3.61 (2.44,5.31)	131	4.29 (2.91,6.29)

Table 778. Reasons for First Revision Following Primary THA for Secur-Fit Max Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	47	35.6
2	Aseptic Loosening	22	16.7
3	Joint Infection	18	13.6
4	Dislocation/Instability	14	10.6
5	Malalignment	13	9.8
6	Implant Failure	6	4.5
7	Metal Reaction/Metallosis	5	3.8
8	Peri-prosthetic fracture - Acetabulum	4	3.0
9	Pain	3	2.3

Table 779. Reasons for First Revision in the First 90 Days Following Primary THA for Secur-Fit Max Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	32	64.0
2	Joint Infection	5	10.0
3	Dislocation/Instability	4	8.0
4	Aseptic Loosening	3	6.0
5	Implant Failure	2	4.0
6	Peri-prosthetic fracture - Acetabulum	2	4.0
7	Pain	1	2.0
8	Malalignment	1	2.0

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Table 780. Reasons for First Revision Between 91 and 365 days Following Primary THA for Secur-Fit Max Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	5	31.2
2	Peri-prosthetic fracture - Femur	4	25.0
3	Aseptic Loosening	3	18.8
4	Dislocation/Instability	3	18.8
5	Peri-prosthetic fracture - Acetabulum	1	6.2

Table 781. Descriptive Statistics of Cases Receiving the Secur-Fit Max Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,662	50.62	
Age (years)	3,283	63.71 (11.20)	65.00 (14.00)
Height (cm)	3,283	170.49 (10.23)	170.18 (15.20)
Weight (kg)	3,283	91.66 (21.84)	89.40 (27.98)
BMI(kg/m^2)	3,283	31.42 (6.52)	30.74 (8.53)
Smoker - Never (%)	1,561	47.55	
Smoker - Previous (%)	1,250	38.07	
Smoker - Current (%)	463	14.1	
Smoker - Unknown (%)	9	0.27	

Table 782. Distribution of Approach Used for Secur-Fit Max Stem in Primary THA Cases

Approach	N	Percent
Anterior	29	0.9
Anterolateral	1866	56.8
Posterior	1,337	40.7
Transtrochanteric	23	0.7
Missing/unknown/other	28	0.8

Table 783. Distribution of Head Size for Secur-Fit Max Stem in Primary THA Cases

Size (mm)	N	Percent
22	3	0.1
28	36	1.2
32	1,026	35.0
36	1,686	57.5
40	162	5.5
44	2	0.1
Missing/unknown/other	16	0.6

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Table 784. Distribution of Bearing Surface for Secur-Fit Max Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,059	32.3
Ceramic-on-plastic	638	19.4
Ceramic-on-ceramic	1,218	37.1
Metal-on-metal	0	0.0
Dual mobility	318	9.7
Missing/unknown/other	50	1.5

Table 785. Distribution of Polyethylene Used for Secur-Fit Max Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	2,019	100.0
Antioxidant XLPE	1	0.1
Missing/unknown/other	0	0.0

Table 786. Volume of Cases by Surgeon and Site for the Secur-Fit Max Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	55 (171)	8 (44)
Cases per site	121 (242)	24 (144)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

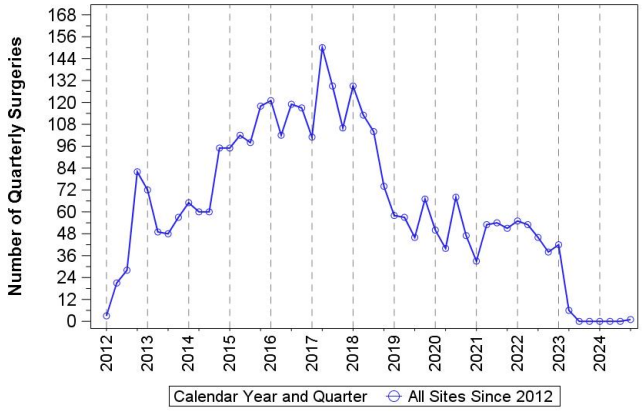


Figure 279. Utilization of the Secur-Fit Max Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

60510935S
60510830S
60511035S
60510730S
60520830S
60520935S
60511140S
60521035S
60520730S
60510625S
60511240S
60521140S
60520625S
60521240S
60510525S
60521340S
60511340S
60511440S
60510425S

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3.2.28 Secur-Fit Plus Max

N = 2,177 primary cases were used for this analysis. Distribution of utilization: 35 surgeons across 21 sites used this implant in primary THA cases.

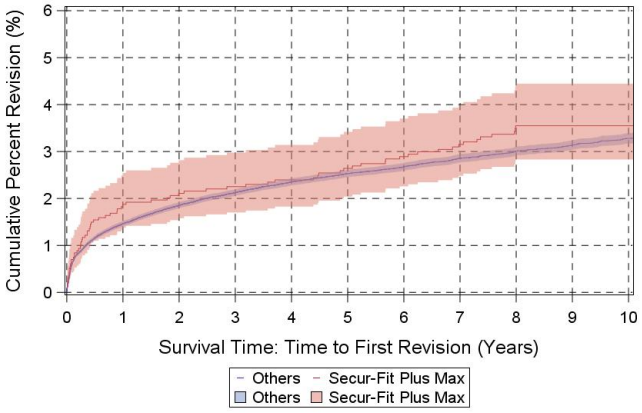


Figure 280. Cumulative Percent Revision Curve for the Secur-Fit Plus Max Stem, Compared to All Other Femoral Components in Primary THA Cases

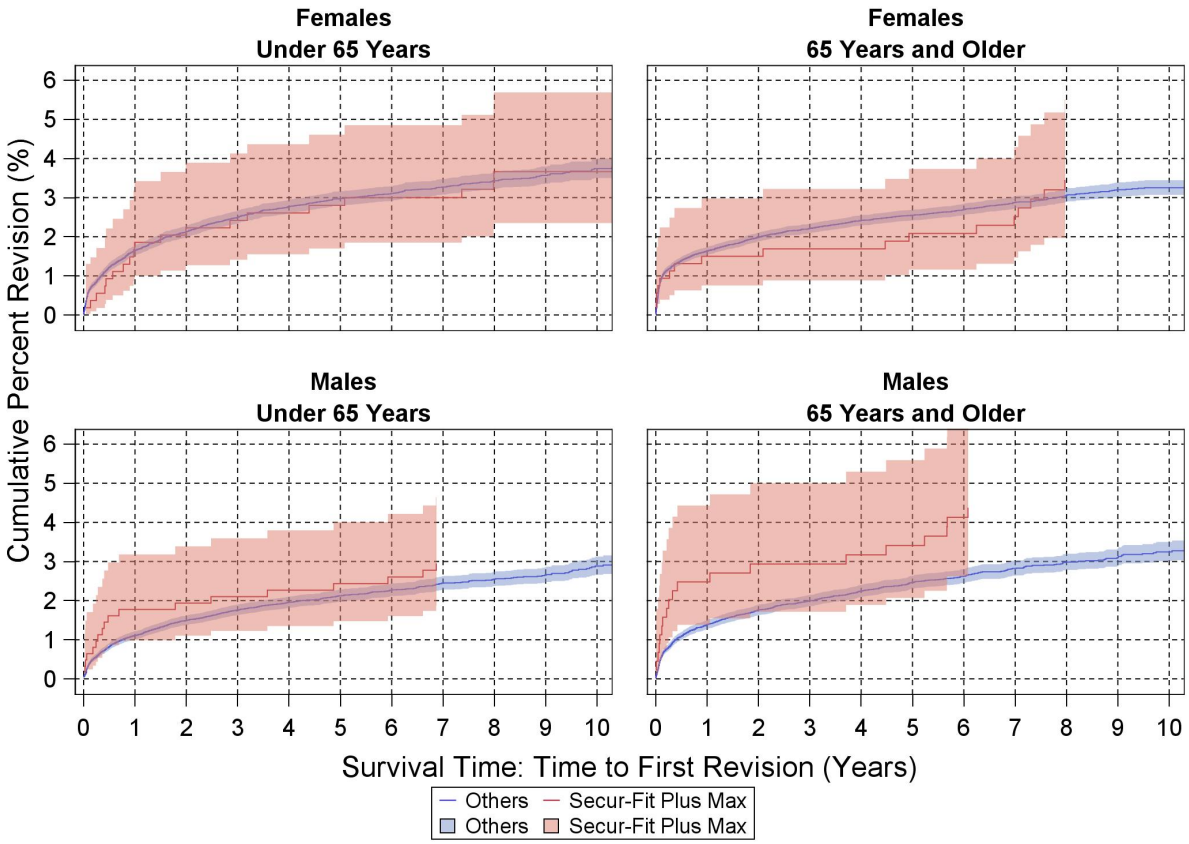


Figure 281. Cumulative Percent Revision Curve for the Secur-Fit Plus Max Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 787. Cumulative Percent Revision and Number at Risk for the Secur-Fit Plus Max Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	2,138	0.00 (0.00,0.00)	540	0.00 (0.00,0.00)	533	0.00 (0.00,0.00)	621	0.00 (0.00,0.00)	444	0.00 (0.00,0.00)
1	2,084	1.87 (1.38,2.55)	527	1.86 (1.00,3.42)	524	1.50 (0.75,2.98)	605	1.77 (0.99,3.18)	428	2.48 (1.38,4.43)
2	2,067	2.11 (1.58,2.82)	523	2.23 (1.27,3.89)	521	1.50 (0.75,2.98)	600	1.94 (1.10,3.39)	423	2.94 (1.71,5.00)
3	2,041	2.25 (1.70,2.98)	514	2.42 (1.41,4.13)	516	1.69 (0.88,3.22)	595	2.10 (1.23,3.59)	416	2.94 (1.71,5.00)
4	2,004	2.40 (1.83,3.14)	502	2.61 (1.55,4.36)	505	1.69 (0.88,3.22)	586	2.27 (1.35,3.80)	411	3.17 (1.89,5.29)
5	1,975	2.64 (2.04,3.42)	496	2.80 (1.70,4.61)	494	2.08 (1.16,3.73)	580	2.43 (1.48,4.01)	405	3.41 (2.07,5.59)
6	1,932	2.89 (2.26,3.70)	486	3.00 (1.85,4.85)	479	2.08 (1.16,3.73)	574	2.60 (1.60,4.22)	393	4.13 (2.62,6.48)
7	1,821	3.15 (2.48,3.99)	467	3.00 (1.85,4.85)	440	2.51 (1.47,4.29)	552	2.95 (1.87,4.65)	362	4.37 (2.81,6.78)
8	1,602	3.55 (2.83,4.45)	425	3.66 (2.35,5.69)	376	3.45 (2.16,5.51)	494	2.95 (1.87,4.65)	307	4.37 (2.81,6.78)
9	1,240	3.55 (2.83,4.45)	340	3.66 (2.35,5.69)	285	3.45 (2.16,5.51)	382	2.95 (1.87,4.65)	233	4.37 (2.81,6.78)
10	887	3.55 (2.83,4.45)	247	3.66 (2.35,5.69)	201	3.45 (2.16,5.51)	280	2.95 (1.87,4.65)	159	4.37 (2.81,6.78)

Table 788. Reasons for First Revision Following Primary THA for Secur-Fit Plus Max Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	16	25.4
2	Joint Infection	15	23.8
3	Dislocation/Instability	13	20.6
4	Aseptic Loosening	10	15.9
5	Implant Failure	3	4.8
6	Metal Reaction/Metallosis	3	4.8
7	Peri-prosthetic fracture - Acetabulum	1	1.6
8	Pain	1	1.6
9	Malalignment	1	1.6

Table 789. Reasons for First Revision in the First 90 Days Following Primary THA for Secur-Fit Plus Max Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	8	40.0
2	Dislocation/Instability	5	25.0
3	Joint Infection	3	15.0
4	Aseptic Loosening	2	10.0
5	Implant Failure	1	5.0
6	Peri-prosthetic fracture - Acetabulum	1	5.0

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Table 790. Reasons for First Revision Between 91 and 365 days Following Primary THA for Secur-Fit Plus Max Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	5	50.0
2	Dislocation/Instability	3	30.0
3	Aseptic Loosening	1	10.0
4	Metal Reaction/Metallosis	1	10.0

Table 791. Descriptive Statistics of Cases Receiving the Secur-Fit Plus Max Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,093	50.21	
Age (years)	2,177	62.44 (13.00)	63.00 (16.00)
Height (cm)	2,177	169.86 (10.67)	170.00 (15.24)
Weight (kg)	2,177	87.44 (19.92)	86.36 (26.90)
BMI(kg/m^2)	2,177	30.22 (6.26)	29.63 (7.36)
Smoker - Never (%)	1,018	46.76	
Smoker - Previous (%)	805	36.98	
Smoker - Current (%)	313	14.38	
Smoker - Unknown (%)	41	1.88	

Table 792. Distribution of Approach Used for Secur-Fit Plus Max Stem in Primary THA Cases

Approach	N	Percent
Anterior	8	0.4
Anterolateral	209	9.6
Posterior	1,940	89.1
Transtrochanteric	4	0.2
Missing/unknown/other	16	0.7

Table 793. Distribution of Head Size for Secur-Fit Plus Max Stem in Primary THA Cases

Size (mm)	N	Percent
28	1	0.1
32	163	7.8
36	1,564	75.2
40	299	14.4
44	47	2.3
Missing/unknown/other	7	0.3

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Table 794. Distribution of Bearing Surface for Secur-Fit Plus Max Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,194	54.9
Ceramic-on-plastic	880	40.4
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	80	3.7
Missing/unknown/other	23	1.1

Table 795. Distribution of Polyethylene Used for Secur-Fit Plus Max Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	2,159	100.0
Antioxidant XLPE	1	0.1
Missing/unknown/other	0	0.0

Table 796. Volume of Cases by Surgeon and Site for the Secur-Fit Plus Max Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	62 (183)	7 (56)
Cases per site	103 (252)	39 (71)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

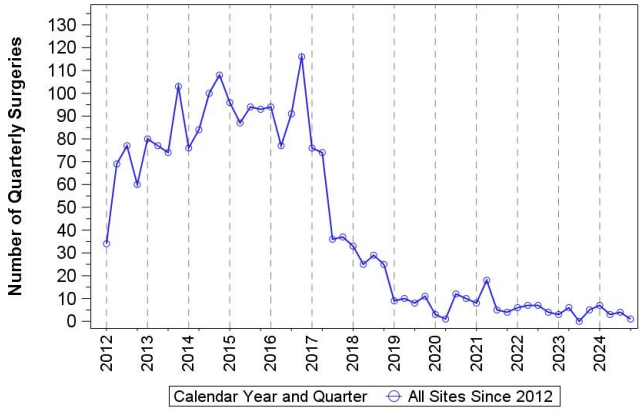


Figure 282. Utilization of the Secur-Fit Plus Max Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

60540913S	60540713S	S2337HF12
60540812S	60541016S	60540511S
60541014S	S2337HF10	60540509S
60540711S	60541117S	60540812
S2337HF08	60540610S	60540915
60541115S	S2337HF11	60541319S
60540814S	60540612S	S2337HF05
60540915S	S2337HF06	S2337HF13
S2337HF09	60541216S	
S2337HF07	60541218S	

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3.2.29 SROM

N = 1,170 primary cases were used for this analysis. Distribution of utilization: 64 surgeons across 36 sites used this implant in primary THA cases.

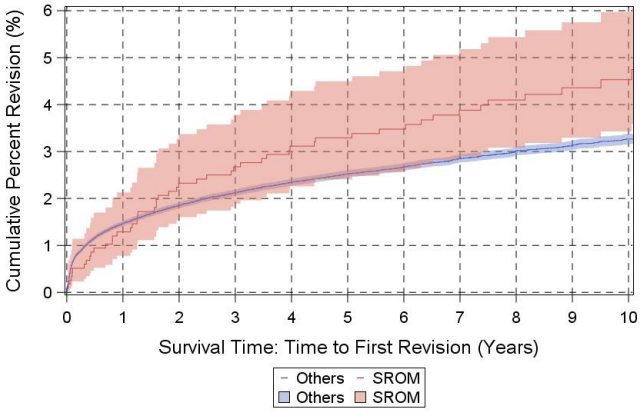


Figure 283. Cumulative Percent Revision Curve for the SROM Stem, Compared to All Other Femoral Components in Primary THA Cases

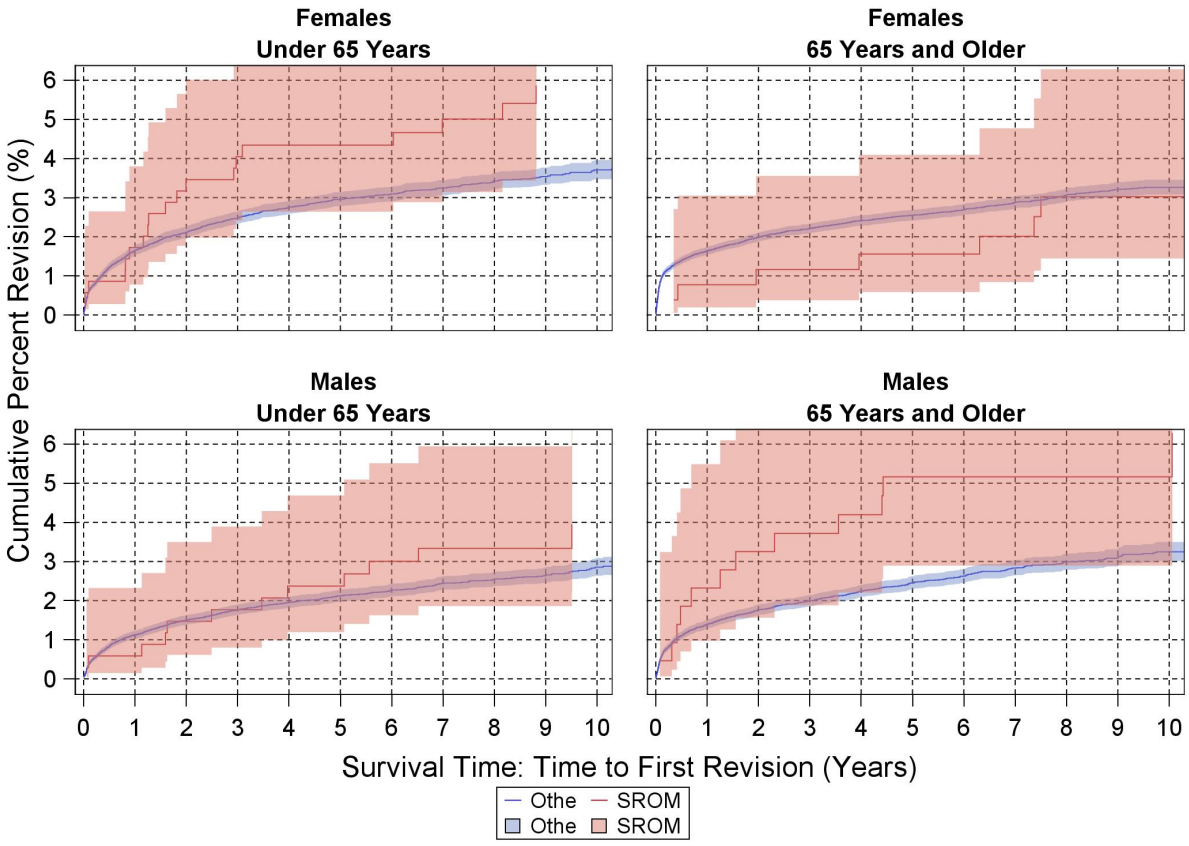


Figure 284. Cumulative Percent Revision Curve for the SROM Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 797. Cumulative Percent Revision and Number at Risk for the SROM Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,166	0.00 (0.00,0.00)	348	0.00 (0.00,0.00)	260	0.00 (0.00,0.00)	342	0.00 (0.00,0.00)	216	0.00 (0.00,0.00)
1	1,144	1.29 (0.78,2.13)	340	1.72 (0.78,3.80)	256	0.77 (0.19,3.05)	338	0.59 (0.15,2.32)	210	2.32 (0.97,5.49)
2	1,127	2.33 (1.60,3.37)	334	3.46 (1.98,6.01)	254	1.16 (0.38,3.56)	331	1.47 (0.61,3.50)	208	3.25 (1.56,6.70)
3	1,114	2.67 (1.89,3.78)	327	4.05 (2.42,6.74)	253	1.16 (0.38,3.56)	329	1.77 (0.80,3.89)	205	3.72 (1.88,7.30)
4	1,094	3.12 (2.26,4.29)	323	4.34 (2.64,7.10)	249	1.56 (0.59,4.09)	322	2.37 (1.19,4.69)	200	4.20 (2.21,7.91)
5	1,066	3.29 (2.41,4.50)	316	4.34 (2.64,7.10)	245	1.56 (0.59,4.09)	315	2.37 (1.19,4.69)	190	5.16 (2.89,9.13)
6	992	3.48 (2.56,4.71)	297	4.34 (2.64,7.10)	221	1.56 (0.59,4.09)	299	3.00 (1.63,5.51)	175	5.16 (2.89,9.13)
7	917	3.88 (2.90,5.18)	275	5.01 (3.14,7.94)	202	2.01 (0.84,4.77)	280	3.34 (1.86,5.95)	160	5.16 (2.89,9.13)
8	807	4.10 (3.08,5.44)	239	5.01 (3.14,7.94)	179	3.03 (1.45,6.28)	249	3.34 (1.86,5.95)	140	5.16 (2.89,9.13)
9	660	4.36 (3.29,5.75)	197	5.87 (3.76,9.10)	147	3.03 (1.45,6.28)	195	3.34 (1.86,5.95)	121	5.16 (2.89,9.13)
10	444	4.53 (3.43,5.97)	132	5.87 (3.76,9.10)	104	3.03 (1.45,6.28)	124	3.95 (2.22,6.99)	84	5.16 (2.89,9.13)

Table 798. Reasons for First Revision Following Primary THA for SROM Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	16	34.0
2	Aseptic Loosening	9	19.1
3	Dislocation/Instability	8	17.0
4	Implant Failure	6	12.8
5	Malalignment	4	8.5
6	Peri-prosthetic fracture - Femur	2	4.3
7	Metal Reaction/Metallosis	1	2.1
8	Pain	1	2.1

Table 799. Reasons for First Revision in the First 90 Days Following Primary THA for SROM Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	3	50.0
2	Dislocation/Instability	2	33.3
3	Peri-prosthetic fracture - Femur	1	16.7

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Table 800. Reasons for First Revision Between 91 and 365 days Following Primary THA for SROM Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	3	50.0
2	Aseptic Loosening	1	16.7
3	Dislocation/Instability	1	16.7
4	Implant Failure	1	16.7

Table 801. Descriptive Statistics of Cases Receiving the SROM Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	610	52.14	
Age (years)	1,170	60.91 (12.61)	62.00 (16.00)
Height (cm)	1,169	170.13 (11.89)	170.18 (17.44)
Weight (kg)	1,169	89.15 (22.40)	88.00 (29.52)
BMI(kg/m^2)	1,169	30.66 (6.56)	29.86 (8.82)
Smoker - Never (%)	582	49.74	
Smoker - Previous (%)	409	34.96	
Smoker - Current (%)	176	15.04	
Smoker - Unknown (%)	3	0.26	

Table 802. Distribution of Approach Used for SROM Stem in Primary THA Cases

Approach	N	Percent
Anterior	14	1.2
Anterolateral	606	51.8
Posterior	528	45.1
Transtrochanteric	14	1.2
Missing/unknown/other	8	0.7

Table 803. Distribution of Head Size for SROM Stem in Primary THA Cases

Size (mm)	N	Percent
22	9	0.8
28	39	3.4
32	269	23.1
36	810	69.7
40	26	2.2
44	2	0.2
Missing/unknown/other	8	0.7

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Table 804. Distribution of Bearing Surface for SROM Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	340	29.1
Ceramic-on-plastic	813	69.5
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	3	0.3
Missing/unknown/other	14	1.2

Table 805. Distribution of Polyethylene Used for SROM Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,153	99.0
Antioxidant XLPE	11	0.9
Missing/unknown/other	0	0.0

Table 806. Volume of Cases by Surgeon and Site for the SROM Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	18 (45)	3 (5)
Cases per site	32 (119)	4 (7)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

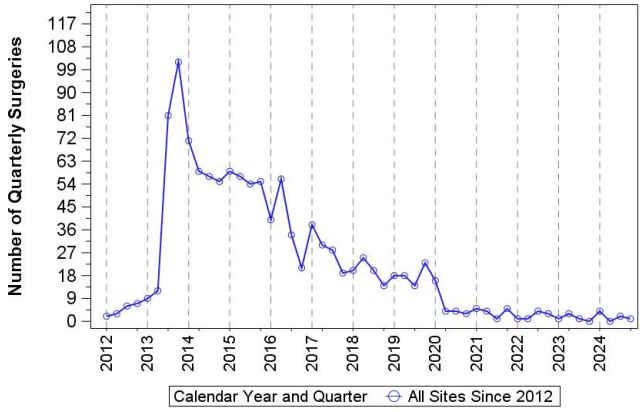


Figure 285. Utilization of the SROM Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

523418	523291	563216L
563618	523191	523197
563517	523394	523251
563620	523208	523396
523420	523293	526516L
563516	523393	526520L
523193	523395	526520R
563518	523195	563118L
523192	563626	563118N
563622	523424	563120L
523194	563624	563124N
523422	563118R	
523292	563120N	
563514	563122N	

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3.2.30 Summit

N = 8,411 primary cases were used for this analysis. Distribution of utilization: 83 surgeons across 42 sites used this implant in primary THA cases.

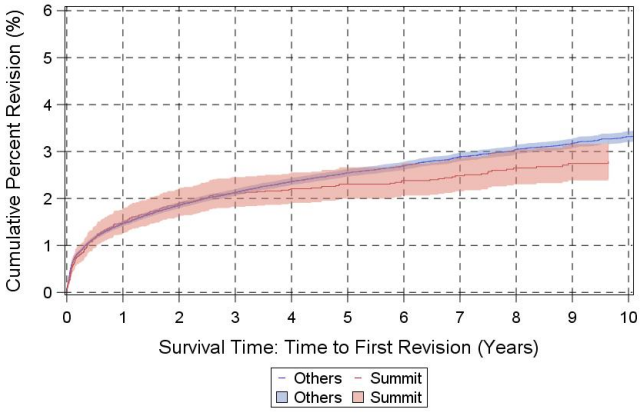


Figure 286. Cumulative Percent Revision Curve for the Summit Stem, Compared to All Other Femoral Components in Primary THA Cases

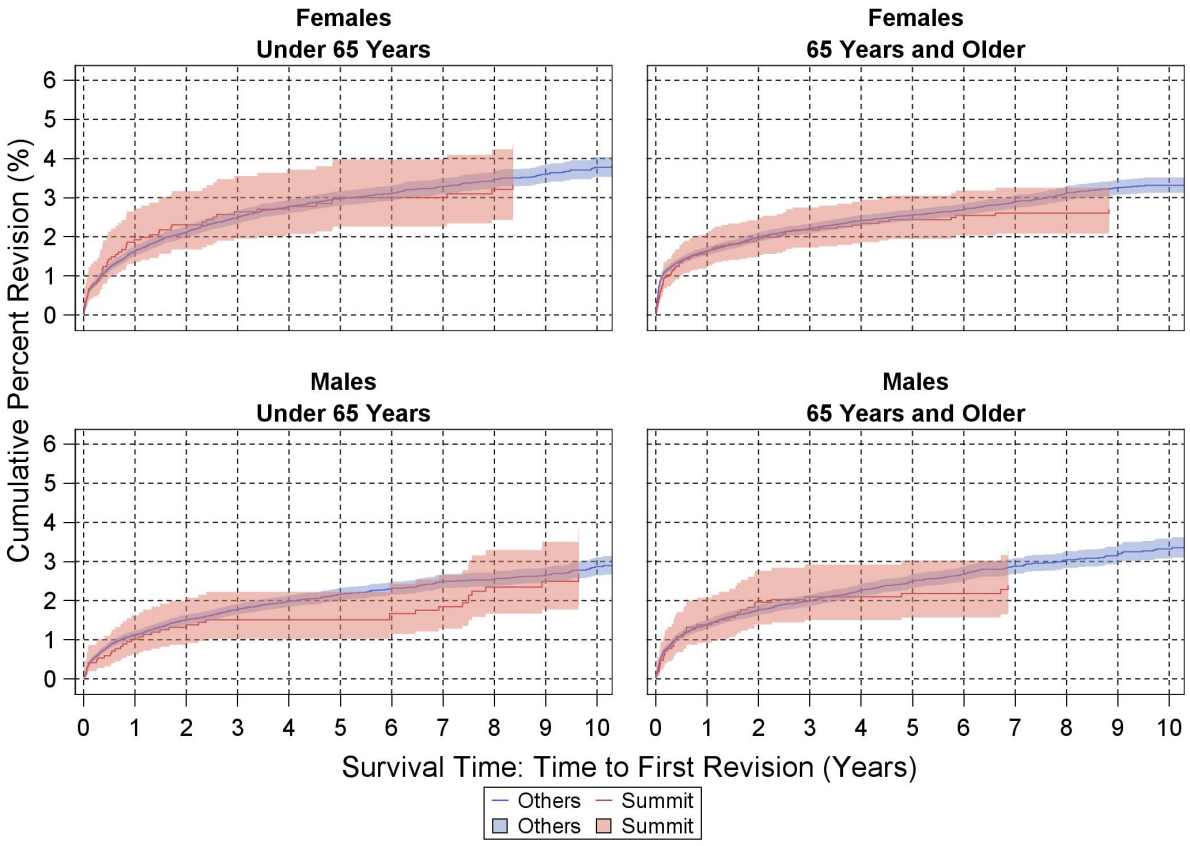


Figure 287. Cumulative Percent Revision Curve for the Summit Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 807. Cumulative Percent Revision and Number at Risk for the Summit Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	8,319	0.00 (0.00,0.00)	1,620	0.00 (0.00,0.00)	3,324	0.00 (0.00,0.00)	1,692	0.00 (0.00,0.00)	1,682	0.00 (0.00,0.00)
1	7,818	1.51 (1.27,1.80)	1,564	1.92 (1.36,2.72)	3,036	1.62 (1.24,2.11)	1,635	1.01 (0.63,1.62)	1,582	1.38 (0.92,2.07)
2	7,369	1.90 (1.62,2.22)	1,507	2.30 (1.67,3.17)	2,793	1.92 (1.50,2.46)	1,571	1.38 (0.92,2.07)	1,497	1.96 (1.39,2.76)
3	6,796	2.12 (1.82,2.46)	1,437	2.64 (1.96,3.55)	2,493	2.18 (1.72,2.75)	1,477	1.51 (1.02,2.23)	1,388	2.10 (1.50,2.92)
4	6,250	2.21 (1.91,2.56)	1,356	2.78 (2.07,3.72)	2,231	2.34 (1.87,2.94)	1,408	1.51 (1.02,2.23)	1,254	2.10 (1.50,2.92)
5	5,762	2.31 (2.00,2.66)	1,286	3.00 (2.26,3.98)	2,007	2.44 (1.95,3.05)	1,316	1.51 (1.02,2.23)	1,152	2.18 (1.57,3.03)
6	5,212	2.38 (2.06,2.75)	1,182	3.00 (2.26,3.98)	1,767	2.54 (2.03,3.18)	1,222	1.67 (1.15,2.43)	1,040	2.18 (1.57,3.03)
7	4,553	2.48 (2.16,2.86)	1,032	3.00 (2.26,3.98)	1,544	2.60 (2.08,3.25)	1,074	1.85 (1.28,2.65)	902	2.39 (1.73,3.30)
8	3,710	2.65 (2.30,3.05)	840	3.21 (2.43,4.24)	1,251	2.60 (2.08,3.25)	874	2.35 (1.67,3.29)	744	2.39 (1.73,3.30)
9	2,725	2.75 (2.38,3.16)	634	3.33 (2.52,4.39)	904	2.70 (2.16,3.39)	630	2.49 (1.77,3.50)	557	2.39 (1.73,3.30)
10	1,687	2.79 (2.42,3.22)	394	3.33 (2.52,4.39)	555	2.70 (2.16,3.39)	391	2.70 (1.91,3.82)	347	2.39 (1.73,3.30)

Table 808. Reasons for First Revision Following Primary THA for Summit Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	62	32.5
2	Joint Infection	38	19.9
3	Peri-prosthetic fracture - Femur	38	19.9
4	Aseptic Loosening	21	11.0
5	Pain	14	7.3
6	Implant Failure	5	2.6
7	Metal Reaction/Metallosis	5	2.6
8	Peri-prosthetic fracture - Acetabulum	3	1.6
9	Malalignment	3	1.6
10	Osteolysis	1	0.5
	Unknown/missing/other	1	0.5

Table 809. Reasons for First Revision in the First 90 Days Following Primary THA for Summit Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	32	50.8
2	Dislocation/Instability	15	23.8
3	Joint Infection	11	17.5
4	Aseptic Loosening	4	6.4
5	Peri-prosthetic fracture - Acetabulum	1	1.6

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Table 810. Reasons for First Revision Between 91 and 365 days Following Primary THA for Summit Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	20	40.0
2	Joint Infection	18	36.0
3	Aseptic Loosening	7	14.0
4	Pain	3	6.0
5	Peri-prosthetic fracture - Acetabulum	2	4.0

Table 811. Descriptive Statistics of Cases Receiving the Summit Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	4,999	59.43	
Age (years)	8,411	67.09 (11.09)	67.00 (15.00)
Height (cm)	8,308	168.82 (10.42)	167.64 (17.78)
Weight (kg)	8,309	88.60 (22.62)	86.18 (29.49)
BMI(kg/m^2)	8,308	30.92 (6.73)	30.02 (8.76)
Smoker - Never (%)	3,896	46.32	
Smoker - Previous (%)	3,347	39.79	
Smoker - Current (%)	1,146	13.63	
Smoker - Unknown (%)	22	0.26	

Table 812. Distribution of Approach Used for Summit Stem in Primary THA Cases

Approach	N	Percent
Anterior	269	3.2
Anterolateral	2948	35.0
Posterior	5,031	59.8
Transtrochanteric	36	0.4
Missing/unknown/other	127	1.5

Table 813. Distribution of Head Size for Summit Stem in Primary THA Cases

Size (mm)	N	Percent
22	2	0.0
28	107	1.3
32	2,047	24.6
36	5,370	64.6
40	712	8.6
44	26	0.3
Missing/unknown/other	48	0.6

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Table 814. Distribution of Bearing Surface for Summit Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	3,185	37.9
Ceramic-on-plastic	5,029	59.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	28	0.3
Missing/unknown/other	169	2.0

Table 815. Distribution of Polyethylene Used for Summit Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	27	0.3
XLPE	8,257	99.7
Antioxidant XLPE	1	0.0
Missing/unknown/other	1	0.0

Table 816. Volume of Cases by Surgeon and Site for the Summit Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	101 (265)	14 (87)
Cases per site	200 (396)	49 (249)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

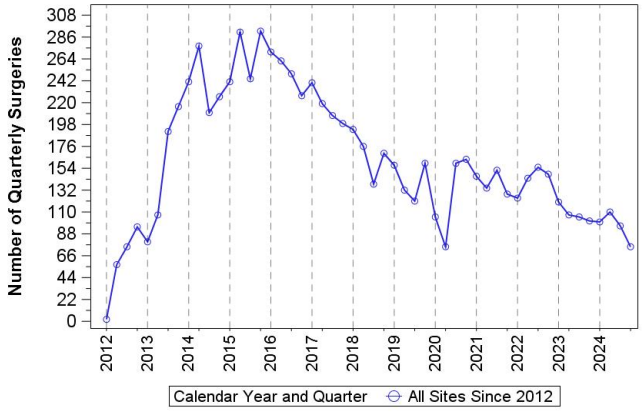


Figure 288. Utilization of the Summit Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

157001110	157003110	157013090
157011110	157001080	157001070
157011135	157011080	157013120
157011120	157003100	157013135
157001100	157011165	157011070
157001120	157001165	157003150
157001135	157003120	157011180
157011100	157003090	157001180
157001090	157003080	157013150
157011090	157013110	
157011150	157013100	
157001150	157003135	

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3.2.31 Synergy

N = 1,747 primary cases were used for this analysis. Distribution of utilization: 45 surgeons across 32 sites used this implant in primary THA cases.

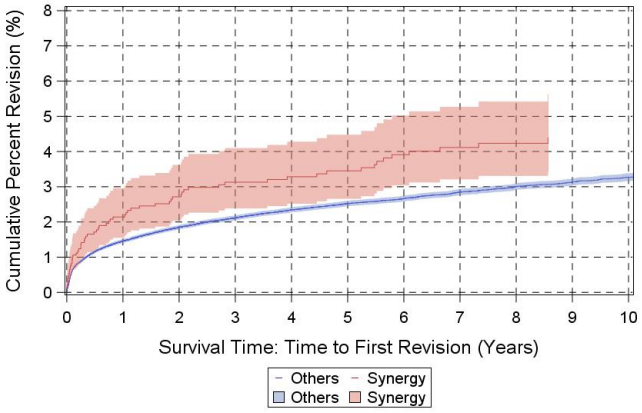


Figure 289. Cumulative Percent Revision Curve for the Synergy Stem, Compared to All Other Femoral Components in Primary THA Cases

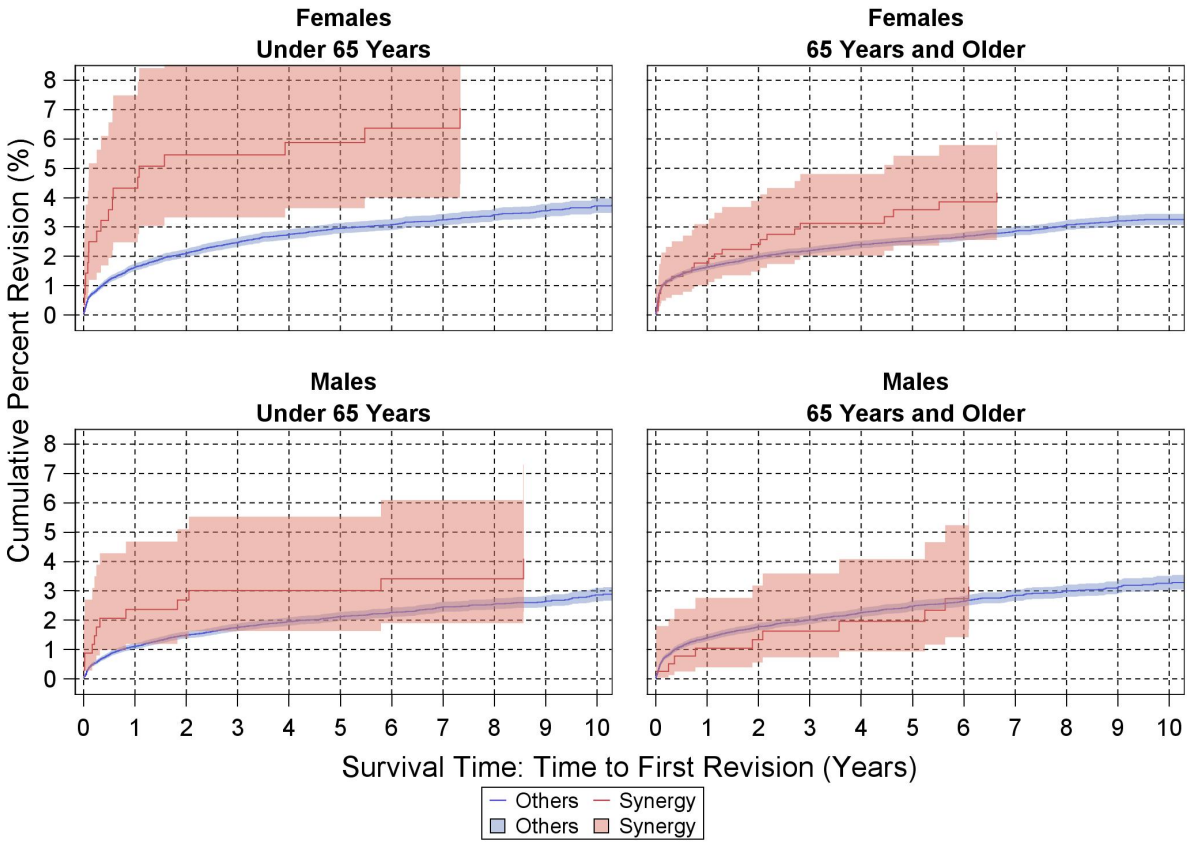


Figure 290. Cumulative Percent Revision Curve for the Synergy Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 817. Cumulative Percent Revision and Number at Risk for the Synergy Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,706	0.00 (0.00,0.00)	280	0.00 (0.00,0.00)	691	0.00 (0.00,0.00)	342	0.00 (0.00,0.00)	392	0.00 (0.00,0.00)
1	1,577	2.14 (1.55,2.96)	255	4.32 (2.48,7.48)	691	0.00 (0.00,0.00)	320	2.37 (1.19,4.68)	363	1.04 (0.39,2.76)
2	1,454	2.72 (2.03,3.62)	243	5.46 (3.32,8.89)	638	1.77 (1.01,3.10)	300	2.69 (1.41,5.10)	338	1.33 (0.56,3.18)
3	1,324	3.13 (2.38,4.10)	232	5.46 (3.32,8.89)	573	2.40 (1.48,3.89)	284	3.01 (1.63,5.53)	312	1.63 (0.73,3.59)
4	1,210	3.28 (2.52,4.28)	220	5.88 (3.64,9.42)	496	3.12 (2.02,4.81)	269	3.01 (1.63,5.53)	280	1.96 (0.94,4.08)
5	1,119	3.45 (2.66,4.48)	204	5.88 (3.64,9.42)	441	3.12 (2.02,4.81)	254	3.01 (1.63,5.53)	260	1.96 (0.94,4.08)
6	996	3.91 (3.04,5.02)	179	6.37 (4.00,10.06)	401	3.59 (2.36,5.43)	233	3.41 (1.90,6.10)	241	2.73 (1.42,5.24)
7	848	4.12 (3.21,5.27)	146	6.37 (4.00,10.06)	343	3.85 (2.56,5.79)	196	3.41 (1.90,6.10)	209	3.14 (1.68,5.82)
8	687	4.24 (3.31,5.42)	118	7.06 (4.46,11.09)	297	4.17 (2.78,6.23)	162	3.41 (1.90,6.10)	165	3.14 (1.68,5.82)
9	507	4.40 (3.43,5.63)	92	7.06 (4.46,11.09)	242	4.17 (2.78,6.23)	120	4.10 (2.28,7.31)	121	3.14 (1.68,5.82)
10	326	4.40 (3.43,5.63)	65	7.06 (4.46,11.09)	174	4.17 (2.78,6.23)	75	4.10 (2.28,7.31)	75	3.14 (1.68,5.82)

Table 818. Reasons for First Revision Following Primary THA for Synergy Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	25	44.6
2	Peri-prosthetic fracture - Femur	9	16.1
3	Aseptic Loosening	8	14.3
4	Joint Infection	7	12.5
5	Pain	2	3.6
6	Malalignment	2	3.6
7	Poly liner wear	1	1.8
8	Implant Failure	1	1.8
9	Metal Reaction/Metallosis	1	1.8

Table 819. Reasons for First Revision in the First 90 Days Following Primary THA for Synergy Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	9	47.4
2	Peri-prosthetic fracture - Femur	4	21.0
3	Joint Infection	2	10.5
4	Malalignment	2	10.5
5	Aseptic Loosening	1	5.3
6	Implant Failure	1	5.3

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Table 820. Reasons for First Revision Between 91 and 365 days Following Primary THA for Synergy Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	7	58.3
2	Aseptic Loosening	4	33.3
3	Joint Infection	1	8.3

Table 821. Descriptive Statistics of Cases Receiving the Synergy Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	991	56.73	
Age (years)	1,747	68.14 (10.81)	69.00 (15.00)
Height (cm)	1,747	168.70 (10.72)	167.64 (17.78)
Weight (kg)	1,747	88.29 (21.12)	86.70 (28.60)
BMI(kg/m^2)	1,747	30.87 (6.12)	30.31 (8.41)
Smoker - Never (%)	786	44.99	
Smoker - Previous (%)	693	39.67	
Smoker - Current (%)	264	15.11	
Smoker - Unknown (%)	4	0.23	

Table 822. Distribution of Approach Used for Synergy Stem in Primary THA Cases

Approach	N	Percent
Anterior	149	8.5
Anterolateral	529	30.3
Posterior	1,055	60.4
Transtrochanteric	8	0.5
Missing/unknown/other	6	0.3

Table 823. Distribution of Head Size for Synergy Stem in Primary THA Cases

Size (mm)	N	Percent
22	2	0.1
28	21	1.3
32	496	30.3
36	1,028	62.8
40	79	4.8
44	4	0.2
Missing/unknown/other	8	0.5

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Table 824. Distribution of Bearing Surface for Synergy Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	718	41.1
Ceramic-on-plastic	918	52.5
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	91	5.2
Missing/unknown/other	20	1.1

Table 825. Distribution of Polyethylene Used for Synergy Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	9	0.5
XLPE	1,686	97.7
Antioxidant XLPE	0	0.0
Missing/unknown/other	31	1.8

Table 826. Volume of Cases by Surgeon and Site for the Synergy Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	38 (70)	6 (24)
Cases per site	54 (98)	10 (71)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

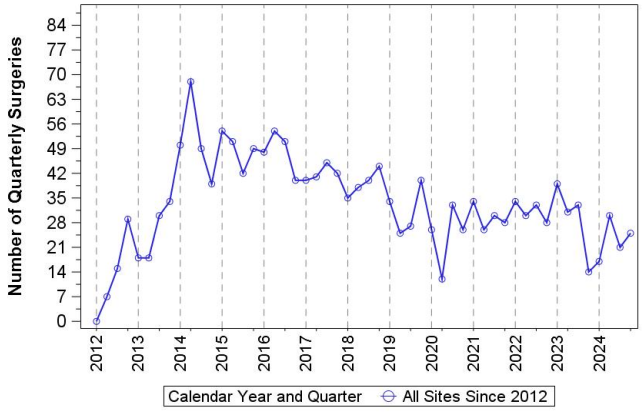


Figure 291. Utilization of the Synergy Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

71306614	71316011	71316214
71306114	71306111	71316216
71306613	71316012	71306618
71306113	71316212	71316016
71306612	71306118	71306110
71306112	71316010	71316215
71306115	71316211	71306610
71306615	71316014	71926107
71306116	71316013	71316017
71306616	71316210	71316217
71306117	71316213	71306609
71306611	71316009	71306608
71306617	71316015	

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3.2.32 Taperloc

N = 522 primary cases were used for this analysis. Distribution of utilization: 20 surgeons across 10 sites used this implant in primary THA cases.

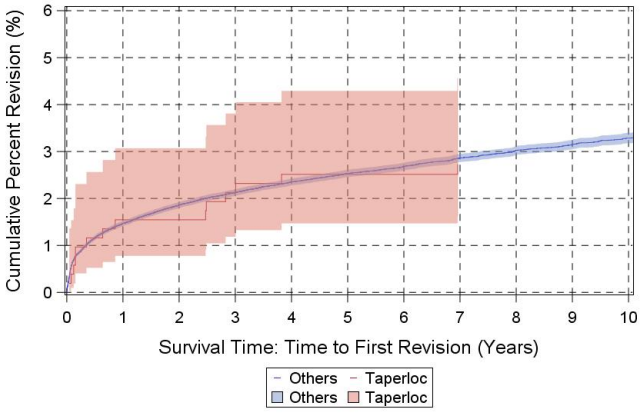


Figure 292. Cumulative Percent Revision Curve for the Taperloc Stem, Compared to All Other Femoral Components in Primary THA Cases

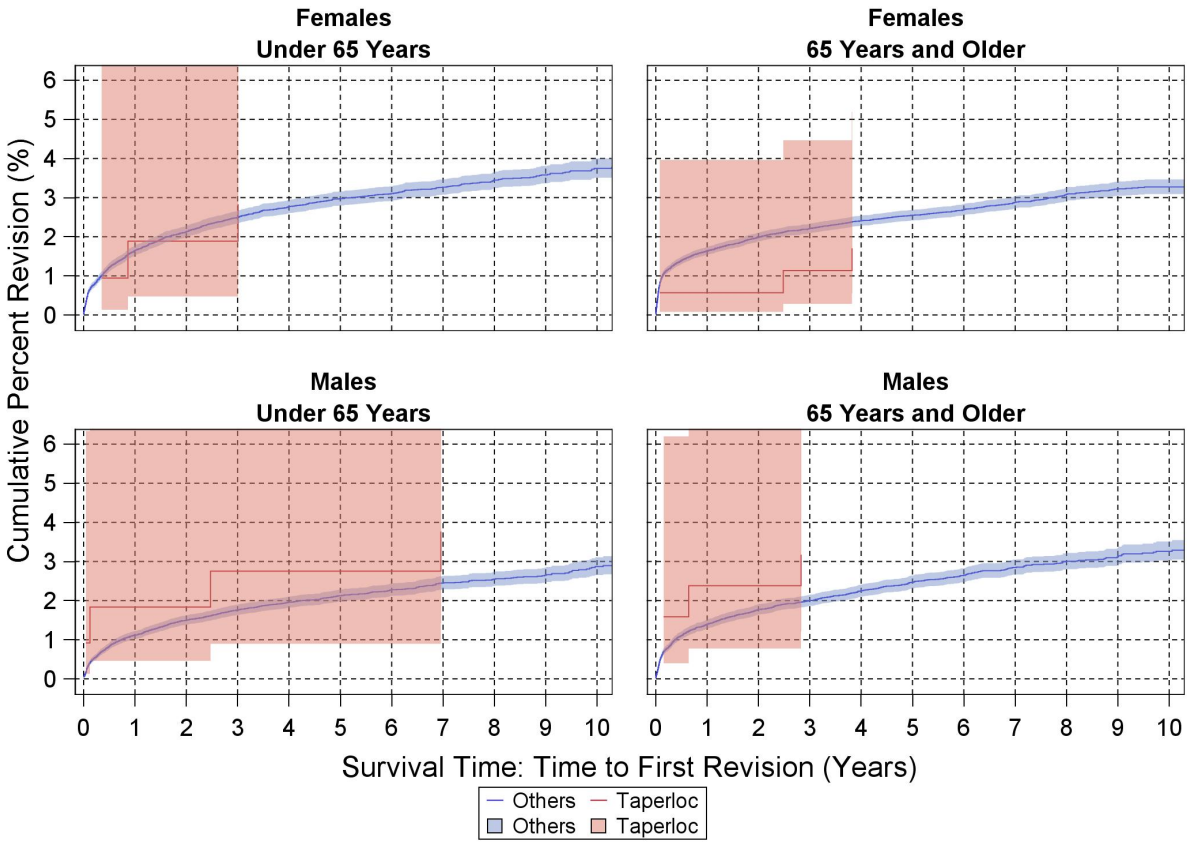


Figure 293. Cumulative Percent Revision Curve for the Taperloc Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 827. Cumulative Percent Revision and Number at Risk for the Taperloc Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	517	0.00 (0.00,0.00)	106	0.00 (0.00,0.00)	176	0.00 (0.00,0.00)	109	0.00 (0.00,0.00)	126	0.00 (0.00,0.00)
1	509	1.55 (0.78,3.07)	104	1.89 (0.48,7.33)	175	0.57 (0.08,3.96)	107	1.83 (0.46,7.14)	123	2.38 (0.77,7.20)
2	509	1.55 (0.78,3.07)	104	1.89 (0.48,7.33)	175	0.57 (0.08,3.96)	107	1.83 (0.46,7.14)	123	2.38 (0.77,7.20)
3	506	2.13 (1.18,3.81)	104	1.89 (0.48,7.33)	174	1.14 (0.29,4.47)	106	2.75 (0.90,8.29)	122	3.17 (1.20,8.24)
4	503	2.51 (1.47,4.29)	103	2.83 (0.92,8.52)	173	1.70 (0.55,5.19)	105	2.75 (0.90,8.29)	122	3.17 (1.20,8.24)
5	502	2.51 (1.47,4.29)	103	2.83 (0.92,8.52)	173	1.70 (0.55,5.19)	104	2.75 (0.90,8.29)	122	3.17 (1.20,8.24)
6	491	2.51 (1.47,4.29)	100	2.83 (0.92,8.52)	171	1.70 (0.55,5.19)	103	2.75 (0.90,8.29)	117	3.17 (1.20,8.24)
7	455	2.73 (1.62,4.56)	95	2.83 (0.92,8.52)	164	1.70 (0.55,5.19)	94	3.77 (1.43,9.73)	102	3.17 (1.20,8.24)
8	419	2.73 (1.62,4.56)	90	2.83 (0.92,8.52)	147	1.70 (0.55,5.19)	84	3.77 (1.43,9.73)	98	3.17 (1.20,8.24)
9	354	2.73 (1.62,4.56)	79	2.83 (0.92,8.52)	123	1.70 (0.55,5.19)	68	3.77 (1.43,9.73)	84	3.17 (1.20,8.24)
10	275	2.73 (1.62,4.56)	56	2.83 (0.92,8.52)	94	1.70 (0.55,5.19)	54	3.77 (1.43,9.73)	71	3.17 (1.20,8.24)

Table 828. Reasons for First Revision Following Primary THA for Taperloc Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	2	16.7
2	Dislocation/Instability	2	16.7
3	Joint Infection	2	16.7
4	Implant Failure	2	16.7
5	Peri-prosthetic fracture - Femur	2	16.7
6	Metal Reaction/Metallosis	1	8.3
7	Malalignment	1	8.3

Table 829. Reasons for First Revision in the First 90 Days Following Primary THA for Taperloc Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	25.0
2	Dislocation/Instability	1	25.0
3	Joint Infection	1	25.0
4	Implant Failure	1	25.0

Table 830. Reasons for First Revision Between 91 and 365 days Following Primary THA for Taperloc Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	1	50.0
2	Implant Failure	1	50.0

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Table 831. Descriptive Statistics of Cases Receiving the Taperloc Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	286	54.79	
Age (years)	522	67.17 (10.42)	67.00 (15.00)
Height (cm)	522	169.93 (10.68)	170.00 (15.30)
Weight (kg)	522	88.28 (20.51)	86.20 (27.40)
BMI(kg/m^2)	522	30.41 (5.75)	29.64 (7.50)
Smoker - Never (%)	236	45.21	
Smoker - Previous (%)	219	41.95	
Smoker - Current (%)	65	12.45	
Smoker - Unknown (%)	2	0.38	

Table 832. Distribution of Approach Used for Taperloc Stem in Primary THA Cases

Approach	N	Percent
Anterior	4	0.8
Anterolateral	240	46.0
Posterior	276	52.9
Transtrochanteric	0	0.0
Missing/unknown/other	2	0.4

Table 833. Distribution of Head Size for Taperloc Stem in Primary THA Cases

Size (mm)	N	Percent
28	6	1.4
32	94	22.0
36	219	51.2
40	81	18.9
44	26	6.1
Missing/unknown/other	2	0.5

Table 834. Distribution of Bearing Surface for Taperloc Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	294	56.3
Ceramic-on-plastic	131	25.1
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	76	14.6
Missing/unknown/other	21	4.0

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Table 835. Distribution of Polyethylene Used for Taperloc Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	3	0.6
XLPE	170	33.7
Antioxidant XLPE	331	65.7
Missing/unknown/other	0	0.0

Table 836. Volume of Cases by Surgeon and Site for the Taperloc Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	26 (41)	6 (21)
Cases per site	52 (79)	10 (93)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

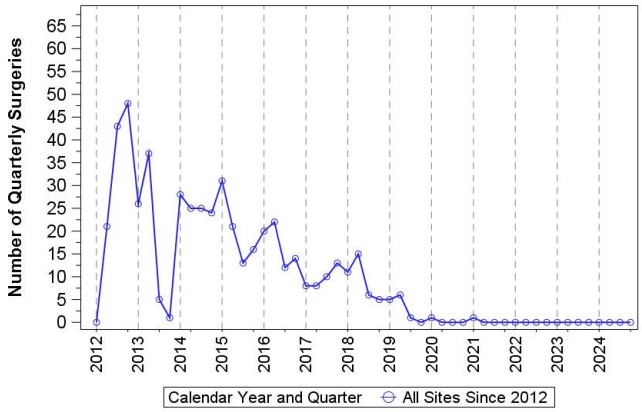


Figure 294. Utilization of the Taperloc Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

11103205	103207	103209
11103203	13103207	12103210
11103204	13103206	11103200
11103206	11103201	12103206
11103208	103201	12103207
11103207	13103208	12103208
103203	13103215	13103209
103205	103208	11103210
103206	13103210	12103211
11103202	11103215	13103211
103204	103200	
103202	11103209	

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3.2.33 Taperloc 133

N = 17,689 primary cases were used for this analysis. Distribution of utilization: 119 surgeons across 66 sites used this implant in primary THA cases.

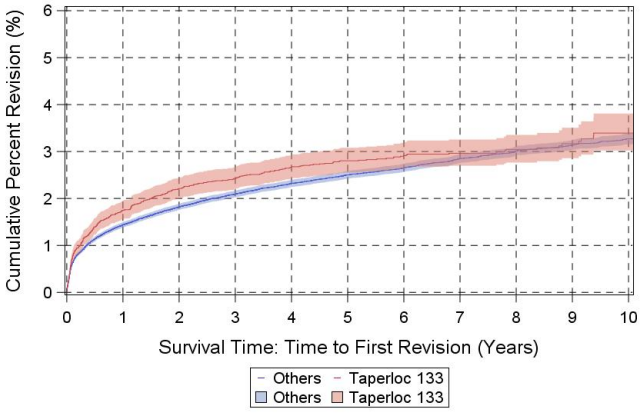


Figure 295. Cumulative Percent Revision Curve for the Taperloc 133 Stem, Compared to All Other Femoral Components in Primary THA Cases

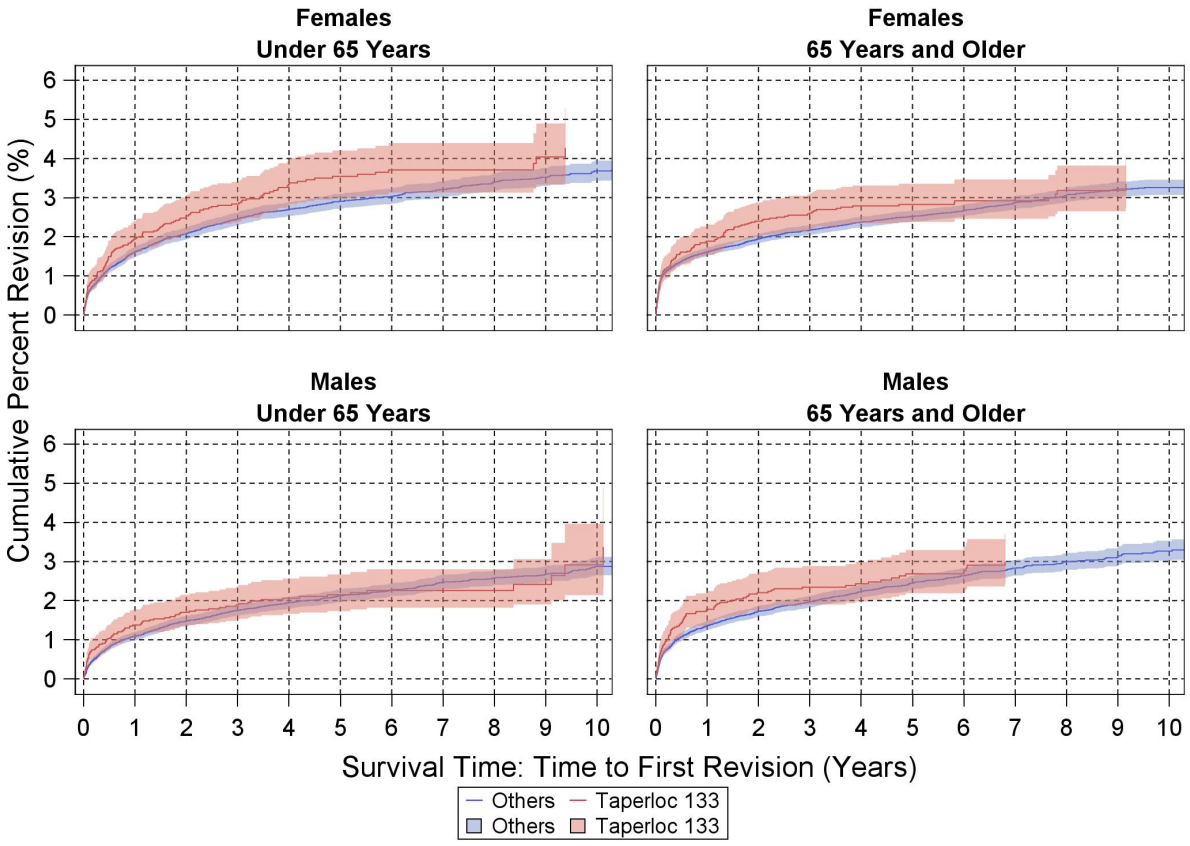


Figure 296. Cumulative Percent Revision Curve for the Taperloc 133 Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 837. Cumulative Percent Revision and Number at Risk for the Taperloc 133 Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	17,594	0.00 (0.00,0.00)	4,296	0.00 (0.00,0.00)	4,966	0.00 (0.00,0.00)	4,334	0.00 (0.00,0.00)	3,992	0.00 (0.00,0.00)
1	15,590	1.75 (1.56,1.96)	3,826	1.94 (1.56,2.41)	4,435	1.89 (1.54,2.31)	3,853	1.38 (1.07,1.78)	3,470	1.78 (1.41,2.25)
2	13,729	2.21 (2.00,2.45)	3,383	2.53 (2.09,3.07)	3,935	2.40 (2.00,2.87)	3,425	1.70 (1.35,2.15)	2,980	2.20 (1.78,2.73)
3	11,882	2.43 (2.20,2.68)	2,945	2.84 (2.36,3.40)	3,448	2.61 (2.19,3.11)	2,941	1.89 (1.51,2.36)	2,542	2.34 (1.90,2.88)
4	10,013	2.67 (2.42,2.93)	2,490	3.34 (2.81,3.97)	2,919	2.79 (2.35,3.31)	2,471	2.06 (1.66,2.57)	2,127	2.43 (1.97,2.99)
5	8,403	2.80 (2.55,3.08)	2,085	3.54 (2.99,4.20)	2,496	2.82 (2.38,3.35)	2,042	2.15 (1.73,2.67)	1,774	2.68 (2.19,3.29)
6	6,462	2.91 (2.65,3.20)	1,630	3.71 (3.13,4.39)	1,974	2.92 (2.46,3.47)	1,522	2.26 (1.82,2.80)	1,330	2.76 (2.24,3.39)
7	4,769	2.96 (2.70,3.26)	1,229	3.71 (3.13,4.39)	1,477	2.92 (2.46,3.47)	1,104	2.26 (1.82,2.80)	953	3.00 (2.43,3.70)
8	3,209	3.05 (2.76,3.35)	841	3.71 (3.13,4.39)	996	3.18 (2.65,3.82)	747	2.26 (1.82,2.80)	619	3.00 (2.43,3.70)
9	2,013	3.17 (2.86,3.51)	528	4.04 (3.33,4.89)	649	3.18 (2.65,3.82)	456	2.41 (1.90,3.06)	375	3.00 (2.43,3.70)
10	1,049	3.39 (3.02,3.81)	279	4.27 (3.46,5.27)	338	3.35 (2.74,4.08)	237	2.91 (2.14,3.96)	190	3.00 (2.43,3.70)

Table 838. Reasons for First Revision Following Primary THA for Taperloc 133 Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	137	30.3
2	Joint Infection	102	22.6
3	Peri-prosthetic fracture - Femur	89	19.7
4	Aseptic Loosening	65	14.4
5	Pain	20	4.4
6	Implant Failure	16	3.5
7	Malalignment	13	2.9
8	Peri-prosthetic fracture - Acetabulum	5	1.1
9	Poly liner wear	3	0.7
10	Metal Reaction/Metallosis	2	0.4

Table 839. Reasons for First Revision in the First 90 Days Following Primary THA for Taperloc 133 Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	79	45.9
2	Dislocation/Instability	30	17.4
3	Joint Infection	28	16.3
4	Aseptic Loosening	13	7.6
5	Implant Failure	12	7.0
6	Peri-prosthetic fracture - Acetabulum	4	2.3
7	Malalignment	4	2.3
8	Pain	2	1.2

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Table 840. Reasons for First Revision Between 91 and 365 days Following Primary THA for Taperloc 133 Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	44	36.7
2	Dislocation/Instability	42	35.0
3	Aseptic Loosening	17	14.2
4	Pain	7	5.8
5	Peri-prosthetic fracture - Femur	4	3.3
6	Malalignment	3	2.5
7	Implant Failure	2	1.7
8	Peri-prosthetic fracture - Acetabulum	1	0.8

Table 841. Descriptive Statistics of Cases Receiving the Taperloc 133 Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	9,304	52.6	
Age (years)	17,689	64.30 (10.60)	65.00 (13.00)
Height (cm)	17,689	170.37 (10.35)	170.18 (15.20)
Weight (kg)	17,689	91.36 (21.17)	89.81 (28.16)
BMI(kg/m^2)	17,689	31.38 (6.34)	30.75 (8.80)
Smoker - Never (%)	8,462	47.84	
Smoker - Previous (%)	6,478	36.62	
Smoker - Current (%)	2,608	14.74	
Smoker - Unknown (%)	141	0.8	

Table 842. Distribution of Approach Used for Taperloc 133 Stem in Primary THA Cases

Approach	N	Percent
Anterior	3,351	18.9
Anterolateral	5343	30.2
Posterior	8,939	50.5
Transtrochanteric	20	0.1
Missing/unknown/other	36	0.2

Table 843. Distribution of Head Size for Taperloc 133 Stem in Primary THA Cases

Size (mm)	N	Percent
28	16	0.1
32	1,290	8.1
36	9,655	60.8
40	4,766	30.0
44	72	0.5
Missing/unknown/other	94	0.6

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Table 844. Distribution of Bearing Surface for Taperloc 133 Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	3,802	21.5
Ceramic-on-plastic	11,998	67.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	1,613	9.1
Missing/unknown/other	276	1.6

Table 845. Distribution of Polyethylene Used for Taperloc 133 Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	20	0.1
XLPE	7,159	41.0
Antioxidant XLPE	10,302	58.9
Missing/unknown/other	0	0.0

Table 846. Volume of Cases by Surgeon and Site for the Taperloc 133 Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	148 (259)	22 (152)
Cases per site	268 (383)	81 (378)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

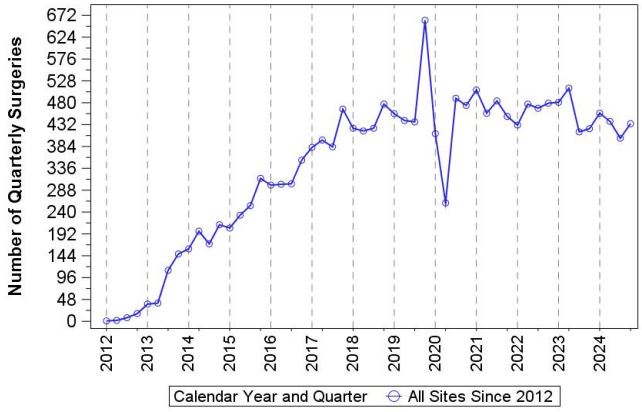


Figure 297. Utilization of the Taperloc 133 Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

51104120	51104170	51101110
51104110	51101060	51101140
51104130	51104180	51101100
51104100	51100070	51103220
51104150	51103160	51101160
51104140	51100060	51100090
51104090	51101050	51100110
51103110	51100050	51101170
51103100	51103180	51101180
51103120	51103170	51104240
51104160	51104200	51100140
51101080	51100040	51103240
51103090	51103200	51100120
51103130	51101150	51100130
51100080	51101130	51100160
51101070	51101120	51100100
51103140	51104220	51100170
51103150	51101090	

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3.2.34 Taperloc 133 Microplasty

N = 5,585 primary cases were used for this analysis. Distribution of utilization: 65 surgeons across 43 sites used this implant in primary THA cases.

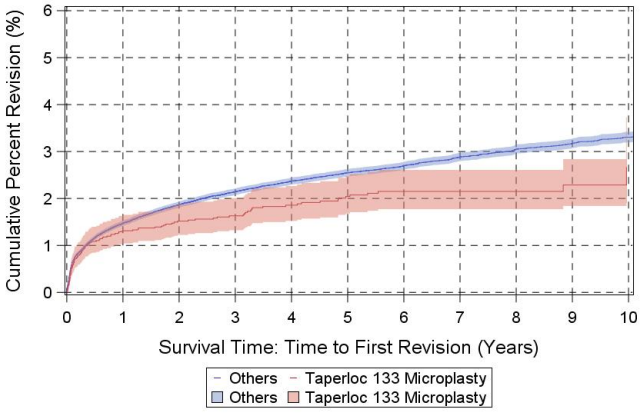


Figure 298. Cumulative Percent Revision Curve for the Taperloc 133 Microplasty Stem, Compared to All Other Femoral Components in Primary THA Cases

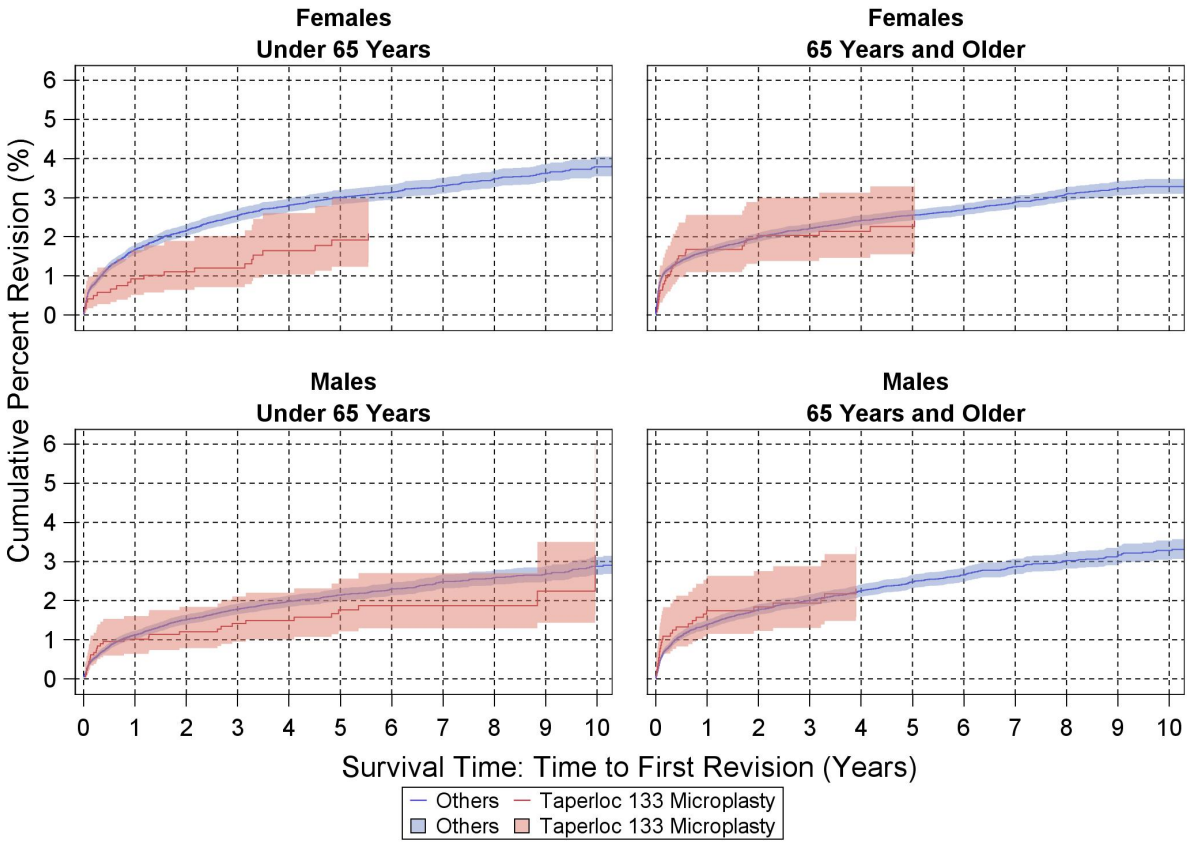


Figure 299. Cumulative Percent Revision Curve for the Taperloc 133 Microplasty Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 847. Cumulative Percent Revision and Number at Risk for the Taperloc 133 Microplasty Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	5,568	0.00 (0.00,0.00)	1,215	0.00 (0.00,0.00)	1,260	0.00 (0.00,0.00)	1,798	0.00 (0.00,0.00)	1,292	0.00 (0.00,0.00)
1	5,125	1.31 (1.04,1.65)	1,130	0.92 (0.51,1.66)	1,176	1.68 (1.10,2.56)	1,656	1.01 (0.64,1.61)	1,160	1.74 (1.15,2.63)
2	4,617	1.52 (1.22,1.88)	1,038	1.10 (0.64,1.89)	1,069	2.04 (1.38,3.00)	1,494	1.20 (0.79,1.84)	1,014	1.84 (1.22,2.75)
3	4,139	1.63 (1.32,2.01)	937	1.20 (0.71,2.02)	977	2.04 (1.38,3.00)	1,351	1.42 (0.95,2.11)	872	1.94 (1.30,2.88)
4	3,501	1.86 (1.52,2.27)	787	1.64 (1.04,2.61)	819	2.14 (1.46,3.13)	1,171	1.49 (1.01,2.20)	722	2.31 (1.58,3.37)
5	2,947	2.04 (1.68,2.48)	677	1.92 (1.23,2.98)	658	2.26 (1.55,3.29)	1,019	1.76 (1.21,2.56)	591	2.31 (1.58,3.37)
6	2,320	2.15 (1.77,2.61)	529	2.08 (1.35,3.21)	508	2.41 (1.66,3.49)	816	1.87 (1.29,2.70)	465	2.31 (1.58,3.37)
7	1,744	2.15 (1.77,2.61)	387	2.08 (1.35,3.21)	396	2.41 (1.66,3.49)	610	1.87 (1.29,2.70)	349	2.31 (1.58,3.37)
8	1,153	2.15 (1.77,2.61)	242	2.08 (1.35,3.21)	257	2.41 (1.66,3.49)	414	1.87 (1.29,2.70)	238	2.31 (1.58,3.37)
9	631	2.29 (1.84,2.84)	126	2.08 (1.35,3.21)	139	2.41 (1.66,3.49)	235	2.24 (1.43,3.50)	129	2.31 (1.58,3.37)
10	245	2.67 (1.91,3.73)	54	2.08 (1.35,3.21)	50	2.41 (1.66,3.49)	99	3.16 (1.65,6.03)	42	2.31 (1.58,3.37)

Table 848. Reasons for First Revision Following Primary THA for Taperloc 133 Microplasty Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	24	22.9
2	Dislocation/Instability	24	22.9
3	Joint Infection	21	20.0
4	Peri-prosthetic fracture - Femur	21	20.0
5	Malalignment	6	5.7
6	Implant Failure	4	3.8
7	Pain	4	3.8
8	Poly liner wear	1	1.0

Table 849. Reasons for First Revision in the First 90 Days Following Primary THA for Taperloc 133 Microplasty Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	19	43.2
2	Joint Infection	8	18.2
3	Aseptic Loosening	6	13.6
4	Dislocation/Instability	6	13.6
5	Implant Failure	4	9.1
6	Malalignment	1	2.3

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Table 850. Reasons for First Revision Between 91 and 365 days Following Primary THA for Taperloc 133 Microplasty Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	11	42.3
2	Aseptic Loosening	9	34.6
3	Joint Infection	4	15.4
4	Pain	1	3.8
5	Malalignment	1	3.8

Table 851. Descriptive Statistics of Cases Receiving the Taperloc 133 Microplasty Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,480	44.4	
Age (years)	5,585	62.76 (10.39)	63.00 (13.00)
Height (cm)	5,585	171.95 (10.13)	172.70 (15.30)
Weight (kg)	5,585	89.50 (19.74)	88.45 (26.90)
BMI(kg/m^2)	5,585	30.14 (5.50)	29.65 (7.22)
Smoker - Never (%)	2,937	52.59	
Smoker - Previous (%)	1,972	35.31	
Smoker - Current (%)	654	11.71	
Smoker - Unknown (%)	22	0.39	

Table 852. Distribution of Approach Used for Taperloc 133 Microplasty Stem in Primary THA Cases

Approach	N	Percent
Anterior	4,071	72.9
Anterolateral	140	2.5
Posterior	1,366	24.5
Transtrochanteric	0	0.0
Missing/unknown/other	8	0.1

Table 853. Distribution of Head Size for Taperloc 133 Microplasty Stem in Primary THA Cases

Size (mm)	N	Percent
28	10	0.2
32	868	16.5
36	4,049	76.9
40	308	5.8
44	3	0.1
Missing/unknown/other	29	0.6

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Table 854. Distribution of Bearing Surface for Taperloc 133 Microplasty Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	558	10.0
Ceramic-on-plastic	4,680	83.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	283	5.1
Missing/unknown/other	64	1.1

Table 855. Distribution of Polyethylene Used for Taperloc 133 Microplasty Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	9	0.2
XLPE	1,318	23.8
Antioxidant XLPE	4,215	76.1
Missing/unknown/other	0	0.0

Table 856. Volume of Cases by Surgeon and Site for the Taperloc 133 Microplasty Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	85 (158)	11 (89)
Cases per site	129 (202)	24 (164)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

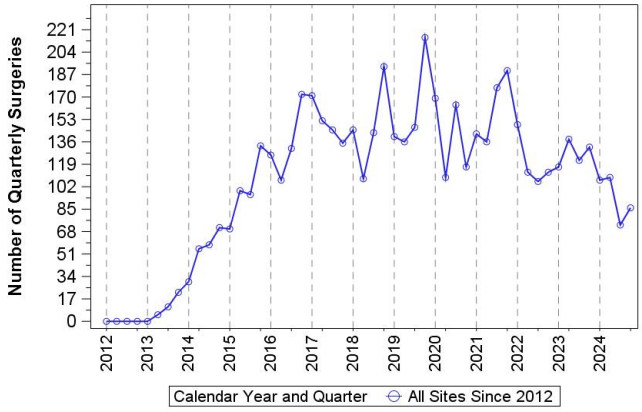


Figure 300. Utilization of the Taperloc 133 Microplasty Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

51107110	51106090	51109050
51107120	51108080	51106180
51107130	51106140	51106170
51106110	51109080	51108050
51107150	51106150	51106200
51107100	51107170	51107200
51107140	51109070	51108040
51106120	51108070	51106220
51106100	51107180	51107220
51106130	51108060	51107240
51107160	51106160	
51107090	51109060	

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3.2.35 Trabecular Metal

N = 1,468 primary cases were used for this analysis. Distribution of utilization: 28 surgeons across 17 sites used this implant in primary THA cases.

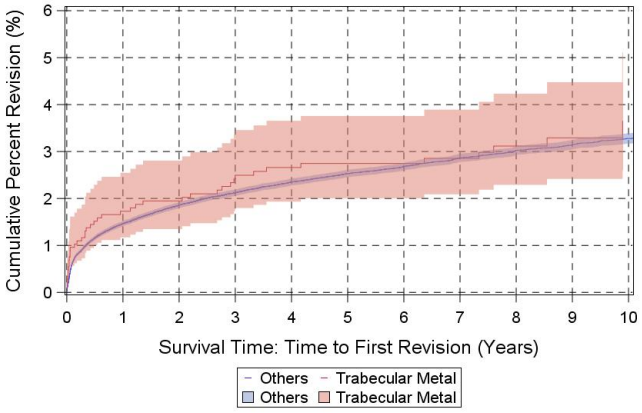


Figure 301. Cumulative Percent Revision Curve for the Trabecular Metal Stem, Compared to All Other Femoral Components in Primary THA Cases

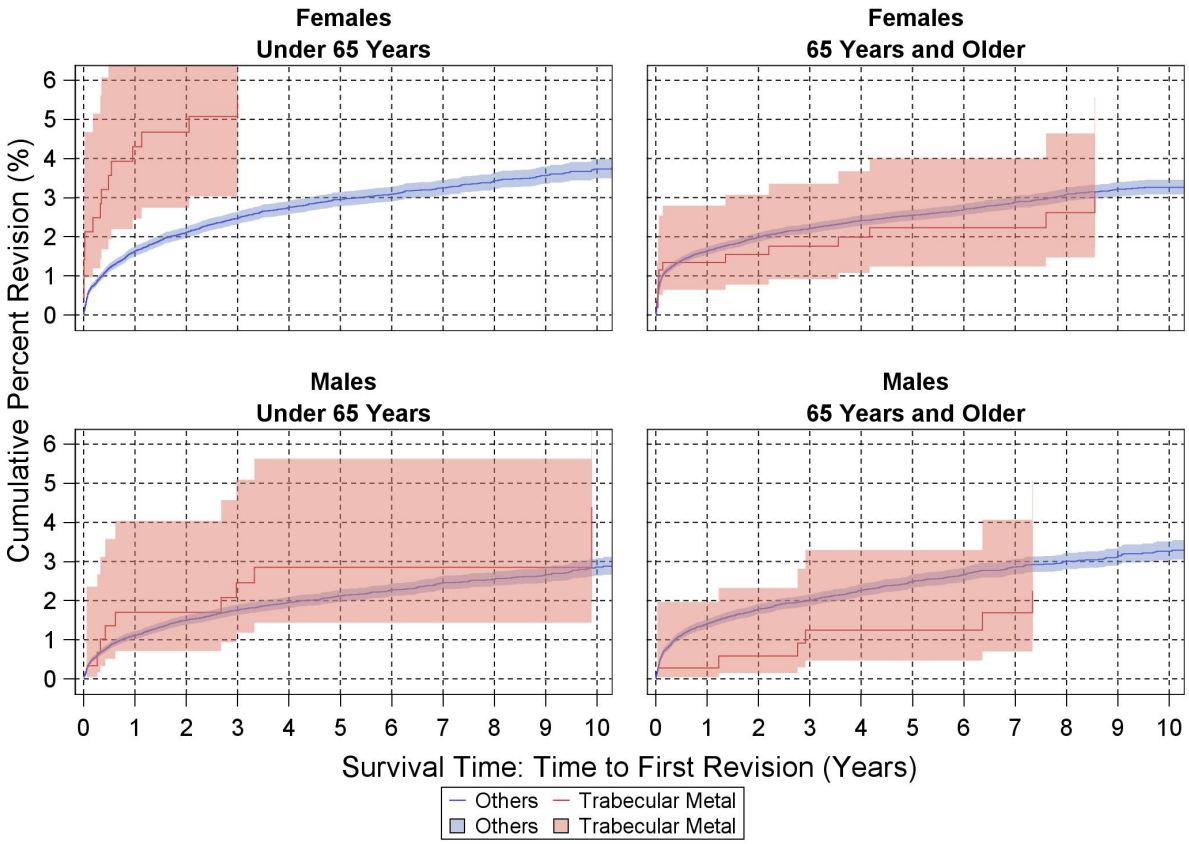


Figure 302. Cumulative Percent Revision Curve for the Trabecular Metal Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 857. Cumulative Percent Revision and Number at Risk for the Trabecular Metal Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,462	0.00 (0.00,0.00)	282	0.00 (0.00,0.00)	524	0.00 (0.00,0.00)	298	0.00 (0.00,0.00)	358	0.00 (0.00,0.00)
1	1,368	1.73 (1.17,2.55)	258	4.30 (2.46,7.45)	489	1.34 (0.64,2.80)	285	1.70 (0.71,4.04)	336	0.28 (0.04,1.97)
2	1,291	1.95 (1.35,2.81)	237	4.67 (2.74,7.91)	467	1.55 (0.78,3.07)	271	1.70 (0.71,4.04)	316	0.59 (0.15,2.32)
3	1,227	2.49 (1.80,3.46)	225	5.50 (3.35,8.96)	450	1.76 (0.92,3.35)	257	2.46 (1.18,5.09)	295	1.25 (0.47,3.29)
4	1,141	2.66 (1.93,3.65)	212	5.50 (3.35,8.96)	414	1.99 (1.07,3.67)	235	2.85 (1.43,5.63)	280	1.25 (0.47,3.29)
5	1,047	2.75 (2.00,3.76)	197	5.50 (3.35,8.96)	382	2.23 (1.24,4.00)	215	2.85 (1.43,5.63)	253	1.25 (0.47,3.29)
6	946	2.75 (2.00,3.76)	178	5.50 (3.35,8.96)	337	2.23 (1.24,4.00)	199	2.85 (1.43,5.63)	232	1.25 (0.47,3.29)
7	817	2.85 (2.09,3.89)	158	5.50 (3.35,8.96)	285	2.23 (1.24,4.00)	178	2.85 (1.43,5.63)	196	1.69 (0.70,4.06)
8	655	3.12 (2.29,4.23)	132	5.50 (3.35,8.96)	228	2.62 (1.47,4.64)	150	2.85 (1.43,5.63)	145	2.25 (0.99,5.08)
9	446	3.29 (2.42,4.48)	101	5.50 (3.35,8.96)	149	3.14 (1.76,5.56)	109	2.85 (1.43,5.63)	87	2.25 (0.99,5.08)
10	238	3.65 (2.60,5.11)	61	5.50 (3.35,8.96)	76	3.14 (1.76,5.56)	59	4.39 (1.94,9.78)	42	2.25 (0.99,5.08)

Table 858. Reasons for First Revision Following Primary THA for Trabecular Metal Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	14	35.0
2	Peri-prosthetic fracture - Femur	7	17.5
3	Aseptic Loosening	6	15.0
4	Joint Infection	5	12.5
5	Pain	5	12.5
6	Implant Failure	1	2.5
7	Metal Reaction/Metallosis	1	2.5
8	Malalignment	1	2.5

Table 859. Reasons for First Revision in the First 90 Days Following Primary THA for Trabecular Metal Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	6	40.0
2	Pain	4	26.7
3	Peri-prosthetic fracture - Femur	3	20.0
4	Joint Infection	1	6.7
5	Implant Failure	1	6.7

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Table 860. Reasons for First Revision Between 91 and 365 days Following Primary THA for Trabecular Metal Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	5	71.4
2	Aseptic Loosening	1	14.3
3	Joint Infection	1	14.3

Table 861. Descriptive Statistics of Cases Receiving the Trabecular Metal Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	808	55.04	
Age (years)	1,468	67.10 (10.71)	67.00 (15.00)
Height (cm)	1,468	169.41 (10.49)	170.00 (17.15)
Weight (kg)	1,468	88.08 (21.43)	86.18 (28.90)
BMI(kg/m^2)	1,468	30.51 (6.14)	29.60 (7.91)
Smoker - Never (%)	637	43.39	
Smoker - Previous (%)	644	43.87	
Smoker - Current (%)	185	12.6	
Smoker - Unknown (%)	2	0.14	

Table 862. Distribution of Approach Used for Trabecular Metal Stem in Primary THA Cases

Approach	N	Percent
Anterior	11	0.8
Anterolateral	1330	90.6
Posterior	119	8.1
Transtrochanteric	7	0.5
Missing/unknown/other	1	0.1

Table 863. Distribution of Head Size for Trabecular Metal Stem in Primary THA Cases

Size (mm)	N	Percent
28	7	0.5
32	480	33.3
36	796	55.3
40	86	6.0
Missing/unknown/other	71	4.9

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Table 864. Distribution of Bearing Surface for Trabecular Metal Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	632	43.0
Ceramic-on-plastic	763	52.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	14	0.9
Missing/unknown/other	59	4.0

Table 865. Distribution of Polyethylene Used for Trabecular Metal Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,283	88.2
Antioxidant XLPE	171	11.8
Missing/unknown/other	0	0.0

Table 866. Volume of Cases by Surgeon and Site for the Trabecular Metal Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	52 (129)	3 (15)
Cases per site	86 (182)	7 (64)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

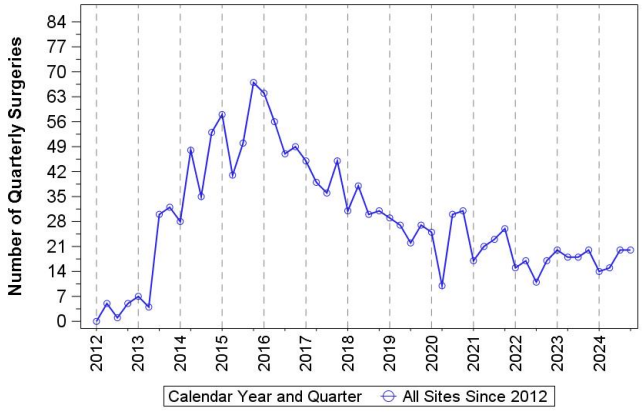


Figure 303. Utilization of the Trabecular Metal Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

786401320	786401520	786401000
786401420	786401500	786401700
786401220	786401100	786401720
786401300	786401120	786401820
786401200	786401620	
786401400	786401600	

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3.2.36 Tri-Lock BPS

N = 4,902 primary cases were used for this analysis. Distribution of utilization: 53 surgeons across 31 sites used this implant in primary THA cases.

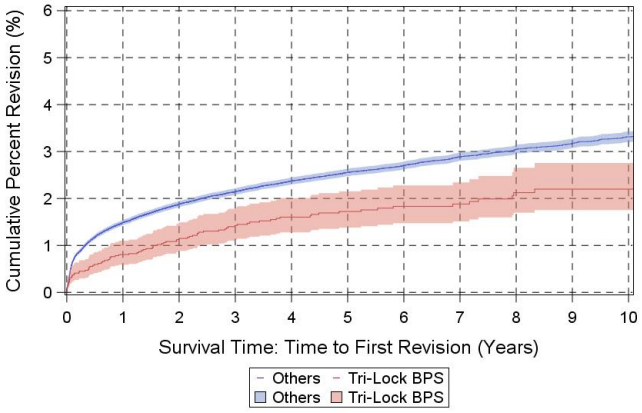


Figure 304. Cumulative Percent Revision Curve for the Tri-Lock BPS Stem, Compared to All Other Femoral Components in Primary THA Cases

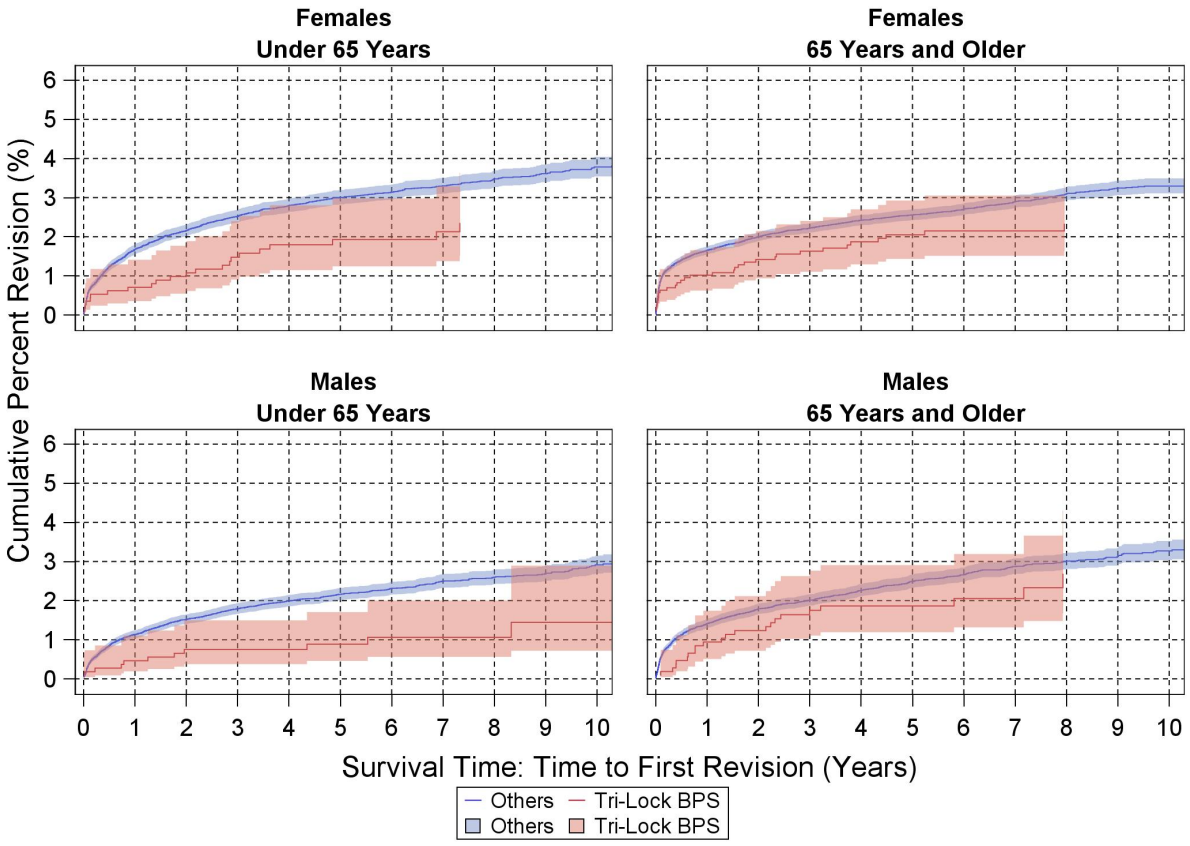


Figure 305. Cumulative Percent Revision Curve for the Tri-Lock BPS Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 867. Cumulative Percent Revision and Number at Risk for the Tri-Lock BPS Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	4,878	0.00 (0.00,0.00)	1,132	0.00 (0.00,0.00)	1,579	0.00 (0.00,0.00)	1,090	0.00 (0.00,0.00)	1,076	0.00 (0.00,0.00)
1	4,730	0.80 (0.59,1.10)	1,105	0.71 (0.36,1.41)	1,525	1.02 (0.62,1.65)	1,060	0.46 (0.19,1.11)	1,039	0.94 (0.51,1.74)
2	4,497	1.15 (0.88,1.49)	1,056	1.08 (0.61,1.89)	1,446	1.42 (0.94,2.15)	1,011	0.75 (0.38,1.50)	983	1.23 (0.72,2.12)
3	4,085	1.42 (1.12,1.81)	956	1.48 (0.91,2.40)	1,316	1.63 (1.10,2.41)	916	0.75 (0.38,1.50)	896	1.75 (1.11,2.77)
4	3,583	1.60 (1.28,2.01)	861	1.80 (1.15,2.80)	1,173	1.87 (1.29,2.70)	782	0.75 (0.38,1.50)	766	1.86 (1.19,2.91)
5	2,999	1.72 (1.38,2.15)	717	1.93 (1.24,2.98)	1,021	2.05 (1.43,2.93)	638	0.89 (0.46,1.71)	622	1.86 (1.19,2.91)
6	2,430	1.83 (1.47,2.28)	586	1.93 (1.24,2.98)	854	2.15 (1.51,3.05)	497	1.06 (0.56,2.00)	492	2.05 (1.32,3.19)
7	1,918	1.88 (1.51,2.34)	478	2.13 (1.38,3.29)	701	2.15 (1.51,3.05)	373	1.06 (0.56,2.00)	365	2.05 (1.32,3.19)
8	1,448	2.12 (1.70,2.65)	367	2.35 (1.52,3.63)	528	2.33 (1.63,3.33)	288	1.06 (0.56,2.00)	264	2.69 (1.68,4.30)
9	1,000	2.20 (1.75,2.76)	256	2.35 (1.52,3.63)	369	2.33 (1.63,3.33)	196	1.45 (0.72,2.90)	178	2.69 (1.68,4.30)
10	488	2.20 (1.75,2.76)	108	2.35 (1.52,3.63)	178	2.33 (1.63,3.33)	104	1.45 (0.72,2.90)	97	2.69 (1.68,4.30)

Table 868. Reasons for First Revision Following Primary THA for Tri-Lock BPS Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	23	26.4
2	Aseptic Loosening	21	24.1
3	Joint Infection	16	18.4
4	Peri-prosthetic fracture - Femur	13	14.9
5	Metal Reaction/Metallosis	4	4.6
6	Implant Failure	3	3.4
7	Pain	3	3.4
8	Malalignment	3	3.4
9	Poly liner wear	1	1.1

Table 869. Reasons for First Revision in the First 90 Days Following Primary THA for Tri-Lock BPS Stem Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	12	57.1
2	Dislocation/Instability	4	19.0
3	Aseptic Loosening	3	14.3
4	Joint Infection	1	4.8
5	Malalignment	1	4.8

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Table 870. Reasons for First Revision Between 91 and 365 days Following Primary THA for Tri-Lock BPS Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	8	47.1
2	Aseptic Loosening	5	29.4
3	Dislocation/Instability	4	23.5

Table 871. Descriptive Statistics of Cases Receiving the Tri-Lock BPS Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,720	55.49	
Age (years)	4,902	65.19 (10.22)	65.00 (13.00)
Height (cm)	4,877	169.89 (10.34)	170.00 (15.44)
Weight (kg)	4,878	88.46 (20.14)	87.00 (27.60)
BMI(kg/m^2)	4,877	30.53 (5.88)	29.94 (8.19)
Smoker - Never (%)	2,377	48.49	
Smoker - Previous (%)	1,854	37.82	
Smoker - Current (%)	645	13.16	
Smoker - Unknown (%)	26	0.53	

Table 872. Distribution of Approach Used for Tri-Lock BPS Stem in Primary THA Cases

Approach	N	Percent
Anterior	2,073	42.3
Anterolateral	892	18.2
Posterior	1,894	38.6
Transtrochanteric	14	0.3
Missing/unknown/other	29	0.6

Table 873. Distribution of Head Size for Tri-Lock BPS Stem in Primary THA Cases

Size (mm)	N	Percent
28	22	0.5
32	1,745	36.2
36	2,715	56.3
40	322	6.7
Missing/unknown/other	18	0.4

Table 874. Distribution of Bearing Surface for Tri-Lock BPS Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,815	37.0
Ceramic-on-plastic	2,938	59.9
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	54	1.1
Missing/unknown/other	95	1.9

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Table 875. Distribution of Polyethylene Used for Tri-Lock BPS Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	34	0.7
XLPE	4,789	99.2
Antioxidant XLPE	2	0.0
Missing/unknown/other	0	0.0

Table 876. Volume of Cases by Surgeon and Site for the Tri-Lock BPS Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	92 (236)	8 (77)
Cases per site	158 (436)	15 (142)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

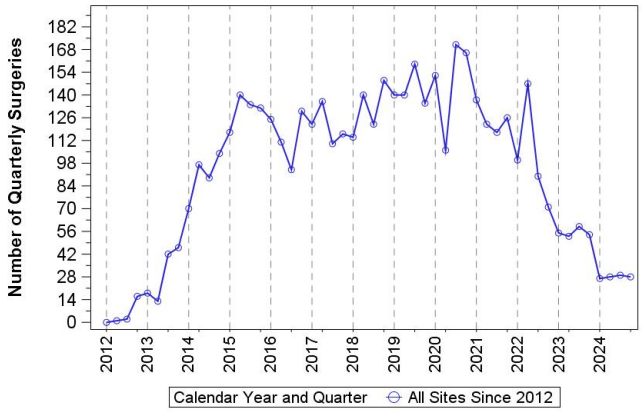


Figure 306. Utilization of the Tri-Lock BPS Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

101204040	101204070	101204005
101204050	101214070	101214100
101204030	101204080	101204100
101204060	101214020	101214005
101214050	101214080	101204110
101214040	101204010	101214110
101204020	101214010	101204120
101214030	101214090	101214120
101214060	101204090	

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3.2.37 Versys Advocate

N = 867 primary cases were used for this analysis. Distribution of utilization: 59 surgeons across 29 sites used this implant in primary THA cases.

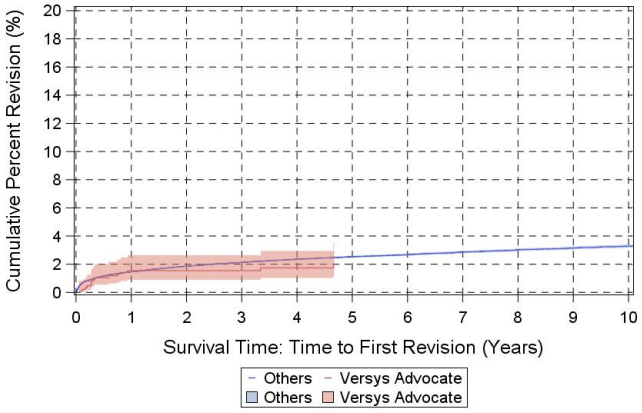


Figure 307. Cumulative Percent Revision Curve for the Versys Advocate Stem, Compared to All Other Femoral Components in Primary THA Cases

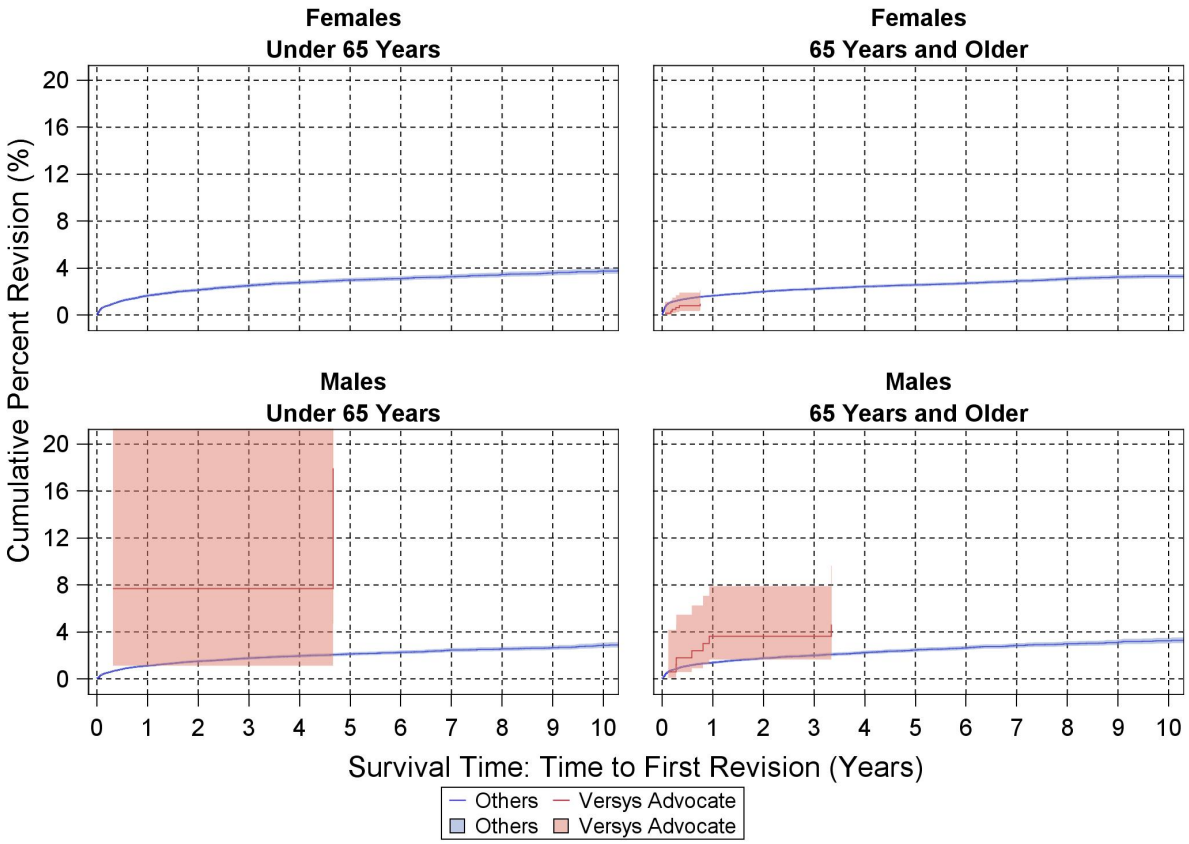


Figure 308. Cumulative Percent Revision Curve for the Versys Advocate Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 877. Cumulative Percent Revision and Number at Risk for the Versys Advocate Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	860	0.00 (0.00,0.00)	46	0.00 (0.00,0.00)	633	0.00 (0.00,0.00)	14	0.00 (0.00,0.00)	167	0.00 (0.00,0.00)
1	786	1.54 (0.90,2.64)	42	0.00 (0.00,0.00)	576	0.96 (0.43,2.13)	12	7.69 (1.12,43.36)	156	3.63 (1.65,7.90)
2	655	1.54 (0.90,2.64)	33	0.00 (0.00,0.00)	486	0.96 (0.43,2.13)	12	7.69 (1.12,43.36)	124	3.63 (1.65,7.90)
3	510	1.54 (0.90,2.64)	24	0.00 (0.00,0.00)	379	0.96 (0.43,2.13)	*	7.69 (1.12,43.36)	97	3.63 (1.65,7.90)
4	407	1.74 (1.03,2.95)	16	0.00 (0.00,0.00)	300	0.96 (0.43,2.13)	*	7.69 (1.12,43.36)	82	4.63 (2.19,9.63)
5	285	2.05 (1.20,3.50)	*	0.00 (0.00,0.00)	212	0.96 (0.43,2.13)	*	17.95 (4.71,55.58)	57	4.63 (2.19,9.63)
6	215	2.05 (1.20,3.50)	*	0.00 (0.00,0.00)	160	0.96 (0.43,2.13)	*	17.95 (4.71,55.58)	44	4.63 (2.19,9.63)
7	165	2.05 (1.20,3.50)	*	0.00 (0.00,0.00)	131	0.96 (0.43,2.13)	*	17.95 (4.71,55.58)	31	4.63 (2.19,9.63)
8	134	2.05 (1.20,3.50)	*	0.00 (0.00,0.00)	107	0.96 (0.43,2.13)	*	17.95 (4.71,55.58)	25	4.63 (2.19,9.63)
9	104	2.05 (1.20,3.50)	*	0.00 (0.00,0.00)	84	0.96 (0.43,2.13)	*	17.95 (4.71,55.58)	18	4.63 (2.19,9.63)
10	67	2.05 (1.20,3.50)	*	0.00 (0.00,0.00)	55	0.96 (0.43,2.13)	*	17.95 (4.71,55.58)	*	4.63 (2.19,9.63)

* Denotes that the number of cases is between 1 and 10.

Table 878. Reasons for First Revision Following Primary THA for Versys Advocate Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	5	35.7
2	Dislocation/Instability	4	28.6
3	Joint Infection	4	28.6
4	Peri-prosthetic fracture - Femur	1	7.1

Table 879. Reasons for First Revision in the First 90 Days Following Primary THA for Versys Advocate Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	2	50.0
2	Dislocation/Instability	1	25.0
3	Peri-prosthetic fracture - Femur	1	25.0

Table 880. Reasons for First Revision Between 91 and 365 days Following Primary THA for Versys Advocate Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	4	50.0
2	Dislocation/Instability	3	37.5
3	Aseptic Loosening	1	12.5

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Table 881. Descriptive Statistics of Cases Receiving the Versys Advocate Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	686	79.12	
Age (years)	867	78.13 (8.83)	79.00 (10.00)
Height (cm)	867	164.30 (9.50)	162.60 (12.68)
Weight (kg)	867	72.89 (16.08)	71.00 (21.70)
BMI(kg/m^2)	867	26.95 (5.28)	26.26 (6.79)
Smoker - Never (%)	470	54.21	
Smoker - Previous (%)	362	41.75	
Smoker - Current (%)	35	4.04	
Smoker - Unknown (%)	0	0.0	

Table 882. Distribution of Approach Used for Versys Advocate Stem in Primary THA Cases

Approach	N	Percent
Anterior	278	32.1
Anterolateral	81	9.3
Posterior	501	57.8
Transtrochanteric	6	0.7
Missing/unknown/other	1	0.1

Table 883. Distribution of Head Size for Versys Advocate Stem in Primary THA Cases

Size (mm)	N	Percent
28	2	0.2
32	123	14.7
36	554	66.3
40	93	11.1
Missing/unknown/other	63	7.5

Table 884. Distribution of Bearing Surface for Versys Advocate Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	416	48.0
Ceramic-on-plastic	356	41.1
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	16	1.9
Missing/unknown/other	79	9.1

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Table 885. Distribution of Polyethylene Used for Versys Advocate Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	536	63.1
Antioxidant XLPE	314	36.9
Missing/unknown/other	0	0.0

Table 886. Volume of Cases by Surgeon and Site for the Versys Advocate Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	14 (35)	3 (7)
Cases per site	29 (59)	5 (25)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

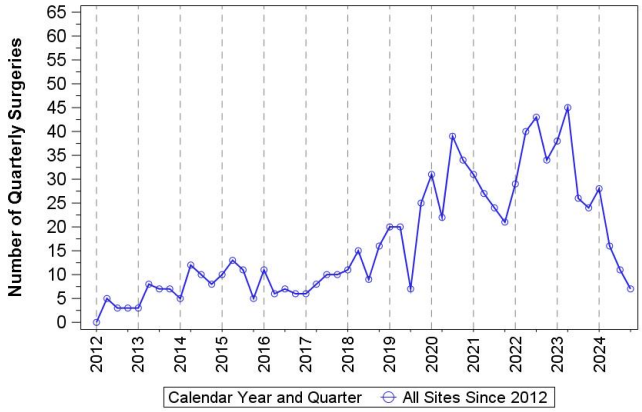


Figure 309. Utilization of the Versys Advocate Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

785001220
785001320
785001100
785001200
785001300
785001420
785001400
785001520
785001500
785001620
785001600
785001620
785016
785001700

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3.2.38 Versys Heritage

N = 701 primary cases were used for this analysis. Distribution of utilization: 26 surgeons across 17 sites used this implant in primary THA cases.

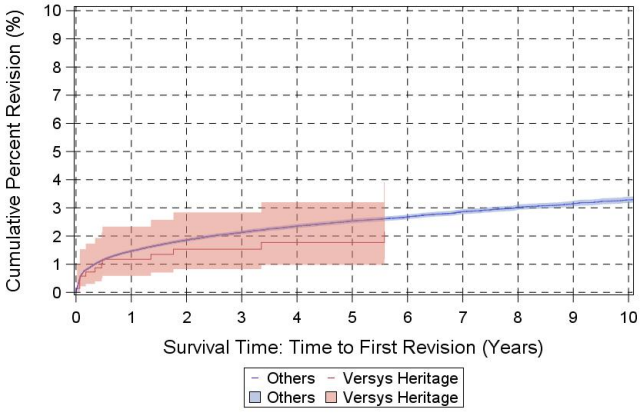


Figure 310. Cumulative Percent Revision Curve for the Versys Heritage Stem, Compared to All Other Femoral Components in Primary THA Cases

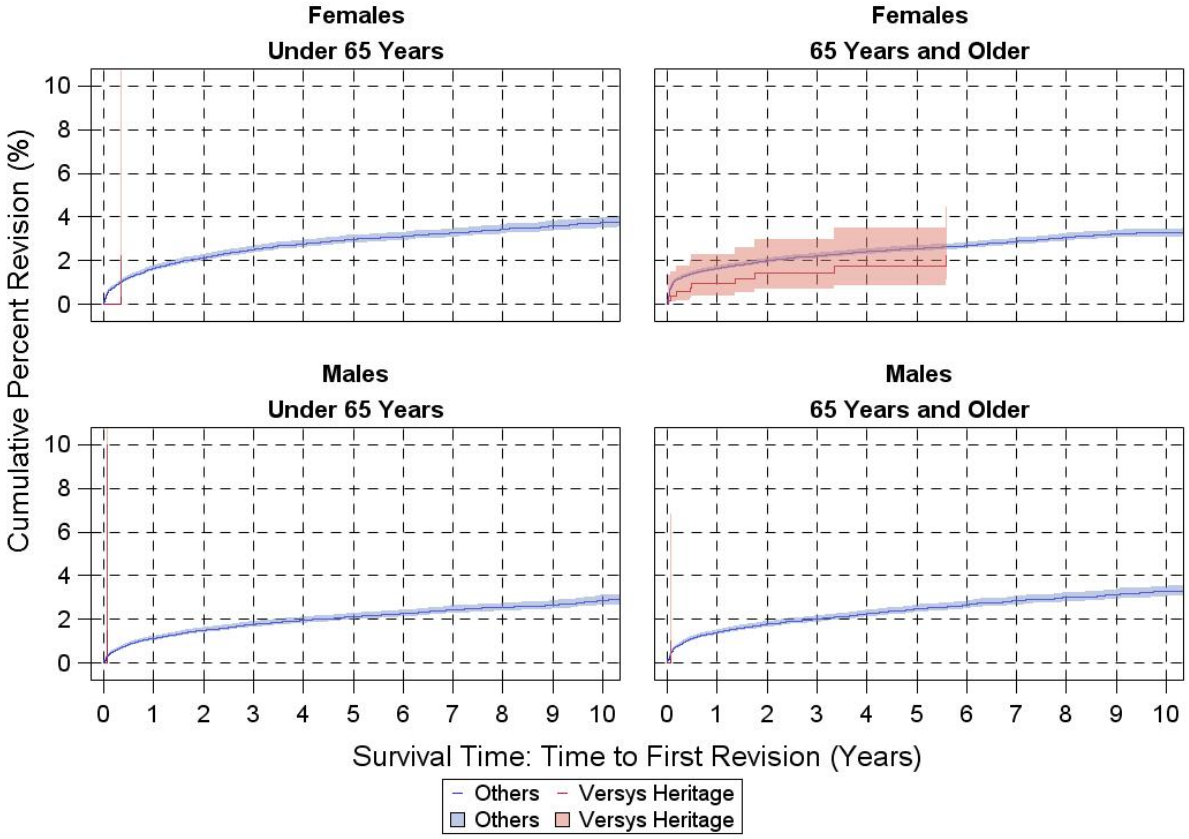


Figure 311. Cumulative Percent Revision Curve for the Versys Heritage Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 887. Cumulative Percent Revision and Number at Risk for the Versys Heritage Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	694	0.00 (0.00,0.00)	45	0.00 (0.00,0.00)	538	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	101	0.00 (0.00,0.00)
1	603	1.17 (0.59,2.33)	42	2.22 (0.32,14.75)	463	0.95 (0.40,2.27)	*	10.00 (1.47,52.70)	89	0.99 (0.14,6.82)
2	510	1.53 (0.83,2.84)	39	2.22 (0.32,14.75)	383	1.43 (0.68,2.98)	*	10.00 (1.47,52.70)	81	0.99 (0.14,6.82)
3	439	1.53 (0.83,2.84)	31	2.22 (0.32,14.75)	330	1.43 (0.68,2.98)	*	10.00 (1.47,52.70)	71	0.99 (0.14,6.82)
4	371	1.77 (0.98,3.20)	27	2.22 (0.32,14.75)	281	1.74 (0.86,3.50)	*	10.00 (1.47,52.70)	57	0.99 (0.14,6.82)
5	309	1.77 (0.98,3.20)	22	2.22 (0.32,14.75)	238	1.74 (0.86,3.50)	*	10.00 (1.47,52.70)	43	0.99 (0.14,6.82)
6	224	2.16 (1.18,3.91)	11	2.22 (0.32,14.75)	173	2.23 (1.11,4.44)	*	10.00 (1.47,52.70)	36	0.99 (0.14,6.82)
7	151	2.16 (1.18,3.91)	11	2.22 (0.32,14.75)	110	2.23 (1.11,4.44)	*	10.00 (1.47,52.70)	27	0.99 (0.14,6.82)
8	102	2.16 (1.18,3.91)	*	2.22 (0.32,14.75)	75	2.23 (1.11,4.44)	*	10.00 (1.47,52.70)	18	0.99 (0.14,6.82)
9	71	2.16 (1.18,3.91)	*	2.22 (0.32,14.75)	50	2.23 (1.11,4.44)	*	10.00 (1.47,52.70)	14	0.99 (0.14,6.82)
10	47	2.16 (1.18,3.91)	*	2.22 (0.32,14.75)	36	2.23 (1.11,4.44)	*	10.00 (1.47,52.70)	*	0.99 (0.14,6.82)

* Denotes that the number of cases is between 1 and 10.

Table 888. Reasons for First Revision Following Primary THA for Versys Heritage Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	6	50.0
2	Joint Infection	3	25.0
3	Aseptic Loosening	1	8.3
4	Implant Failure	1	8.3
5	Peri-prosthetic fracture - Acetabulum	1	8.3

Table 889. Reasons for First Revision in the First 90 Days Following Primary THA for Versys Heritage Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	2	40.0
2	Joint Infection	2	40.0
3	Peri-prosthetic fracture - Acetabulum	1	20.0

Table 890. Reasons for First Revision Between 91 and 365 days Following Primary THA for Versys Heritage Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	2	66.7
2	Aseptic Loosening	1	33.3

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Table 891. Descriptive Statistics of Cases Receiving the Versys Heritage Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	586	83.59	
Age (years)	701	77.40 (9.39)	78.00 (12.00)
Height (cm)	700	163.09 (9.36)	162.56 (10.16)
Weight (kg)	700	74.03 (15.98)	72.20 (21.42)
BMI(kg/m^2)	700	27.78 (5.30)	27.04 (7.18)
Smoker - Never (%)	378	53.92	
Smoker - Previous (%)	298	42.51	
Smoker - Current (%)	24	3.42	
Smoker - Unknown (%)	1	0.14	

Table 892. Distribution of Approach Used for Versys Heritage Stem in Primary THA Cases

Approach	N	Percent
Anterior	97	13.8
Anterolateral	23	3.3
Posterior	576	82.2
Transtrochanteric	0	0.0
Missing/unknown/other	5	0.7

Table 893. Distribution of Head Size for Versys Heritage Stem in Primary THA Cases

Size (mm)	N	Percent
28	1	0.2
32	133	23.5
36	400	70.7
40	26	4.6
Missing/unknown/other	6	1.1

Table 894. Distribution of Bearing Surface for Versys Heritage Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	257	36.7
Ceramic-on-plastic	305	43.5
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	128	18.3
Missing/unknown/other	11	1.6

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Table 895. Distribution of Polyethylene Used for Versys Heritage Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	573	82.7
Antioxidant XLPE	119	17.2
Missing/unknown/other	1	0.1

Table 896. Volume of Cases by Surgeon and Site for the Versys Heritage Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	27 (52)	3 (41)
Cases per site	41 (63)	12 (39)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

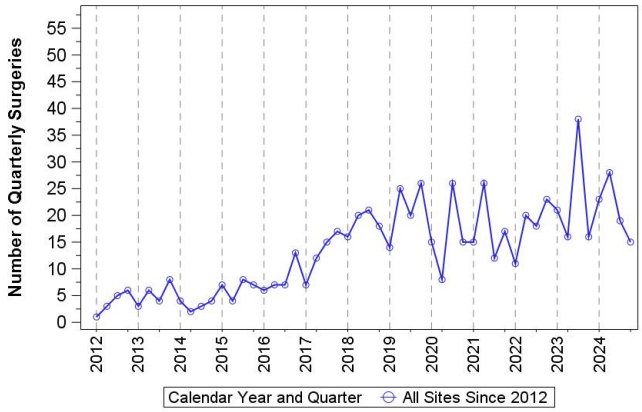


Figure 312. Utilization of the Versys Heritage Stem in Primary THA Cases

Catalog Numbers of Stems Used in the Analysis

785701200
785701320
785701100
785701300
785701400
785701420
785701500
785701520
785701620
785701700
785701600
785701600
78571400

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3.2.39 Wagner Cone

N = 768 primary cases were used for this analysis. Distribution of utilization: 68 surgeons across 36 sites used this implant in primary THA cases.

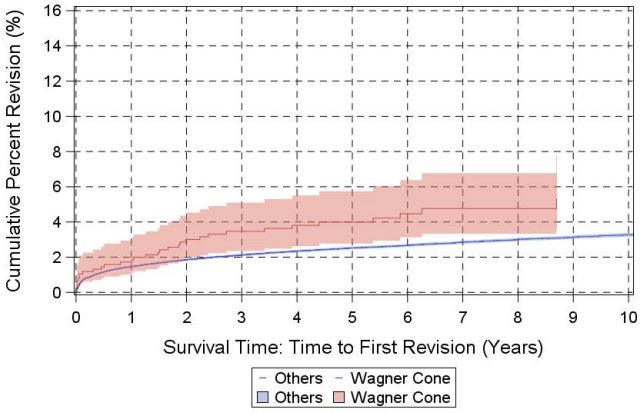


Figure 313. Cumulative Percent Revision Curve for the Wagner Cone Stem, Compared to All Other Femoral Components in Primary THA Cases

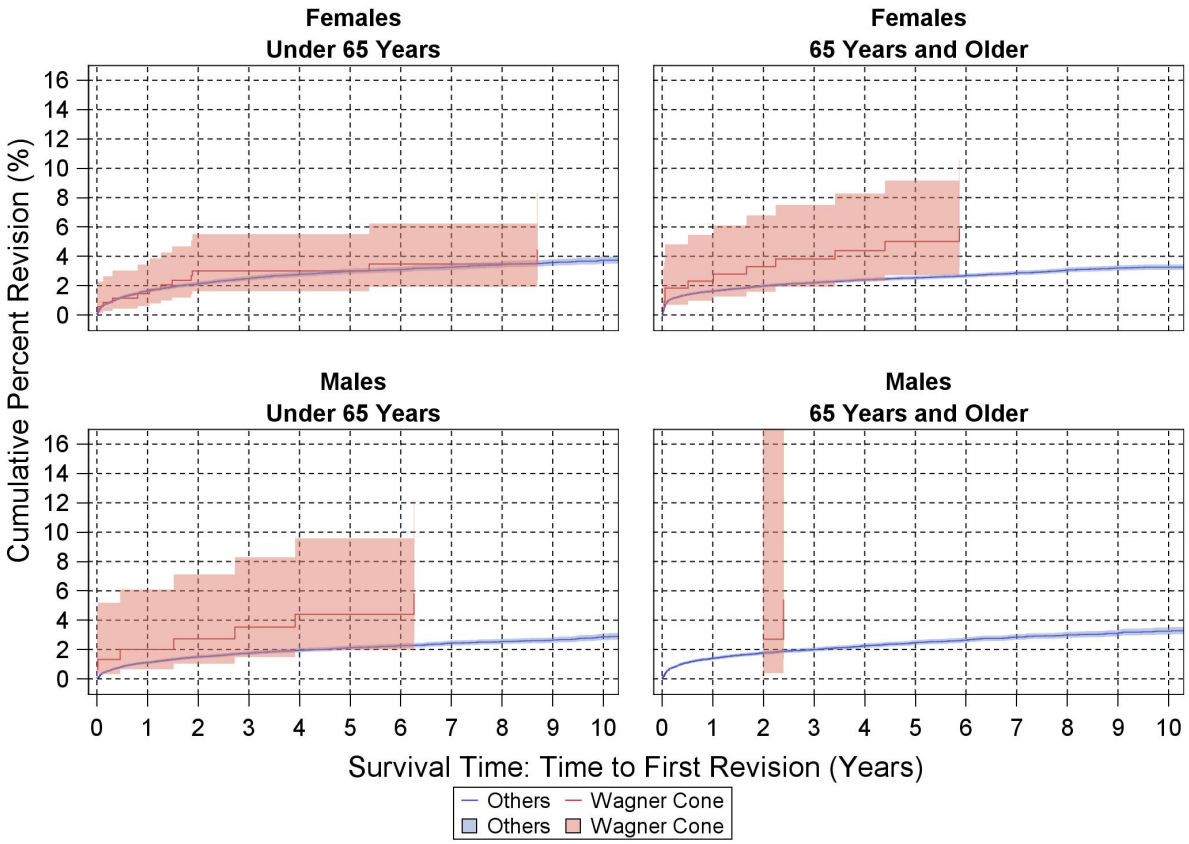


Figure 314. Cumulative Percent Revision Curve for the Wagner Cone Stem, Compared to All Other Femoral Components in Primary THA Cases by Age and Sex

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Table 897. Cumulative Percent Revision and Number at Risk for the Wagner Cone Stem in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	763	0.00 (0.00,0.00)	350	0.00 (0.00,0.00)	218	0.00 (0.00,0.00)	151	0.00 (0.00,0.00)	44	0.00 (0.00,0.00)
1	712	1.72 (1.00,2.94)	326	1.45 (0.60,3.44)	205	2.31 (0.97,5.46)	140	2.01 (0.65,6.09)	41	0.00 (0.00,0.00)
2	653	3.01 (1.99,4.53)	301	3.00 (1.63,5.51)	187	3.29 (1.58,6.78)	129	2.73 (1.03,7.12)	36	2.70 (0.39,17.68)
3	609	3.47 (2.35,5.09)	281	3.00 (1.63,5.51)	175	3.82 (1.93,7.50)	119	3.53 (1.48,8.29)	34	5.41 (1.38,19.93)
4	550	3.81 (2.62,5.51)	253	3.00 (1.63,5.51)	161	4.39 (2.30,8.28)	108	4.40 (1.99,9.58)	28	5.41 (1.38,19.93)
5	473	3.99 (2.77,5.74)	219	3.00 (1.63,5.51)	140	5.01 (2.72,9.16)	92	4.40 (1.99,9.58)	22	5.41 (1.38,19.93)
6	355	4.47 (3.13,6.38)	179	3.48 (1.92,6.24)	99	5.91 (3.26,10.60)	69	4.40 (1.99,9.58)	*	5.41 (1.38,19.93)
7	288	4.76 (3.33,6.77)	151	3.48 (1.92,6.24)	70	5.91 (3.26,10.60)	59	5.82 (2.72,12.25)	*	5.41 (1.38,19.93)
8	216	4.76 (3.33,6.77)	123	3.48 (1.92,6.24)	48	5.91 (3.26,10.60)	40	5.82 (2.72,12.25)	*	5.41 (1.38,19.93)
9	137	5.34 (3.65,7.78)	81	4.47 (2.38,8.32)	34	5.91 (3.26,10.60)	19	5.82 (2.72,12.25)	*	5.41 (1.38,19.93)
10	86	5.34 (3.65,7.78)	50	4.47 (2.38,8.32)	22	5.91 (3.26,10.60)	11	5.82 (2.72,12.25)	*	5.41 (1.38,19.93)

* Denotes that the number of cases is between 1 and 10.

Table 898. Reasons for First Revision Following Primary THA for Wagner Cone Stem Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	7	22.6
2	Dislocation/Instability	7	22.6
3	Joint Infection	4	12.9
4	Peri-prosthetic fracture - Femur	4	12.9
5	Metal Reaction/Metallosis	3	9.7
6	Malalignment	3	9.7
7	Implant Failure	1	3.2
8	Peri-prosthetic fracture - Acetabulum	1	3.2
9	Pain	1	3.2

Table 899. Reasons for First Revision in the First 90 Days Following Primary THA for Wagner Cone Stem Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	2	25.0
2	Peri-prosthetic fracture - Femur	2	25.0
3	Aseptic Loosening	1	12.5
4	Implant Failure	1	12.5
5	Peri-prosthetic fracture - Acetabulum	1	12.5
6	Malalignment	1	12.5

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Table 900. Reasons for First Revision Between 91 and 365 days Following Primary THA for Wagner Cone Stem Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	2	50.0
2	Dislocation/Instability	1	25.0
3	Peri-prosthetic fracture - Femur	1	25.0

Table 901. Descriptive Statistics of Cases Receiving the Wagner Cone Stem in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	572	74.48	
Age (years)	768	57.84 (15.42)	59.00 (21.00)
Height (cm)	737	163.65 (11.29)	162.60 (12.70)
Weight (kg)	737	81.60 (21.25)	80.40 (28.00)
BMI(kg/m^2)	737	30.38 (7.04)	29.99 (10.37)
Smoker - Never (%)	460	59.9	
Smoker - Previous (%)	212	27.6	
Smoker - Current (%)	96	12.5	
Smoker - Unknown (%)	0	0.0	

Table 902. Distribution of Approach Used for Wagner Cone Stem in Primary THA Cases

Approach	N	Percent
Anterior	35	4.6
Anterolateral	60	7.8
Posterior	636	82.8
Transtrochanteric	1	0.1
Missing/unknown/other	36	4.7

Table 903. Distribution of Head Size for Wagner Cone Stem in Primary THA Cases

Size (mm)	N	Percent
22	1	0.1
28	10	1.5
32	145	22.0
36	417	63.4
40	77	11.7
Missing/unknown/other	8	1.2

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Table 904. Distribution of Bearing Surface for Wagner Cone Stem in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	190	24.7
Ceramic-on-plastic	461	60.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	101	13.2
Missing/unknown/other	16	2.1

Table 905. Distribution of Polyethylene Used for Wagner Cone Stem Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.1
XLPE	476	63.4
Antioxidant XLPE	274	36.5
Missing/unknown/other	0	0.0

Table 906. Volume of Cases by Surgeon and Site for the Wagner Cone Stem in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	11 (22)	4 (11)
Cases per site	21 (42)	6 (9)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

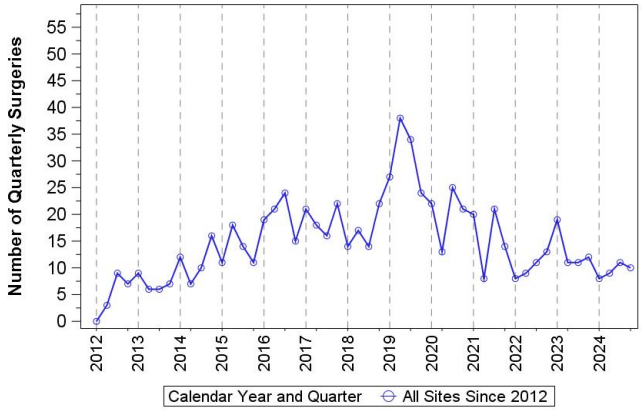


Figure 315. Utilization of the Wagner Cone Stem in Primary THA Cases

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Catalog Numbers of Stems Used in the Analysis

100561218	100561321	100561314
100561221	100561215	100561224
100561217	100561222	100561323
100561318	100561319	100561324
100561219	100561316	100561213
100561220	100561223	100561313
100561317	100561315	
100561320	100561322	
100561216	100561214	

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3.3 Conventional THA Cups

The discrepancy between the number of cases listed at the beginning of an implant and N at year 0 in the table following the CPR figures is due to deaths. The former number is the total number of cases; the latter is the number of cases used to estimate the CPR considering deaths as censored events.

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3.3.1 BiMobile

N = 792 primary cases were used for this analysis. Fewer than ten surgeons used this implant at fewer than ten sites in primary THA cases.

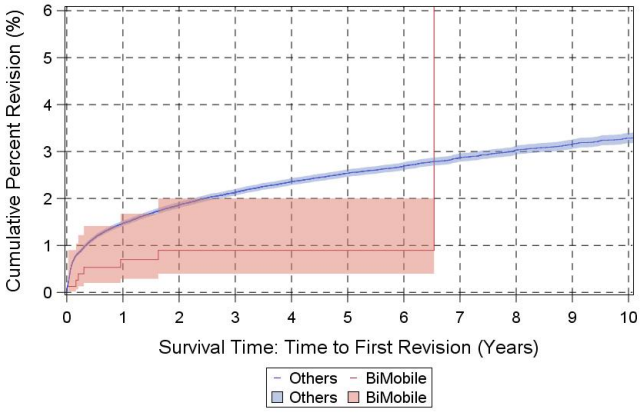


Figure 316. Cumulative Percent Revision Curve for the BiMobile Cup, Compared to All Other Cups in Primary THA Cases

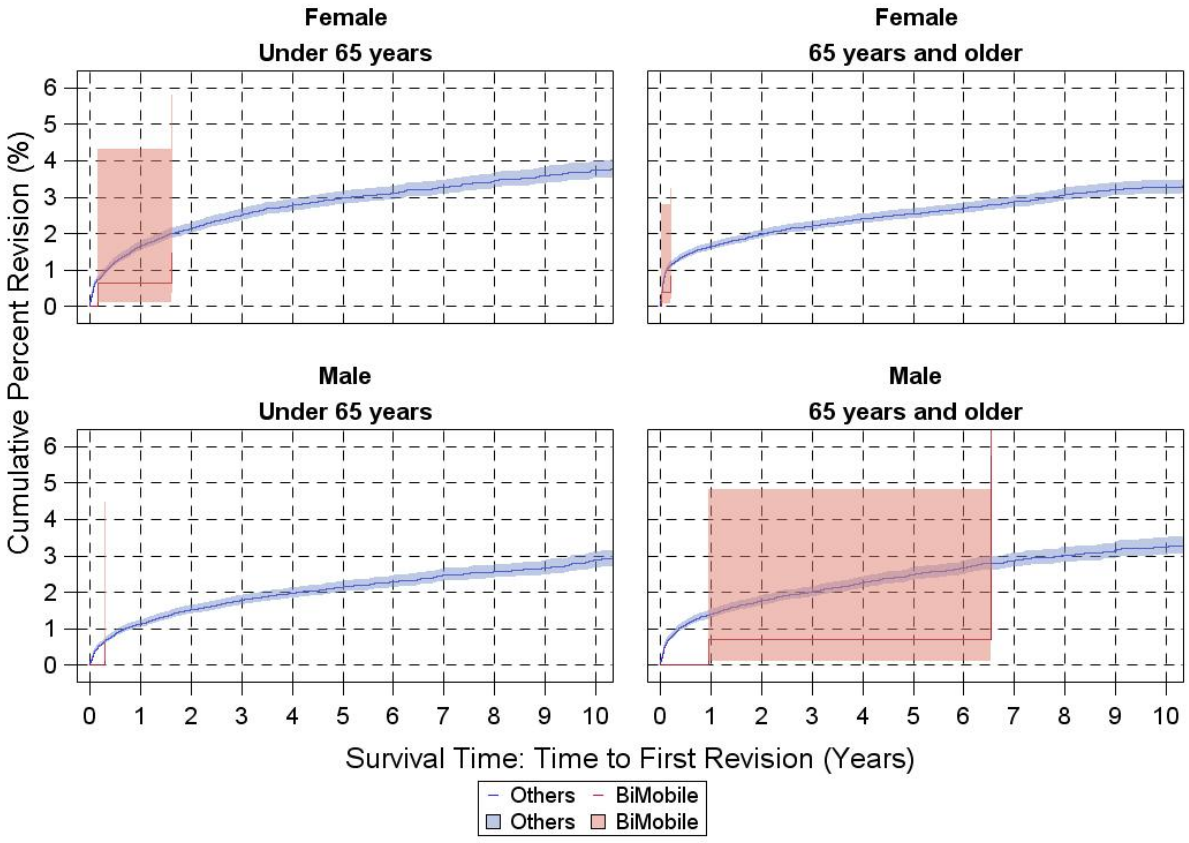


Figure 317. Cumulative Percent Revision Curve for the BiMobile Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 907. Cumulative Percent Revision and Number at Risk for the BiMobile Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	788	0.00 (0.00,0.00)	167	0.00 (0.00,0.00)	253	0.00 (0.00,0.00)	165	0.00 (0.00,0.00)	202	0.00 (0.00,0.00)
1	599	0.70 (0.29,1.68)	135	0.62 (0.09,4.33)	195	0.82 (0.20,3.22)	126	0.64 (0.09,4.46)	143	0.69 (0.10,4.83)
2	453	0.89 (0.40,2.00)	110	1.46 (0.36,5.82)	143	0.82 (0.20,3.22)	92	0.64 (0.09,4.46)	108	0.69 (0.10,4.83)
3	334	0.89 (0.40,2.00)	79	1.46 (0.36,5.82)	108	0.82 (0.20,3.22)	66	0.64 (0.09,4.46)	81	0.69 (0.10,4.83)
4	189	0.89 (0.40,2.00)	48	1.46 (0.36,5.82)	54	0.82 (0.20,3.22)	37	0.64 (0.09,4.46)	50	0.69 (0.10,4.83)
5	113	0.89 (0.40,2.00)	23	1.46 (0.36,5.82)	34	0.82 (0.20,3.22)	23	0.64 (0.09,4.46)	33	0.69 (0.10,4.83)
6	40	0.89 (0.40,2.00)	*	1.46 (0.36,5.82)	*	0.82 (0.20,3.22)	*	0.64 (0.09,4.46)	13	0.69 (0.10,4.83)
7	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 908. Reasons for First Revision Following Primary THA for BiMobile Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Acetabulum	2	28.6
2	Malalignment	2	28.6
3	Osteolysis	1	14.3
4	Joint Infection	1	14.3
5	Peri-prosthetic fracture - Femur	1	14.3

Table 909. Reasons for First Revision in the First 90 Days Following Primary THA for BiMobile Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Acetabulum	2	66.7
2	Peri-prosthetic fracture - Femur	1	33.3

Table 910. Reasons for First Revision Between 91 and 365 days Following Primary THA for BiMobile Cup Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	1	50.0
2	Malalignment	1	50.0

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Table 911. Descriptive Statistics of Cases Receiving the BiMobile Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	422	53.28	
Age (years)	792	65.74 (10.62)	67.00 (15.00)
Height (cm)	792	170.28 (10.39)	170.20 (15.20)
Weight (kg)	792	93.48 (23.21)	91.30 (31.15)
BMI(kg/m^2)	792	32.17 (7.28)	31.28 (9.92)
Smoker - Never (%)	403	50.88	
Smoker - Previous (%)	318	40.15	
Smoker - Current (%)	71	8.96	
Smoker - Unknown (%)	0	0.0	

Table 912. Distribution of Approach Used for BiMobile Cup in Primary THA Cases

Approach	N	Percent
Anterior	0	0.0
Anterolateral	143	18.1
Posterior	649	81.9
Transtrochanteric	0	0.0
Missing/unknown/other	0	0.0

Table 913. Distribution of Bearing Surface for BiMobile Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	0	0.0
Ceramic-on-plastic	0	0.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	503	63.5
Missing/unknown/other	289	36.5

Table 914. Distribution of Polyethylene Used for BiMobile Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	503	100.0
XLPE	0	0.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 915. Volume of Cases by Surgeon and Site for the BiMobile Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	396 (360)	396 (510)
Cases per site	396 (360)	396 (510)

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The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

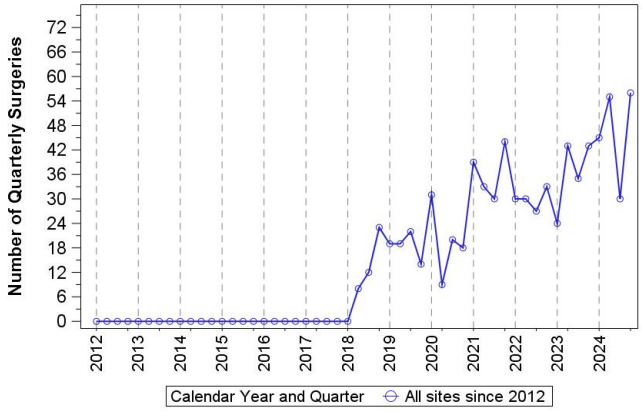


Figure 318. Utilization of the BiMobile Cup in Primary THA Cases

Catalog Numbers of Acetabular Cups Used in the Analysis

184101/48	184101/54	184101/60
184101/50	184101/56	
184101/52	184101/58	

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3.3.2 Continuum

N = 17,061 primary cases were used for this analysis. Distribution of utilization: 120 surgeons across 43 sites used this implant in primary THA cases.

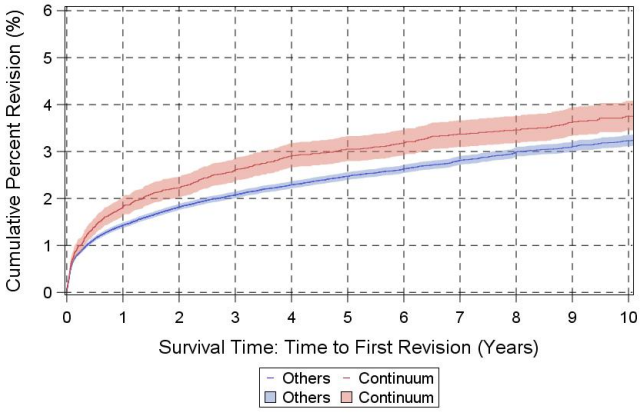


Figure 319. Cumulative Percent Revision Curve for the Continuum Cup, Compared to All Other Cups in Primary THA Cases

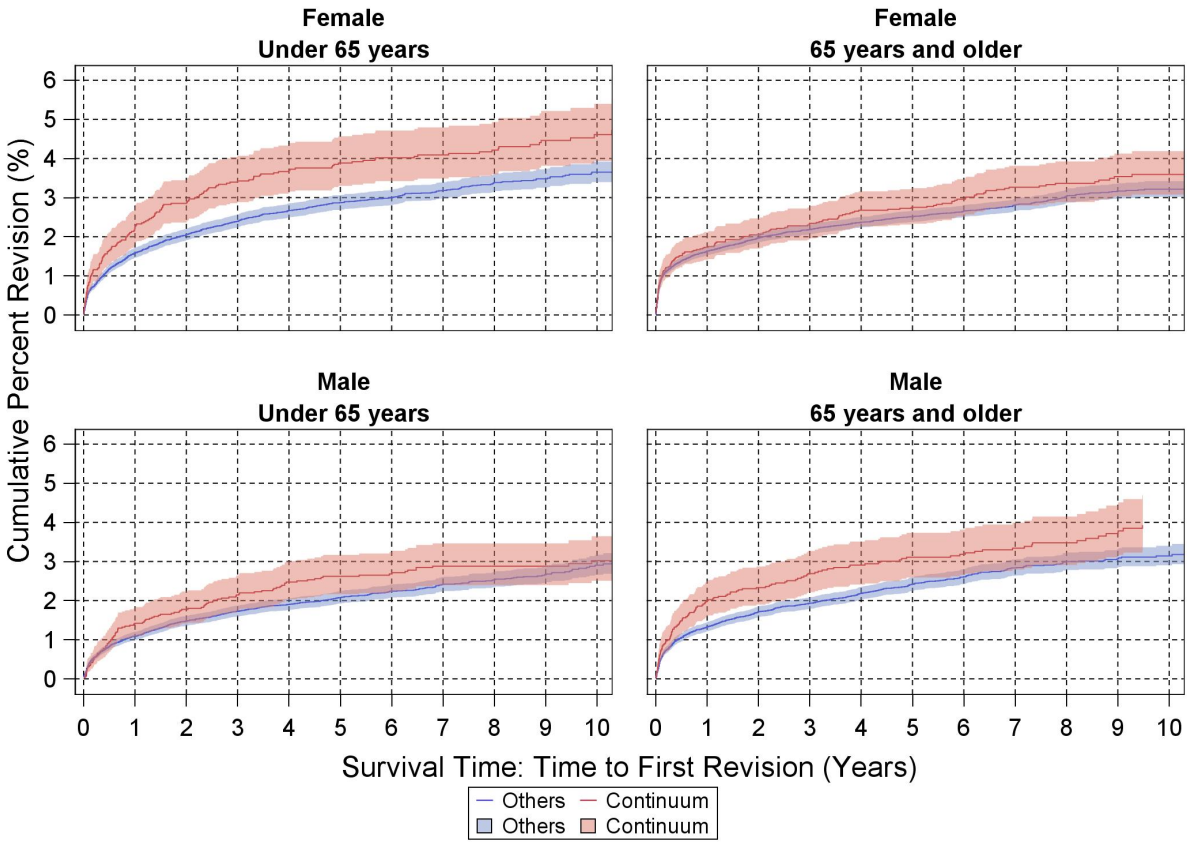


Figure 320. Cumulative Percent Revision Curve for the Continuum Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 916. Cumulative Percent Revision and Number at Risk for the Continuum Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	16,920	0.00 (0.00,0.00)	3,720	0.00 (0.00,0.00)	5,284	0.00 (0.00,0.00)	4,111	0.00 (0.00,0.00)	3,803	0.00 (0.00,0.00)
1	16,093	1.83 (1.64,2.04)	3,564	2.25 (1.81,2.78)	5,029	1.73 (1.41,2.12)	3,938	1.42 (1.10,1.84)	3,560	2.00 (1.60,2.50)
2	15,407	2.22 (2.01,2.46)	3,445	2.85 (2.36,3.44)	4,768	2.05 (1.70,2.47)	3,814	1.78 (1.41,2.23)	3,379	2.33 (1.90,2.87)
3	14,675	2.61 (2.38,2.87)	3,294	3.43 (2.88,4.07)	4,520	2.34 (1.96,2.79)	3,655	2.15 (1.74,2.64)	3,205	2.69 (2.21,3.27)
4	13,844	2.91 (2.66,3.18)	3,144	3.70 (3.13,4.36)	4,213	2.68 (2.27,3.16)	3,477	2.48 (2.04,3.01)	3,009	2.91 (2.41,3.51)
5	13,023	3.05 (2.80,3.33)	2,992	3.88 (3.30,4.57)	3,934	2.75 (2.33,3.24)	3,295	2.62 (2.16,3.17)	2,801	3.11 (2.59,3.73)
6	12,009	3.18 (2.92,3.46)	2,766	4.02 (3.42,4.72)	3,615	2.96 (2.52,3.47)	3,056	2.68 (2.22,3.24)	2,571	3.18 (2.65,3.82)
7	10,711	3.37 (3.10,3.67)	2,517	4.09 (3.49,4.79)	3,215	3.27 (2.80,3.81)	2,714	2.88 (2.40,3.46)	2,264	3.34 (2.79,3.99)
8	9,011	3.46 (3.18,3.76)	2,187	4.21 (3.60,4.93)	2,706	3.37 (2.89,3.92)	2,266	2.88 (2.40,3.46)	1,851	3.48 (2.91,4.15)
9	6,990	3.62 (3.33,3.93)	1,739	4.46 (3.81,5.22)	2,058	3.54 (3.03,4.13)	1,773	2.88 (2.40,3.46)	1,420	3.71 (3.11,4.43)
10	4,516	3.75 (3.45,4.08)	1,108	4.61 (3.94,5.40)	1,330	3.59 (3.08,4.19)	1,167	3.02 (2.51,3.65)	911	3.93 (3.29,4.69)

Table 917. Reasons for First Revision Following Primary THA for Continuum Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	144	27.3
2	Peri-prosthetic fracture - Femur	115	21.8
3	Aseptic Loosening	93	17.6
4	Joint Infection	83	15.7
5	Pain	33	6.3
6	Malalignment	22	4.2
7	Implant Failure	18	3.4
8	Metal Reaction/Metallosis	12	2.3
9	Peri-prosthetic fracture - Acetabulum	6	1.1
10	Poly liner wear	1	0.2

Table 918. Reasons for First Revision in the First 90 Days Following Primary THA for Continuum Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	74	47.1
2	Dislocation/Instability	42	26.8
3	Joint Infection	13	8.3
4	Aseptic Loosening	10	6.4
5	Implant Failure	5	3.2
6	Peri-prosthetic fracture - Acetabulum	5	3.2
7	Pain	4	2.6
8	Malalignment	4	2.6

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Table 919. Reasons for First Revision Between 91 and 365 days Following Primary THA for Continuum Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	35	31.0
2	Joint Infection	29	25.7
3	Aseptic Loosening	18	15.9
4	Pain	10	8.8
5	Peri-prosthetic fracture - Femur	8	7.1
6	Malalignment	7	6.2
7	Implant Failure	6	5.3

Table 920. Descriptive Statistics of Cases Receiving the Continuum Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	9,071	53.17	
Age (years)	17,061	65.33 (10.90)	65.00 (15.00)
Height (cm)	16,940	170.13 (10.47)	170.18 (15.24)
Weight (kg)	16,939	87.73 (20.59)	86.18 (27.60)
BMI(kg/m^2)	16,939	30.17 (5.97)	29.48 (7.81)
Smoker - Never (%)	8,490	49.76	
Smoker - Previous (%)	6,540	38.33	
Smoker - Current (%)	2,002	11.73	
Smoker - Unknown (%)	29	0.17	

Table 921. Distribution of Approach Used for Continuum Cup in Primary THA Cases

Approach	N	Percent
Anterior	5,555	32.6
Anterolateral	2980	17.5
Posterior	8,252	48.4
Transtrochanteric	96	0.6
Missing/unknown/other	178	1.0

Table 922. Distribution of Head Size for Continuum Cup in Primary THA Cases

Size (mm)	N	Percent
28	52	0.3
32	3,608	21.3
36	11,662	68.8
40	1,479	8.7
Missing/unknown/other	163	1.0

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Table 923. Distribution of Bearing Surface for Continuum Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	4,847	28.4
Ceramic-on-plastic	11,951	70.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	263	1.5

Table 924. Distribution of Polyethylene Used for Continuum Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.0
XLPE	10,388	61.2
Antioxidant XLPE	6,572	38.8
Missing/unknown/other	0	0.0

Table 925. Volume of Cases by Surgeon and Site for the Continuum Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	142 (336)	25 (88)
Cases per site	396 (757)	89 (395)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

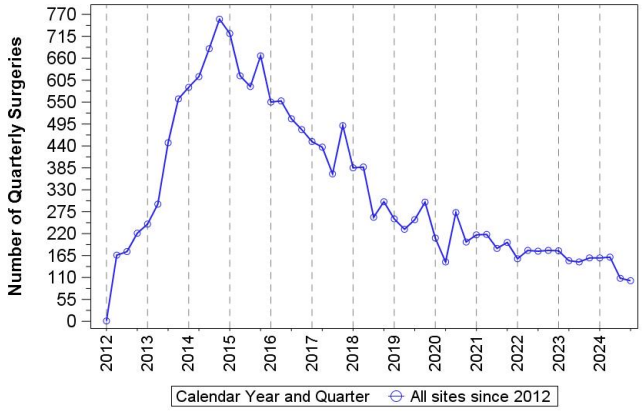


Figure 321. Utilization of the Continuum Cup in Primary THA Cases

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Catalog Numbers of Acetabular Cups Used in the Analysis

875705201	875705400	875706202
875705401	875705600	875706402
875705601	875704802	875706801
875705801	875705602	875704402
875706001	875705802	875704401
875705001	875705000	875706200
875704801	875705800	875706602
875706201	875704800	875704002
875706401	875706601	875706400
875705200	875706002	875706802
875705402	875704601	875707001
875705202	875704602	
875705002	875706000	

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3.3.3 Converge

N = 580 primary cases were used for this analysis. Distribution of utilization: 10 surgeons used this implant at fewer than 10 sites in primary THA cases.

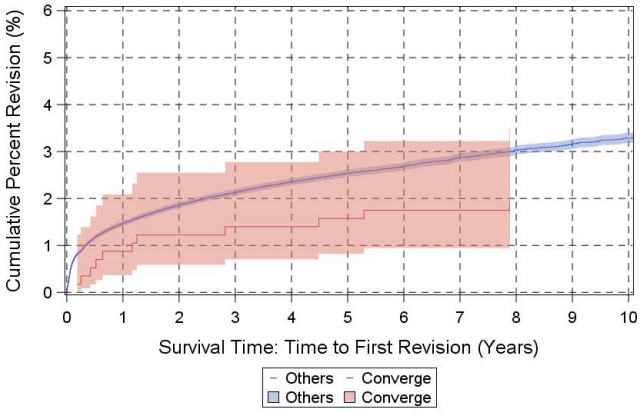


Figure 322. Cumulative Percent Revision Curve for the Converge Cup, Compared to All Other Cups in Primary THA Cases

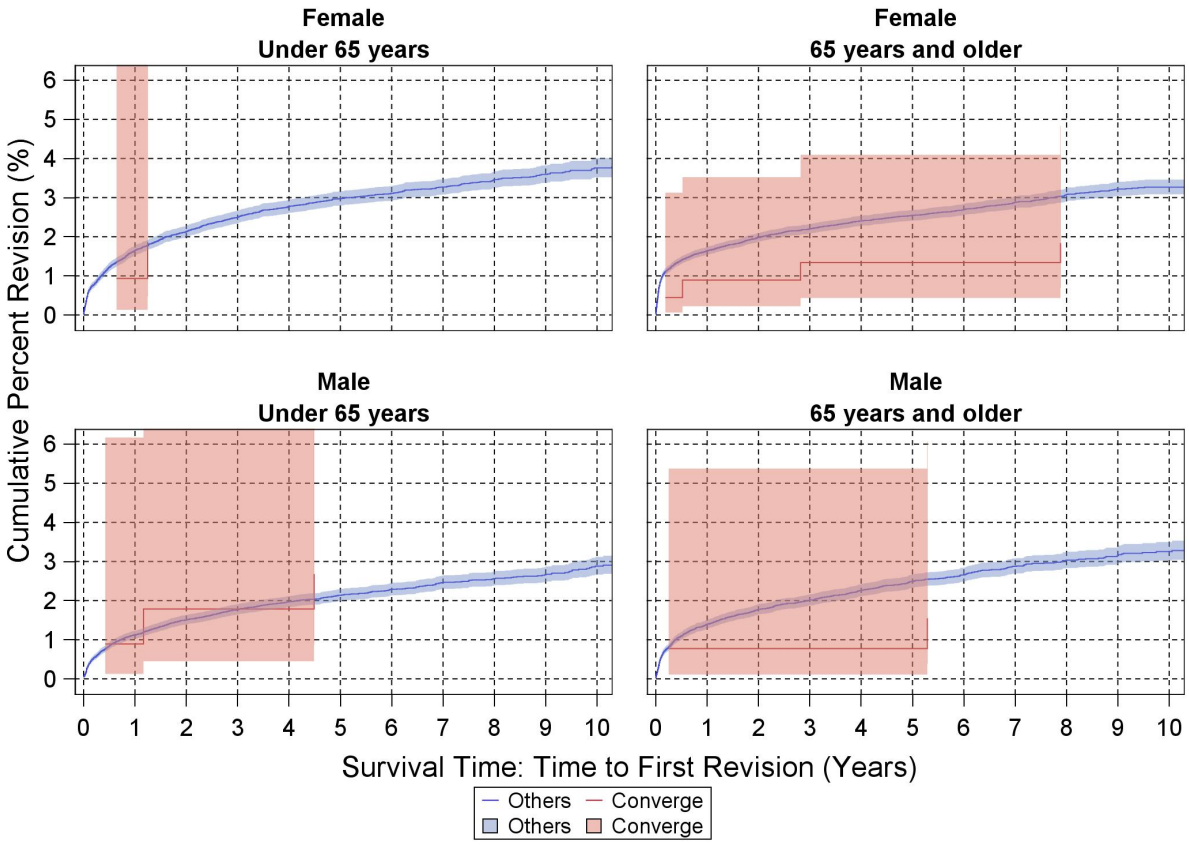


Figure 323. Cumulative Percent Revision Curve for the Converge Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 926. Cumulative Percent Revision and Number at Risk for the Converge Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	572	0.00 (0.00,0.00)	107	0.00 (0.00,0.00)	224	0.00 (0.00,0.00)	112	0.00 (0.00,0.00)	129	0.00 (0.00,0.00)
1	567	0.87 (0.36,2.09)	106	0.93 (0.13,6.45)	222	0.89 (0.22,3.52)	111	0.89 (0.13,6.17)	128	0.78 (0.11,5.37)
2	565	1.22 (0.59,2.55)	105	1.87 (0.47,7.27)	222	0.89 (0.22,3.52)	110	1.79 (0.45,6.95)	128	0.78 (0.11,5.37)
3	564	1.40 (0.70,2.78)	105	1.87 (0.47,7.27)	221	1.34 (0.43,4.09)	110	1.79 (0.45,6.95)	128	0.78 (0.11,5.37)
4	564	1.40 (0.70,2.78)	105	1.87 (0.47,7.27)	221	1.34 (0.43,4.09)	110	1.79 (0.45,6.95)	128	0.78 (0.11,5.37)
5	563	1.57 (0.82,3.00)	105	1.87 (0.47,7.27)	221	1.34 (0.43,4.09)	109	2.68 (0.87,8.07)	128	0.78 (0.11,5.37)
6	562	1.75 (0.94,3.22)	105	1.87 (0.47,7.27)	221	1.34 (0.43,4.09)	109	2.68 (0.87,8.07)	127	1.55 (0.39,6.06)
7	562	1.75 (0.94,3.22)	105	1.87 (0.47,7.27)	221	1.34 (0.43,4.09)	109	2.68 (0.87,8.07)	127	1.55 (0.39,6.06)
8	498	1.94 (1.08,3.48)	97	1.87 (0.47,7.27)	194	1.84 (0.69,4.84)	97	2.68 (0.87,8.07)	110	1.55 (0.39,6.06)
9	374	1.94 (1.08,3.48)	77	1.87 (0.47,7.27)	151	1.84 (0.69,4.84)	74	2.68 (0.87,8.07)	72	1.55 (0.39,6.06)
10	230	1.94 (1.08,3.48)	41	1.87 (0.47,7.27)	100	1.84 (0.69,4.84)	49	2.68 (0.87,8.07)	40	1.55 (0.39,6.06)

Table 927. Reasons for First Revision Following Primary THA for Converge Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	4	44.4
2	Joint Infection	3	33.3
3	Aseptic Loosening	2	22.2

Table 928. Reasons for First Revision in the First 90 Days Following Primary THA for Converge Cup Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	100.0

Table 929. Reasons for First Revision Between 91 and 365 days Following Primary THA for Converge Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	50.0
2	Joint Infection	1	50.0

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Table 930. Descriptive Statistics of Cases Receiving the Converge Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	336	57.93	
Age (years)	580	67.95 (11.25)	68.00 (16.50)
Height (cm)	580	168.67 (10.20)	167.64 (16.74)
Weight (kg)	580	86.72 (21.08)	83.91 (27.90)
BMI(kg/m^2)	580	30.32 (6.09)	29.55 (8.33)
Smoker - Never (%)	269	46.38	
Smoker - Previous (%)	251	43.28	
Smoker - Current (%)	60	10.34	
Smoker - Unknown (%)	0	0.0	

Table 931. Distribution of Approach Used for Converge Cup in Primary THA Cases

Approach	N	Percent
Anterior	4	0.7
Anterolateral	444	76.5
Posterior	121	20.9
Transtrochanteric	8	1.4
Missing/unknown/other	3	0.5

Table 932. Distribution of Head Size for Converge Cup in Primary THA Cases

Size (mm)	N	Percent
28	3	0.5
32	426	73.7
44	2	0.3
Missing/unknown/other	147	25.4

Table 933. Distribution of Bearing Surface for Converge Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	266	45.9
Ceramic-on-plastic	297	51.2
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	17	2.9

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Table 934. Distribution of Polyethylene Used for Converge Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	578	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 935. Volume of Cases by Surgeon and Site for the Converge Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	58 (106)	32 (46)
Cases per site	72 (95)	32 (132)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

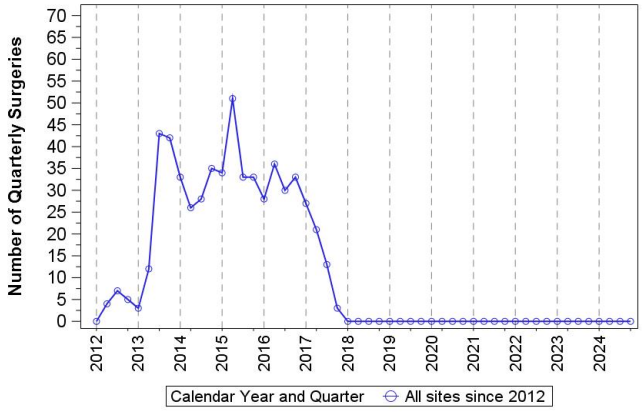


Figure 324. Utilization of the Converge Cup in Primary THA Cases

Catalog Numbers of Acetabular Cups Used in the Analysis

536100055
536100051
536100053
536100049
536100057
536000051
536000057
536000055
536100059
536000049
536000053
536000059
536100061
536000061
636100051
536000063
536000047
536100063
636100049
536000065

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3.3.4 G7

N = 46,913 primary cases were used for this analysis. Distribution of utilization: 212 surgeons across 86 sites used this implant in primary THA cases.

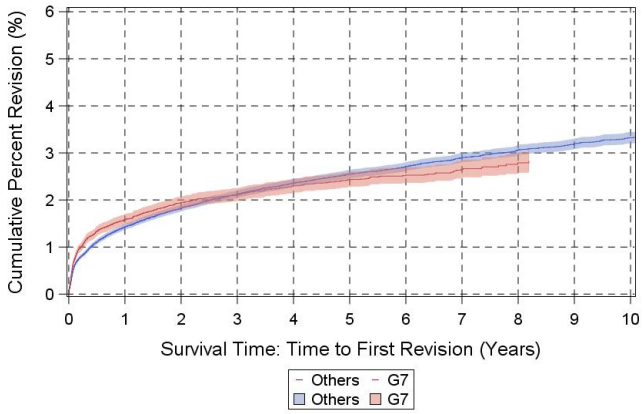


Figure 325. Cumulative Percent Revision Curve for the G7 Cup, Compared to All Other Cups in Primary THA Cases

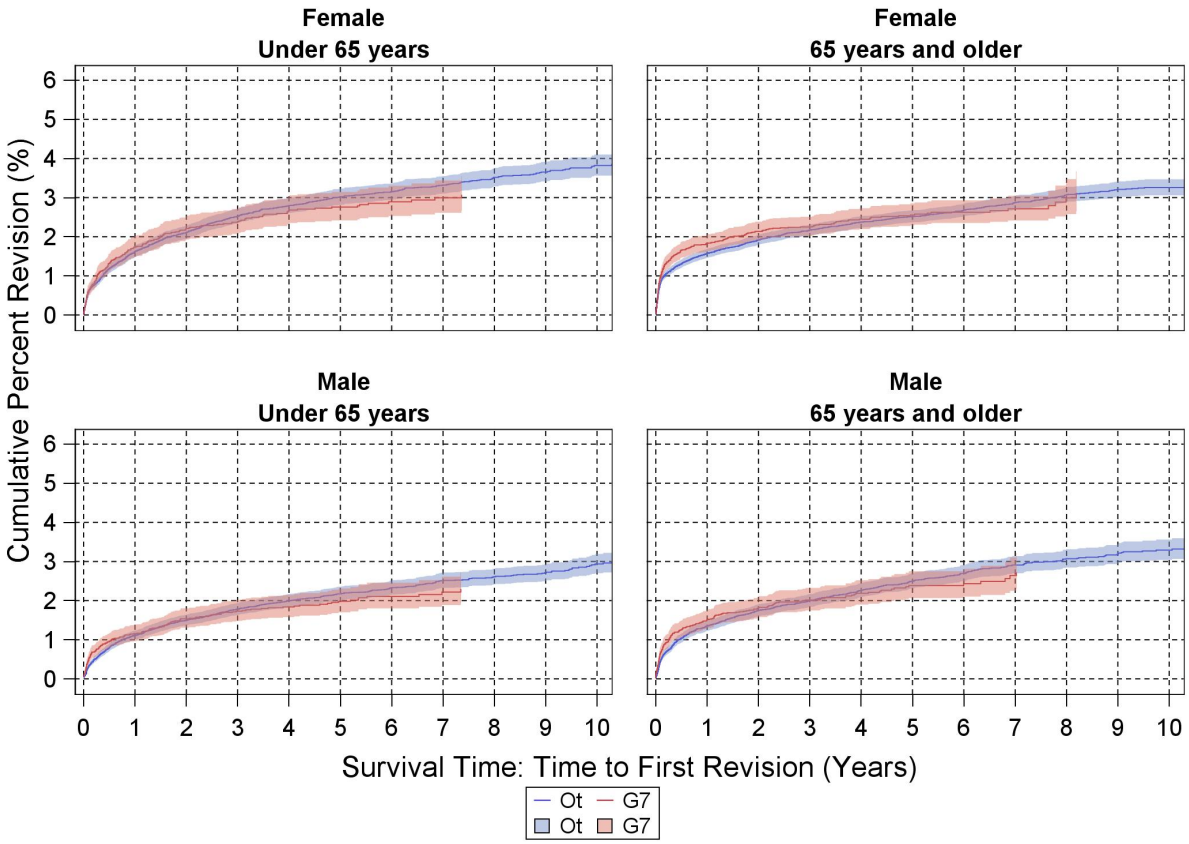


Figure 326. Cumulative Percent Revision Curve for the G7 Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 936. Cumulative Percent Revision and Number at Risk for the G7 Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	46,743	0.00 (0.00,0.00)	9,943	0.00 (0.00,0.00)	15,556	0.00 (0.00,0.00)	10,514	0.00 (0.00,0.00)	10,720	0.00 (0.00,0.00)
1	38,320	1.59 (1.47,1.71)	8,278	1.73 (1.49,2.02)	12,516	1.83 (1.63,2.06)	8,841	1.16 (0.96,1.38)	8,676	1.51 (1.29,1.77)
2	30,881	1.95 (1.82,2.08)	6,779	2.21 (1.93,2.54)	9,917	2.14 (1.91,2.38)	7,292	1.54 (1.31,1.80)	6,886	1.83 (1.58,2.11)
3	24,583	2.11 (1.97,2.25)	5,534	2.37 (2.07,2.71)	7,765	2.25 (2.02,2.51)	5,923	1.73 (1.48,2.02)	5,355	2.02 (1.75,2.32)
4	19,284	2.30 (2.15,2.45)	4,417	2.66 (2.33,3.04)	6,007	2.45 (2.20,2.73)	4,741	1.84 (1.58,2.14)	4,115	2.19 (1.90,2.52)
5	14,927	2.43 (2.28,2.60)	3,496	2.76 (2.42,3.15)	4,644	2.56 (2.29,2.85)	3,698	1.98 (1.70,2.31)	3,085	2.38 (2.07,2.75)
6	10,079	2.53 (2.36,2.70)	2,472	2.89 (2.53,3.30)	3,108	2.63 (2.35,2.93)	2,512	2.11 (1.80,2.46)	1,985	2.43 (2.10,2.81)
7	6,125	2.65 (2.47,2.84)	1,548	3.00 (2.61,3.44)	1,869	2.71 (2.42,3.05)	1,524	2.22 (1.88,2.61)	1,182	2.64 (2.25,3.10)
8	2,951	2.79 (2.58,3.02)	746	3.07 (2.67,3.55)	900	2.99 (2.58,3.47)	752	2.30 (1.94,2.73)	551	2.72 (2.30,3.22)
9	910	2.83 (2.61,3.07)	240	3.07 (2.67,3.55)	271	3.12 (2.65,3.67)	246	2.30 (1.94,2.73)	151	2.72 (2.30,3.22)
10	221	2.83 (2.61,3.07)	56	3.07 (2.67,3.55)	58	3.12 (2.65,3.67)	72	2.30 (1.94,2.73)	35	2.72 (2.30,3.22)

Table 937. Reasons for First Revision Following Primary THA for G7 Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	256	26.2
2	Dislocation/Instability	251	25.7
3	Joint Infection	193	19.7
4	Aseptic Loosening	156	16.0
5	Implant Failure	40	4.1
6	Malalignment	34	3.5
7	Pain	32	3.3
8	Peri-prosthetic fracture - Acetabulum	10	1.0
9	Poly liner wear	4	0.4
10	Metal Reaction/Metallosis	2	0.2

Table 938. Reasons for First Revision in the First 90 Days Following Primary THA for G7 Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	219	46.0
2	Dislocation/Instability	89	18.7
3	Joint Infection	66	13.9
4	Aseptic Loosening	46	9.7
5	Implant Failure	28	5.9
6	Malalignment	13	2.7
7	Peri-prosthetic fracture - Acetabulum	9	1.9
8	Pain	5	1.0
9	Poly liner wear	1	0.2

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Table 939. Reasons for First Revision Between 91 and 365 days Following Primary THA for G7 Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	82	35.0
2	Joint Infection	65	27.8
3	Aseptic Loosening	45	19.2
4	Peri-prosthetic fracture - Femur	13	5.6
5	Pain	13	5.6
6	Implant Failure	7	3.0
7	Malalignment	6	2.6
8	Poly liner wear	2	0.8
9	Peri-prosthetic fracture - Acetabulum	1	0.4

Table 940. Descriptive Statistics of Cases Receiving the G7 Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	25,581	54.53	
Age (years)	46,913	65.56 (11.08)	66.00 (14.00)
Height (cm)	46,670	169.89 (10.51)	170.18 (15.24)
Weight (kg)	46,670	88.34 (20.76)	86.70 (28.20)
BMI(kg/m^2)	46,670	30.49 (6.18)	29.84 (8.27)
Smoker - Never (%)	23,399	49.88	
Smoker - Previous (%)	17,284	36.84	
Smoker - Current (%)	6,048	12.89	
Smoker - Unknown (%)	182	0.39	

Table 941. Distribution of Approach Used for G7 Cup in Primary THA Cases

Approach	N	Percent
Anterior	21,172	45.1
Anterolateral	6592	14.1
Posterior	18,809	40.1
Transtrochanteric	40	0.1
Missing/unknown/other	300	0.6

Table 942. Distribution of Head Size for G7 Cup in Primary THA Cases

Size (mm)	N	Percent
28	44	0.1
32	4,162	9.9
36	28,977	69.2
40	8,403	20.1
44	5	0.0
Missing/unknown/other	314	0.8

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Table 943. Distribution of Bearing Surface for G7 Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	5,328	11.4
Ceramic-on-plastic	36,265	77.3
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	4,512	9.6
Missing/unknown/other	808	1.7

Table 944. Distribution of Polyethylene Used for G7 Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	19,115	41.3
Antioxidant XLPE	27,135	58.7
Missing/unknown/other	0	0.0

Table 945. Volume of Cases by Surgeon and Site for the G7 Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	221 (380)	50 (277)
Cases per site	545 (694)	304 (776)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

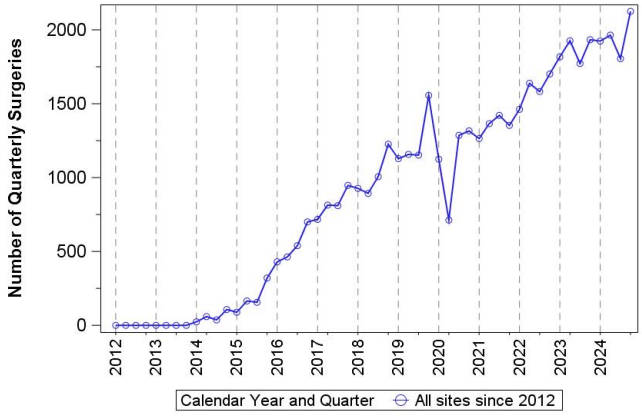


Figure 327. Utilization of the G7 Cup in Primary THA Cases

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Catalog Numbers of Acetabular Cups Used in the Analysis

110010244	110017106	110010269
110010245	110010241	110010240
110010243	110010263	110010270
110010246	110010249	110017109
10000664	110017101	110010261
10000663	110010264	110010271
10000665	110010265	10000670
110010247	10000668	10000671
10000662	110010266	110017099
10000666	110017107	10000659
110010242	10000660	110010239
110017103	110010267	110010272
110017102	110010262	110010251
110017104	110010268	110017110
110010248	110017100	110010273
10000667	110017108	110010274
110017105	10000669	
10000661	110010250	

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3.3.5 Mpact

N = 520 primary cases were used for this analysis. Distribution of utilization: 10 surgeons used this implant at fewer than 10 sites in primary THA cases.

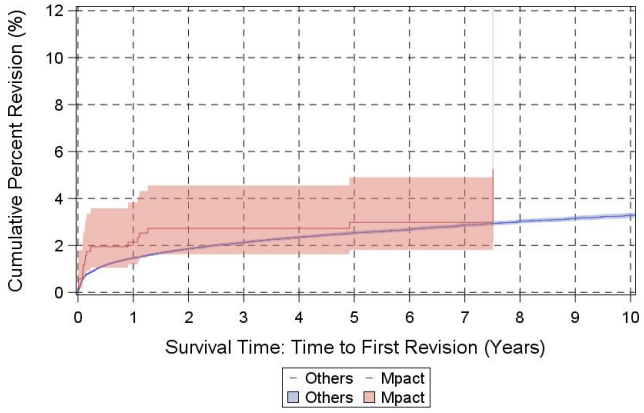


Figure 328. Cumulative Percent Revision Curve for the Mpact Cup, Compared to All Other Cups in Primary THA Cases

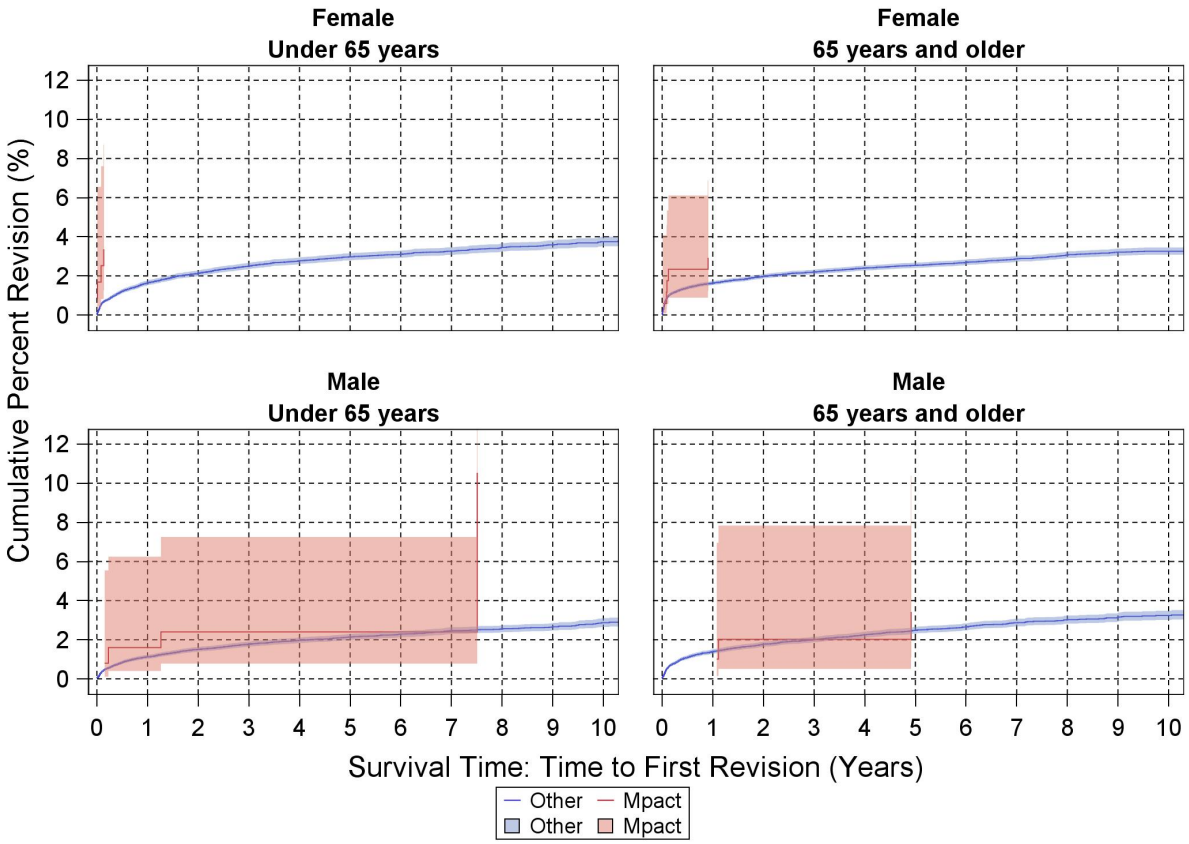


Figure 329. Cumulative Percent Revision Curve for the Mpact Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 946. Cumulative Percent Revision and Number at Risk for the Mpact Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	514	0.00 (0.00,0.00)	119	0.00 (0.00,0.00)	171	0.00 (0.00,0.00)	125	0.00 (0.00,0.00)	99	0.00 (0.00,0.00)
1	503	2.14 (1.19,3.83)	115	3.36 (1.28,8.71)	166	2.92 (1.23,6.88)	123	1.60 (0.40,6.25)	99	0.00 (0.00,0.00)
2	500	2.72 (1.62,4.56)	115	3.36 (1.28,8.71)	166	2.92 (1.23,6.88)	122	2.40 (0.78,7.26)	97	2.02 (0.51,7.84)
3	486	2.72 (1.62,4.56)	113	3.36 (1.28,8.71)	161	2.92 (1.23,6.88)	118	2.40 (0.78,7.26)	94	2.02 (0.51,7.84)
4	450	2.72 (1.62,4.56)	104	3.36 (1.28,8.71)	153	2.92 (1.23,6.88)	106	2.40 (0.78,7.26)	87	2.02 (0.51,7.84)
5	367	2.98 (1.80,4.90)	85	3.36 (1.28,8.71)	127	2.92 (1.23,6.88)	87	2.40 (0.78,7.26)	68	3.42 (1.10,10.39)
6	225	2.98 (1.80,4.90)	47	3.36 (1.28,8.71)	80	2.92 (1.23,6.88)	60	2.40 (0.78,7.26)	38	3.42 (1.10,10.39)
7	62	2.98 (1.80,4.90)	12	3.36 (1.28,8.71)	22	2.92 (1.23,6.88)	19	2.40 (0.78,7.26)	*	3.42 (1.10,10.39)
8	*	5.24 (2.16,12.44)	0	N/A	*	2.92 (1.23,6.88)	*	10.53 (2.33,40.89)	*	3.42 (1.10,10.39)
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 947. Reasons for First Revision Following Primary THA for Mpact Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	8	50.0
2	Aseptic Loosening	3	18.8
3	Joint Infection	3	18.8
4	Dislocation/Instability	1	6.2
5	Implant Failure	1	6.2

Table 948. Reasons for First Revision in the First 90 Days Following Primary THA for Mpact Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	6	60.0
2	Joint Infection	2	20.0
3	Dislocation/Instability	1	10.0
4	Implant Failure	1	10.0

Table 949. Reasons for First Revision Between 91 and 365 days Following Primary THA for Mpact Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	1	100.0

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Table 950. Descriptive Statistics of Cases Receiving the Mpact Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	293	56.35	
Age (years)	520	65.21 (10.24)	65.00 (13.00)
Height (cm)	520	169.53 (10.05)	170.18 (15.20)
Weight (kg)	520	86.58 (18.24)	85.40 (25.10)
BMI(kg/m^2)	520	30.01 (5.17)	29.36 (7.20)
Smoker - Never (%)	254	48.85	
Smoker - Previous (%)	199	38.27	
Smoker - Current (%)	53	10.19	
Smoker - Unknown (%)	14	2.69	

Table 951. Distribution of Approach Used for Mpact Cup in Primary THA Cases

Approach	N	Percent
Anterior	512	98.5
Anterolateral	8	1.5
Posterior	0	0.0
Transtrochanteric	0	0.0
Missing/unknown/other	0	0.0

Table 952. Distribution of Head Size for Mpact Cup in Primary THA Cases

Size (mm)	N	Percent
32	32	20.0
36	117	73.1
40	10	6.2
Missing/unknown/other	1	0.6

Table 953. Distribution of Bearing Surface for Mpact Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	63	12.1
Ceramic-on-plastic	96	18.5
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	356	68.5
Missing/unknown/other	5	1.0

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Table 954. Distribution of Polyethylene Used for Mpact Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	516	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 955. Volume of Cases by Surgeon and Site for the Mpact Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	52 (65)	10 (109)
Cases per site	57 (90)	5 (75)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

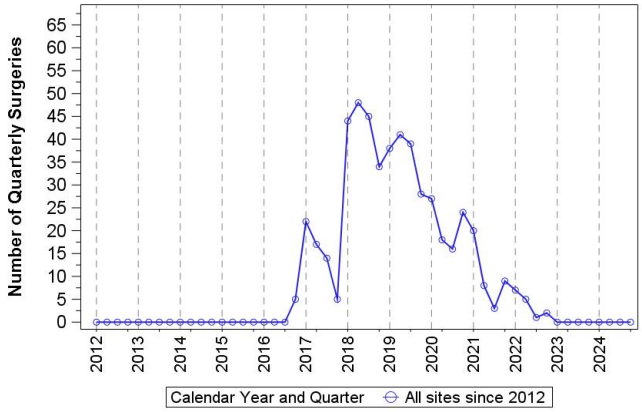


Figure 330. Utilization of the Mpact Cup in Primary THA Cases

Catalog Numbers of Acetabular Cups Used in the Analysis

0132154MB	0132150DH	0132156MH
0132156MB	0132156DH	0132160MH
0132152MB	0132160MB	0132162MB
0132150MB	0132158DH	0132150MH
0132148MB	0132154MH	0132162DH
0132152DH	0132160DH	0132164DH
0132154DH	0132152MH	
0132158MB	0132148DH	

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3.3.6 Pinnacle

N = 30,776 primary cases were used for this analysis. Distribution of utilization: 167 surgeons across 60 sites used this implant in primary THA cases.

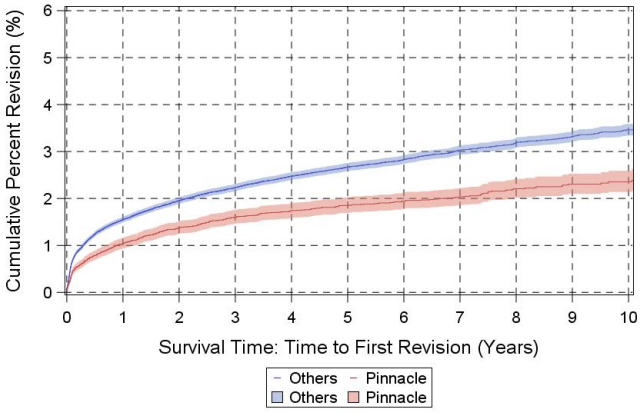


Figure 331. Cumulative Percent Revision Curve for the Pinnacle Cup, Compared to All Other Cups in Primary THA Cases

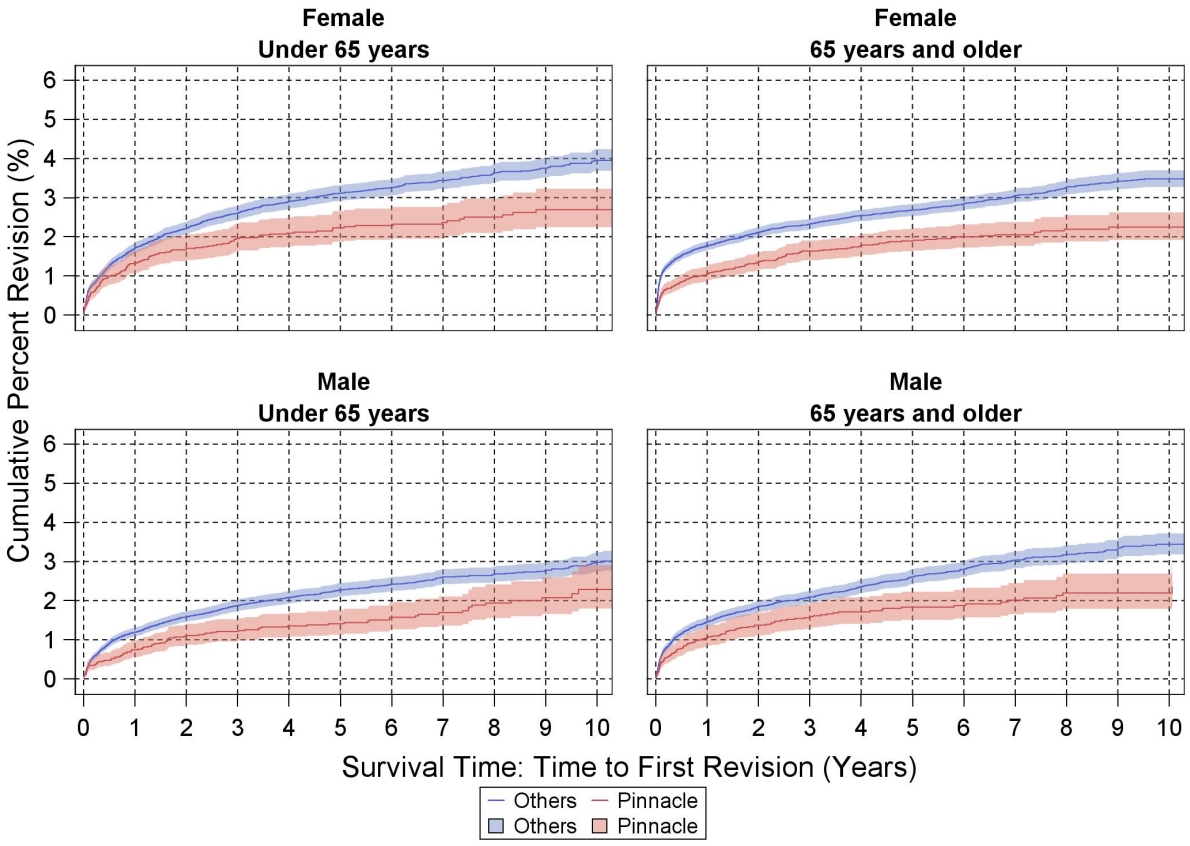


Figure 332. Cumulative Percent Revision Curve for the Pinnacle Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 956. Cumulative Percent Revision and Number at Risk for the Pinnacle Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	30,558	0.00 (0.00,0.00)	6,425	0.00 (0.00,0.00)	11,061	0.00 (0.00,0.00)	6,409	0.00 (0.00,0.00)	6,661	0.00 (0.00,0.00)
1	27,005	1.05 (0.94,1.17)	5,799	1.33 (1.07,1.65)	9,677	1.05 (0.87,1.26)	5,765	0.74 (0.56,0.99)	5,762	1.06 (0.84,1.34)
2	23,536	1.38 (1.25,1.52)	5,155	1.70 (1.41,2.06)	8,402	1.34 (1.14,1.58)	5,051	1.11 (0.87,1.41)	4,926	1.37 (1.11,1.70)
3	20,351	1.60 (1.46,1.76)	4,503	1.95 (1.63,2.34)	7,186	1.63 (1.40,1.91)	4,429	1.21 (0.96,1.53)	4,231	1.59 (1.30,1.94)
4	17,336	1.74 (1.59,1.90)	3,937	2.09 (1.75,2.50)	6,087	1.77 (1.52,2.06)	3,815	1.35 (1.08,1.69)	3,495	1.71 (1.41,2.08)
5	14,795	1.85 (1.69,2.02)	3,395	2.23 (1.87,2.65)	5,172	1.89 (1.63,2.19)	3,310	1.41 (1.13,1.76)	2,916	1.83 (1.51,2.23)
6	12,170	1.94 (1.78,2.13)	2,825	2.29 (1.92,2.72)	4,153	2.00 (1.72,2.32)	2,792	1.57 (1.26,1.96)	2,398	1.87 (1.54,2.28)
7	9,714	2.04 (1.86,2.23)	2,289	2.37 (1.99,2.81)	3,245	2.05 (1.77,2.38)	2,270	1.69 (1.36,2.11)	1,908	2.01 (1.65,2.45)
8	7,428	2.21 (2.01,2.42)	1,763	2.50 (2.10,2.98)	2,426	2.19 (1.88,2.55)	1,778	1.94 (1.55,2.41)	1,459	2.20 (1.79,2.69)
9	5,205	2.30 (2.10,2.53)	1,277	2.69 (2.25,3.23)	1,658	2.25 (1.92,2.62)	1,232	2.07 (1.66,2.60)	1,037	2.20 (1.79,2.69)
10	3,008	2.35 (2.14,2.59)	739	2.69 (2.25,3.23)	940	2.25 (1.92,2.62)	711	2.29 (1.80,2.91)	617	2.20 (1.79,2.69)

Table 957. Reasons for First Revision Following Primary THA for Pinnacle Cup Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	134	25.6
2	Dislocation/Instability	132	25.2
3	Aseptic Loosening	88	16.8
4	Peri-prosthetic fracture - Femur	74	14.1
5	Pain	30	5.7
6	Implant Failure	22	4.2
7	Malalignment	18	3.4
8	Metal Reaction/Metallosis	14	2.7
9	Peri-prosthetic fracture - Acetabulum	7	1.3
10	Poly liner wear	4	0.8
	Unknown/missing/other	1	0.2

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Table 958. Reasons for First Revision in the First 90 Days Following Primary THA for Pinnacle Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	60	34.5
2	Dislocation/Instability	43	24.7
3	Joint Infection	38	21.8
4	Aseptic Loosening	15	8.6
5	Peri-prosthetic fracture - Acetabulum	5	2.9
6	Malalignment	5	2.9
7	Implant Failure	4	2.3
8	Pain	3	1.7
9	Metal Reaction/Metallosis	1	0.6

Table 959. Reasons for First Revision Between 91 and 365 days Following Primary THA for Pinnacle Cup Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	45	37.2
2	Dislocation/Instability	38	31.4
3	Aseptic Loosening	18	14.9
4	Pain	9	7.4
5	Implant Failure	3	2.5
6	Malalignment	3	2.5
7	Peri-prosthetic fracture - Acetabulum	2	1.6
8	Peri-prosthetic fracture - Femur	2	1.6
9	Metal Reaction/Metallosis	1	0.8

Table 960. Descriptive Statistics of Cases Receiving the Pinnacle Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	17,606	57.21	
Age (years)	30,776	66.16 (10.65)	66.00 (15.00)
Height (cm)	30,489	169.51 (10.45)	168.90 (15.24)
Weight (kg)	30,491	88.74 (21.30)	86.80 (28.80)
BMI(kg/m^2)	30,489	30.75 (6.38)	29.98 (8.37)
Smoker - Never (%)	14,867	48.31	
Smoker - Previous (%)	11,659	37.88	
Smoker - Current (%)	4,192	13.62	
Smoker - Unknown (%)	58	0.19	

Table 961. Distribution of Approach Used for Pinnacle Cup in Primary THA Cases

Approach	N	Percent
Anterior	11,722	38.1
Anterolateral	7763	25.2
Posterior	10,883	35.4
Transtrochanteric	75	0.2
Missing/unknown/other	333	1.1

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Table 962. Distribution of Head Size for Pinnacle Cup in Primary THA Cases

Size (mm)	N	Percent
22	11	0.0
28	273	0.9
32	7,472	24.7
36	19,650	64.9
40	2,710	8.9
44	46	0.1
Missing/unknown/other	130	0.4

Table 963. Distribution of Bearing Surface for Pinnacle Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	8,599	27.9
Ceramic-on-plastic	21,438	69.7
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	140	0.5
Missing/unknown/other	599	1.9

Table 964. Distribution of Polyethylene Used for Pinnacle Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	140	0.5
XLPE	30,162	99.5
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 965. Volume of Cases by Surgeon and Site for the Pinnacle Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	184 (376)	15 (180)
Cases per site	512 (875)	135 (534)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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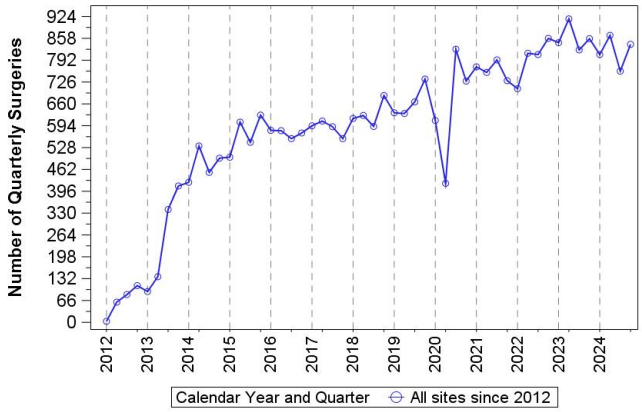


Figure 333. Utilization of the Pinnacle Cup in Primary THA Cases

Catalog Numbers of Acetabular Cups Used in the Analysis

121732052	121703054	121701060
121732054	121701056	121722064
121732056	121701050	121720044
121722052	121731050	121730066
121732050	121732064	121703062
121732058	121730058	121701062
121732048	121703056	121730068
121722054	121701048	121730038
121722050	121730050	121730040
121732060	121731048	121730042
121722056	121731058	121703064
121722048	121722062	121722066
121722058	121730048	121731046
121732062	121703048	121731062
121730052	121703050	121701064
121731052	121701058	121716068
121701052	121730060	121716070
121703052	121703058	121716074
121731054	121720046	121717060
121722060	121731060	121717062
121730054	121730044	121720038
121730056	121730062	121720052
121701054	121703060	121720054
121730046	121730064	
121731056	121732066	

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3.3.7 PolarCup

N = 638 primary cases were used for this analysis. Distribution of utilization: 13 surgeons used this implant at fewer than 10 sites in primary THA cases.

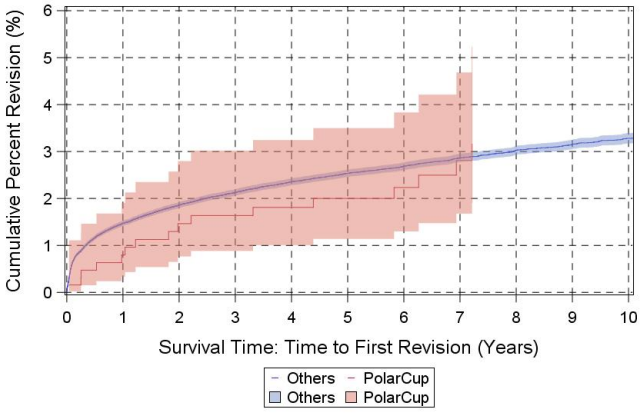


Figure 334. Cumulative Percent Revision Curve for the PolarCup Cup, Compared to All Other Cups in Primary THA Cases

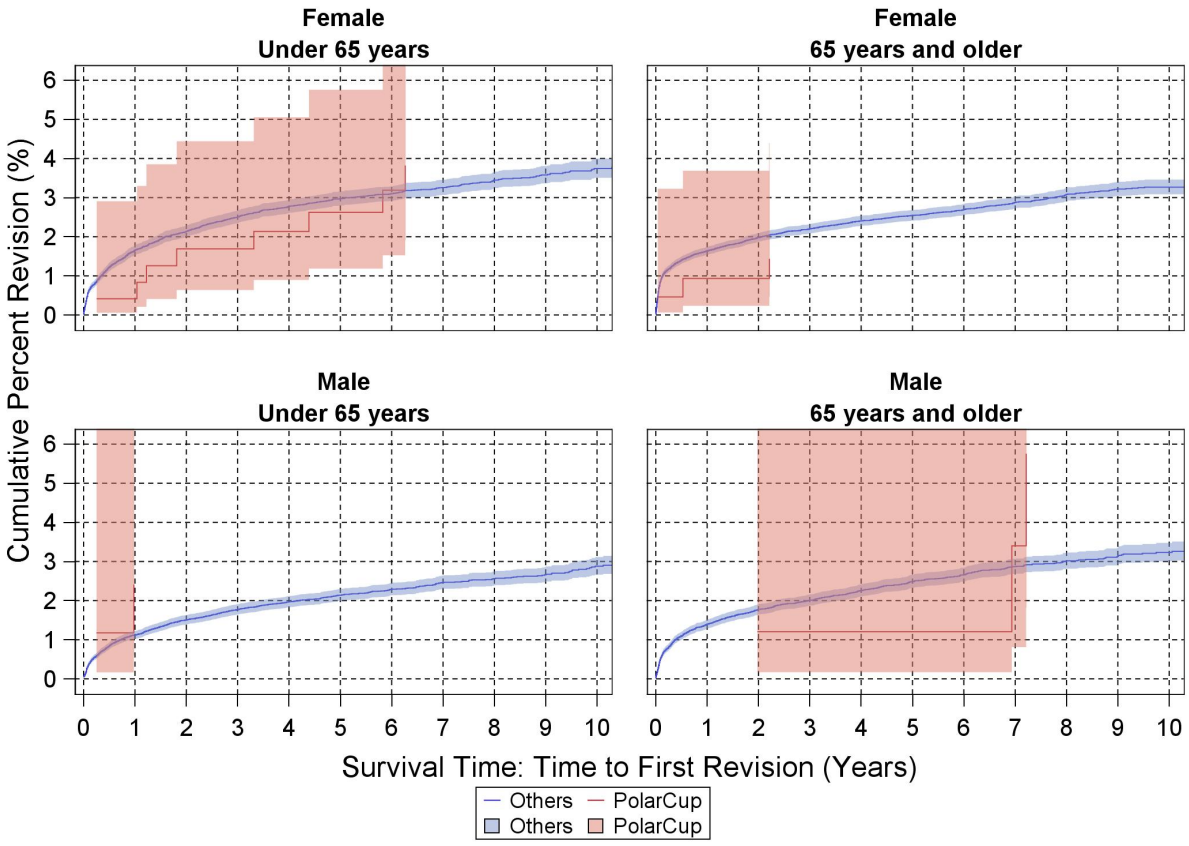


Figure 335. Cumulative Percent Revision Curve for the PolarCup Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 966. Cumulative Percent Revision and Number at Risk for the PolarCup Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	637	0.00 (0.00,0.00)	241	0.00 (0.00,0.00)	217	0.00 (0.00,0.00)	87	0.00 (0.00,0.00)	91	0.00 (0.00,0.00)
1	605	0.80 (0.33,1.91)	237	0.41 (0.06,2.91)	203	0.93 (0.23,3.69)	79	2.41 (0.61,9.31)	86	0.00 (0.00,0.00)
2	581	1.47 (0.76,2.80)	228	1.69 (0.64,4.44)	198	0.93 (0.23,3.69)	73	2.41 (0.61,9.31)	82	1.20 (0.17,8.25)
3	566	1.64 (0.88,3.02)	222	1.69 (0.64,4.44)	191	1.44 (0.47,4.39)	71	2.41 (0.61,9.31)	82	1.20 (0.17,8.25)
4	548	1.81 (1.01,3.25)	212	2.13 (0.89,5.05)	187	1.44 (0.47,4.39)	69	2.41 (0.61,9.31)	80	1.20 (0.17,8.25)
5	483	2.00 (1.14,3.50)	193	2.62 (1.19,5.76)	150	1.44 (0.47,4.39)	66	2.41 (0.61,9.31)	74	1.20 (0.17,8.25)
6	400	2.23 (1.30,3.83)	166	3.19 (1.53,6.61)	120	1.44 (0.47,4.39)	57	2.41 (0.61,9.31)	57	1.20 (0.17,8.25)
7	305	2.81 (1.68,4.69)	133	3.82 (1.91,7.56)	90	1.44 (0.47,4.39)	39	2.41 (0.61,9.31)	43	3.40 (0.81,13.67)
8	191	3.16 (1.91,5.23)	86	3.82 (1.91,7.56)	56	1.44 (0.47,4.39)	22	2.41 (0.61,9.31)	27	5.76 (1.82,17.46)
9	77	3.16 (1.91,5.23)	38	3.82 (1.91,7.56)	17	1.44 (0.47,4.39)	12	2.41 (0.61,9.31)	*	5.76 (1.82,17.46)
10	*	3.16 (1.91,5.23)	0	N/A	0	N/A	*	2.41 (0.61,9.31)	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 967. Reasons for First Revision Following Primary THA for PolarCup Cup Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	9	56.2
2	Malalignment	3	18.8
3	Joint Infection	1	6.2
4	Peri-prosthetic fracture - Acetabulum	1	6.2
5	Peri-prosthetic fracture - Femur	1	6.2
6	Metal Reaction/Metallosis	1	6.2

Table 968. Reasons for First Revision in the First 90 Days Following Primary THA for PolarCup Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Acetabulum	1	100.0

Table 969. Reasons for First Revision Between 91 and 365 days Following Primary THA for PolarCup Cup Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	3	75.0
2	Joint Infection	1	25.0

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Table 970. Descriptive Statistics of Cases Receiving the PolarCup Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	459	71.94	
Age (years)	638	63.07 (11.99)	64.00 (15.00)
Height (cm)	638	167.23 (9.16)	167.60 (12.98)
Weight (kg)	638	88.19 (24.39)	84.53 (29.50)
BMI(kg/m^2)	638	31.46 (8.07)	30.09 (9.12)
Smoker - Never (%)	324	50.78	
Smoker - Previous (%)	245	38.4	
Smoker - Current (%)	69	10.82	
Smoker - Unknown (%)	0	0.0	

Table 971. Distribution of Approach Used for PolarCup Cup in Primary THA Cases

Approach	N	Percent
Anterior	6	0.9
Anterolateral	512	80.2
Posterior	49	7.7
Transtrochanteric	71	11.1
Missing/unknown/other	0	0.0

Table 972. Distribution of Bearing Surface for PolarCup Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1	0.2
Ceramic-on-plastic	0	0.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	630	98.8
Missing/unknown/other	7	1.1

Table 973. Distribution of Polyethylene Used for PolarCup Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	631	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 974. Volume of Cases by Surgeon and Site for the PolarCup Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	49 (149)	1 (2)
Cases per site	79 (190)	1 (42)

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The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

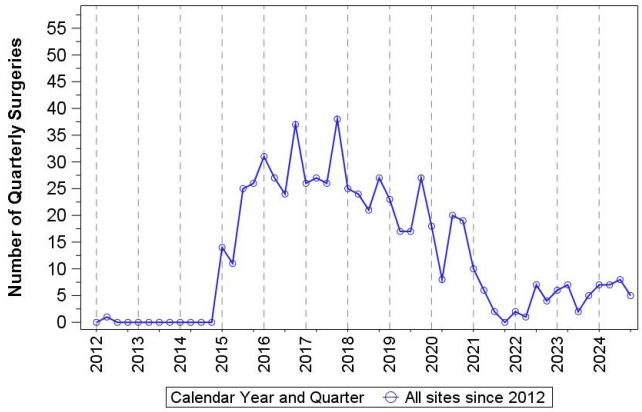


Figure 336. Utilization of the PolarCup Cup in Primary THA Cases

Catalog Numbers of Acetabular Cups Used in the Analysis

75100409	75100414	75100455
75100410	75100407	75100457
75100411	75100453	75100458
75100408	75100451	
75100412	75100406	
75100413	75100415	

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3.3.8 Procotyl Prime

N = 912 primary cases were used for this analysis. Fewer than ten surgeons across 11 sites used this implant in primary THA cases.

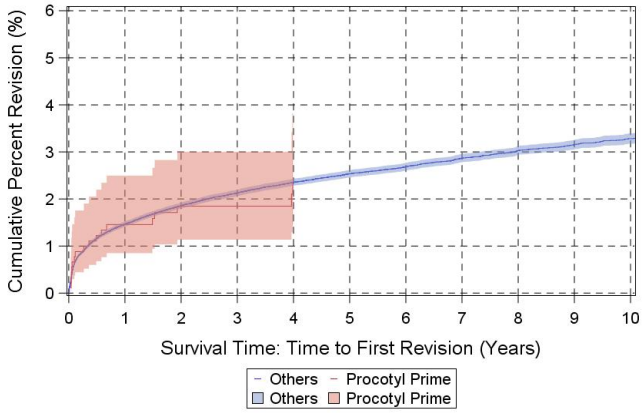


Figure 337. Cumulative Percent Revision Curve for the Procotyl Prime Cup, Compared to All Other Cups in Primary THA Cases

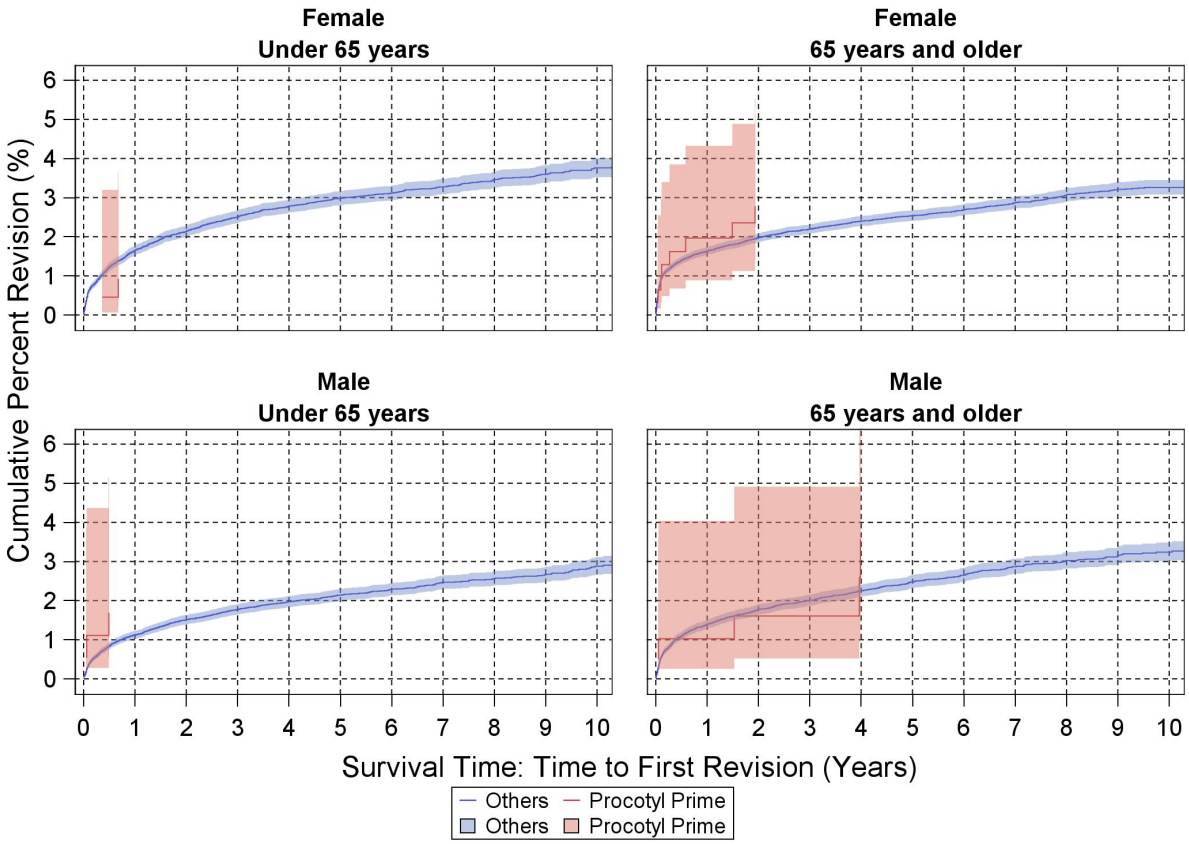


Figure 338. Cumulative Percent Revision Curve for the Procotyl Prime Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 975. Cumulative Percent Revision and Number at Risk for the Procotyl Prime Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	909	0.00 (0.00,0.00)	222	0.00 (0.00,0.00)	311	0.00 (0.00,0.00)	180	0.00 (0.00,0.00)	196	0.00 (0.00,0.00)
1	817	1.46 (0.85,2.50)	206	0.93 (0.23,3.65)	271	1.97 (0.89,4.32)	160	1.69 (0.55,5.15)	180	1.03 (0.26,4.04)
2	716	1.85 (1.14,3.00)	185	0.93 (0.23,3.65)	226	2.78 (1.40,5.51)	144	1.69 (0.55,5.15)	161	1.61 (0.52,4.91)
3	584	1.85 (1.14,3.00)	141	0.93 (0.23,3.65)	183	2.78 (1.40,5.51)	119	1.69 (0.55,5.15)	141	1.61 (0.52,4.91)
4	377	2.36 (1.45,3.82)	94	0.93 (0.23,3.65)	121	2.78 (1.40,5.51)	64	1.69 (0.55,5.15)	98	3.58 (1.44,8.73)
5	271	2.36 (1.45,3.82)	64	0.93 (0.23,3.65)	96	2.78 (1.40,5.51)	45	1.69 (0.55,5.15)	66	3.58 (1.44,8.73)
6	193	2.36 (1.45,3.82)	49	0.93 (0.23,3.65)	65	2.78 (1.40,5.51)	32	1.69 (0.55,5.15)	47	3.58 (1.44,8.73)
7	53	2.36 (1.45,3.82)	*	0.93 (0.23,3.65)	16	2.78 (1.40,5.51)	*	1.69 (0.55,5.15)	19	3.58 (1.44,8.73)
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 976. Reasons for First Revision Following Primary THA for Procotyl Prime Cup Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	8	44.4
2	Dislocation/Instability	4	22.2
3	Joint Infection	3	16.7
4	Peri-prosthetic fracture - Femur	3	16.7

Table 977. Reasons for First Revision in the First 90 Days Following Primary THA for Procotyl Prime Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	3	37.5
2	Dislocation/Instability	2	25.0
3	Joint Infection	2	25.0
4	Aseptic Loosening	1	12.5

Table 978. Reasons for First Revision Between 91 and 365 days Following Primary THA for Procotyl Prime Cup Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	4	80.0
2	Joint Infection	1	20.0

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Table 979. Descriptive Statistics of Cases Receiving the Procotyl Prime Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	536	58.77	
Age (years)	912	65.21 (10.61)	66.00 (13.50)
Height (cm)	912	169.23 (10.04)	167.64 (15.24)
Weight (kg)	912	89.65 (21.04)	88.09 (26.91)
BMI(kg/m^2)	912	31.24 (6.66)	30.17 (8.85)
Smoker - Never (%)	426	46.71	
Smoker - Previous (%)	358	39.25	
Smoker - Current (%)	124	13.6	
Smoker - Unknown (%)	4	0.44	

Table 980. Distribution of Approach Used for Procotyl Prime Cup in Primary THA Cases

Approach	N	Percent
Anterior	790	86.6
Anterolateral	47	5.2
Posterior	73	8.0
Transtrochanteric	0	0.0
Missing/unknown/other	2	0.2

Table 981. Distribution of Head Size for Procotyl Prime Cup in Primary THA Cases

Size (mm)	N	Percent
32	34	3.8
36	627	70.4
40	160	18.0
Missing/unknown/other	70	7.9

Table 982. Distribution of Bearing Surface for Procotyl Prime Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	13	1.4
Ceramic-on-plastic	808	88.6
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	91	10.0

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Table 983. Distribution of Polyethylene Used for Procotyl Prime Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	367	41.2
Antioxidant XLPE	524	58.8
Missing/unknown/other	0	0.0

Table 984. Volume of Cases by Surgeon and Site for the Procotyl Prime Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	114 (191)	55 (100)
Cases per site	82 (91)	51 (82)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

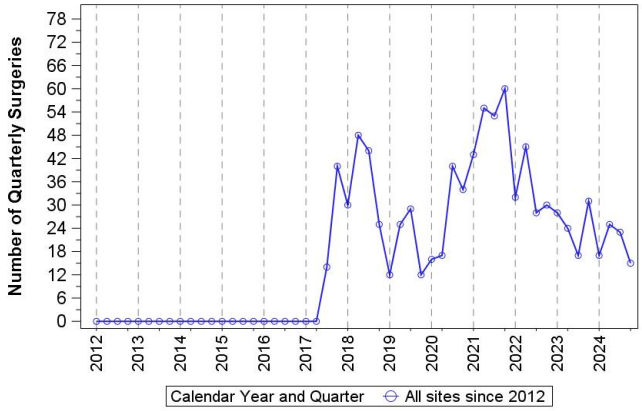


Figure 339. Utilization of the Procotyl Prime Cup in Primary THA Cases

Catalog Numbers of Acetabular Cups Used in the Analysis

P3SBQC50
P3SBQC52
P3SBQD54
P3SBQE58
P3SBQD56
P3SBQB48
P3SBQE60
P3SBQF62
P3SBQB46
P3SBQF64
P3SBQG66

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3.3.9 Reflection

N = 552 primary cases were used for this analysis. Distribution of utilization: 10 surgeons used this implant at fewer than 10 sites in primary THA cases.

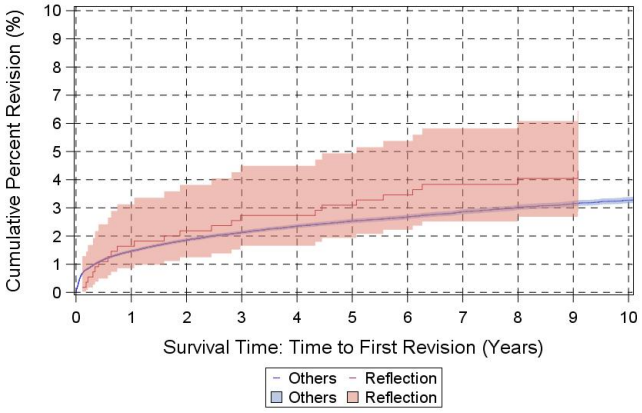


Figure 340. Cumulative Percent Revision Curve for the Reflection Cup, Compared to All Other Cups in Primary THA Cases

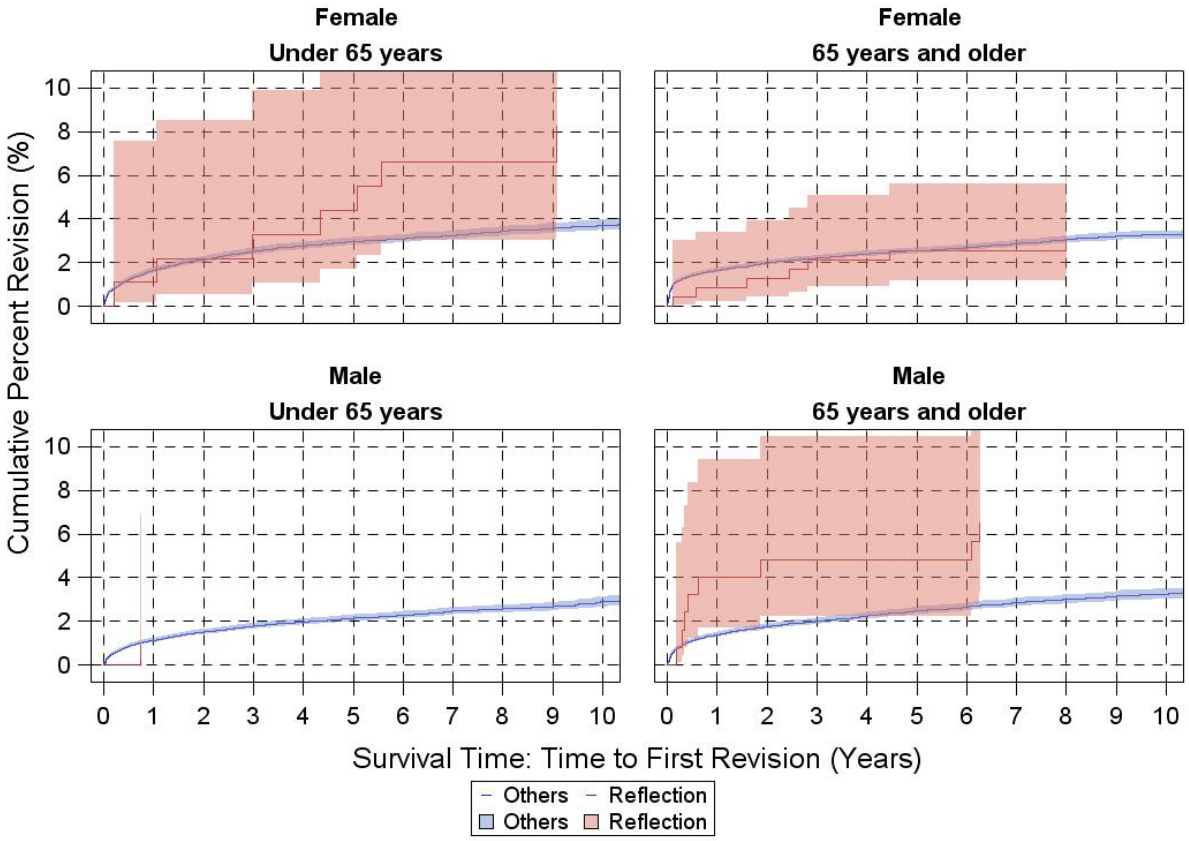


Figure 341. Cumulative Percent Revision Curve for the Reflection Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 985. Cumulative Percent Revision and Number at Risk for the Reflection Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	549	0.00 (0.00,0.00)	91	0.00 (0.00,0.00)	234	0.00 (0.00,0.00)	100	0.00 (0.00,0.00)	124	0.00 (0.00,0.00)
1	540	1.64 (0.86,3.13)	90	1.10 (0.16,7.54)	232	0.85 (0.21,3.37)	99	1.00 (0.14,6.89)	119	4.03 (1.70,9.42)
2	537	2.19 (1.25,3.82)	89	2.20 (0.55,8.50)	231	1.28 (0.42,3.92)	99	1.00 (0.14,6.89)	118	4.84 (2.20,10.45)
3	534	2.73 (1.66,4.49)	88	3.30 (1.08,9.87)	229	2.14 (0.89,5.06)	99	1.00 (0.14,6.89)	118	4.84 (2.20,10.45)
4	534	2.73 (1.66,4.49)	88	3.30 (1.08,9.87)	229	2.14 (0.89,5.06)	99	1.00 (0.14,6.89)	118	4.84 (2.20,10.45)
5	531	3.10 (1.94,4.93)	87	4.40 (1.67,11.29)	228	2.56 (1.16,5.62)	98	1.00 (0.14,6.89)	118	4.84 (2.20,10.45)
6	522	3.46 (2.22,5.37)	84	6.61 (3.02,14.12)	225	2.56 (1.16,5.62)	98	1.00 (0.14,6.89)	115	4.84 (2.20,10.45)
7	499	3.83 (2.52,5.82)	80	6.61 (3.02,14.12)	216	2.56 (1.16,5.62)	94	1.00 (0.14,6.89)	109	6.51 (3.31,12.59)
8	452	4.05 (2.68,6.08)	76	6.61 (3.02,14.12)	191	3.07 (1.47,6.35)	86	1.00 (0.14,6.89)	99	6.51 (3.31,12.59)
9	353	4.05 (2.68,6.08)	59	6.61 (3.02,14.12)	154	3.07 (1.47,6.35)	59	1.00 (0.14,6.89)	81	6.51 (3.31,12.59)
10	223	4.32 (2.89,6.45)	34	8.24 (3.97,16.70)	102	3.07 (1.47,6.35)	31	1.00 (0.14,6.89)	56	6.51 (3.31,12.59)

Table 986. Reasons for First Revision Following Primary THA for Reflection Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	7	33.3
2	Aseptic Loosening	4	19.0
3	Joint Infection	3	14.3
4	Metal Reaction/Metallosis	2	9.5
5	Pain	2	9.5
6	Poly liner wear	1	4.8
7	Implant Failure	1	4.8
8	Peri-prosthetic fracture - Femur	1	4.8

Table 987. Reasons for First Revision in the First 90 Days Following Primary THA for Reflection Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	3	100.0

Table 988. Reasons for First Revision Between 91 and 365 days Following Primary THA for Reflection Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	3	60.0
2	Joint Infection	1	20.0
3	Pain	1	20.0

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Table 989. Descriptive Statistics of Cases Receiving the Reflection Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	327	59.24	
Age (years)	552	68.61 (10.86)	69.00 (17.00)
Height (cm)	552	168.57 (10.43)	167.64 (16.46)
Weight (kg)	552	86.86 (21.49)	84.60 (27.79)
BMI(kg/m^2)	552	30.42 (6.42)	29.87 (7.78)
Smoker - Never (%)	272	49.28	
Smoker - Previous (%)	213	38.59	
Smoker - Current (%)	65	11.78	
Smoker - Unknown (%)	2	0.36	

Table 990. Distribution of Approach Used for Reflection Cup in Primary THA Cases

Approach	N	Percent
Anterior	12	2.2
Anterolateral	11	2.0
Posterior	526	95.3
Transtrochanteric	1	0.2
Missing/unknown/other	2	0.4

Table 991. Distribution of Head Size for Reflection Cup in Primary THA Cases

Size (mm)	N	Percent
28	18	3.3
32	358	66.4
36	156	28.9
Missing/unknown/other	7	1.3

Table 992. Distribution of Bearing Surface for Reflection Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	333	60.3
Ceramic-on-plastic	206	37.3
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	13	2.4

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Table 993. Distribution of Polyethylene Used for Reflection Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	48	8.8
XLPE	348	63.6
Antioxidant XLPE	0	0.0
Missing/unknown/other	151	27.6

Table 994. Volume of Cases by Surgeon and Site for the Reflection Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	55 (68)	18 (105)
Cases per site	78 (132)	7 (188)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

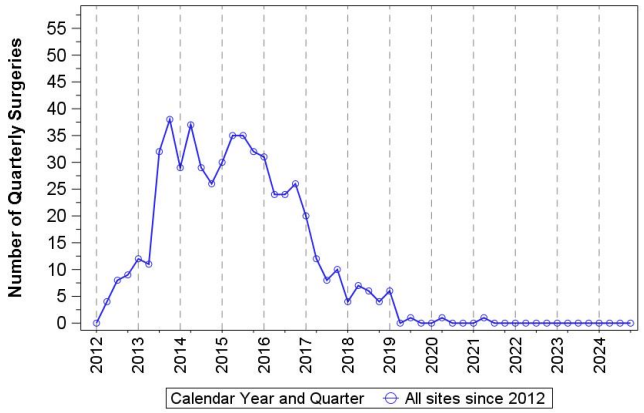


Figure 342. Utilization of the Reflection Cup in Primary THA Cases

Catalog Numbers of Acetabular Cups Used in the Analysis

71336450	71336458	71335056
71334154	71334160	71336462
71334152	71334162	71358007
71336452	71336446	71358026
71336454	71336460	71358068
71334150	71336448	743066
71334156	71334164	
71336456	71358065	
71334158	71358066	

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3.3.10 Reflection 3

N = 13,140 primary cases were used for this analysis. Distribution of utilization: 98 surgeons across 53 sites used this implant in primary THA cases.

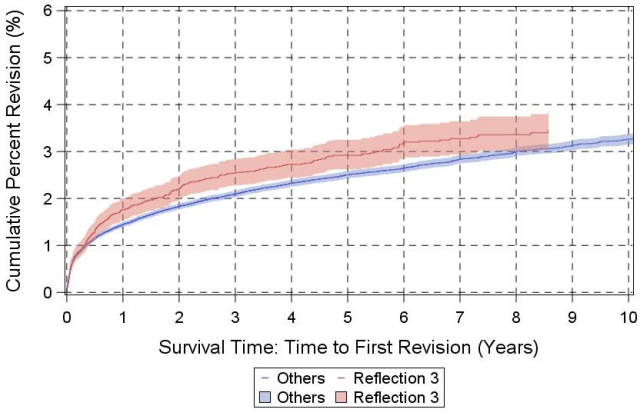


Figure 343. Cumulative Percent Revision Curve for the Reflection 3 Cup, Compared to All Other Cups in Primary THA Cases

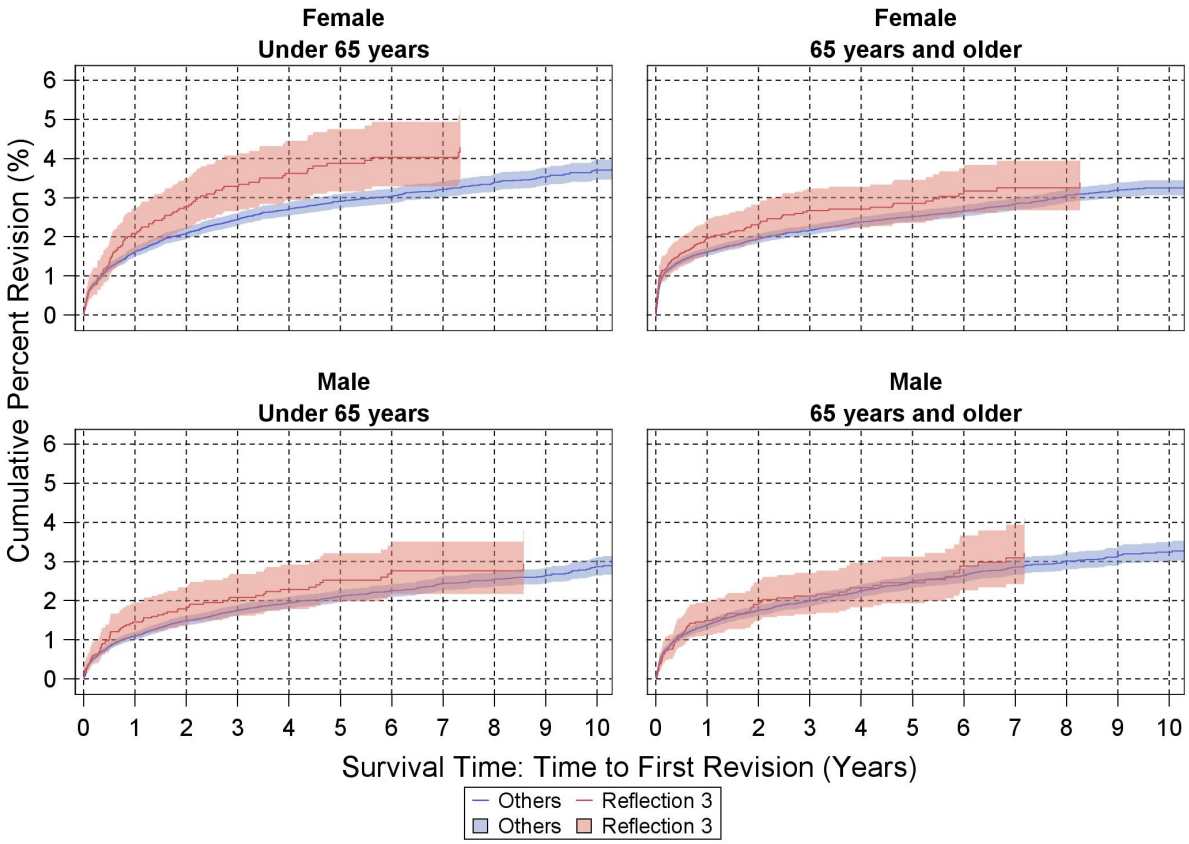


Figure 344. Cumulative Percent Revision Curve for the Reflection 3 Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 995. Cumulative Percent Revision and Number at Risk for the Reflection 3 Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	13,045	0.00 (0.00,0.00)	2,653	0.00 (0.00,0.00)	4,138	0.00 (0.00,0.00)	3,044	0.00 (0.00,0.00)	3,198	0.00 (0.00,0.00)
1	11,624	1.76 (1.54,2.00)	2,416	2.09 (1.60,2.72)	3,636	1.96 (1.57,2.44)	2,761	1.45 (1.08,1.95)	2,800	1.49 (1.12,1.98)
2	10,269	2.20 (1.95,2.47)	2,157	2.77 (2.19,3.49)	3,168	2.30 (1.88,2.82)	2,479	1.79 (1.37,2.34)	2,459	1.91 (1.47,2.47)
3	8,644	2.54 (2.27,2.84)	1,883	3.29 (2.65,4.08)	2,617	2.67 (2.20,3.23)	2,128	2.08 (1.62,2.68)	2,014	2.12 (1.65,2.71)
4	7,281	2.73 (2.45,3.04)	1,619	3.62 (2.94,4.45)	2,192	2.71 (2.23,3.28)	1,804	2.28 (1.78,2.92)	1,666	2.33 (1.83,2.97)
5	6,102	2.92 (2.62,3.25)	1,384	3.88 (3.16,4.75)	1,823	2.85 (2.36,3.45)	1,526	2.52 (1.98,3.21)	1,369	2.46 (1.93,3.12)
6	4,780	3.20 (2.87,3.56)	1,101	4.03 (3.29,4.94)	1,412	3.17 (2.61,3.84)	1,199	2.76 (2.17,3.51)	1,068	2.88 (2.26,3.66)
7	3,606	3.27 (2.94,3.65)	812	4.03 (3.29,4.94)	1,071	3.25 (2.68,3.94)	906	2.76 (2.17,3.51)	817	3.09 (2.42,3.94)
8	2,651	3.36 (3.01,3.75)	611	4.29 (3.48,5.27)	800	3.25 (2.68,3.94)	666	2.76 (2.17,3.51)	574	3.22 (2.51,4.11)
9	1,551	3.45 (3.08,3.85)	377	4.29 (3.48,5.27)	437	3.38 (2.77,4.14)	396	2.94 (2.28,3.80)	341	3.22 (2.51,4.11)
10	837	3.45 (3.08,3.85)	215	4.29 (3.48,5.27)	234	3.38 (2.77,4.14)	230	2.94 (2.28,3.80)	158	3.22 (2.51,4.11)

Table 996. Reasons for First Revision Following Primary THA for Reflection 3 Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	87	25.4
2	Aseptic Loosening	67	19.6
3	Joint Infection	66	19.3
4	Peri-prosthetic fracture - Femur	66	19.3
5	Malalignment	17	5.0
6	Implant Failure	15	4.4
7	Pain	15	4.4
8	Peri-prosthetic fracture - Acetabulum	5	1.5
9	Poly liner wear	2	0.6
10	Metal Reaction/Metallosis	2	0.6

Table 997. Reasons for First Revision in the First 90 Days Following Primary THA for Reflection 3 Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	50	44.2
2	Dislocation/Instability	25	22.1
3	Joint Infection	15	13.3
4	Aseptic Loosening	7	6.2
5	Implant Failure	6	5.3
6	Malalignment	6	5.3
7	Peri-prosthetic fracture - Acetabulum	4	3.5

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Table 998. Reasons for First Revision Between 91 and 365 days Following Primary THA for Reflection 3 Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	33	33.7
2	Joint Infection	26	26.5
3	Aseptic Loosening	21	21.4
4	Pain	8	8.2
5	Peri-prosthetic fracture - Femur	5	5.1
6	Malalignment	3	3.1
7	Implant Failure	2	2.0

Table 999. Descriptive Statistics of Cases Receiving the Reflection 3 Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	6,834	52.01	
Age (years)	13,140	65.72 (10.71)	66.00 (14.00)
Height (cm)	13,139	170.10 (10.45)	170.18 (15.24)
Weight (kg)	13,139	90.42 (21.76)	88.45 (28.96)
BMI(kg/m^2)	13,139	31.13 (6.46)	30.38 (8.57)
Smoker - Never (%)	6,239	47.48	
Smoker - Previous (%)	4,959	37.74	
Smoker - Current (%)	1,909	14.53	
Smoker - Unknown (%)	33	0.25	

Table 1000. Distribution of Approach Used for Reflection 3 Cup in Primary THA Cases

Approach	N	Percent
Anterior	7,202	54.8
Anterolateral	3337	25.4
Posterior	2,563	19.5
Transtrochanteric	20	0.1
Missing/unknown/other	18	0.1

Table 1001. Distribution of Head Size for Reflection 3 Cup in Primary THA Cases

Size (mm)	N	Percent
22	11	0.1
28	96	0.8
32	2,619	21.5
36	8,634	71.0
40	727	6.0
44	20	0.2
Missing/unknown/other	56	0.5

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Table 1002. Distribution of Bearing Surface for Reflection 3 Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	2,286	17.4
Ceramic-on-plastic	9,822	74.8
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	888	6.8
Missing/unknown/other	144	1.1

Table 1003. Distribution of Polyethylene Used for Reflection 3 Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	10	0.1
XLPE	12,894	99.9
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 1004. Volume of Cases by Surgeon and Site for the Reflection 3 Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	134 (252)	30 (144)
Cases per site	247 (383)	54 (276)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

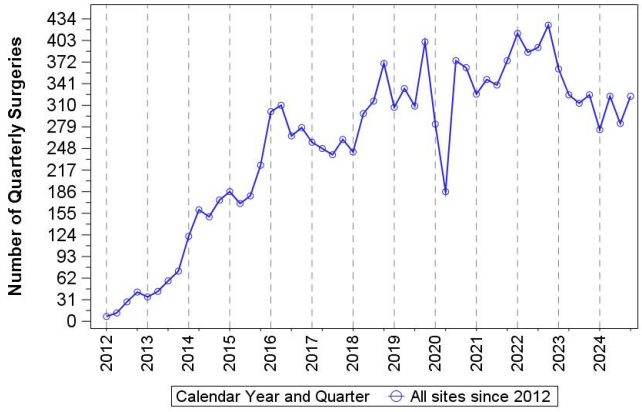


Figure 345. Utilization of the Reflection 3 Cup in Primary THA Cases

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Catalog Numbers of Acetabular Cups Used in the Analysis

71335552	71338665	71331846
71335554	71331858	71331862
71335556	71338666	71338671
71335550	71338667	71335566
71335558	71331860	71331864
71335548	71331848	71335544
71335560	71335546	71335568
71331854	71338664	71338672
71331852	71335564	71338675
71331856	71338668	
71335562	71338669	
71331850	71338663	

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3.3.11 Regenerex RingLoc+

N = 1,031 primary cases were used for this analysis. Distribution of utilization: 30 surgeons across 21 sites used this implant in primary THA cases.

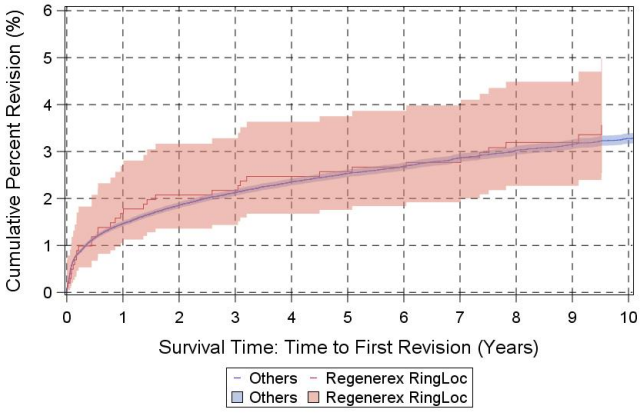


Figure 346. Cumulative Percent Revision Curve for the Regenerex RingLoc+ Cup, Compared to All Other Cups in Primary THA Cases

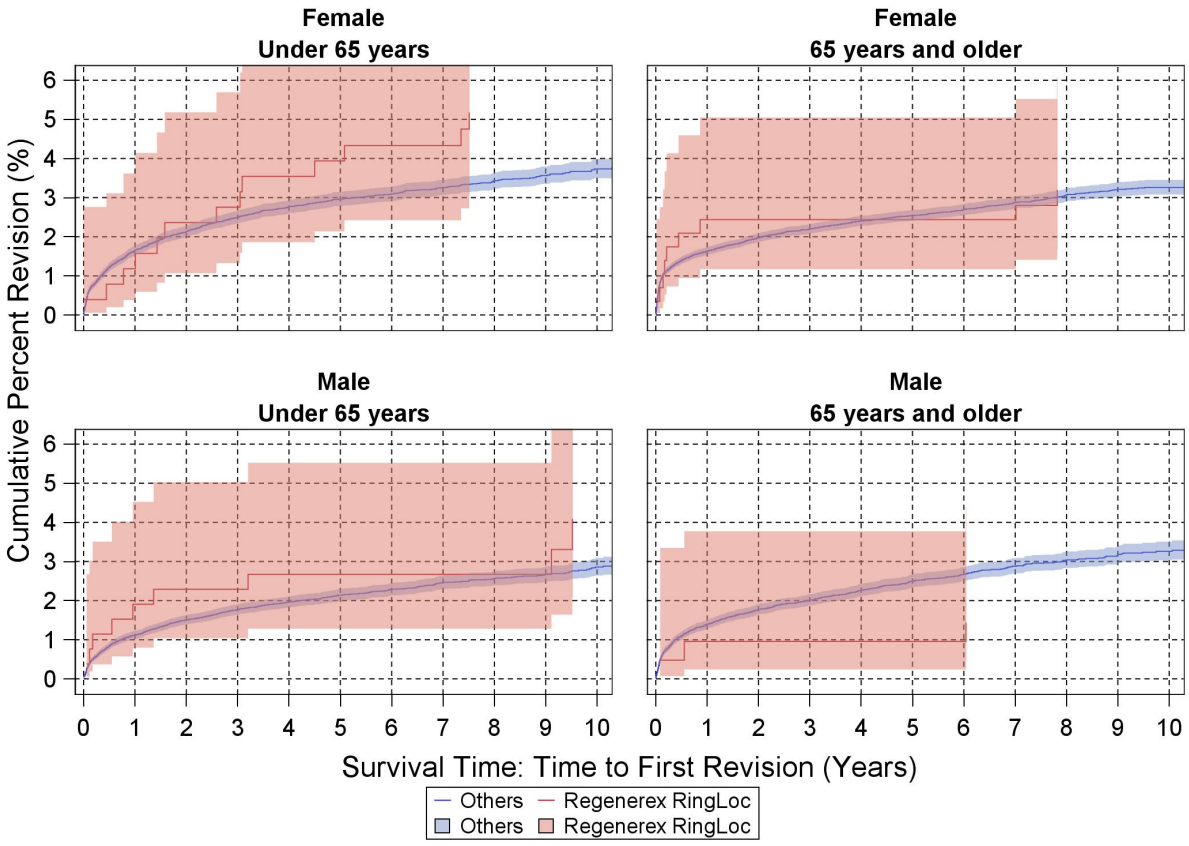


Figure 347. Cumulative Percent Revision Curve for the Regenerex RingLoc+ Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 1005. Cumulative Percent Revision and Number at Risk for the Regenerex RingLoc+ Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,012	0.00 (0.00,0.00)	254	0.00 (0.00,0.00)	287	0.00 (0.00,0.00)	262	0.00 (0.00,0.00)	209	0.00 (0.00,0.00)
1	995	1.68 (1.05,2.69)	251	1.18 (0.38,3.62)	280	2.44 (1.17,5.05)	257	1.91 (0.80,4.52)	207	0.96 (0.24,3.77)
2	991	2.08 (1.36,3.16)	248	2.36 (1.07,5.18)	280	2.44 (1.17,5.05)	256	2.29 (1.04,5.03)	207	0.96 (0.24,3.77)
3	990	2.17 (1.44,3.28)	247	2.76 (1.32,5.69)	280	2.44 (1.17,5.05)	256	2.29 (1.04,5.03)	207	0.96 (0.24,3.77)
4	987	2.47 (1.68,3.63)	245	3.54 (1.86,6.70)	280	2.44 (1.17,5.05)	255	2.67 (1.28,5.52)	207	0.96 (0.24,3.77)
5	986	2.57 (1.76,3.75)	244	3.94 (2.14,7.19)	280	2.44 (1.17,5.05)	255	2.67 (1.28,5.52)	207	0.96 (0.24,3.77)
6	980	2.67 (1.84,3.87)	242	4.33 (2.42,7.68)	277	2.44 (1.17,5.05)	255	2.67 (1.28,5.52)	206	0.96 (0.24,3.77)
7	953	2.77 (1.92,3.98)	237	4.33 (2.42,7.68)	270	2.44 (1.17,5.05)	249	2.67 (1.28,5.52)	197	1.44 (0.47,4.39)
8	844	3.19 (2.27,4.49)	209	5.18 (3.04,8.75)	236	3.20 (1.68,6.06)	219	2.67 (1.28,5.52)	180	1.44 (0.47,4.39)
9	608	3.19 (2.27,4.49)	155	5.18 (3.04,8.75)	166	3.20 (1.68,6.06)	160	2.67 (1.28,5.52)	127	1.44 (0.47,4.39)
10	304	3.57 (2.54,4.99)	82	5.18 (3.04,8.75)	86	3.20 (1.68,6.06)	84	4.09 (2.08,7.95)	52	1.44 (0.47,4.39)

Table 1006. Reasons for First Revision Following Primary THA for Regenerex RingLoc+ Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	9	26.5
2	Aseptic Loosening	8	23.5
3	Dislocation/Instability	7	20.6
4	Joint Infection	5	14.7
5	Pain	2	5.9
6	Malalignment	2	5.9
7	Implant Failure	1	2.9

Table 1007. Reasons for First Revision in the First 90 Days Following Primary THA for Regenerex RingLoc+ Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	6	60.0
2	Aseptic Loosening	2	20.0
3	Dislocation/Instability	1	10.0
4	Malalignment	1	10.0

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Table 1008. Reasons for First Revision Between 91 and 365 days Following Primary THA for Regenerex RingLoc+ Cup Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	2	28.6
2	Dislocation/Instability	2	28.6
3	Joint Infection	2	28.6
4	Pain	1	14.3

Table 1009. Descriptive Statistics of Cases Receiving the Regenerex RingLoc+ Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	548	53.15	
Age (years)	1,031	64.28 (11.46)	64.00 (15.00)
Height (cm)	1,031	169.93 (10.57)	170.18 (15.24)
Weight (kg)	1,031	90.46 (22.49)	88.60 (29.49)
BMI(kg/m^2)	1,031	31.25 (7.04)	30.41 (9.16)
Smoker - Never (%)	398	38.6	
Smoker - Previous (%)	390	37.83	
Smoker - Current (%)	239	23.18	
Smoker - Unknown (%)	4	0.39	

Table 1010. Distribution of Approach Used for Regenerex RingLoc+ Cup in Primary THA Cases

Approach	N	Percent
Anterior	103	10.0
Anterolateral	450	43.6
Posterior	470	45.6
Transtrochanteric	3	0.3
Missing/unknown/other	5	0.5

Table 1011. Distribution of Head Size for Regenerex RingLoc+ Cup in Primary THA Cases

Size (mm)	N	Percent
28	7	0.7
32	107	10.5
36	597	58.6
40	294	28.9
44	3	0.3
Missing/unknown/other	11	1.1

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Table 1012. Distribution of Bearing Surface for Regenerex RingLoc+ Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	645	62.6
Ceramic-on-plastic	363	35.2
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	23	2.2

Table 1013. Distribution of Polyethylene Used for Regenerex RingLoc+ Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	6	0.6
XLPE	279	27.4
Antioxidant XLPE	734	72.0
Missing/unknown/other	0	0.0

Table 1014. Volume of Cases by Surgeon and Site for the Regenerex RingLoc+ Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	34 (56)	5 (41)
Cases per site	49 (78)	16 (30)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

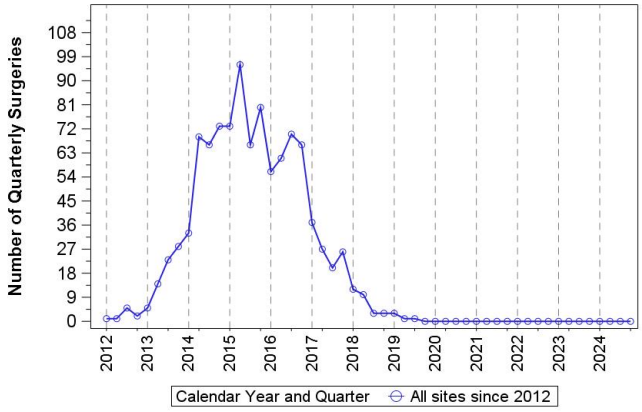


Figure 348. Utilization of the Regenerex RingLoc+ Cup in Primary THA Cases

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Catalog Numbers of Acetabular Cups Used in the Analysis

PT116052	PT106058	PT106052
PT116056	PT104050	PT106068
PT116054	PT106060	PT116066
PT116058	PT104054	PT104062
PT116060	PT106064	PT104066
PT116050	PT104052	PT106070
PT106054	PT104058	PT106072
PT106056	PT106062	PT116064
PT116048	PT104060	
PT116062	PT106066	
PT104056	PT104048	

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3.3.12 Restoration ADM

N = 531 primary cases were used for this analysis. Fewer than ten surgeons used this implant at fewer than ten sites in primary THA cases.

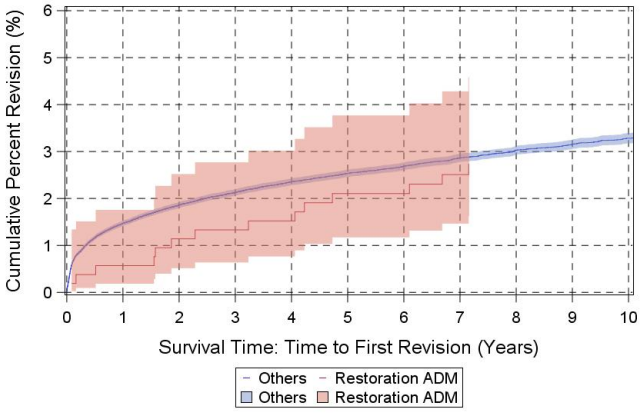


Figure 349. Cumulative Percent Revision Curve for the Restoration ADM Cup, Compared to All Other Cups in Primary THA Cases

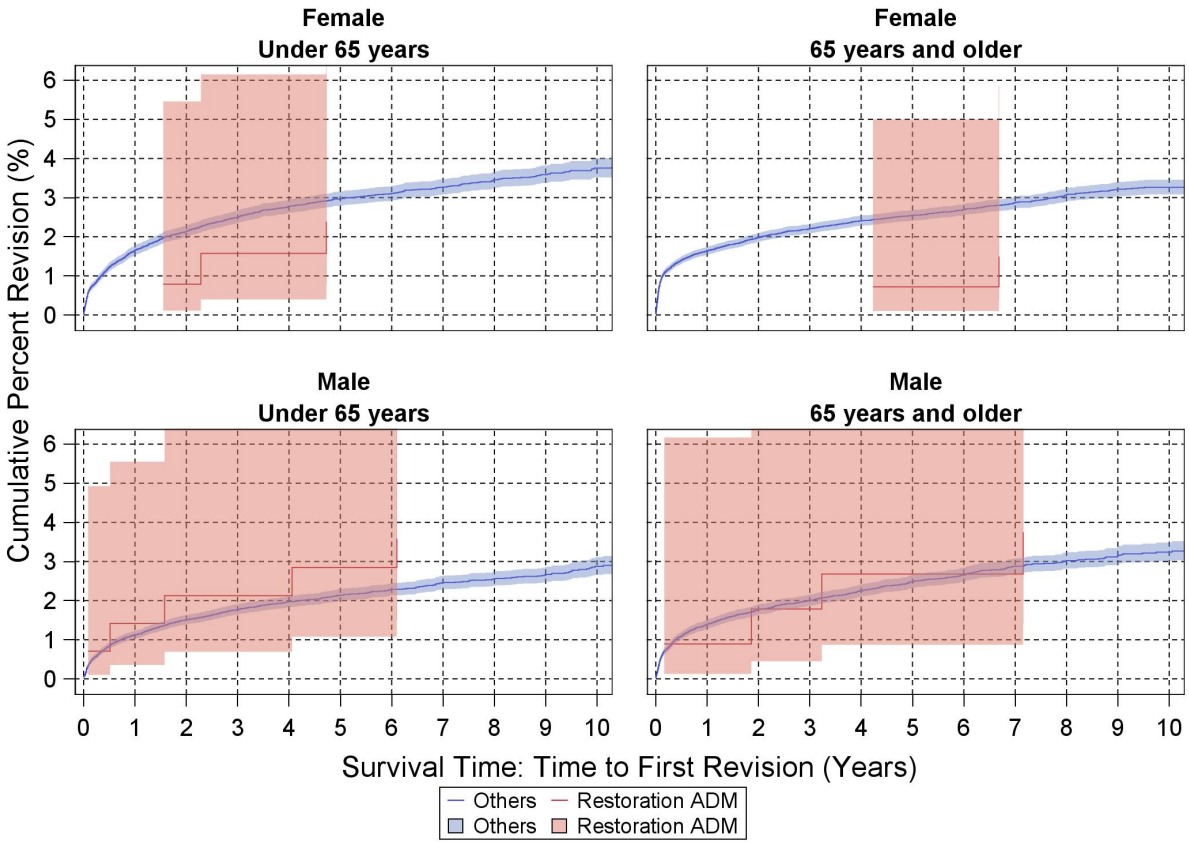


Figure 350. Cumulative Percent Revision Curve for the Restoration ADM Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 1015. Cumulative Percent Revision and Number at Risk for the Restoration ADM Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	526	0.00 (0.00,0.00)	127	0.00 (0.00,0.00)	146	0.00 (0.00,0.00)	141	0.00 (0.00,0.00)	112	0.00 (0.00,0.00)
1	523	0.57 (0.18,1.76)	127	0.00 (0.00,0.00)	146	0.00 (0.00,0.00)	139	1.42 (0.36,5.55)	111	0.89 (0.13,6.17)
2	520	1.14 (0.51,2.52)	126	0.79 (0.11,5.46)	146	0.00 (0.00,0.00)	138	2.13 (0.69,6.45)	110	1.79 (0.45,6.95)
3	519	1.33 (0.64,2.77)	125	1.57 (0.40,6.15)	146	0.00 (0.00,0.00)	138	2.13 (0.69,6.45)	110	1.79 (0.45,6.95)
4	509	1.52 (0.76,3.02)	124	1.57 (0.40,6.15)	140	0.00 (0.00,0.00)	136	2.13 (0.69,6.45)	109	2.68 (0.87,8.07)
5	497	2.11 (1.17,3.77)	120	2.38 (0.77,7.20)	133	0.72 (0.10,5.00)	135	2.85 (1.08,7.41)	109	2.68 (0.87,8.07)
6	490	2.11 (1.17,3.77)	118	2.38 (0.77,7.20)	132	0.72 (0.10,5.00)	133	2.85 (1.08,7.41)	107	2.68 (0.87,8.07)
7	444	2.51 (1.46,4.28)	110	2.38 (0.77,7.20)	118	1.50 (0.38,5.85)	119	3.58 (1.50,8.38)	97	2.68 (0.87,8.07)
8	345	2.74 (1.63,4.58)	85	2.38 (0.77,7.20)	89	1.50 (0.38,5.85)	93	3.58 (1.50,8.38)	78	3.75 (1.42,9.71)
9	242	2.74 (1.63,4.58)	52	2.38 (0.77,7.20)	70	1.50 (0.38,5.85)	64	3.58 (1.50,8.38)	56	3.75 (1.42,9.71)
10	135	2.74 (1.63,4.58)	26	2.38 (0.77,7.20)	46	1.50 (0.38,5.85)	29	3.58 (1.50,8.38)	34	3.75 (1.42,9.71)

Table 1016. Reasons for First Revision Following Primary THA for Restoration ADM Cup Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	3	23.1
2	Peri-prosthetic fracture - Femur	3	23.1
3	Aseptic Loosening	2	15.4
4	Dislocation/Instability	2	15.4
5	Malalignment	2	15.4
6	Poly liner wear	1	7.7

Table 1017. Reasons for First Revision in the First 90 Days Following Primary THA for Restoration ADM Cup Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	2	100.0

There were no reasons for revision recorded between day 91 and day 365, so no table of reasons for revisions during this time period is included.

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Table 1018. Descriptive Statistics of Cases Receiving the Restoration ADM Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	276	51.98	
Age (years)	531	63.46 (11.55)	64.00 (15.00)
Height (cm)	531	169.62 (10.43)	170.18 (15.24)
Weight (kg)	531	90.44 (23.43)	88.20 (30.10)
BMI(kg/m^2)	531	31.26 (6.83)	30.40 (8.14)
Smoker - Never (%)	240	45.2	
Smoker - Previous (%)	238	44.82	
Smoker - Current (%)	53	9.98	
Smoker - Unknown (%)	0	0.0	

Table 1019. Distribution of Approach Used for Restoration ADM Cup in Primary THA Cases

Approach	N	Percent
Anterior	1	0.2
Anterolateral	75	14.1
Posterior	455	85.7
Transtrochanteric	0	0.0
Missing/unknown/other	0	0.0

Table 1020. Distribution of Bearing Surface for Restoration ADM Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	0	0.0
Ceramic-on-plastic	0	0.0
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	531	100.0
Missing/unknown/other	0	0.0

Table 1021. Distribution of Polyethylene Used for Restoration ADM Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	531	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 1022. Volume of Cases by Surgeon and Site for the Restoration ADM Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	106 (176)	39 (71)
Cases per site	132 (169)	80 (244)

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The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

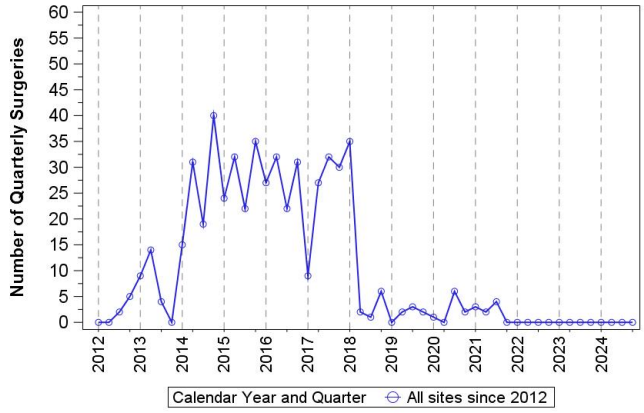


Figure 351. Utilization of the Restoration ADM Cup in Primary THA Cases

Catalog Numbers of Acetabular Cups Used in the Analysis

12352501	12352502	12352602
12352521	12352482	12352601
12352541	12352562	12352621
12352522	12352461	12352622
12352542	12352462	12352641
12352481	12352581	12352642
12352561	12352582	

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3.3.13 RingLoc

N = 2,655 primary cases were used for this analysis. Distribution of utilization: 46 surgeons across 25 sites used this implant in primary THA cases.

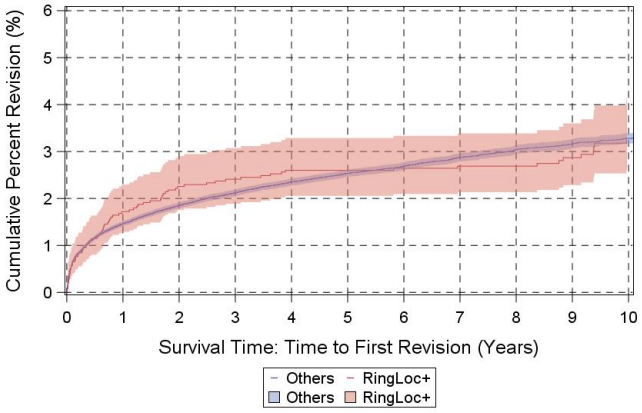


Figure 352. Cumulative Percent Revision Curve for the RingLoc Cup, Compared to All Other Cups in Primary THA Cases

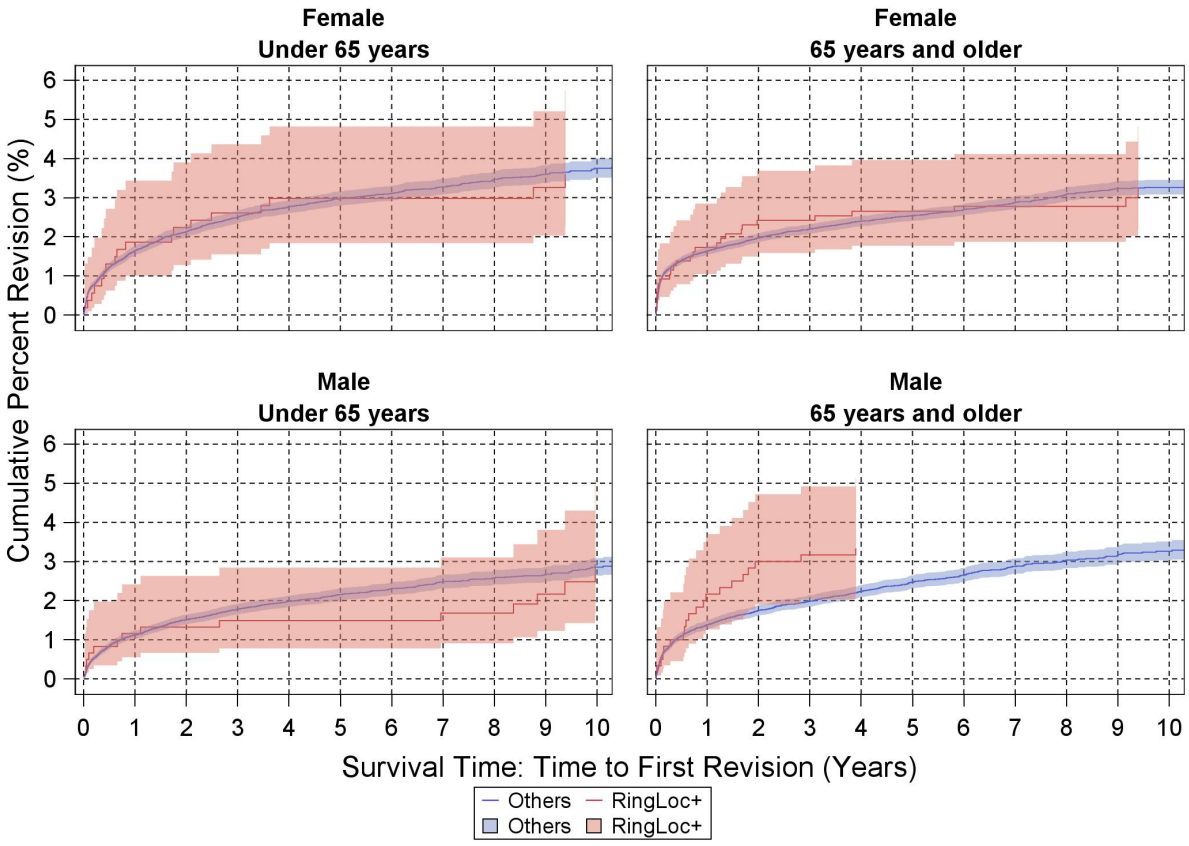


Figure 353. Cumulative Percent Revision Curve for the RingLoc Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 1023. Cumulative Percent Revision and Number at Risk for the RingLoc Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	2,615	0.00 (0.00,0.00)	537	0.00 (0.00,0.00)	869	0.00 (0.00,0.00)	604	0.00 (0.00,0.00)	600	0.00 (0.00,0.00)
1	2,569	1.72 (1.29,2.30)	527	1.86 (1.01,3.43)	853	1.73 (1.04,2.85)	597	1.16 (0.55,2.42)	587	2.17 (1.26,3.70)
2	2,554	2.26 (1.75,2.90)	525	2.23 (1.28,3.90)	846	2.42 (1.58,3.69)	596	1.32 (0.66,2.63)	582	3.00 (1.90,4.72)
3	2,548	2.41 (1.89,3.07)	522	2.61 (1.55,4.36)	846	2.42 (1.58,3.69)	595	1.49 (0.78,2.84)	580	3.17 (2.03,4.92)
4	2,533	2.60 (2.06,3.29)	520	2.98 (1.84,4.82)	839	2.65 (1.77,3.96)	592	1.49 (0.78,2.84)	577	3.33 (2.16,5.12)
5	2,494	2.60 (2.06,3.29)	516	2.98 (1.84,4.82)	823	2.65 (1.77,3.96)	587	1.49 (0.78,2.84)	563	3.33 (2.16,5.12)
6	2,306	2.64 (2.09,3.33)	480	2.98 (1.84,4.82)	751	2.78 (1.87,4.11)	555	1.49 (0.78,2.84)	515	3.33 (2.16,5.12)
7	2,085	2.69 (2.13,3.39)	437	2.98 (1.84,4.82)	679	2.78 (1.87,4.11)	510	1.68 (0.91,3.11)	454	3.33 (2.16,5.12)
8	1,829	2.69 (2.13,3.39)	391	2.98 (1.84,4.82)	591	2.78 (1.87,4.11)	445	1.68 (0.91,3.11)	397	3.33 (2.16,5.12)
9	1,484	2.87 (2.28,3.60)	325	3.26 (2.03,5.21)	474	2.78 (1.87,4.11)	372	2.17 (1.23,3.81)	308	3.33 (2.16,5.12)
10	819	3.29 (2.62,4.14)	190	3.61 (2.27,5.73)	260	3.26 (2.20,4.82)	210	2.93 (1.68,5.09)	154	3.33 (2.16,5.12)

Table 1024. Reasons for First Revision Following Primary THA for RingLoc Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	19	27.5
2	Joint Infection	17	24.6
3	Peri-prosthetic fracture - Femur	12	17.4
4	Aseptic Loosening	10	14.5
5	Implant Failure	4	5.8
6	Pain	4	5.8
7	Malalignment	2	2.9
8	Poly liner wear	1	1.4

Table 1025. Reasons for First Revision in the First 90 Days Following Primary THA for RingLoc Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	9	47.4
2	Dislocation/Instability	4	21.0
3	Aseptic Loosening	2	10.5
4	Joint Infection	2	10.5
5	Implant Failure	1	5.3
6	Pain	1	5.3

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Table 1026. Reasons for First Revision Between 91 and 365 days Following Primary THA for RingLoc Cup Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	9	52.9
2	Dislocation/Instability	4	23.5
3	Implant Failure	2	11.8
4	Aseptic Loosening	1	5.9
5	Pain	1	5.9

Table 1027. Descriptive Statistics of Cases Receiving the RingLoc Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,424	53.63	
Age (years)	2,655	65.96 (10.53)	66.00 (14.00)
Height (cm)	2,655	170.06 (10.42)	170.00 (15.24)
Weight (kg)	2,655	89.74 (21.49)	87.70 (27.51)
BMI(kg/m^2)	2,655	30.91 (6.35)	30.11 (8.44)
Smoker - Never (%)	1,252	47.16	
Smoker - Previous (%)	1,039	39.13	
Smoker - Current (%)	332	12.5	
Smoker - Unknown (%)	32	1.21	

Table 1028. Distribution of Approach Used for RingLoc Cup in Primary THA Cases

Approach	N	Percent
Anterior	526	19.8
Anterolateral	831	31.3
Posterior	1,274	48.0
Transtrochanteric	10	0.4
Missing/unknown/other	14	0.5

Table 1029. Distribution of Head Size for RingLoc Cup in Primary THA Cases

Size (mm)	N	Percent
32	261	9.9
36	1,566	59.5
40	669	25.4
44	99	3.8
Missing/unknown/other	35	1.3

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Table 1030. Distribution of Bearing Surface for RingLoc Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,483	55.9
Ceramic-on-plastic	1,111	41.9
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	61	2.3

Table 1031. Distribution of Polyethylene Used for RingLoc Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	29	1.1
XLPE	224	8.5
Antioxidant XLPE	2,377	90.4
Missing/unknown/other	0	0.0

Table 1032. Volume of Cases by Surgeon and Site for the RingLoc Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	57 (104)	2 (39)
Cases per site	106 (143)	27 (157)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

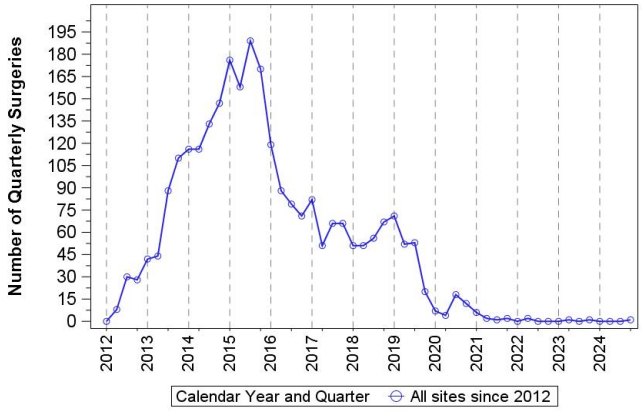


Figure 354. Utilization of the RingLoc Cup in Primary THA Cases

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Catalog Numbers of Acetabular Cups Used in the Analysis

16104154	16116056	11165216
16104150	16104164	11165214
16104156	14103660	11165208
16104152	14103662	14103664
16104158	16104146	16116062
14103654	16116058	11165212
16104160	14103554	11165218
14103656	14103560	14103566
14103652	14103564	14103666
16116050	14103558	16116064
14103650	14103562	11165224
16116054	14103556	11165228
16104162	16116048	11165230
16116052	16116060	14103668
14103658	14103552	
16104148	16116046	

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3.3.14 Trabecular Metal

N = 2,056 primary cases were used for this analysis. Distribution of utilization: 54 surgeons across 26 sites used this implant in primary THA cases.

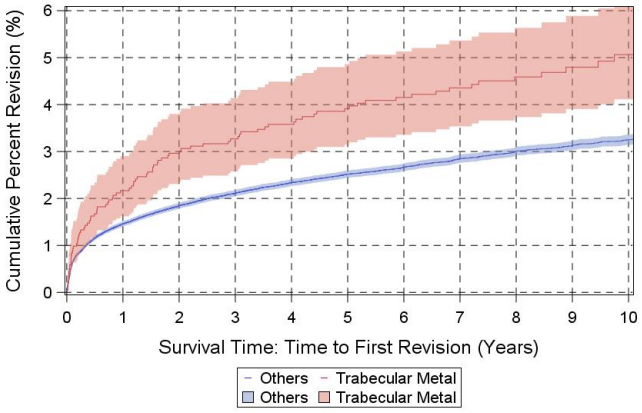


Figure 355. Cumulative Percent Revision Curve for the Trabecular Metal Cup, Compared to All Other Cups in Primary THA Cases

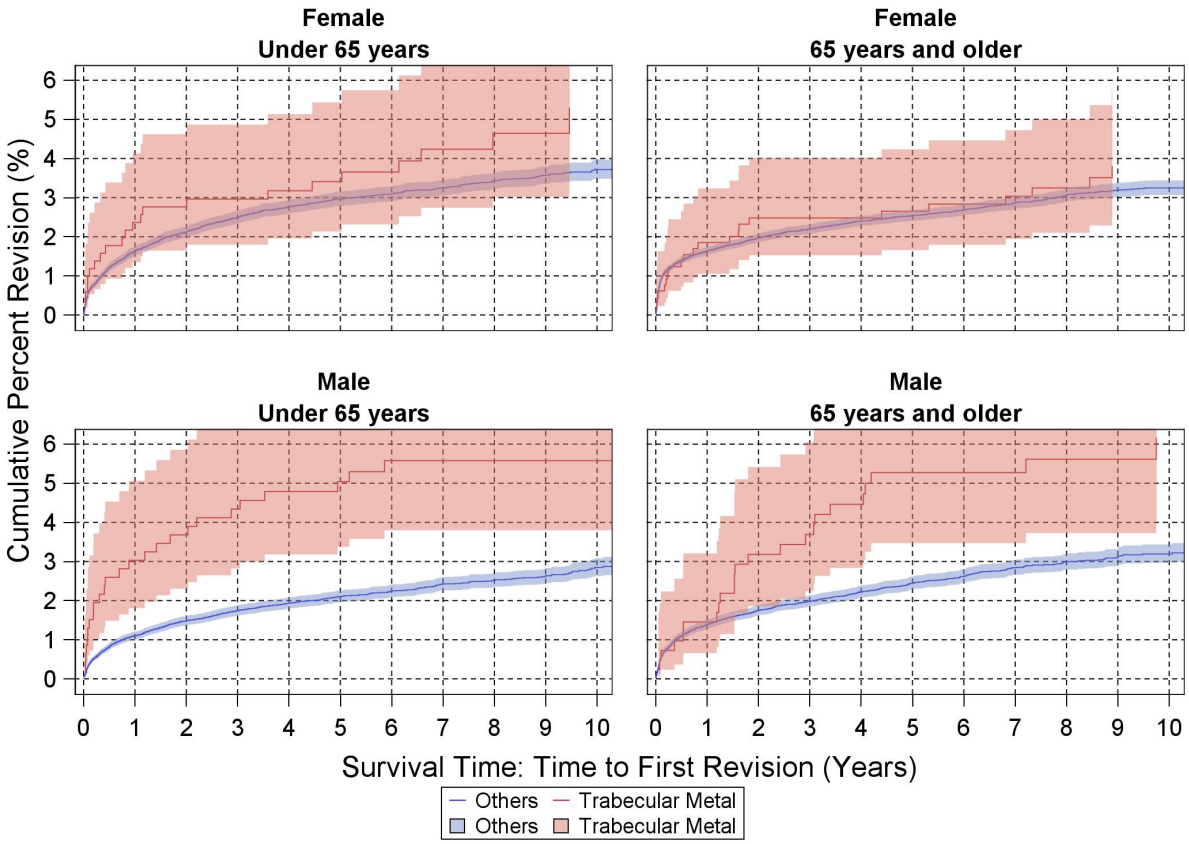


Figure 356. Cumulative Percent Revision Curve for the Trabecular Metal Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 1033. Cumulative Percent Revision and Number at Risk for the Trabecular Metal Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	2,031	0.00 (0.00,0.00)	507	0.00 (0.00,0.00)	649	0.00 (0.00,0.00)	462	0.00 (0.00,0.00)	413	0.00 (0.00,0.00)
1	1,982	2.17 (1.62,2.90)	495	2.37 (1.35,4.13)	634	1.85 (1.05,3.23)	448	3.03 (1.81,5.06)	405	1.45 (0.66,3.21)
2	1,925	2.96 (2.31,3.80)	487	2.76 (1.65,4.62)	614	2.48 (1.53,4.02)	441	3.68 (2.30,5.85)	383	3.18 (1.86,5.42)
3	1,889	3.27 (2.58,4.14)	476	2.96 (1.80,4.87)	603	2.48 (1.53,4.02)	433	4.34 (2.82,6.64)	377	3.69 (2.24,6.05)
4	1,772	3.58 (2.85,4.49)	435	3.18 (1.96,5.13)	576	2.48 (1.53,4.02)	406	4.79 (3.18,7.18)	355	4.46 (2.83,6.99)
5	1,654	3.91 (3.15,4.86)	394	3.41 (2.13,5.43)	550	2.65 (1.66,4.23)	375	5.04 (3.38,7.49)	335	5.27 (3.47,7.98)
6	1,503	4.15 (3.36,5.13)	349	3.65 (2.32,5.75)	513	2.83 (1.79,4.46)	330	5.58 (3.80,8.15)	311	5.27 (3.47,7.98)
7	1,335	4.36 (3.53,5.36)	291	4.24 (2.74,6.52)	473	3.04 (1.94,4.73)	284	5.58 (3.80,8.15)	287	5.27 (3.47,7.98)
8	1,134	4.59 (3.73,5.63)	235	4.64 (3.02,7.11)	415	3.25 (2.10,5.00)	228	5.58 (3.80,8.15)	256	5.61 (3.73,8.41)
9	832	4.80 (3.90,5.89)	162	4.64 (3.02,7.11)	320	3.80 (2.49,5.78)	151	5.58 (3.80,8.15)	199	5.61 (3.73,8.41)
10	650	5.06 (4.11,6.23)	119	5.30 (3.39,8.25)	254	3.80 (2.49,5.78)	113	5.58 (3.80,8.15)	164	6.17 (4.09,9.25)

Table 1034. Reasons for First Revision Following Primary THA for Trabecular Metal Cup Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	21	24.4
2	Dislocation/Instability	21	24.4
3	Peri-prosthetic fracture - Femur	17	19.8
4	Joint Infection	10	11.6
5	Implant Failure	7	8.1
6	Pain	4	4.7
7	Malalignment	4	4.7
8	Osteolysis	1	1.2
9	Metal Reaction/Metallosis	1	1.2

Table 1035. Reasons for First Revision in the First 90 Days Following Primary THA for Trabecular Metal Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	10	38.5
2	Peri-prosthetic fracture - Femur	10	38.5
3	Aseptic Loosening	6	23.1

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Table 1036. Reasons for First Revision Between 91 and 365 days Following Primary THA for Trabecular Metal Cup Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	5	35.7
2	Joint Infection	3	21.4
3	Implant Failure	3	21.4
4	Peri-prosthetic fracture - Femur	1	7.1
5	Pain	1	7.1
6	Malalignment	1	7.1

Table 1037. Descriptive Statistics of Cases Receiving the Trabecular Metal Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,169	56.86	
Age (years)	2,056	64.82 (11.19)	65.00 (14.00)
Height (cm)	2,051	168.98 (10.73)	167.64 (17.78)
Weight (kg)	2,050	88.86 (22.07)	87.09 (30.30)
BMI(kg/m^2)	2,050	31.11 (7.77)	30.10 (9.25)
Smoker - Never (%)	843	41	
Smoker - Previous (%)	746	36.28	
Smoker - Current (%)	462	22.47	
Smoker - Unknown (%)	5	0.24	

Table 1038. Distribution of Approach Used for Trabecular Metal Cup in Primary THA Cases

Approach	N	Percent
Anterior	35	1.7
Anterolateral	749	36.4
Posterior	1,176	57.2
Transtrochanteric	72	3.5
Missing/unknown/other	24	1.2

Table 1039. Distribution of Head Size for Trabecular Metal Cup in Primary THA Cases

Size (mm)	N	Percent
22	2	0.1
28	38	1.9
32	840	41.4
36	1,015	50.0
40	92	4.5
Missing/unknown/other	43	2.1

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Table 1040. Distribution of Bearing Surface for Trabecular Metal Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,034	50.3
Ceramic-on-plastic	953	46.4
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	1	0.1
Missing/unknown/other	68	3.3

Table 1041. Distribution of Polyethylene Used for Trabecular Metal Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	2	0.1
XLPE	2,025	99.7
Antioxidant XLPE	4	0.2
Missing/unknown/other	0	0.0

Table 1042. Volume of Cases by Surgeon and Site for the Trabecular Metal Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	38 (108)	3 (18)
Cases per site	79 (151)	7 (62)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

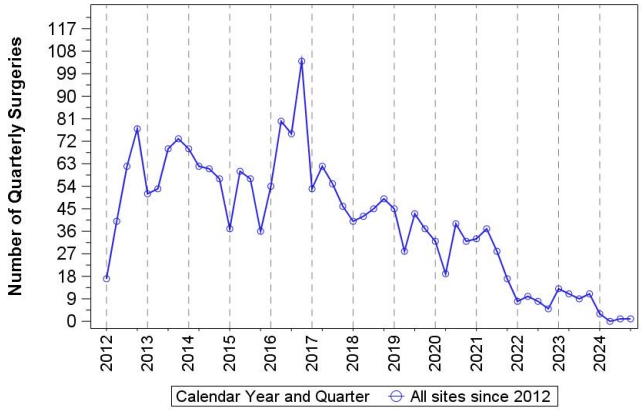


Figure 357. Utilization of the Trabecular Metal Cup in Primary THA Cases

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Catalog Numbers of Acetabular Cups Used in the Analysis

620205222
620205022
620204822
620205422
620205622
620205822
620205021
620206022
620205221
620205421
620205020
620205820
620205621
620205220
620205620
620204622
620205420
620205821
620204821
620206222
620206220
620206020
620204820
620206422
620206021
620206420
620204621
620204422
620207022
700005620
620206221
620206820
620207020
712305648
620203822
620204020
620206620
620206622
620207420
700006220
712306254

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3.3.15 Trident

N = 31,199 primary cases were used for this analysis. Distribution of utilization: 173 surgeons across 58 sites used this implant in primary THA cases.

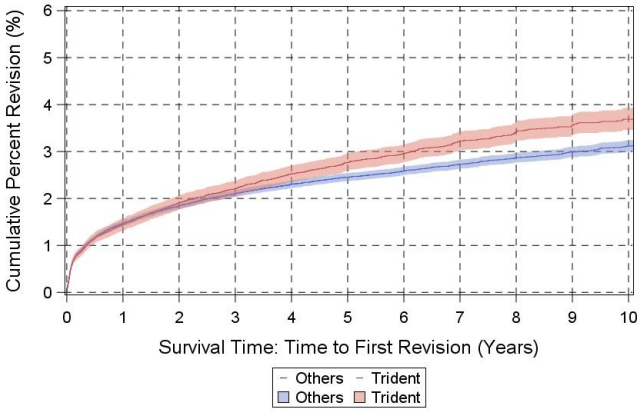


Figure 358. Cumulative Percent Revision Curve for the Trident Cup, Compared to All Other Cups in Primary THA Cases

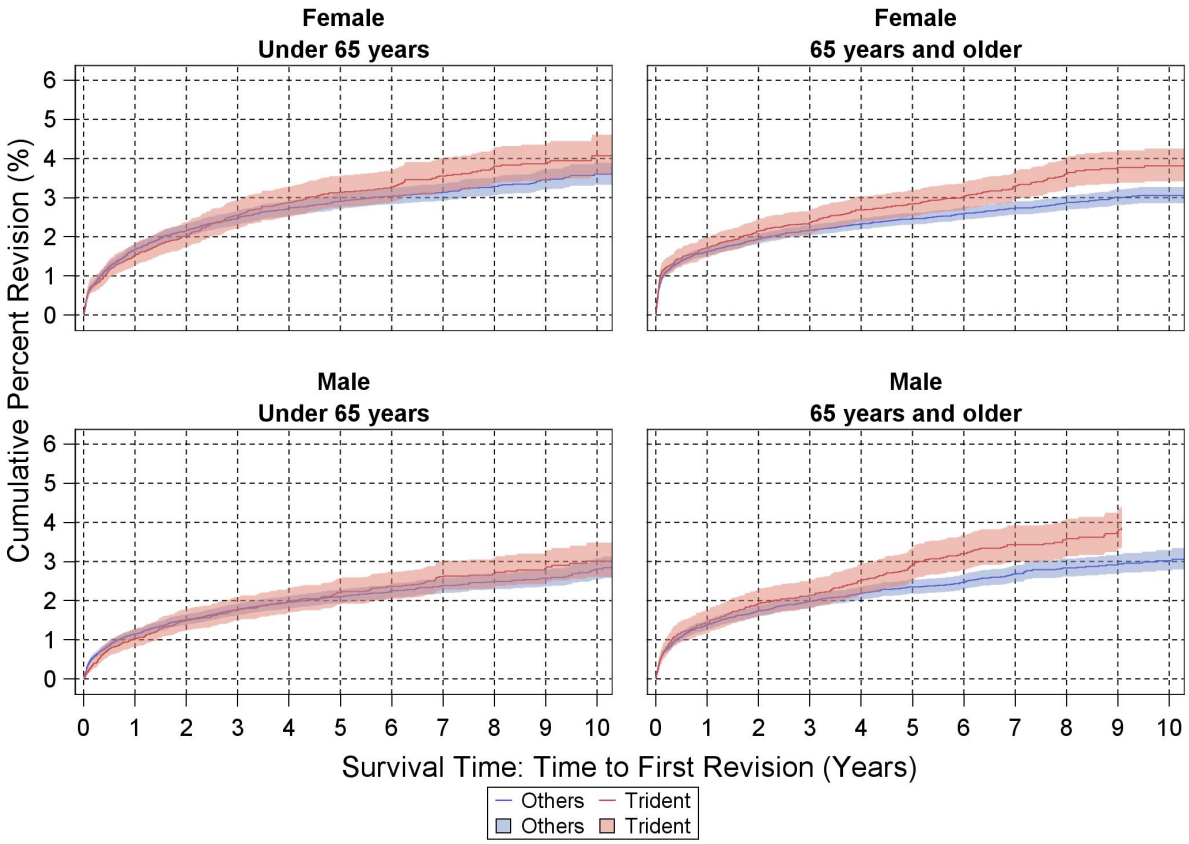


Figure 359. Cumulative Percent Revision Curve for the Trident Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 1043. Cumulative Percent Revision and Number at Risk for the Trident Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	30,896	0.00 (0.00,0.00)	7,378	0.00 (0.00,0.00)	9,671	0.00 (0.00,0.00)	7,560	0.00 (0.00,0.00)	6,279	0.00 (0.00,0.00)
1	30,316	1.44 (1.31,1.58)	7,223	1.52 (1.27,1.83)	9,443	1.71 (1.47,1.99)	7,473	1.02 (0.82,1.27)	6,169	1.43 (1.17,1.76)
2	29,913	1.92 (1.77,2.07)	7,132	2.03 (1.73,2.38)	9,291	2.15 (1.88,2.46)	7,394	1.50 (1.25,1.80)	6,088	1.93 (1.62,2.30)
3	29,378	2.21 (2.05,2.38)	6,997	2.54 (2.20,2.92)	9,103	2.36 (2.08,2.68)	7,294	1.76 (1.49,2.09)	5,976	2.14 (1.81,2.53)
4	28,745	2.52 (2.35,2.70)	6,805	2.88 (2.52,3.29)	8,894	2.68 (2.38,3.03)	7,193	1.98 (1.69,2.32)	5,845	2.51 (2.15,2.93)
5	27,786	2.77 (2.59,2.96)	6,568	3.14 (2.76,3.56)	8,609	2.84 (2.53,3.19)	6,968	2.20 (1.89,2.56)	5,633	2.90 (2.51,3.35)
6	25,019	2.96 (2.77,3.16)	5,969	3.28 (2.89,3.71)	7,740	3.03 (2.70,3.39)	6,281	2.36 (2.04,2.74)	5,021	3.20 (2.79,3.67)
7	20,483	3.21 (3.02,3.42)	4,986	3.55 (3.15,4.01)	6,313	3.29 (2.95,3.68)	5,132	2.61 (2.27,3.00)	4,045	3.43 (3.00,3.92)
8	15,174	3.42 (3.22,3.64)	3,756	3.81 (3.38,4.29)	4,575	3.60 (3.23,4.01)	3,885	2.70 (2.35,3.11)	2,951	3.58 (3.14,4.10)
9	9,843	3.55 (3.34,3.78)	2,504	3.86 (3.43,4.35)	2,978	3.77 (3.38,4.20)	2,497	2.82 (2.45,3.25)	1,857	3.76 (3.29,4.31)
10	5,573	3.69 (3.46,3.93)	1,406	4.07 (3.59,4.61)	1,683	3.81 (3.41,4.25)	1,439	3.01 (2.60,3.48)	1,041	3.87 (3.37,4.44)

Table 1044. Reasons for First Revision Following Primary THA for Trident Cup Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	255	25.8
2	Peri-prosthetic fracture - Femur	222	22.5
3	Joint Infection	178	18.0
4	Dislocation/Instability	147	14.9
5	Metal Reaction/Metallosis	48	4.9
6	Pain	41	4.1
7	Malalignment	39	3.9
8	Implant Failure	35	3.5
9	Peri-prosthetic fracture - Acetabulum	20	2.0
10	Osteolysis	2	0.2
	Unknown/missing/other	1	0.1

Table 1045. Reasons for First Revision in the First 90 Days Following Primary THA for Trident Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	138	54.1
2	Dislocation/Instability	40	15.7
3	Joint Infection	27	10.6
4	Aseptic Loosening	18	7.1
5	Implant Failure	14	5.5
6	Peri-prosthetic fracture - Acetabulum	9	3.5
7	Malalignment	5	2.0
8	Pain	4	1.6

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Table 1046. Reasons for First Revision Between 91 and 365 days Following Primary THA for Trident Cup Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	48	31.2
2	Dislocation/Instability	36	23.4
3	Aseptic Loosening	29	18.8
4	Peri-prosthetic fracture - Femur	16	10.4
5	Pain	14	9.1
6	Implant Failure	4	2.6
7	Malalignment	4	2.6
8	Peri-prosthetic fracture - Acetabulum	3	2.0

Table 1047. Descriptive Statistics of Cases Receiving the Trident Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	17,202	55.14	
Age (years)	31,199	64.57 (11.46)	65.00 (14.00)
Height (cm)	31,199	169.67 (10.43)	170.00 (15.24)
Weight (kg)	31,199	88.09 (21.21)	86.18 (28.27)
BMI(kg/m^2)	31,199	30.47 (6.38)	29.76 (8.32)
Smoker - Never (%)	14,990	48.05	
Smoker - Previous (%)	11,848	37.98	
Smoker - Current (%)	4,163	13.34	
Smoker - Unknown (%)	198	0.63	

Table 1048. Distribution of Approach Used for Trident Cup in Primary THA Cases

Approach	N	Percent
Anterior	6,723	21.6
Anterolateral	6639	21.3
Posterior	17,695	56.7
Transtrochanteric	49	0.2
Missing/unknown/other	93	0.3

Table 1049. Distribution of Head Size for Trident Cup in Primary THA Cases

Size (mm)	N	Percent
22	18	0.1
28	79	0.3
32	5,655	19.7
36	20,540	71.5
40	2,159	7.5
44	166	0.6
Missing/unknown/other	118	0.4

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Table 1050. Distribution of Bearing Surface for Trident Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	7,647	24.5
Ceramic-on-plastic	19,776	63.4
Ceramic-on-ceramic	1,240	4.0
Metal-on-metal	0	0.0
Dual mobility	2,303	7.4
Missing/unknown/other	233	0.8

Table 1051. Distribution of Polyethylene Used for Trident Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.0
XLPE	29,767	99.8
Antioxidant XLPE	0	0.0
Missing/unknown/other	46	0.1

Table 1052. Volume of Cases by Surgeon and Site for the Trident Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	180 (350)	31 (162)
Cases per site	537 (816)	153 (687)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

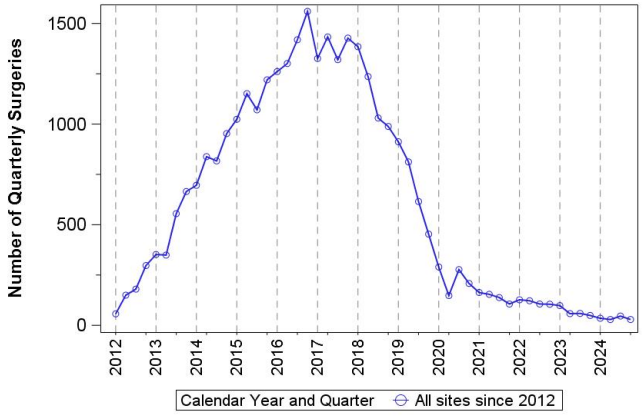


Figure 360. Utilization of the Trident Cup in Primary THA Cases

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Catalog Numbers of Acetabular Cups Used in the Analysis

5421150E	5000360F	5401146D
5021152E	5090254E	65C3252
5020354E	5000352D	65C3254
5421154F	5090256E	5000348C
5021154E	5000150D	5000364G
5021156F	5000350D	5021166H
5021150D	5000148D	5081160G
5020350D	5020364G	5421142B
5020352D	5021146C	65C3250
5020356E	5000156F	5401162H
5421152E	5081152E	5000160G
5020358F	5001152E	65C3256
5021158F	5401160G	5090266H
5421158G	5020158F	5001148D
5421156F	5021164H	5020162G
5421146D	5090258F	5081146C
5021148D	5401148D	5090270I
5020360F	5020148D	5401164H
5021160G	5081150D	65C3248
5421148D	5000158F	5081162G
5401150E	5421162H	5401144C
5000354E	5020346B	5000162G
5020362G	5081148D	5001158F
5020348C	5090260F	5020344A
5401152E	5421164H	5021168I
5021162G	5090262G	5090272I
5401154F	5000362G	5421168I
5421160G	5020150D	5000146C
5000356E	5081154E	5000164H
5000358F	5020160G	5021142A
5020152E	5090264G	5081164H
5421144C	5020154E	5090276J
5401156F	5020366H	5401166I
5000152E	5081156F	65C3258
5401158G	5090268H	
5020156F	5081158F	
5000154E	5021144B	

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3.3.16 Trident II

N = 31,917 primary cases were used for this analysis. Distribution of utilization: 177 surgeons across 72 sites used this implant in primary THA cases.

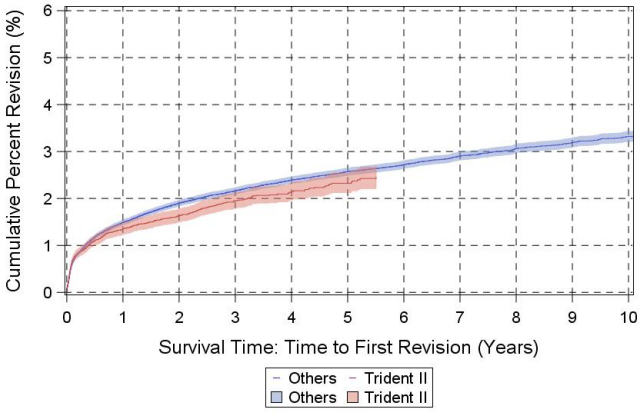


Figure 361. Cumulative Percent Revision Curve for the Trident II Cup, Compared to All Other Cups in Primary THA Cases

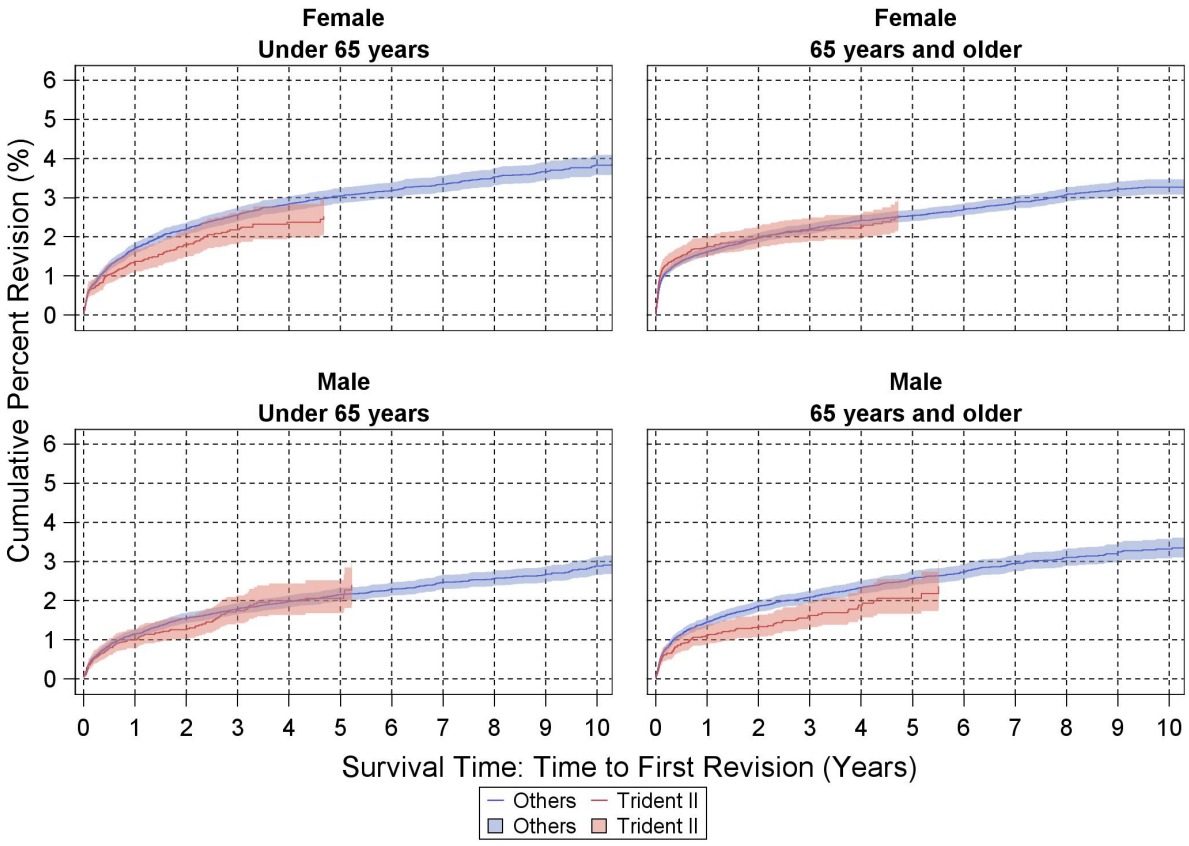


Figure 362. Cumulative Percent Revision Curve for the Trident II Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 1053. Cumulative Percent Revision and Number at Risk for the Trident II Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	31,810	0.00 (0.00,0.00)	6,736	0.00 (0.00,0.00)	10,615	0.00 (0.00,0.00)	7,007	0.00 (0.00,0.00)	7,447	0.00 (0.00,0.00)
1	25,008	1.36 (1.23,1.49)	5,412	1.37 (1.11,1.69)	8,237	1.75 (1.51,2.02)	5,651	1.00 (0.78,1.27)	5,705	1.12 (0.89,1.39)
2	18,844	1.63 (1.49,1.79)	4,101	1.79 (1.48,2.17)	6,163	1.99 (1.73,2.28)	4,338	1.26 (1.01,1.57)	4,239	1.33 (1.08,1.64)
3	13,200	1.95 (1.79,2.13)	2,901	2.18 (1.82,2.61)	4,342	2.17 (1.89,2.49)	3,027	1.74 (1.42,2.13)	2,929	1.62 (1.32,1.98)
4	8,481	2.14 (1.96,2.34)	1,897	2.37 (1.98,2.84)	2,736	2.26 (1.96,2.60)	1,941	2.00 (1.63,2.44)	1,907	1.88 (1.53,2.32)
5	4,436	2.32 (2.12,2.55)	1,032	2.53 (2.09,3.05)	1,420	2.55 (2.18,2.97)	1,019	2.06 (1.68,2.52)	965	2.06 (1.66,2.55)
6	1,343	2.46 (2.23,2.73)	295	2.53 (2.09,3.05)	444	2.55 (2.18,2.97)	312	2.40 (1.89,3.04)	292	2.37 (1.82,3.07)
7	183	2.46 (2.23,2.73)	46	2.53 (2.09,3.05)	56	2.55 (2.18,2.97)	41	2.40 (1.89,3.04)	40	2.37 (1.82,3.07)
8	13	2.46 (2.23,2.73)	*	2.53 (2.09,3.05)	*	2.55 (2.18,2.97)	*	2.40 (1.89,3.04)	*	2.37 (1.82,3.07)
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 1054. Reasons for First Revision Following Primary THA for Trident II Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	164	29.2
2	Joint Infection	137	24.4
3	Aseptic Loosening	94	16.7
4	Dislocation/Instability	86	15.3
5	Implant Failure	24	4.3
6	Malalignment	22	3.9
7	Pain	13	2.3
8	Peri-prosthetic fracture - Acetabulum	12	2.1
9	Metal Reaction/Metallosis	6	1.1
10	Osteolysis	2	0.4
	Unknown/missing/other	2	0.4

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Table 1055. Reasons for First Revision in the First 90 Days Following Primary THA for Trident II Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	139	50.6
2	Joint Infection	46	16.7
3	Dislocation/Instability	39	14.2
4	Aseptic Loosening	18	6.6
5	Implant Failure	13	4.7
6	Peri-prosthetic fracture - Acetabulum	9	3.3
7	Malalignment	8	2.9
8	Pain	2	0.7
9	Metal Reaction/Metallosis	1	0.4

Table 1056. Reasons for First Revision Between 91 and 365 days Following Primary THA for Trident II Cup Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	50	37.0
2	Dislocation/Instability	29	21.5
3	Aseptic Loosening	25	18.5
4	Peri-prosthetic fracture - Femur	15	11.1
5	Malalignment	6	4.4
6	Pain	4	3.0
7	Implant Failure	2	1.5
8	Osteolysis	1	0.7
9	Poly liner wear	1	0.7
10	Peri-prosthetic fracture - Acetabulum	1	0.7
	Unknown/missing/other	1	0.8

Table 1057. Descriptive Statistics of Cases Receiving the Trident II Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	17,405	54.53	
Age (years)	31,917	65.54 (10.87)	66.00 (14.00)
Height (cm)	31,917	170.02 (10.46)	170.18 (15.24)
Weight (kg)	31,917	88.61 (21.04)	86.80 (28.90)
BMI(kg/m^2)	31,917	30.53 (6.19)	29.80 (8.23)
Smoker - Never (%)	16,193	50.73	
Smoker - Previous (%)	11,103	34.79	
Smoker - Current (%)	4,531	14.2	
Smoker - Unknown (%)	90	0.28	

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Table 1058. Distribution of Approach Used for Trident II Cup in Primary THA Cases

Approach	N	Percent
Anterior	12,157	38.1
Anterolateral	3127	9.8
Posterior	16,536	51.8
Transtrochanteric	16	0.1
Missing/unknown/other	81	0.2

Table 1059. Distribution of Head Size for Trident II Cup in Primary THA Cases

Size (mm)	N	Percent
22	13	0.1
28	27	0.1
32	2,441	9.2
36	21,221	79.7
40	2,684	10.1
44	141	0.5
Missing/unknown/other	102	0.4

Table 1060. Distribution of Bearing Surface for Trident II Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,223	3.8
Ceramic-on-plastic	25,303	79.3
Ceramic-on-ceramic	1	0.0
Metal-on-metal	0	0.0
Dual mobility	4,785	15.0
Missing/unknown/other	605	1.9

Table 1061. Distribution of Polyethylene Used for Trident II Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	31,231	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 1062. Volume of Cases by Surgeon and Site for the Trident II Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	180 (296)	60 (193)
Cases per site	443 (608)	176 (523)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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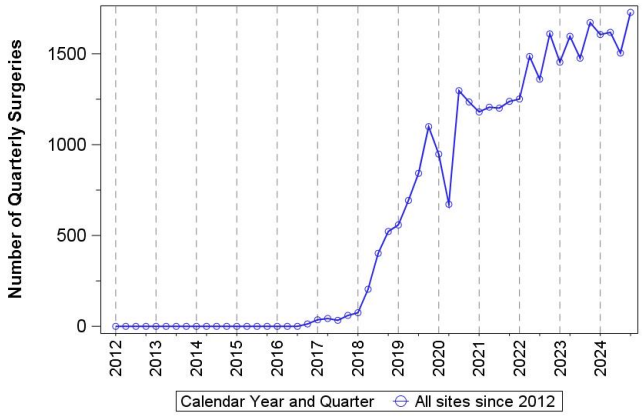


Figure 363. Utilization of the Trident II Cup in Primary THA Cases

Catalog Numbers of Acetabular Cups Used in the Analysis

7020452E	7000458F	7090462G
7020454E	7090452E	7421158F
7020456F	7000448D	7090464H
7020450D	7090448D	7000462G
7020448D	7090454E	7090446C
7020458F	7090456F	7020466H
7021152E	7421152E	7021164H
7021150D	7021146C	7421160G
7021154E	7090450D	7421146C
7021156F	7020444B	7421162G
7020460G	7090458F	7090466H
7021148D	7421154E	7090468I
7000452E	7000460G	7021144B
7021158F	7021162G	7021166H
7020446C	7020464H	7090470I
7000454E	7421156F	7090442A
7000456F	7421148D	7090472J
7020462G	7421150D	
7000450D	7090460G	
7021160G	7000446C	

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3.3.17 Trilogy

N = 1,616 primary cases were used for this analysis. Distribution of utilization: 24 surgeons across 12 sites used this implant in primary THA cases.

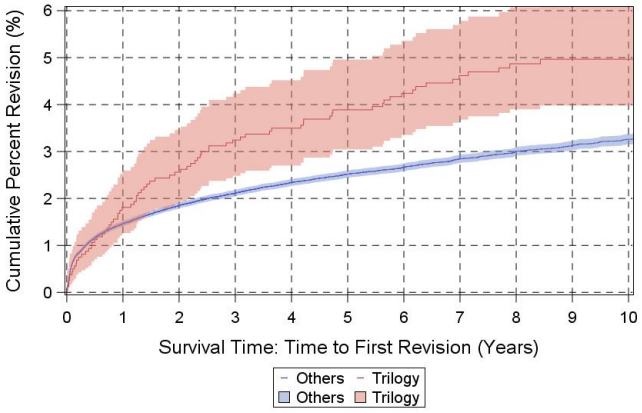


Figure 364. Cumulative Percent Revision Curve for the Trilogy Cup, Compared to All Other Cups in Primary THA Cases

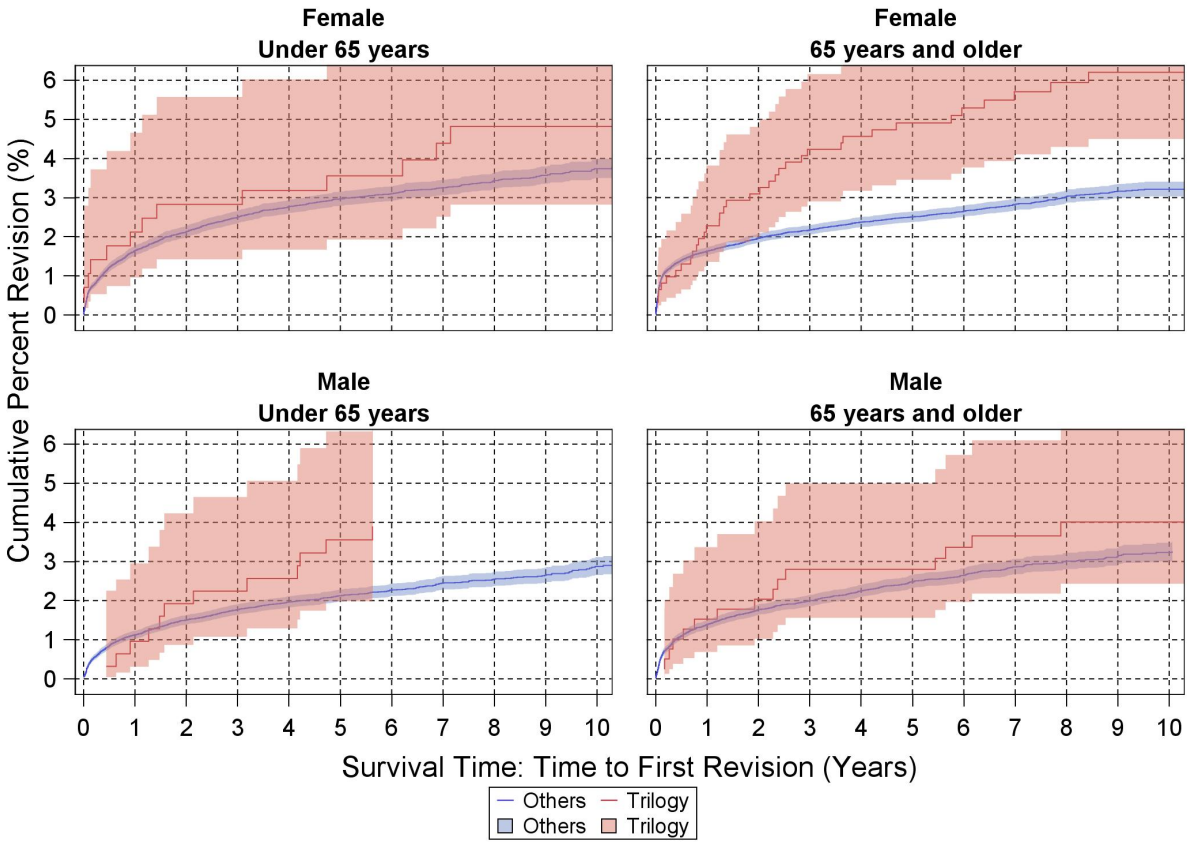


Figure 365. Cumulative Percent Revision Curve for the Trilogy Cup, Compared to All Other Cups in Primary THA Cases by Age and Sex

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Table 1063. Cumulative Percent Revision and Number at Risk for the Trilogy Cup in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,602	0.00 (0.00,0.00)	283	0.00 (0.00,0.00)	614	0.00 (0.00,0.00)	312	0.00 (0.00,0.00)	393	0.00 (0.00,0.00)
1	1,573	1.81 (1.26,2.59)	277	2.12 (0.96,4.66)	600	2.28 (1.36,3.82)	309	0.96 (0.31,2.95)	387	1.53 (0.69,3.37)
2	1,561	2.56 (1.89,3.46)	275	2.83 (1.42,5.57)	595	3.09 (1.98,4.81)	306	1.92 (0.87,4.23)	385	2.04 (1.02,4.03)
3	1,550	3.25 (2.48,4.24)	275	2.83 (1.42,5.57)	588	4.23 (2.90,6.16)	305	2.24 (1.08,4.65)	382	2.80 (1.56,5.00)
4	1,515	3.50 (2.70,4.52)	270	3.18 (1.67,6.02)	571	4.56 (3.17,6.54)	301	2.57 (1.29,5.06)	373	2.80 (1.56,5.00)
5	1,432	3.89 (3.04,4.96)	254	3.56 (1.93,6.51)	537	4.91 (3.46,6.95)	285	3.55 (1.98,6.32)	356	2.80 (1.56,5.00)
6	1,331	4.24 (3.35,5.36)	237	3.56 (1.93,6.51)	490	5.29 (3.77,7.40)	269	3.90 (2.23,6.76)	335	3.36 (1.97,5.72)
7	1,213	4.62 (3.68,5.78)	223	4.39 (2.51,7.61)	439	5.71 (4.11,7.90)	247	3.90 (2.23,6.76)	304	3.65 (2.18,6.10)
8	1,077	4.87 (3.90,6.07)	199	4.82 (2.82,8.17)	389	5.94 (4.29,8.19)	221	3.90 (2.23,6.76)	268	4.01 (2.43,6.58)
9	859	4.97 (3.98,6.19)	152	4.82 (2.82,8.17)	318	6.20 (4.50,8.52)	172	3.90 (2.23,6.76)	217	4.01 (2.43,6.58)
10	621	4.97 (3.98,6.19)	111	4.82 (2.82,8.17)	223	6.20 (4.50,8.52)	136	3.90 (2.23,6.76)	151	4.01 (2.43,6.58)

Table 1064. Reasons for First Revision Following Primary THA for Trilogy Cup Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	15	20.5
2	Dislocation/Instability	13	17.8
3	Joint Infection	12	16.4
4	Peri-prosthetic fracture - Femur	10	13.7
5	Malalignment	8	11.0
6	Metal Reaction/Metallosis	7	9.6
7	Implant Failure	4	5.5
8	Peri-prosthetic fracture - Acetabulum	2	2.7
9	Poly liner wear	1	1.4
10	Pain	1	1.4

Table 1065. Reasons for First Revision in the First 90 Days Following Primary THA for Trilogy Cup Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	6	60.0
2	Dislocation/Instability	2	20.0
3	Peri-prosthetic fracture - Acetabulum	1	10.0
4	Malalignment	1	10.0

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Table 1066. Reasons for First Revision Between 91 and 365 days Following Primary THA for Trilogy Cup Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	5	35.7
2	Joint Infection	4	28.6
3	Aseptic Loosening	2	14.3
4	Implant Failure	1	7.1
5	Peri-prosthetic fracture - Acetabulum	1	7.1
6	Peri-prosthetic fracture - Femur	1	7.1

Table 1067. Descriptive Statistics of Cases Receiving the Trilogy Cup in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	906	56.06	
Age (years)	1,616	67.93 (9.67)	68.00 (14.00)
Height (cm)	1,616	168.98 (10.42)	167.64 (16.80)
Weight (kg)	1,616	86.38 (19.63)	85.00 (27.39)
BMI(kg/m^2)	1,616	30.12 (5.74)	29.51 (7.57)
Smoker - Never (%)	727	44.99	
Smoker - Previous (%)	673	41.65	
Smoker - Current (%)	213	13.18	
Smoker - Unknown (%)	3	0.19	

Table 1068. Distribution of Approach Used for Trilogy Cup in Primary THA Cases

Approach	N	Percent
Anterior	7	0.4
Anterolateral	1152	71.3
Posterior	431	26.7
Transtrochanteric	23	1.4
Missing/unknown/other	3	0.2

Table 1069. Distribution of Head Size for Trilogy Cup in Primary THA Cases

Size (mm)	N	Percent
28	15	0.9
32	991	61.5
36	552	34.3
40	17	1.1
Missing/unknown/other	36	2.2

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Table 1070. Distribution of Bearing Surface for Trilogy Cup in Primary THA Cases

Bearing	N	Percent
Metal-on-plastic	1,205	74.6
Ceramic-on-plastic	370	22.9
Ceramic-on-ceramic	0	0.0
Metal-on-metal	0	0.0
Dual mobility	0	0.0
Missing/unknown/other	41	2.5

Table 1071. Distribution of Polyethylene Used for Trilogy Cup Cases in Which Polyethylene Was Used in Primary THA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,611	100.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	0	0.0

Table 1072. Volume of Cases by Surgeon and Site for the Trilogy Cup in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	67 (127)	12 (69)
Cases per site	134 (205)	33 (204)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

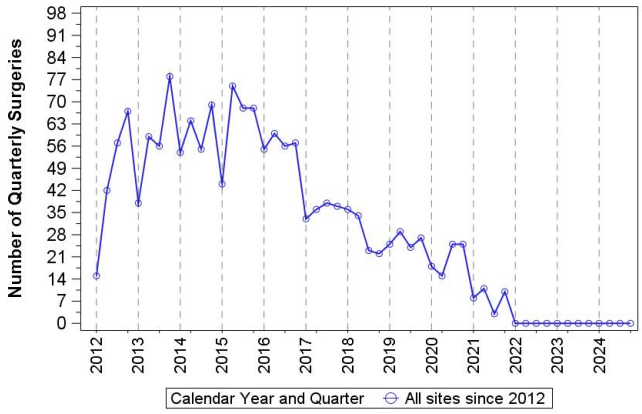


Figure 366. Utilization of the Trilogy Cup in Primary THA Cases

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Catalog Numbers of Acetabular Cups Used in the Analysis

620005222	620004822	620005824
620005422	620005020	620006024
620005822	620006422	620006622
620005022	620006224	620006624
620005622	620005024	
620006022	620005424	
620006222	620005624	

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3.4 Resurfacing THA

The discrepancy between the number of cases listed at the beginning of an implant combination and N at year 0 in the table following the CPR figures is due to deaths. The former number is the total number of cases; the latter is the number of cases used to estimate the CPR considering deaths as censored events.

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3.4.1 BHR/BHR

N = 1,294 primary cases were used for this analysis. Distribution of utilization: 25 surgeons across 24 sites used this implant combination in primary THA cases.

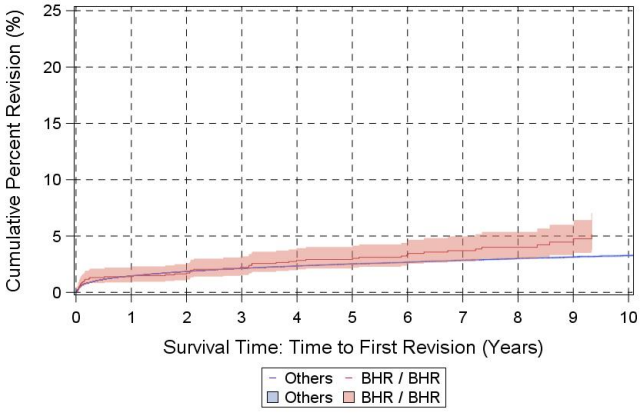


Figure 367. Cumulative Percent Revision Curve for the BHR/BHR Combination, Compared to All Other Implant Combinations in Primary THA Cases

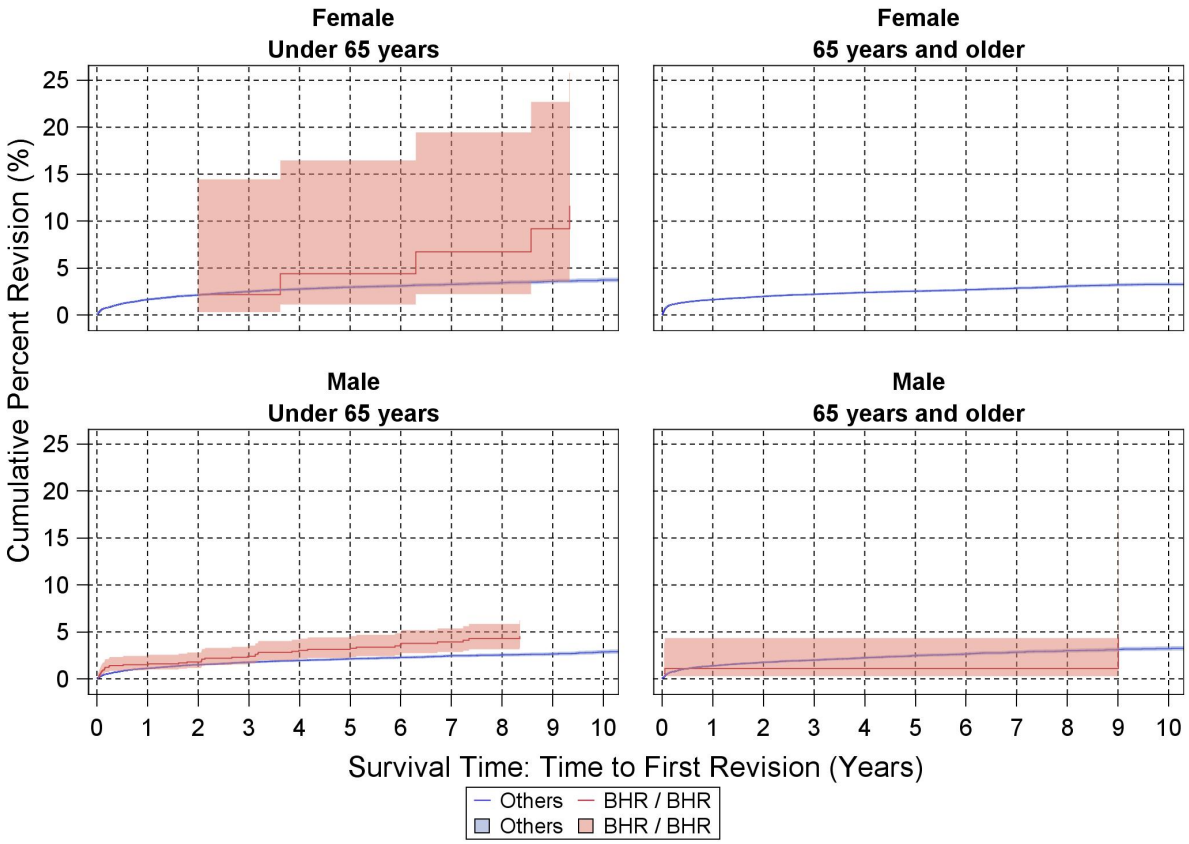


Figure 368. Cumulative Percent Revision Curve for the BHR/BHR Combination, Compared to All Other Implant Combinations in Primary THA Cases by Age and Sex

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Table 1073. Cumulative Percent Revision and Number at Risk for the BHR/BHR Combination in Primary THA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,292	0.00 (0.00,0.00)	46	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	1,063	0.00 (0.00,0.00)	181	0.00 (0.00,0.00)
1	1,241	1.40 (0.88,2.21)	46	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	1,029	1.51 (0.93,2.45)	164	1.10 (0.28,4.35)
2	1,191	1.72 (1.14,2.60)	45	2.17 (0.31,14.45)	*	0.00 (0.00,0.00)	987	1.80 (1.15,2.81)	157	1.10 (0.28,4.35)
3	1,145	2.22 (1.54,3.20)	44	2.17 (0.31,14.45)	*	0.00 (0.00,0.00)	948	2.40 (1.63,3.54)	151	1.10 (0.28,4.35)
4	1,088	2.83 (2.04,3.92)	43	4.40 (1.12,16.46)	*	0.00 (0.00,0.00)	904	3.03 (2.14,4.29)	140	1.10 (0.28,4.35)
5	1,009	2.92 (2.12,4.03)	43	4.40 (1.12,16.46)	*	0.00 (0.00,0.00)	839	3.14 (2.23,4.42)	126	1.10 (0.28,4.35)
6	853	3.34 (2.46,4.54)	42	4.40 (1.12,16.46)	*	0.00 (0.00,0.00)	710	3.64 (2.64,5.03)	100	1.10 (0.28,4.35)
7	693	3.70 (2.75,4.98)	39	6.73 (2.22,19.45)	*	0.00 (0.00,0.00)	584	3.93 (2.87,5.38)	69	1.10 (0.28,4.35)
8	535	4.01 (2.99,5.37)	38	6.73 (2.22,19.45)	*	0.00 (0.00,0.00)	441	4.30 (3.15,5.85)	55	1.10 (0.28,4.35)
9	330	4.46 (3.31,6.00)	37	9.18 (3.54,22.69)	*	0.00 (0.00,0.00)	262	4.56 (3.33,6.23)	30	1.10 (0.28,4.35)
10	132	5.14 (3.75,7.05)	16	11.64 (5.00,25.78)	0	N/A	108	4.56 (3.33,6.23)	*	4.40 (0.98,18.52)

* Denotes that the number of cases is between 1 and 10.

Table 1074. Reasons for First Revision Following Primary THA for BHR/BHR Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	15	31.3
2	Aseptic Loosening	13	27.1
3	Metal Reaction/Metallosis	9	18.8
4	Dislocation/Instability	3	6.2
5	Implant Failure	3	6.2
6	Joint Infection	2	4.2
7	Pain	2	4.2
8	Malalignment	1	2.1

Table 1075. Reasons for First Revision in the First 90 Days Following Primary THA for BHR/BHR Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	12	75.0
2	Dislocation/Instability	2	12.5
3	Implant Failure	2	12.5

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Table 1076. Reasons for First Revision Between 91 and 365 days Following Primary THA for BHR/BHR Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	50.0
2	Peri-prosthetic fracture - Femur	1	50.0

Table 1077. Descriptive Statistics of Cases Receiving the BHR/BHR Combination in Primary THA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	47	3.63	
Age (years)	1,294	54.73 (8.92)	55.00 (12.00)
Height (cm)	1,294	179.17 (7.44)	180.00 (9.00)
Weight (kg)	1,294	99.66 (19.87)	96.75 (25.08)
BMI(kg/m^2)	1,294	30.96 (5.44)	30.01 (6.60)
Smoker - Never (%)	804	62.13	
Smoker - Previous (%)	323	24.96	
Smoker - Current (%)	166	12.83	
Smoker - Unknown (%)	1	0.08	

Table 1078. Distribution of Approach Used for BHR/BHR Combination in Primary THA Cases

Approach	N	Percent
Anterior	18	1.4
Anterolateral	789	61.0
Posterior	368	28.4
Transtrochanteric	117	9.0
Missing/unknown/other	2	0.1

Table 1079. Volume of Cases by Surgeon and Site for the BHR/BHR Combination in Primary THA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	51 (141)	8 (25)
Cases per site	53 (144)	9 (28)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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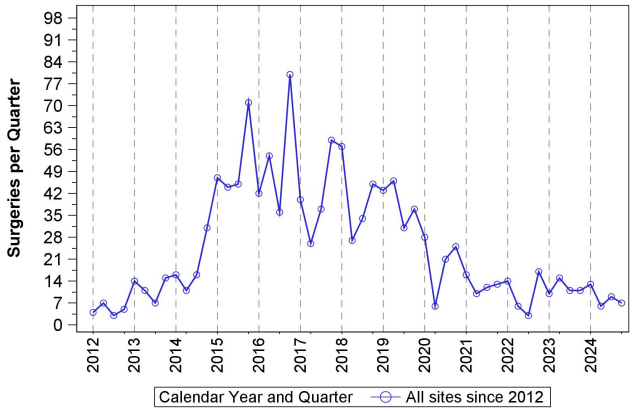


Figure 369. Utilization of the BHR/BHR Combination in Primary THA Cases

Catalog Numbers of Femoral Components Used in the Analysis

74123148	74121146	74121158
74121150	74123156	74123140
74123152	74121142	
74121154	74123144	

Catalog Numbers of Acetabular Cups Used in the Analysis

74122154	74122162	74122160
74120156	74122156	74120154
74122158	74120148	74120164
74120160	74122150	74122148
74120152	74120158	

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3.5 TKA

The discrepancy between the number of cases listed at the beginning of an implant combination and N at year 0 in the table following the CPR figures is due to deaths. The former number is the total number of cases; the latter is the number of cases used to estimate the CPR considering deaths as censored events.

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3.5.1 Attune CR (Cemented)/Attune

N = 3,709 primary cases were used for this analysis. Distribution of utilization: 58 surgeons across 29 sites used this implant combination in primary TKA cases.

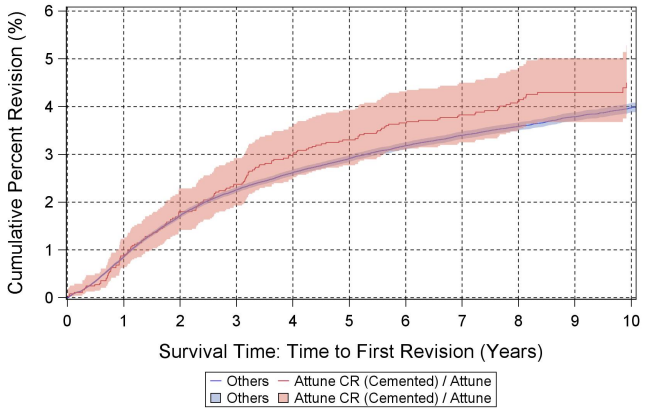


Figure 370. Cumulative Percent Revision Curve for the Attune CR (Cemented)/Attune Combination, Compared to All Other Implant Combinations in Primary TKA Cases

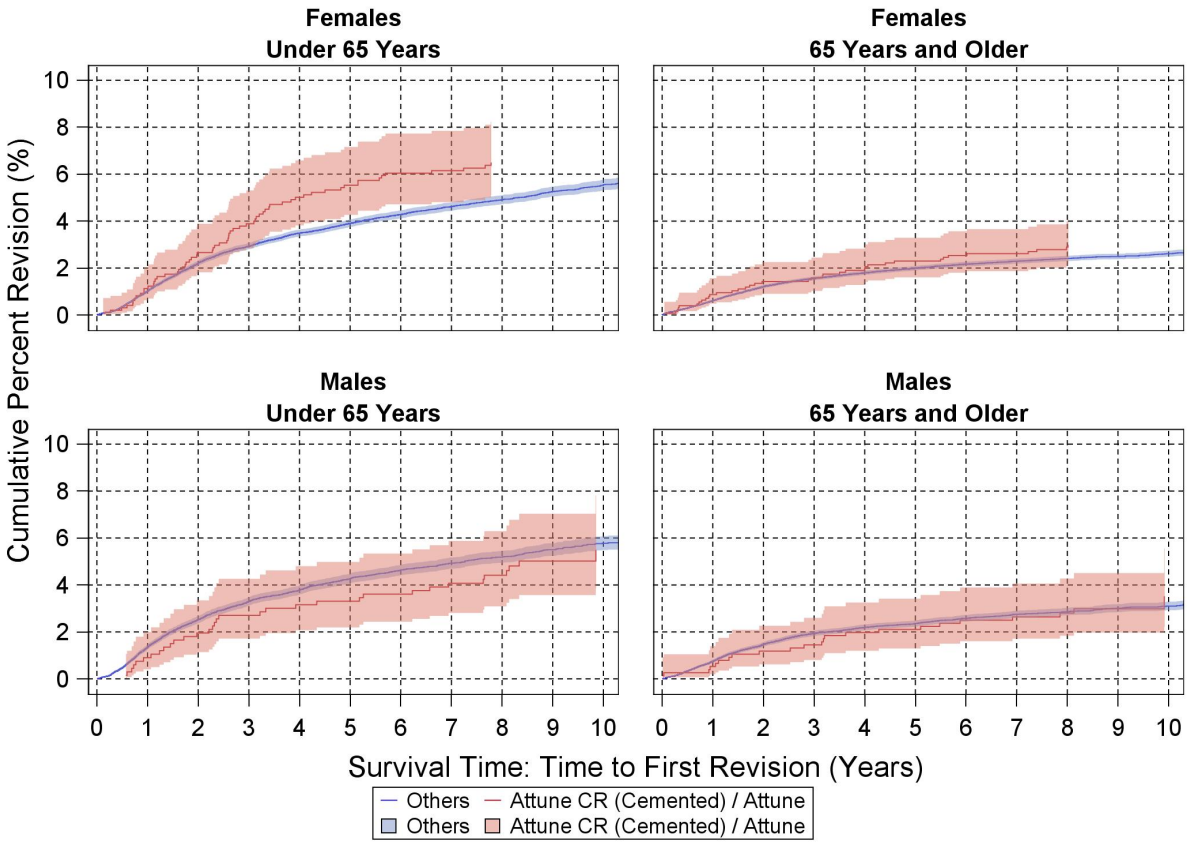


Figure 371. Cumulative Percent Revision Curve for the Attune CR (Cemented)/Attune Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1080. Cumulative Percent Revision and Number at Risk for the Attune CR (Cemented)/Attune Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	3,664	0.00 (0.00,0.00)	977	0.00 (0.00,0.00)	1,262	0.00 (0.00,0.00)	665	0.00 (0.00,0.00)	760	0.00 (0.00,0.00)
1	3,632	0.87 (0.62,1.23)	966	1.13 (0.63,2.02)	1,251	0.87 (0.48,1.57)	659	0.90 (0.41,2.00)	756	0.53 (0.20,1.40)
2	3,598	1.80 (1.42,2.29)	951	2.66 (1.82,3.88)	1,244	1.43 (0.90,2.25)	652	1.95 (1.14,3.34)	751	1.18 (0.62,2.26)
3	3,575	2.37 (1.93,2.92)	938	3.89 (2.85,5.31)	1,242	1.58 (1.03,2.45)	647	2.71 (1.71,4.26)	748	1.45 (0.80,2.60)
4	3,552	3.00 (2.50,3.61)	927	5.02 (3.82,6.58)	1,237	1.98 (1.34,2.92)	644	3.16 (2.07,4.80)	744	1.97 (1.19,3.25)
5	3,541	3.30 (2.77,3.93)	922	5.53 (4.26,7.16)	1,233	2.30 (1.60,3.29)	643	3.31 (2.19,4.98)	743	2.11 (1.30,3.41)
6	3,511	3.66 (3.10,4.32)	912	6.04 (4.71,7.73)	1,225	2.54 (1.80,3.57)	639	3.61 (2.43,5.34)	735	2.50 (1.60,3.89)
7	3,361	3.83 (3.25,4.50)	878	6.15 (4.81,7.85)	1,168	2.62 (1.87,3.66)	610	4.07 (2.81,5.88)	705	2.64 (1.71,4.06)
8	2,747	4.11 (3.51,4.81)	735	6.50 (5.11,8.24)	941	2.89 (2.09,3.99)	513	4.41 (3.09,6.29)	558	2.81 (1.84,4.27)
9	1,826	4.29 (3.68,5.01)	505	6.50 (5.11,8.24)	613	2.99 (2.18,4.11)	339	5.02 (3.57,7.04)	369	2.99 (1.97,4.51)
10	806	4.50 (3.83,5.28)	234	6.50 (5.11,8.24)	247	2.99 (2.18,4.11)	162	5.50 (3.86,7.81)	163	3.52 (2.22,5.55)

Table 1081. Reasons for First Revision Following Primary TKA for Attune CR (Cemented)/Attune Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	55	35.5
2	Dislocation/Instability	40	25.8
3	Joint Infection	27	17.4
4	Arthrofibrosis	12	7.7
5	Implant Failure	7	4.5
6	Pain	7	4.5
7	Malalignment	3	1.9
8	Metal Reaction/Metallosis	2	1.3
9	Extensor mechanism failure	1	0.6
10	Osteolysis	1	0.6

Table 1082. Reasons for First Revision in the First 90 Days Following Primary TKA for Attune CR (Cemented)/Attune Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	3	100.0

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Table 1083. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Attune CR (Cemented)/Attune Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	7	25.0
2	Joint Infection	6	21.4
3	Aseptic Loosening	4	14.3
4	Pain	3	10.7
5	Arthrofibrosis	3	10.7
6	Implant Failure	2	7.1
7	Metal Reaction/Metallosis	1	3.6
8	Malalignment	1	3.6
9	Extensor mechanism failure	1	3.6

Table 1084. Descriptive Statistics of Cases Receiving the Attune CR (Cemented)/Attune Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,257	60.9	
Age (years)	3,709	65.6 (9.1)	66 (13)
Height (cm)	3,707	168.7 (10.6)	167.6 (17.8)
Weight (kg)	3,707	95.9 (21)	94.2 (27.9)
BMI(kg/m^2)	3,707	33.7 (6.7)	33 (8.9)
Smoker - Never (%)	1,855	50	
Smoker - Previous (%)	1,450	39.1	
Smoker - Current (%)	371	10	
Smoker - Unknown (%)	33	0.9	

Table 1085. Distribution of Approach Used for Attune CR (Cemented)/Attune Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	3,159	85.2
Mid-vastus	528	14.2
Sub-vastus	9	0.2
Lateral parapatellar	5	0.1
Missing/unknown/other	8	0.2

Table 1086. Distribution of Polyethylene Used for Attune CR (Cemented)/Attune Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.0
XLPE	0	0.0
Antioxidant XLPE	3,692	99.5
Missing/unknown/other	16	0.4

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Table 1087. Volume of Cases by Surgeon and Site for the Attune CR (Cemented)/Attune Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	64 (114)	10 (48)
Cases per site	127 (183)	59 (159)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

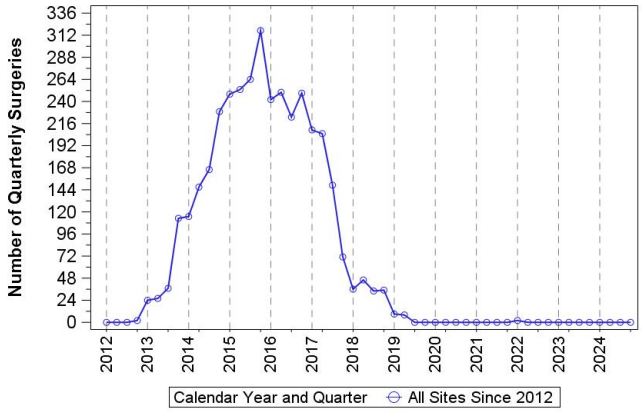


Figure 372. Utilization of the Attune CR (Cemented)/Attune Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

150400207	150400126	150400203
150400107	150400125	150400103
150400205	150400225	150400210
150400106	150400204	150400110
150400105	150400104	150400123
150400208	150400209	150400202
150400206	150400224	150400223
150400226	150400109	150400102
150400108	150400124	

Catalog Numbers of Tibial Components Used in the Analysis

150600005	150600009	150610006
150600004	150600010	150610007
150600006	150610004	150600001
150600007	150610005	150610003
150600008	150610008	
150600003	150600002	

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3.5.2 Attune CR (Cemented)/Attune S+

N = 5,490 primary cases were used for this analysis. Distribution of utilization: 49 surgeons across 34 sites used this implant combination in primary TKA cases.

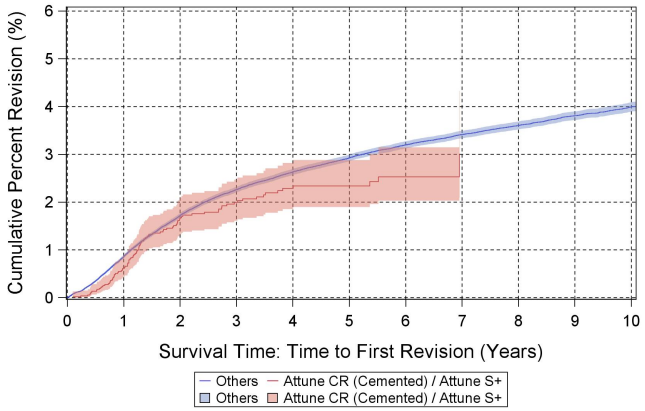


Figure 373. Cumulative Percent Revision Curve for the Attune CR (Cemented)/Attune S+ Combination, Compared to All Other Implant Combinations in Primary TKA Cases

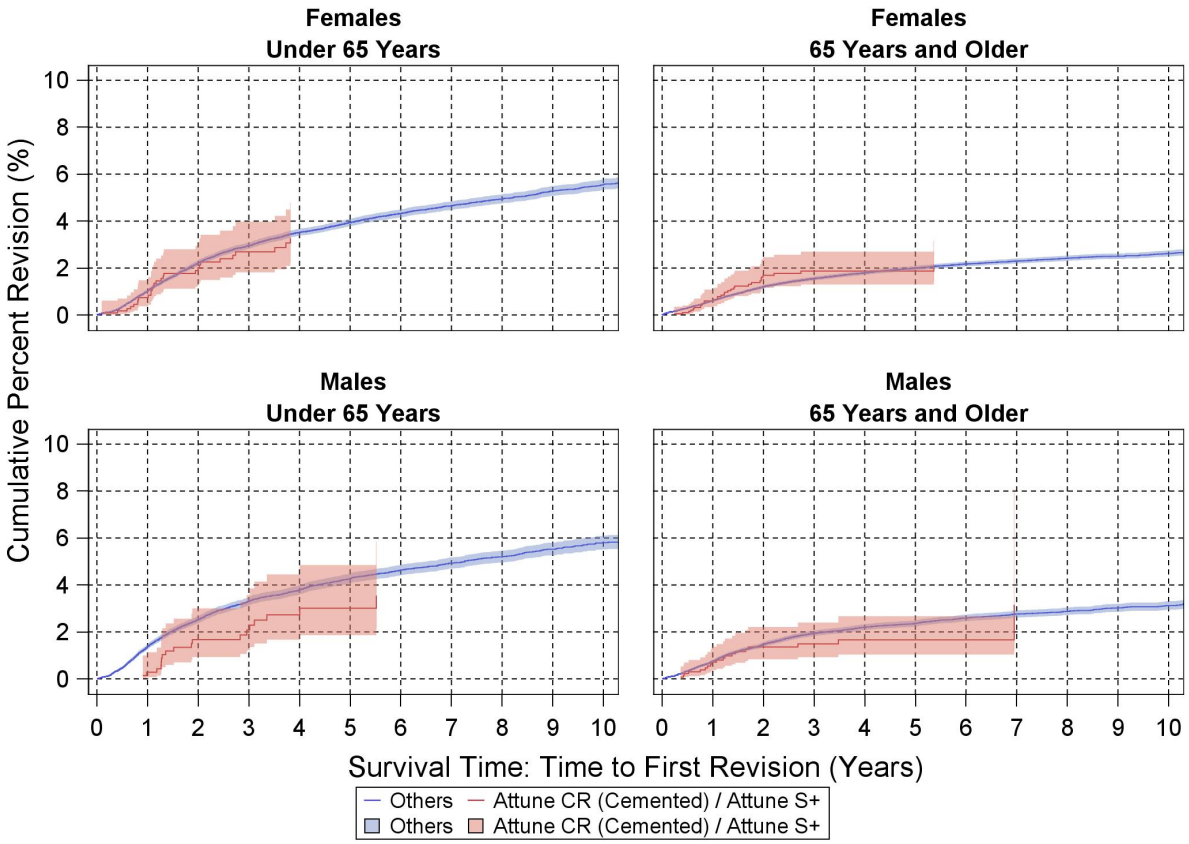


Figure 374. Cumulative Percent Revision Curve for the Attune CR (Cemented)/Attune S+ Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1088. Cumulative Percent Revision and Number at Risk for the Attune CR (Cemented)/Attune S+ Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	5,478	0.00 (0.00,0.00)	1,170	0.00 (0.00,0.00)	2,074	0.00 (0.00,0.00)	808	0.00 (0.00,0.00)	1,426	0.00 (0.00,0.00)
1	4,527	0.61 (0.43,0.88)	996	0.74 (0.37,1.48)	1,656	0.60 (0.33,1.08)	695	0.28 (0.07,1.13)	1,180	0.72 (0.37,1.37)
2	3,555	1.67 (1.33,2.10)	802	2.01 (1.30,3.11)	1,250	1.69 (1.16,2.46)	581	1.67 (0.93,3.00)	922	1.36 (0.83,2.21)
3	2,691	1.99 (1.61,2.47)	615	2.69 (1.82,3.98)	929	1.87 (1.30,2.70)	471	2.08 (1.21,3.57)	676	1.49 (0.92,2.40)
4	1,924	2.29 (1.85,2.82)	423	3.28 (2.24,4.77)	672	1.87 (1.30,2.70)	348	2.73 (1.67,4.45)	481	1.66 (1.04,2.67)
5	1,280	2.34 (1.90,2.88)	250	3.28 (2.24,4.77)	450	1.87 (1.30,2.70)	231	3.01 (1.86,4.85)	349	1.66 (1.04,2.67)
6	734	2.53 (2.03,3.15)	122	3.28 (2.24,4.77)	275	2.12 (1.43,3.15)	131	3.55 (2.14,5.84)	206	1.66 (1.04,2.67)
7	169	3.01 (2.09,4.33)	21	3.28 (2.24,4.77)	65	2.12 (1.43,3.15)	30	3.55 (2.14,5.84)	53	3.15 (1.21,8.08)
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

Table 1089. Reasons for First Revision Following Primary TKA for Attune CR (Cemented)/Attune S+ Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	29	29.9
2	Joint Infection	28	28.9
3	Aseptic Loosening	16	16.5
4	Arthrofibrosis	14	14.4
5	Pain	3	3.1
6	Malalignment	2	2.1
7	Extensor mechanism failure	1	1.0
8	Implant Failure	1	1.0
9	Osteolysis	1	1.0
10	Patellofemoral Joint	1	1.0
	Unknown/missing/other	1	1.0

Table 1090. Reasons for First Revision in the First 90 Days Following Primary TKA for Attune CR (Cemented)/Attune S+ Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	2	100.0

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Table 1091. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Attune CR (Cemented)/Attune S+ Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	13	43.3
2	Dislocation/Instability	8	26.7
3	Arthrofibrosis	3	10.0
4	Aseptic Loosening	2	6.7
5	Pain	2	6.7
6	Peri-prosthetic fracture - Femur	1	3.3
7	Patellofemoral Joint	1	3.3

Table 1092. Descriptive Statistics of Cases Receiving the Attune CR (Cemented)/Attune S+ Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	3,248	59.2	
Age (years)	5,490	67.5 (8.9)	68 (12)
Height (cm)	5,485	169.4 (10.6)	167.6 (15.8)
Weight (kg)	5,485	94 (20.8)	92.8 (28.4)
BMI(kg/m^2)	5,485	32.7 (6.1)	32.1 (8.4)
Smoker - Never (%)	2,953	53.8	
Smoker - Previous (%)	2,015	36.7	
Smoker - Current (%)	519	9.5	
Smoker - Unknown (%)	0	0.0	

Table 1093. Distribution of Approach Used for Attune CR (Cemented)/Attune S+ Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	5,333	97.1
Mid-vastus	140	2.6
Sub-vastus	1	0.0
Lateral parapatellar	5	0.1
Missing/unknown/other	11	0.2

Table 1094. Distribution of Polyethylene Used for Attune CR (Cemented)/Attune S+ Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	459	8.4
XLPE	0	0.0
Antioxidant XLPE	4,931	89.8
Missing/unknown/other	100	1.8

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Table 1095. Volume of Cases by Surgeon and Site for the Attune CR (Cemented)/Attune S+ Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	112 (230)	12 (132)
Cases per site	161 (297)	18 (240)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

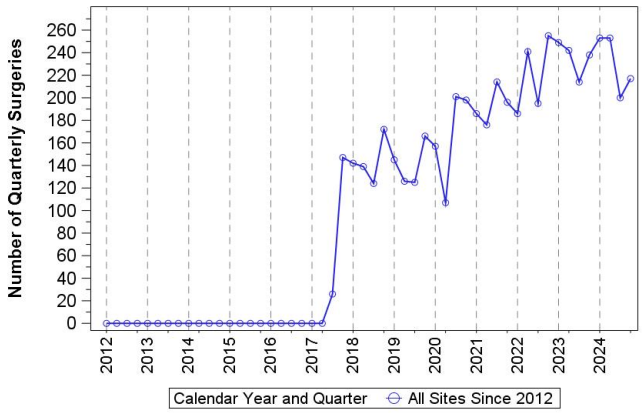


Figure 375. Utilization of the Attune CR (Cemented)/Attune S+ Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

150400107	150400105	150400203
150400207	150400125	150400103
150400206	150400225	150400110
150400226	150400204	150400210
150400208	150400104	150400223
150400108	150400209	150400123
150400126	150400109	150400102
150400205	150400224	150400202
150400106	150400124	

Catalog Numbers of Tibial Components Used in the Analysis

150670005	150680005	150680003
150670004	150670010	150680002
150670007	150680004	150670001
150670006	150670002	150680009
150670008	150680007	
150670003	150680006	
150670009	150680008	

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3.5.3 Attune CR/PS (Cemented)/Attune Revision

N = 918 primary cases were used for this analysis. Distribution of utilization: 34 surgeons across 19 sites used this implant combination in primary TKA cases.

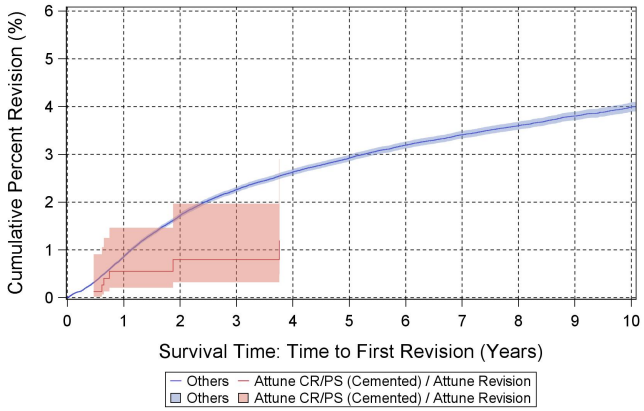


Figure 376. Cumulative Percent Revision Curve for the Attune CR/PS (Cemented)/Attune Revision Combination, Compared to All Other Implant Combinations in Primary TKA Cases

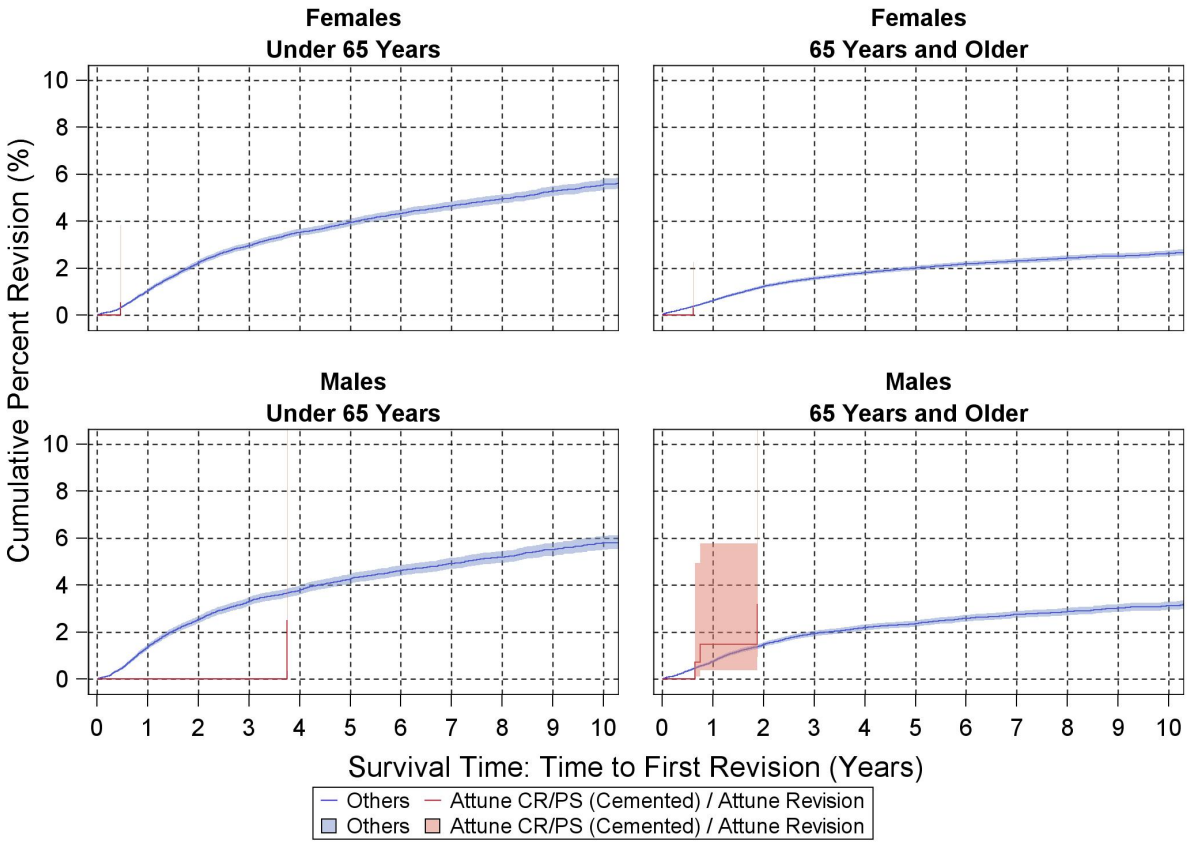


Figure 377. Cumulative Percent Revision Curve for the Attune CR/PS (Cemented)/Attune Revision Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1096. Cumulative Percent Revision and Number at Risk for the Attune CR/PS (Cemented)/Attune Revision Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	918	0.00 (0.00,0.00)	212	0.00 (0.00,0.00)	386	0.00 (0.00,0.00)	140	0.00 (0.00,0.00)	180	0.00 (0.00,0.00)
1	622	0.55 (0.21,1.46)	149	0.55 (0.08,3.84)	271	0.32 (0.05,2.25)	87	0.00 (0.00,0.00)	115	1.47 (0.37,5.77)
2	395	0.80 (0.32,1.97)	103	0.55 (0.08,3.84)	182	0.32 (0.05,2.25)	56	0.00 (0.00,0.00)	54	3.20 (0.94,10.63)
3	306	0.80 (0.32,1.97)	73	0.55 (0.08,3.84)	141	0.32 (0.05,2.25)	49	0.00 (0.00,0.00)	43	3.20 (0.94,10.63)
4	221	1.20 (0.49,2.90)	54	0.55 (0.08,3.84)	104	0.32 (0.05,2.25)	32	2.50 (0.36,16.45)	31	3.20 (0.94,10.63)
5	131	1.20 (0.49,2.90)	26	0.55 (0.08,3.84)	69	0.32 (0.05,2.25)	16	2.50 (0.36,16.45)	20	3.20 (0.94,10.63)
6	65	1.20 (0.49,2.90)	*	0.55 (0.08,3.84)	36	0.32 (0.05,2.25)	*	2.50 (0.36,16.45)	11	3.20 (0.94,10.63)
7	25	1.20 (0.49,2.90)	*	0.55 (0.08,3.84)	15	0.32 (0.05,2.25)	*	2.50 (0.36,16.45)	*	3.20 (0.94,10.63)
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 1097. Reasons for First Revision Following Primary TKA for Attune CR/PS (Cemented)/Attune Revision Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	2	33.3
2	Arthrofibrosis	1	16.7
3	Aseptic Loosening	1	16.7
4	Dislocation/Instability	1	16.7
5	Extensor mechanism failure	1	16.7

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1098. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Attune CR/PS (Cemented)/Attune Revision Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	2	50.0
2	Dislocation/Instability	1	25.0
3	Arthrofibrosis	1	25.0

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Table 1099. Descriptive Statistics of Cases Receiving the Attune CR/PS (Cemented)/Attune Revision Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	598	65.1	
Age (years)	918	67 (9.6)	67 (13)
Height (cm)	909	168.6 (10.4)	167.6 (15.3)
Weight (kg)	909	101.8 (24.8)	101.3 (33.1)
BMI(kg/m^2)	909	35.8 (8)	35.6 (11.2)
Smoker - Never (%)	503	54.8	
Smoker - Previous (%)	342	37.3	
Smoker - Current (%)	73	8	
Smoker - Unknown (%)	0	0.0	

Table 1100. Distribution of Approach Used for Attune CR/PS (Cemented)/Attune Revision Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	903	98.4
Mid-vastus	5	0.5
Sub-vastus	0	0.0
Lateral parapatellar	0	0.0
Missing/unknown/other	10	1.1

Table 1101. Distribution of Polyethylene Used for Attune CR/PS (Cemented)/Attune Revision Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	188	20.5
XLPE	0	0.0
Antioxidant XLPE	689	75.1
Missing/unknown/other	41	4.5

Table 1102. Volume of Cases by Surgeon and Site for the Attune CR/PS (Cemented)/Attune Revision Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	27 (59)	4 (17)
Cases per site	48 (63)	8 (114)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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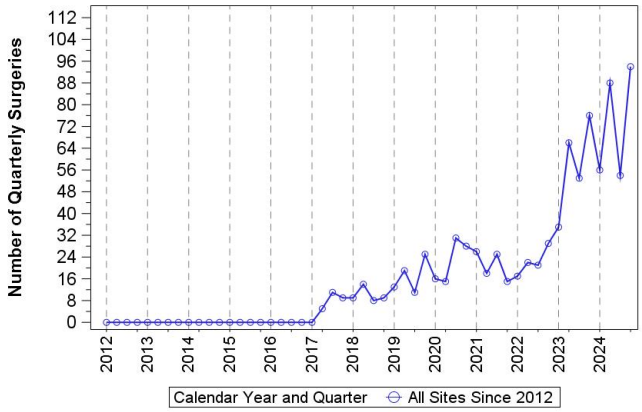


Figure 378. Utilization of the Attune CR/PS (Cemented)/Attune Revision Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

150400107	150400204	150400203
150400205	150410125	150400209
150400106	150400126	150410109
150400105	150410106	150410204
150400206	150400108	150400124
150410107	150400125	150400210
150400207	150410205	150410210
150410207	150400226	150410223
150410226	150400225	150400110
150410208	150410105	150410103
150400104	150400103	150410110
150410126	150410104	150410202
150400208	150410124	150410203
150410108	150410209	
150410206	150410224	
150410225	150400109	

Catalog Numbers of Tibial Components Used in the Analysis

150640005	150660004	150660002
150640004	150660005	151600605
150640006	150660006	150640010
150640007	150660007	150640009
150640003	150660003	
150640008	150660008	

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3.5.4 Attune PS (Cemented)/Attune

N = 3,255 primary cases were used for this analysis. Distribution of utilization: 47 surgeons across 26 sites used this implant combination in primary TKA cases.

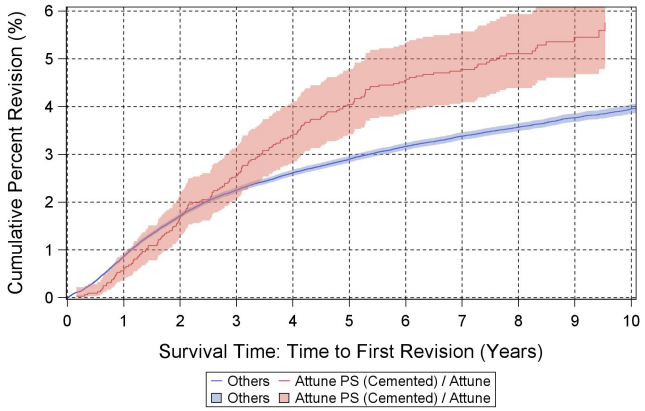


Figure 379. Cumulative Percent Revision Curve for the Attune PS (Cemented)/Attune Combination, Compared to All Other Implant Combinations in Primary TKA Cases

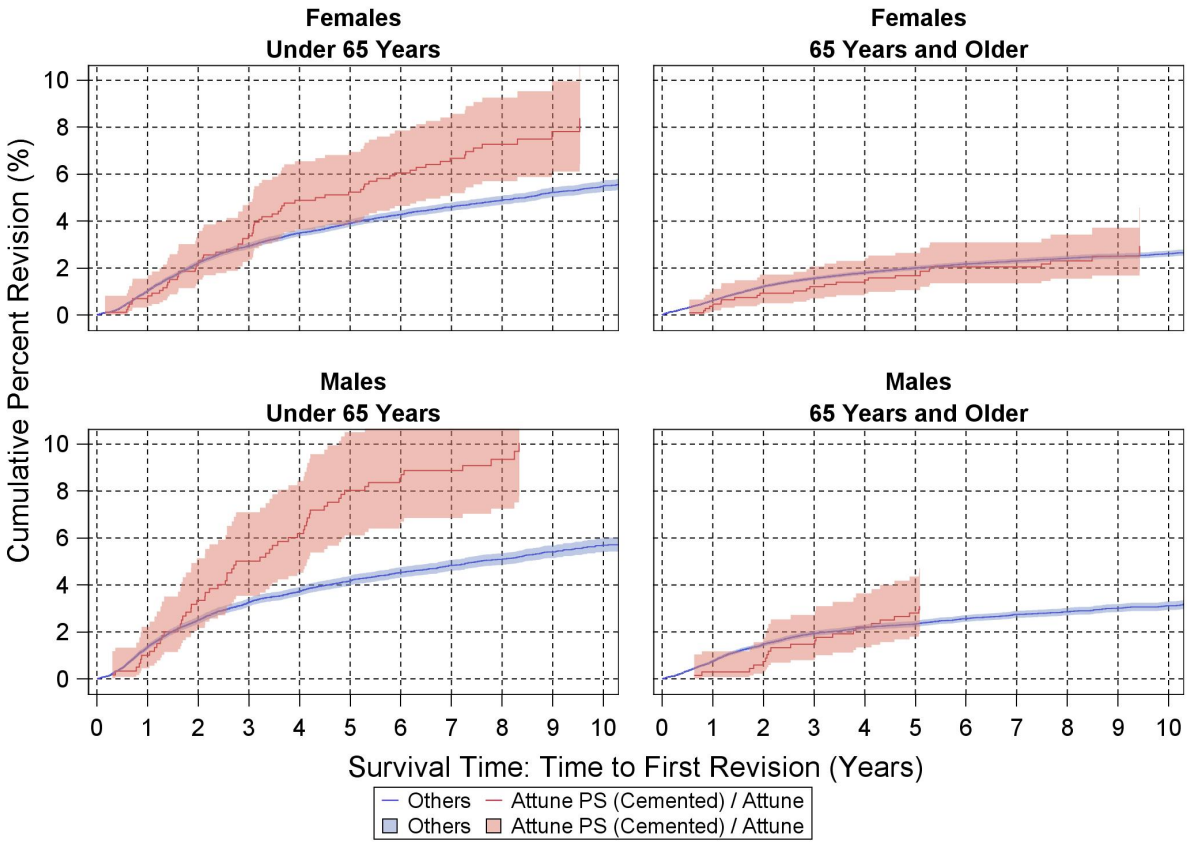


Figure 380. Cumulative Percent Revision Curve for the Attune PS (Cemented)/Attune Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1103. Cumulative Percent Revision and Number at Risk for the Attune PS (Cemented)/Attune Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	3,215	0.00 (0.00,0.00)	860	0.00 (0.00,0.00)	1,076	0.00 (0.00,0.00)	598	0.00 (0.00,0.00)	678	0.00 (0.00,0.00)
1	3,197	0.56 (0.35,0.89)	854	0.70 (0.31,1.55)	1,072	0.37 (0.14,0.99)	592	1.00 (0.45,2.22)	676	0.29 (0.07,1.17)
2	3,161	1.68 (1.29,2.19)	841	2.21 (1.41,3.44)	1,066	0.93 (0.50,1.72)	578	3.34 (2.17,5.14)	673	0.74 (0.31,1.76)
3	3,131	2.55 (2.06,3.16)	831	3.37 (2.36,4.82)	1,061	1.21 (0.70,2.07)	568	5.02 (3.53,7.10)	668	1.47 (0.80,2.72)
4	3,102	3.42 (2.85,4.11)	818	4.88 (3.63,6.55)	1,058	1.49 (0.91,2.42)	561	6.19 (4.52,8.44)	662	2.21 (1.34,3.64)
5	3,076	4.05 (3.42,4.79)	815	5.23 (3.93,6.95)	1,051	1.67 (1.06,2.64)	549	8.03 (6.11,10.51)	658	2.80 (1.80,4.36)
6	3,017	4.55 (3.88,5.32)	798	6.05 (4.64,7.86)	1,031	2.05 (1.35,3.09)	537	8.53 (6.55,11.07)	648	3.10 (2.03,4.71)
7	2,651	4.78 (4.09,5.57)	690	6.67 (5.19,8.57)	919	2.05 (1.35,3.09)	460	8.87 (6.85,11.45)	579	3.10 (2.03,4.71)
8	1,845	5.11 (4.39,5.94)	498	7.27 (5.70,9.26)	632	2.30 (1.55,3.43)	307	9.35 (7.25,12.02)	405	3.10 (2.03,4.71)
9	977	5.45 (4.68,6.34)	288	7.81 (6.11,9.96)	323	2.50 (1.68,3.72)	160	10.05 (7.80,12.92)	204	3.10 (2.03,4.71)
10	267	5.76 (4.90,6.77)	71	8.39 (6.44,10.89)	93	2.94 (1.88,4.57)	53	10.05 (7.80,12.92)	50	3.10 (2.03,4.71)

Table 1104. Reasons for First Revision Following Primary TKA for Attune PS (Cemented)/Attune Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	80	47.9
2	Joint Infection	31	18.6
3	Dislocation/Instability	28	16.8
4	Implant Failure	7	4.2
5	Arthrofibrosis	6	3.6
6	Malalignment	6	3.6
7	Pain	5	3.0
8	Peri-prosthetic fracture - Femur	2	1.2
9	Poly liner wear	2	1.2

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1105. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Attune PS (Cemented)/Attune Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	6	37.5
2	Joint Infection	6	37.5
3	Aseptic Loosening	2	12.5
4	Implant Failure	1	6.2
5	Pain	1	6.2

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Table 1106. Descriptive Statistics of Cases Receiving the Attune PS (Cemented)/Attune Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,958	60.2	
Age (years)	3,255	65.6 (9.5)	66 (13)
Height (cm)	3,003	168.9 (10.5)	168 (16.8)
Weight (kg)	3,003	96.2 (21.4)	94.8 (27.3)
BMI(kg/m^2)	3,003	33.7 (6.7)	33.1 (9.3)
Smoker - Never (%)	1,660	51	
Smoker - Previous (%)	1,239	38.1	
Smoker - Current (%)	345	10.6	
Smoker - Unknown (%)	11	0.3	

Table 1107. Distribution of Approach Used for Attune PS (Cemented)/Attune Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	2,894	88.9
Mid-vastus	107	3.3
Sub-vastus	0	0.0
Lateral parapatellar	1	0.0
Missing/unknown/other	253	7.8

Table 1108. Distribution of Polyethylene Used for Attune PS (Cemented)/Attune Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	0	0.0
Antioxidant XLPE	3,252	99.9
Missing/unknown/other	3	0.1

Table 1109. Volume of Cases by Surgeon and Site for the Attune PS (Cemented)/Attune Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	69 (115)	10 (94)
Cases per site	125 (234)	25 (85)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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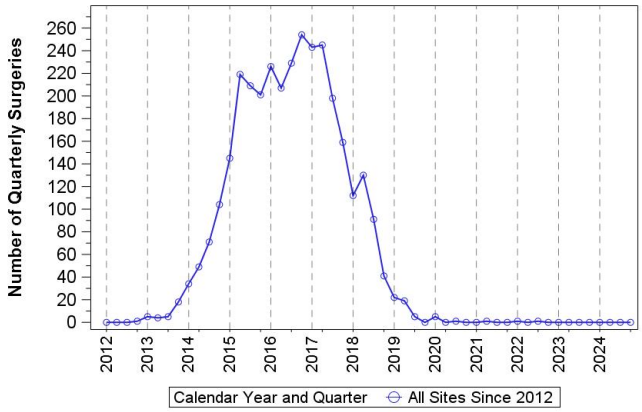


Figure 381. Utilization of the Attune PS (Cemented)/Attune Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

150410207	150410126	150410103
150410107	150410225	150410210
150410206	150410125	150410203
150410208	150410104	150410110
150410108	150410209	150410223
150410226	150410204	150410123
150410205	150410109	
150410106	150410224	
150410105	150410124	

Catalog Numbers of Tibial Components Used in the Analysis

150600005	150610007	150600010
150610005	150600008	150610002
150600006	150610008	150600002
150600004	150600003	150610010
150610004	150610003	
150610006	150600009	
150600007	150610009	

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3.5.5 Attune PS (Cemented)/Attune S+

N = 4,752 primary cases were used for this analysis. Distribution of utilization: 47 surgeons across 35 sites used this implant combination in primary TKA cases.

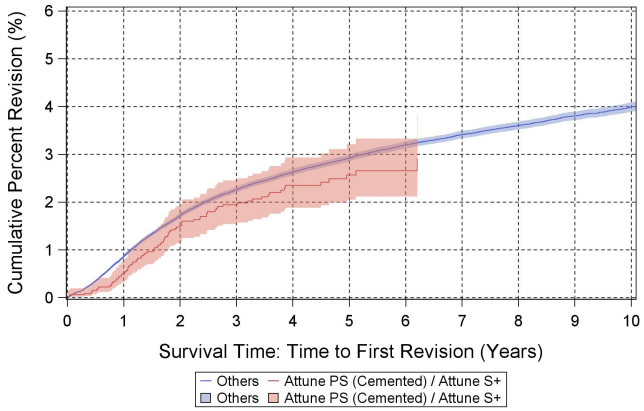


Figure 382. Cumulative Percent Revision Curve for the Attune PS (Cemented)/Attune S+ Combination, Compared to All Other Implant Combinations in Primary TKA Cases

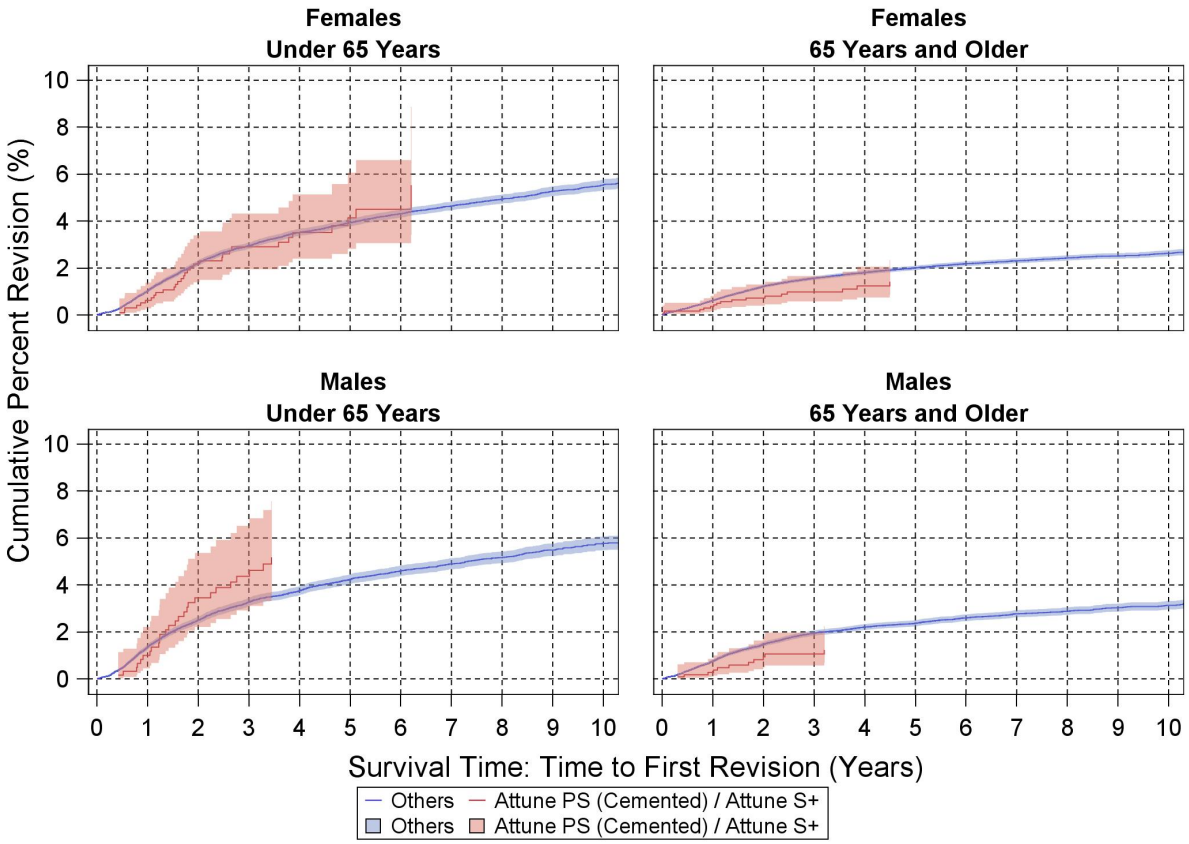


Figure 383. Cumulative Percent Revision Curve for the Attune PS (Cemented)/Attune S+ Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1110. Cumulative Percent Revision and Number at Risk for the Attune PS (Cemented)/Attune S+ Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	4,736	0.00 (0.00,0.00)	1,084	0.00 (0.00,0.00)	1,792	0.00 (0.00,0.00)	665	0.00 (0.00,0.00)	1,194	0.00 (0.00,0.00)
1	3,962	0.49 (0.32,0.75)	915	0.62 (0.28,1.38)	1,480	0.36 (0.16,0.81)	568	1.00 (0.45,2.21)	998	0.28 (0.09,0.85)
2	3,255	1.51 (1.17,1.95)	747	2.18 (1.39,3.39)	1,217	0.72 (0.40,1.30)	475	3.45 (2.21,5.36)	816	0.94 (0.49,1.81)
3	2,540	1.95 (1.54,2.45)	593	2.91 (1.95,4.32)	969	0.98 (0.58,1.66)	375	4.37 (2.91,6.52)	603	1.06 (0.57,1.97)
4	1,840	2.35 (1.88,2.94)	431	3.51 (2.40,5.13)	701	1.24 (0.75,2.05)	276	5.18 (3.54,7.56)	432	1.24 (0.68,2.25)
5	1,190	2.57 (2.05,3.21)	285	4.14 (2.82,6.06)	456	1.42 (0.85,2.35)	189	5.18 (3.54,7.56)	260	1.24 (0.68,2.25)
6	508	2.66 (2.12,3.33)	133	4.50 (3.06,6.60)	200	1.42 (0.85,2.35)	65	5.18 (3.54,7.56)	110	1.24 (0.68,2.25)
7	66	2.92 (2.23,3.83)	18	5.53 (3.42,8.87)	28	1.42 (0.85,2.35)	*	5.18 (3.54,7.56)	12	1.24 (0.68,2.25)
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 1111. Reasons for First Revision Following Primary TKA for Attune PS (Cemented)/Attune S+ Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	24	27.9
2	Joint Infection	20	23.3
3	Dislocation/Instability	18	20.9
4	Arthrofibrosis	10	11.6
5	Pain	5	5.8
6	Malalignment	3	3.5
7	Peri-prosthetic fracture - Femur	3	3.5
8	Implant Failure	1	1.2
9	Osteolysis	1	1.2
10	Poly liner wear	1	1.2

Table 1112. Reasons for First Revision in the First 90 Days Following Primary TKA for Attune PS (Cemented)/Attune S+ Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	2	66.7
2	Peri-prosthetic fracture - Femur	1	33.3

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Table 1113. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Attune PS (Cemented)/Attune S+ Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	5	27.8
2	Joint Infection	4	22.2
3	Dislocation/Instability	3	16.7
4	Pain	2	11.1
5	Implant Failure	1	5.6
6	Peri-prosthetic fracture - Femur	1	5.6
7	Malalignment	1	5.6
8	Arthrofibrosis	1	5.6

Table 1114. Descriptive Statistics of Cases Receiving the Attune PS (Cemented)/Attune S+ Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,885	60.7	
Age (years)	4,752	67.4 (9.2)	68 (13)
Height (cm)	4,621	168.8 (10.5)	167.6 (16.5)
Weight (kg)	4,621	95.3 (20.4)	94.3 (27.2)
BMI(kg/m^2)	4,621	33.4 (6.3)	33 (8.8)
Smoker - Never (%)	2,499	52.6	
Smoker - Previous (%)	1,834	38.6	
Smoker - Current (%)	416	8.8	
Smoker - Unknown (%)	0	0.0	

Table 1115. Distribution of Approach Used for Attune PS (Cemented)/Attune S+ Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	4,542	95.6
Mid-vastus	44	0.9
Sub-vastus	16	0.3
Lateral parapatellar	3	0.1
Missing/unknown/other	147	3.1

Table 1116. Distribution of Polyethylene Used for Attune PS (Cemented)/Attune S+ Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	0	0.0
Antioxidant XLPE	4,733	99.6
Missing/unknown/other	19	0.4

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Table 1117. Volume of Cases by Surgeon and Site for the Attune PS (Cemented)/Attune S+ Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	101 (199)	11 (86)
Cases per site	135 (320)	14 (108)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

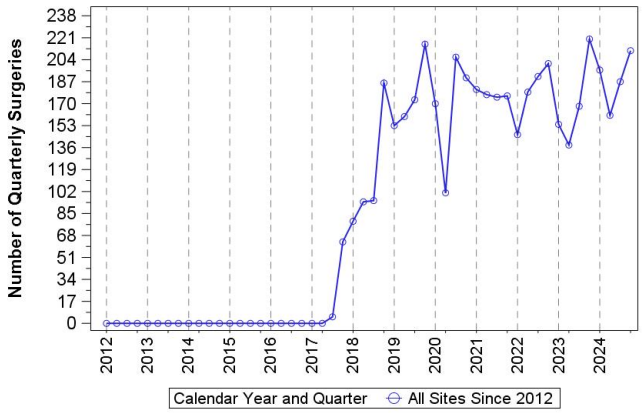


Figure 384. Utilization of the Attune PS (Cemented)/Attune S+ Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

150410207	150410125	150410203
150410107	150410105	150410210
150410226	150410205	150410103
150410208	150410204	150410110
150410106	150410104	150410123
150410206	150410209	150410223
150410126	150410109	150410102
150410108	150410124	150410202
150410225	150410224	

Catalog Numbers of Tibial Components Used in the Analysis

150680005	150680003	150680002
150680004	150680008	150670010
150680006	150670007	150670002
150680007	150670003	150680010
150670005	150670008	150680001
150670004	150680009	
150670006	150670009	

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3.5.6 Evolution MP/Evolution MP

N = 7,135 primary cases were used for this analysis. Distribution of utilization: 42 surgeons across 26 sites used this implant combination in primary TKA cases.

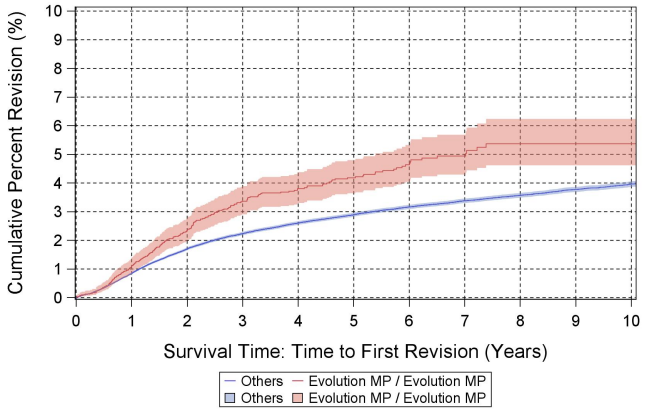


Figure 385. Cumulative Percent Revision Curve for the Evolution MP/Evolution MP Combination, Compared to All Other Implant Combinations in Primary TKA Cases

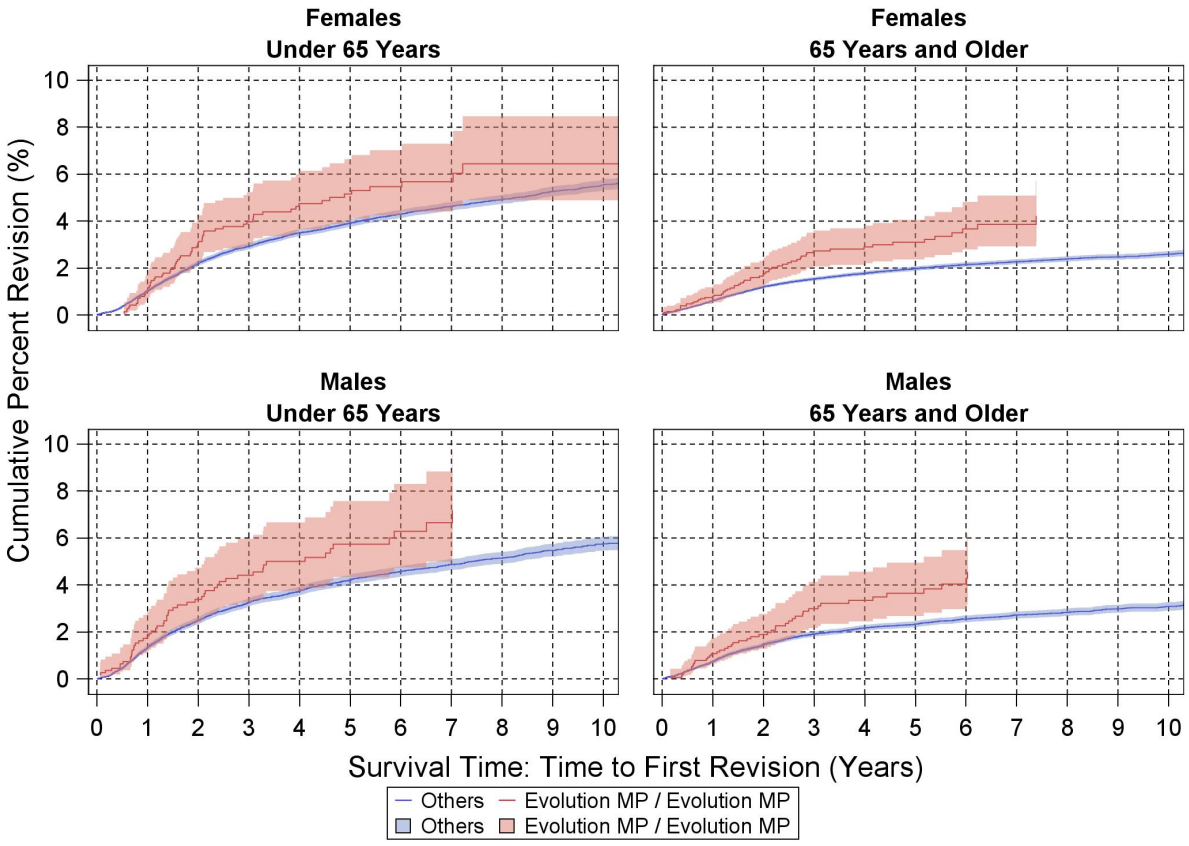


Figure 386. Cumulative Percent Revision Curve for the Evolution MP/Evolution MP Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1118. Cumulative Percent Revision and Number at Risk for the Evolution MP/Evolution MP Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	7,113	0.00 (0.00,0.00)	1,581	0.00 (0.00,0.00)	2,693	0.00 (0.00,0.00)	1,147	0.00 (0.00,0.00)	1,691	0.00 (0.00,0.00)
1	5,654	1.10 (0.87,1.39)	1,312	1.09 (0.66,1.80)	2,044	0.79 (0.51,1.24)	951	1.83 (1.17,2.85)	1,346	1.07 (0.66,1.75)
2	4,572	2.35 (1.99,2.78)	1,095	3.04 (2.23,4.14)	1,609	1.72 (1.24,2.38)	795	3.39 (2.42,4.74)	1,072	1.89 (1.28,2.76)
3	3,806	3.37 (2.91,3.89)	933	3.97 (3.01,5.23)	1,309	2.73 (2.07,3.60)	687	4.41 (3.26,5.96)	877	2.99 (2.16,4.13)
4	3,127	3.81 (3.30,4.38)	802	4.74 (3.66,6.14)	1,055	2.90 (2.21,3.81)	574	5.00 (3.74,6.67)	696	3.34 (2.45,4.56)
5	2,514	4.18 (3.64,4.80)	644	5.15 (3.99,6.63)	852	3.10 (2.36,4.05)	469	5.74 (4.33,7.58)	549	3.65 (2.68,4.95)
6	1,709	4.64 (4.04,5.33)	457	5.47 (4.25,7.02)	560	3.67 (2.79,4.82)	315	6.28 (4.74,8.31)	377	4.04 (2.97,5.49)
7	991	4.94 (4.29,5.68)	267	5.68 (4.41,7.29)	337	3.86 (2.92,5.09)	177	6.65 (4.99,8.84)	210	4.55 (3.32,6.21)
8	545	5.37 (4.62,6.24)	151	6.44 (4.89,8.47)	187	4.22 (3.12,5.70)	101	7.18 (5.31,9.68)	106	4.55 (3.32,6.21)
9	342	5.37 (4.62,6.24)	97	6.44 (4.89,8.47)	116	4.22 (3.12,5.70)	65	7.18 (5.31,9.68)	64	4.55 (3.32,6.21)
10	251	5.37 (4.62,6.24)	81	6.44 (4.89,8.47)	85	4.22 (3.12,5.70)	50	7.18 (5.31,9.68)	35	4.55 (3.32,6.21)

Table 1119. Reasons for First Revision Following Primary TKA for Evolution MP/Evolution MP Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	100	44.2
2	Aseptic Loosening	46	20.4
3	Joint Infection	41	18.1
4	Malalignment	8	3.5
5	Arthrofibrosis	7	3.1
6	Peri-prosthetic fracture - Femur	7	3.1
7	Pain	6	2.7
8	Implant Failure	4	1.8
9	Patellofemoral Joint	3	1.3
10	Extensor mechanism failure	2	0.9
	Unknown/missing/other	1	0.9

Table 1120. Reasons for First Revision in the First 90 Days Following Primary TKA for Evolution MP/Evolution MP Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	4	44.4
2	Dislocation/Instability	2	22.2
3	Implant Failure	1	11.1
4	Peri-prosthetic fracture - Femur	1	11.1
5	Malalignment	1	11.1

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Table 1121. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Evolution MP/Evolution MP Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	29	49.2
2	Joint Infection	15	25.4
3	Aseptic Loosening	5	8.5
4	Implant Failure	2	3.4
5	Pain	2	3.4
6	Malalignment	2	3.4
7	Arthrofibrosis	2	3.4
8	Extensor mechanism failure	2	3.4

Table 1122. Descriptive Statistics of Cases Receiving the Evolution MP/Evolution MP Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	4,284	60	
Age (years)	7,135	67 (9.2)	67 (12)
Height (cm)	7,135	169 (10.7)	167.6 (17.8)
Weight (kg)	7,135	95.2 (21.9)	93 (29.1)
BMI(kg/m^2)	7,135	33.3 (6.8)	32.5 (9.1)
Smoker - Never (%)	3,876	54.3	
Smoker - Previous (%)	2,665	37.4	
Smoker - Current (%)	560	7.9	
Smoker - Unknown (%)	34	0.5	

Table 1123. Distribution of Approach Used for Evolution MP/Evolution MP Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	7,048	98.8
Mid-vastus	69	1.0
Sub-vastus	2	0.0
Lateral parapatellar	6	0.1
Missing/unknown/other	10	0.1

Table 1124. Distribution of Polyethylene Used for Evolution MP/Evolution MP Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	7,081	99.2
XLPE	0	0.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	54	0.8

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Table 1125. Volume of Cases by Surgeon and Site for the Evolution MP/Evolution MP Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	169 (260)	54 (217)
Cases per site	274 (340)	141 (290)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

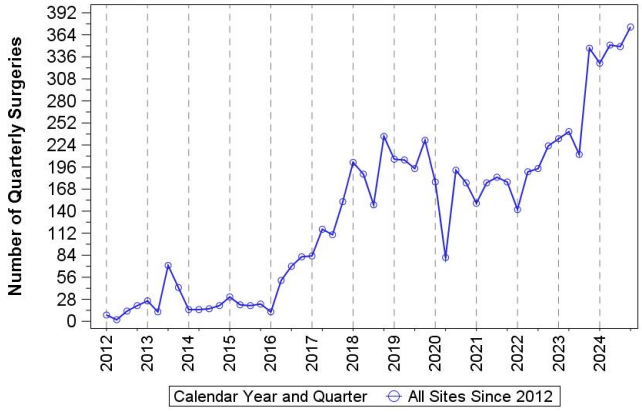


Figure 387. Utilization of the Evolution MP/Evolution MP Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

EFSRN5PR	EFSRP4PL	EFPSN4PL
EFSRN5PL	EFSRP4PR	EFPSN4PR
EFSRN4PR	EFSRP7PR	EFPSN7PL
EFSRN4PL	EFSRP7PL	EFPSN6PL
EFSRN6PR	EFSRP3PL	EFPSN6PR
EFSRN6PL	EFSRN8PR	EFPSN5PR
EFSRN7PR	EFSRP3PR	EFSRP2PR
EFSRN3PL	EFSRN8PL	EFPSN7PR
EFSRN7PL	EFSRN2PL	EFPSN3PR
EFSRN3PR	EFSRP8PL	EFPSN8PR
EFSRP5PR	EFSRP8PR	EFPSN2PR
EFSRP5PL	EFSRN2PR	EFPSN8PL
EFSRP6PL	EFPSN5PL	
EFSRP6PR	EFSRP2PL	

Catalog Numbers of Tibial Components Used in the Analysis

ETPKN5SR	ETPKN6SR	ETPKN3SL
ETPKN4SR	ETPK1556	ETPKN6PR
ETPKN4SL	ETPK1534	ETPKN7SL
ETPKN5SL	ETPK1578	ETPKN6PL
ETPKN6SL	ETPKN7SR	ETPKN3SR

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ETPLB5SL
ETPLB5SR
ETPLB6SR
ETPKN8SR
ETPLB6SL
ETPLB4SL
ETPKN8SL
ETPLB4SR
ETPLB6PL
ETPLB7SR
ETPLB6PR
ETPLB8SL
ETPLB7SL
ETPLB8SR
ETPKN2PL
ETPLB3SR
ETPKN8PR
ETPKN2PR
ETPKN2SL
ETPKN8PL
ETRKN5SR
ETPLB3SL
ETPKN2SR
ETPLB2PL
ETRKN4SR
ETRKN5SL
ETRKN4SL
ETRKN6SR
ETRKN3SL
ETRKN6SL
ETRKN7SR
ETRKN6PR
ETRKN7SL
ETPSB5SL
ETRKN3SR
ETRKN6PL

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3.5.7 Genesis II (CoCr)/Genesis II

N = 733 primary cases were used for this analysis. Distribution of utilization: 14 surgeons used this implant combination at fewer than 10 sites in primary TKA cases.

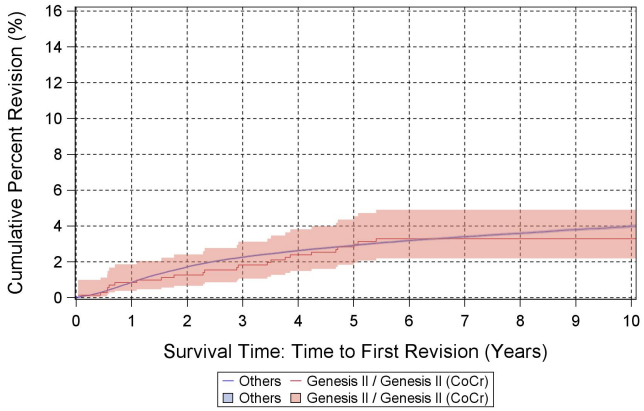


Figure 388. Cumulative Percent Revision Curve for the Genesis II (CoCr)/Genesis II Combination, Compared to All Other Implant Combinations in Primary TKA Cases

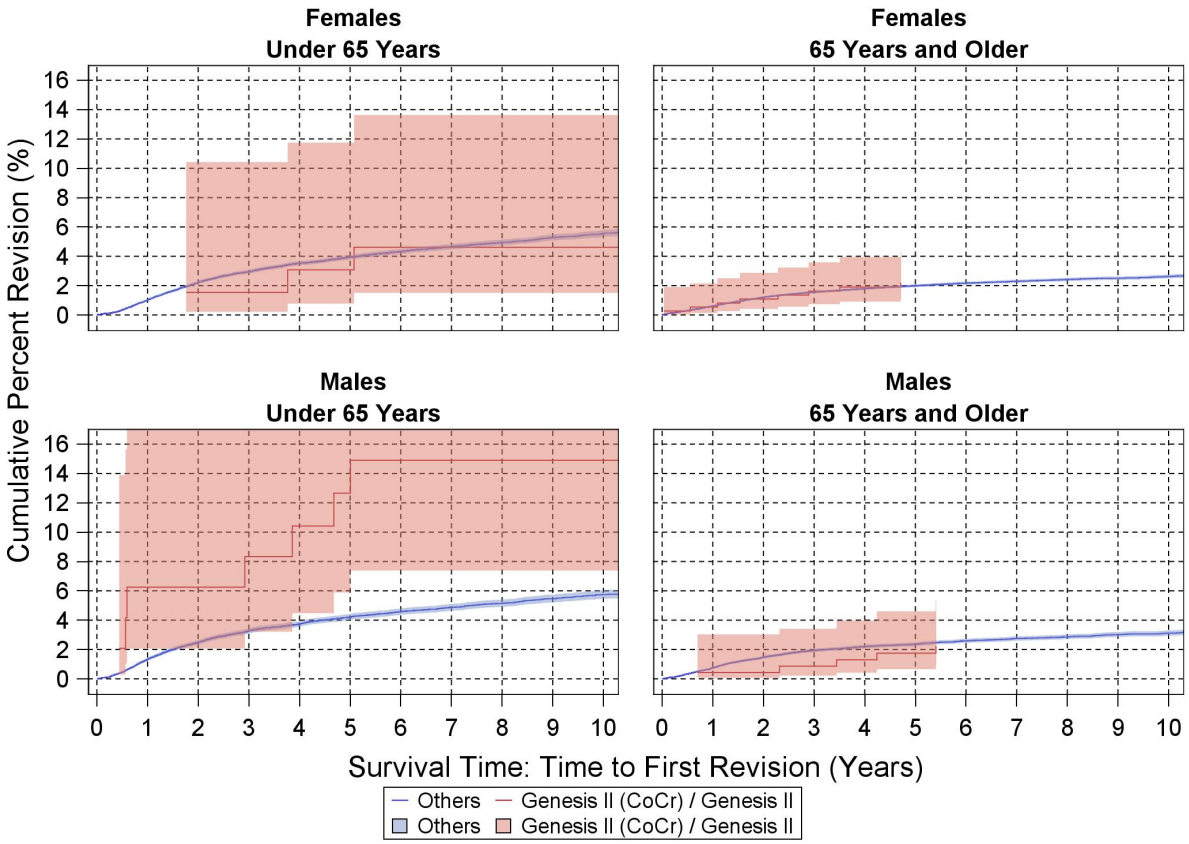


Figure 389. Cumulative Percent Revision Curve for the Genesis II (CoCr)/Genesis II Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1126. Cumulative Percent Revision and Number at Risk for the Genesis II (CoCr)/Genesis II Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	712	0.00 (0.00,0.00)	65	0.00 (0.00,0.00)	368	0.00 (0.00,0.00)	48	0.00 (0.00,0.00)	231	0.00 (0.00,0.00)
1	706	0.84 (0.38,1.87)	65	0.00 (0.00,0.00)	366	0.54 (0.14,2.16)	45	6.25 (2.06,18.14)	230	0.43 (0.06,3.03)
2	703	1.26 (0.66,2.42)	64	1.54 (0.22,10.42)	364	1.09 (0.41,2.87)	45	6.25 (2.06,18.14)	230	0.43 (0.06,3.03)
3	699	1.83 (1.06,3.12)	64	1.54 (0.22,10.42)	362	1.63 (0.74,3.59)	44	8.33 (3.21,20.70)	229	0.87 (0.22,3.42)
4	682	2.39 (1.49,3.82)	63	3.08 (0.78,11.75)	356	1.90 (0.91,3.95)	43	10.42 (4.47,23.23)	220	1.30 (0.42,3.97)
5	647	2.83 (1.84,4.36)	63	3.08 (0.78,11.75)	340	2.19 (1.10,4.32)	39	12.66 (5.89,26.04)	205	1.75 (0.66,4.61)
6	606	3.29 (2.20,4.91)	57	4.62 (1.51,13.63)	326	2.19 (1.10,4.32)	33	14.90 (7.39,28.76)	190	2.25 (0.94,5.33)
7	544	3.29 (2.20,4.91)	51	4.62 (1.51,13.63)	292	2.19 (1.10,4.32)	32	14.90 (7.39,28.76)	169	2.25 (0.94,5.33)
8	470	3.29 (2.20,4.91)	45	4.62 (1.51,13.63)	255	2.19 (1.10,4.32)	30	14.90 (7.39,28.76)	140	2.25 (0.94,5.33)
9	384	3.29 (2.20,4.91)	35	4.62 (1.51,13.63)	212	2.19 (1.10,4.32)	25	14.90 (7.39,28.76)	112	2.25 (0.94,5.33)
10	286	3.29 (2.20,4.91)	25	4.62 (1.51,13.63)	159	2.19 (1.10,4.32)	22	14.90 (7.39,28.76)	80	2.25 (0.94,5.33)

Table 1127. Reasons for First Revision Following Primary TKA for Genesis II (CoCr)/Genesis II Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	6	26.1
2	Joint Infection	6	26.1
3	Aseptic Loosening	5	21.7
4	Pain	4	17.4
5	Malalignment	1	4.3
6	Poly liner wear	1	4.3

Table 1128. Reasons for First Revision in the First 90 Days Following Primary TKA for Genesis II (CoCr)/Genesis II Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	100.0

Table 1129. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Genesis II (CoCr)/Genesis II Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	33.3
2	Joint Infection	1	33.3
3	Pain	1	33.3

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Table 1130. Descriptive Statistics of Cases Receiving the Genesis II (CoCr)/Genesis II Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	448	61.1	
Age (years)	733	72.1 (8.3)	73 (11)
Height (cm)	733	167.2 (10.1)	167.6 (15.3)
Weight (kg)	733	89.9 (19.2)	88.6 (26.2)
BMI(kg/m^2)	733	32.1 (6.2)	31.6 (8.3)
Smoker - Never (%)	381	52	
Smoker - Previous (%)	298	40.7	
Smoker - Current (%)	49	6.7	
Smoker - Unknown (%)	5	0.7	

Table 1131. Distribution of Approach Used for Genesis II (CoCr)/Genesis II Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	687	93.7
Mid-vastus	44	6.0
Sub-vastus	0	0.0
Lateral parapatellar	2	0.3
Missing/unknown/other	0	0.0

Table 1132. Distribution of Polyethylene Used for Genesis II (CoCr)/Genesis II Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	602	82.1
XLPE	130	17.7
Antioxidant XLPE	0	0.0
Missing/unknown/other	1	0.1

Table 1133. Volume of Cases by Surgeon and Site for the Genesis II (CoCr)/Genesis II Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	52 (84)	13 (73)
Cases per site	81 (100)	65 (91)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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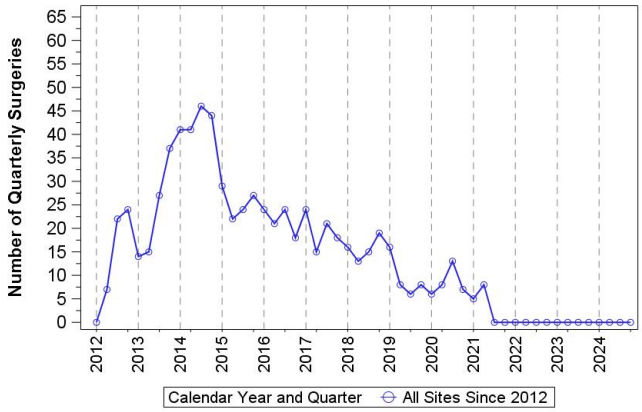


Figure 390. Utilization of the Genesis II (CoCr)/Genesis II Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

71420022	71420020	71420118
71420026	71420090	71420094
71420008	71420122	71420108
71420010	71420124	71420014
71420024	71420074	71420030
71420006	71420076	71420100
71420012	71420086	71420110
71420088	71420070	71420116
71420028	71420092	71420084
71420072	71420120	71420126
71420104	71420102	
71420004	71420106	

Catalog Numbers of Tibial Components Used in the Analysis

71420184	71420182	71420180
71420166	71420188	71420162
71420186	71420190	71423116
71420170	71420172	
71420164	71420174	
71420168	71420191	

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3.5.8 Genesis II (Oxinium)/Genesis II

N = 696 primary cases were used for this analysis. Distribution of utilization: 23 surgeons across 13 sites used this implant combination in primary TKA cases.

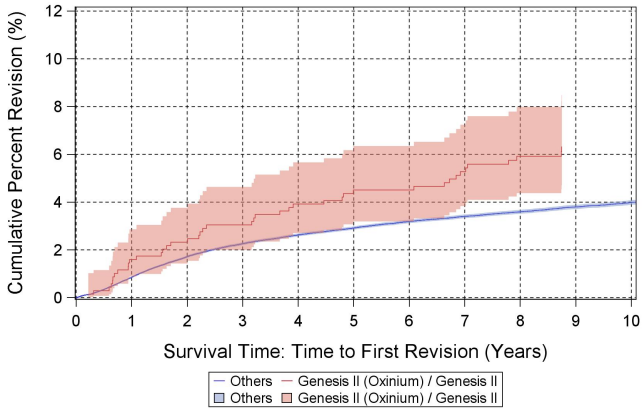


Figure 391. Cumulative Percent Revision Curve for the Genesis II (Oxinium)/Genesis II Combination, Compared to All Other Implant Combinations in Primary TKA Cases

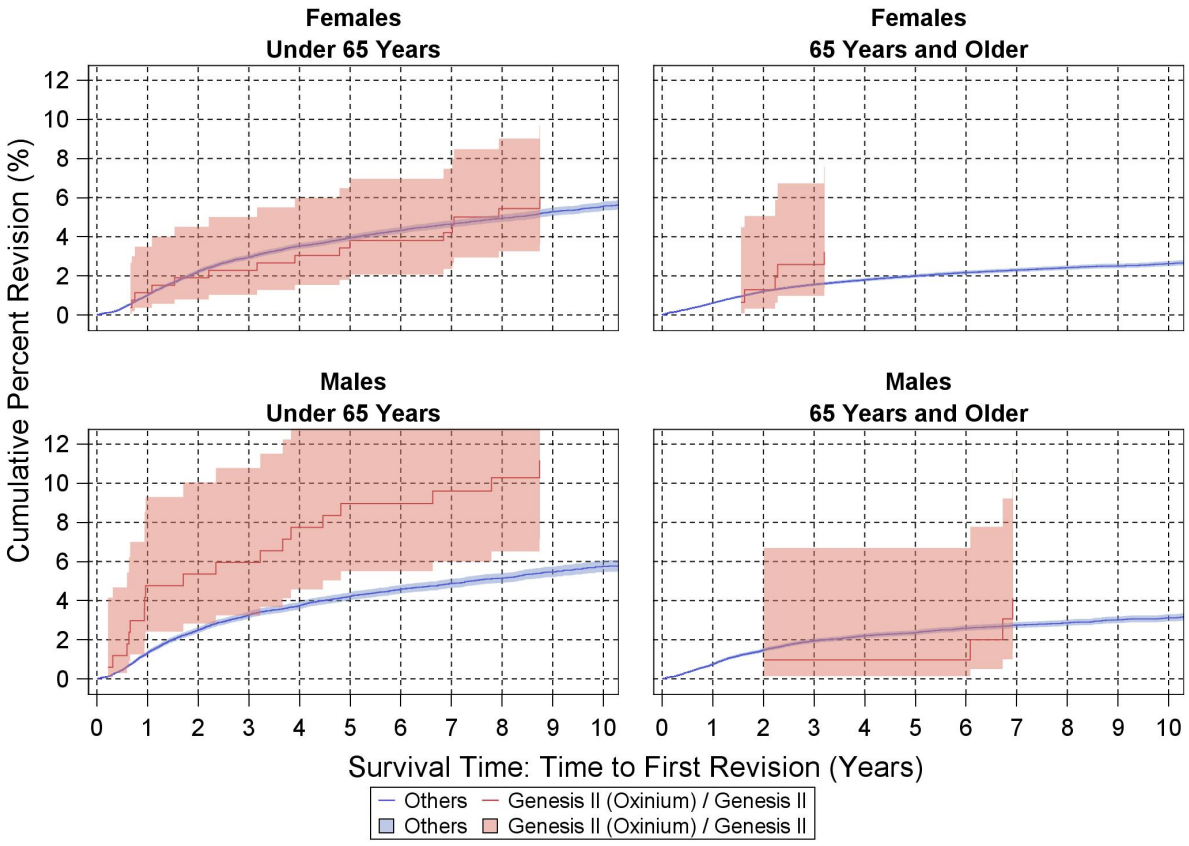


Figure 392. Cumulative Percent Revision Curve for the Genesis II (Oxinium)/Genesis II Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1134. Cumulative Percent Revision and Number at Risk for the Genesis II (Oxinium)/Genesis II Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	689	0.00 (0.00,0.00)	263	0.00 (0.00,0.00)	155	0.00 (0.00,0.00)	168	0.00 (0.00,0.00)	103	0.00 (0.00,0.00)
1	678	1.60 (0.89,2.86)	260	1.14 (0.37,3.49)	155	0.00 (0.00,0.00)	160	4.76 (2.41,9.30)	103	0.00 (0.00,0.00)
2	673	2.32 (1.43,3.76)	258	1.90 (0.80,4.51)	153	1.29 (0.32,5.06)	159	5.36 (2.82,10.04)	103	0.00 (0.00,0.00)
3	668	3.05 (2.00,4.64)	257	2.28 (1.03,5.01)	151	2.58 (0.98,6.73)	158	5.95 (3.25,10.78)	102	0.97 (0.14,6.69)
4	657	3.92 (2.71,5.66)	254	3.04 (1.53,5.99)	150	3.23 (1.36,7.58)	152	7.74 (4.57,12.96)	101	0.97 (0.14,6.69)
5	646	4.51 (3.19,6.35)	251	3.81 (2.07,6.97)	148	3.23 (1.36,7.58)	147	8.96 (5.50,14.43)	100	0.97 (0.14,6.69)
6	634	4.51 (3.19,6.35)	247	3.81 (2.07,6.97)	145	3.23 (1.36,7.58)	146	8.96 (5.50,14.43)	96	0.97 (0.14,6.69)
7	610	5.28 (3.83,7.24)	239	4.21 (2.35,7.47)	142	3.23 (1.36,7.58)	139	9.60 (5.99,15.20)	90	4.13 (1.57,10.65)
8	556	5.92 (4.38,7.99)	219	5.44 (3.26,9.02)	124	3.23 (1.36,7.58)	127	10.28 (6.52,16.03)	86	4.13 (1.57,10.65)
9	424	6.33 (4.71,8.48)	167	5.96 (3.63,9.71)	99	3.23 (1.36,7.58)	93	11.18 (7.16,17.22)	65	4.13 (1.57,10.65)
10	264	6.33 (4.71,8.48)	101	5.96 (3.63,9.71)	56	3.23 (1.36,7.58)	69	11.18 (7.16,17.22)	38	4.13 (1.57,10.65)

Table 1135. Reasons for First Revision Following Primary TKA for Genesis II (Oxinium)/Genesis II Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	12	30.8
2	Arthrofibrosis	10	25.6
3	Dislocation/Instability	4	10.3
4	Pain	4	10.3
5	Joint Infection	3	7.7
6	Implant Failure	2	5.1
7	Osteolysis	2	5.1
8	Patellofemoral Joint	1	2.6
9	Poly liner wear	1	2.6

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1136. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Genesis II (Oxinium)/Genesis II Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	2	22.2
2	Dislocation/Instability	2	22.2
3	Joint Infection	2	22.2
4	Arthrofibrosis	2	22.2
5	Pain	1	11.1

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Table 1137. Descriptive Statistics of Cases Receiving the Genesis II (Oxinium)/Genesis II Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	424	60.9	
Age (years)	696	61.6 (8.3)	62 (10)
Height (cm)	696	169.4 (11.1)	168 (17.8)
Weight (kg)	696	99.7 (22.1)	97.5 (29)
BMI(kg/m^2)	696	34.8 (7.1)	33.8 (9.2)
Smoker - Never (%)	389	55.9	
Smoker - Previous (%)	235	33.8	
Smoker - Current (%)	69	9.9	
Smoker - Unknown (%)	3	0.4	

Table 1138. Distribution of Approach Used for Genesis II (Oxinium)/Genesis II Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	541	77.7
Mid-vastus	150	21.6
Sub-vastus	0	0.0
Lateral parapatellar	1	0.1
Missing/unknown/other	4	0.6

Table 1139. Distribution of Polyethylene Used for Genesis II (Oxinium)/Genesis II Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	96	13.8
XLPE	599	86.1
Antioxidant XLPE	0	0.0
Missing/unknown/other	1	0.1

Table 1140. Volume of Cases by Surgeon and Site for the Genesis II (Oxinium)/Genesis II Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	30 (51)	3 (56)
Cases per site	53 (97)	7 (59)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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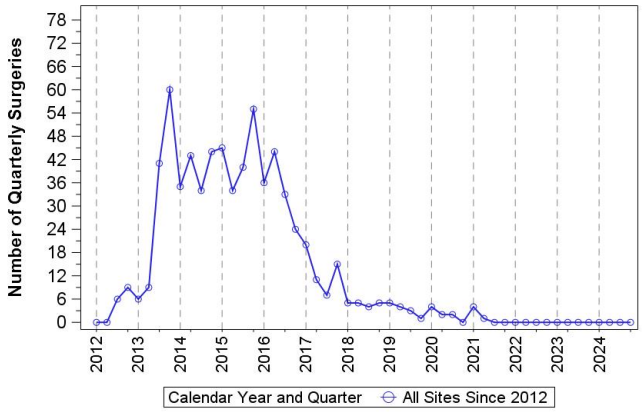


Figure 393. Utilization of the Genesis II (Oxinium)/Genesis II Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

71420136	71420158	71421113
71420152	71421016	71421118
71420154	71421015	71421018
71420138	71421117	71930008
71420140	71421116	71421013
71420156	71420148	71930007
71420134	71421017	71930009
71420150	71421114	71930010
71420142	71420132	
71421115	71421014	

Catalog Numbers of Tibial Components Used in the Analysis

71420184	71420164	71420180
71420168	71420172	71420162
71420166	71420188	71420176
71420186	71420182	
71420170	71420174	
71420190	71420191	

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3.5.9 GMK Sphere/GMK Primary

N = 628 primary cases were used for this analysis. Distribution of utilization: 10 surgeons across 12 sites used this implant combination in primary TKA cases.

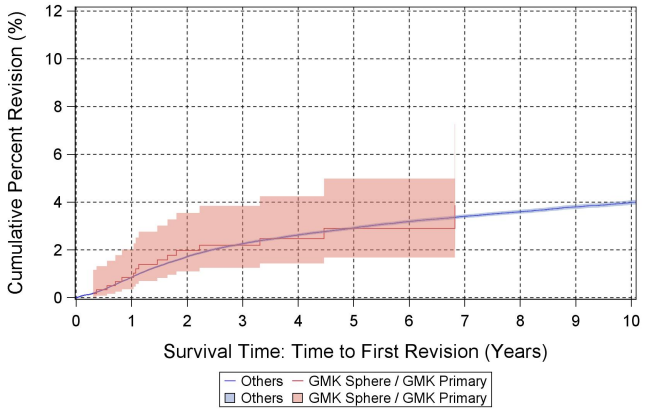


Figure 394. Cumulative Percent Revision Curve for the GMK Sphere/GMK Primary Combination, Compared to All Other Implant Combinations in Primary TKA Cases

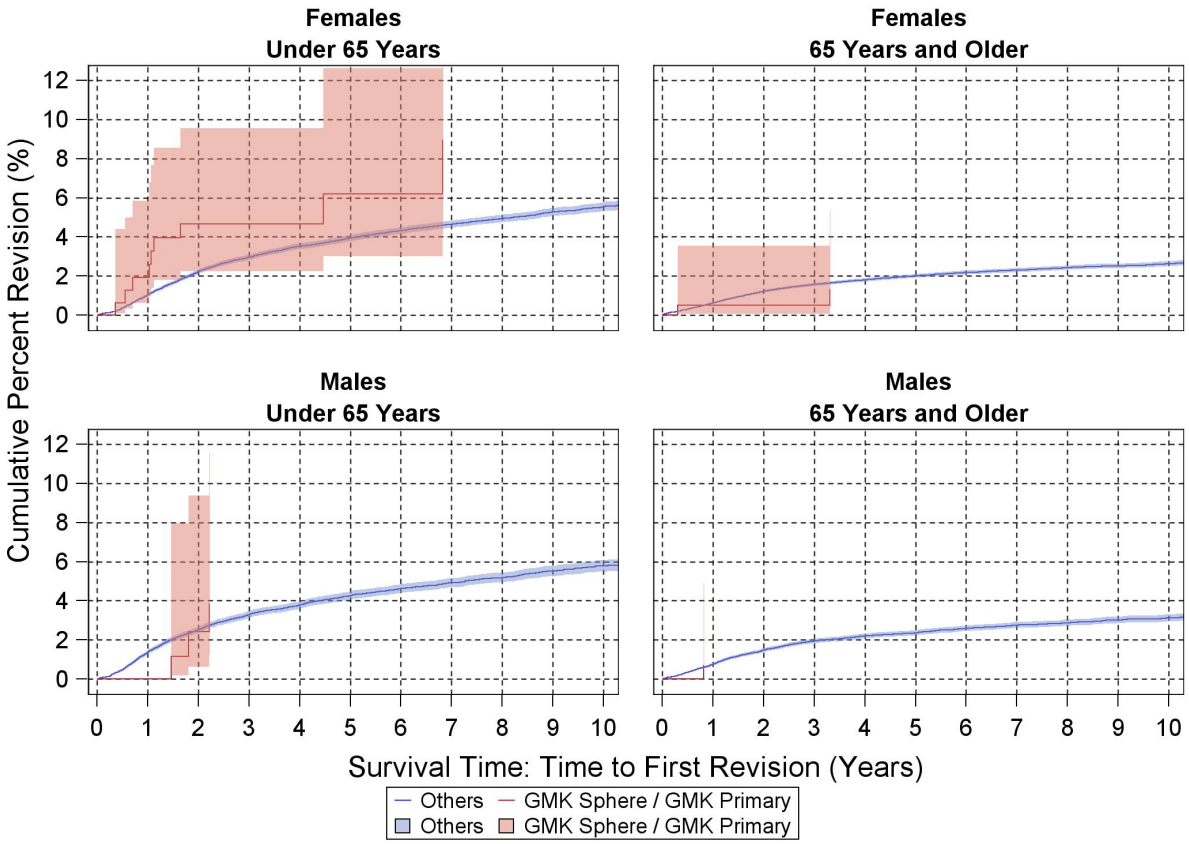


Figure 395. Cumulative Percent Revision Curve for the GMK Sphere/GMK Primary Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1141. Cumulative Percent Revision and Number at Risk for the GMK Sphere/GMK Primary Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	628	0.00 (0.00,0.00)	165	0.00 (0.00,0.00)	208	0.00 (0.00,0.00)	99	0.00 (0.00,0.00)	156	0.00 (0.00,0.00)
1	551	0.85 (0.35,2.02)	146	1.92 (0.62,5.85)	182	0.51 (0.07,3.53)	90	0.00 (0.00,0.00)	133	0.70 (0.10,4.89)
2	470	1.98 (1.10,3.55)	123	4.67 (2.25,9.55)	163	0.51 (0.07,3.53)	73	2.43 (0.61,9.38)	111	0.70 (0.10,4.89)
3	384	2.20 (1.25,3.84)	109	4.67 (2.25,9.55)	132	0.51 (0.07,3.53)	59	3.86 (1.26,11.56)	84	0.70 (0.10,4.89)
4	290	2.47 (1.43,4.25)	86	4.67 (2.25,9.55)	96	1.33 (0.32,5.41)	46	3.86 (1.26,11.56)	62	0.70 (0.10,4.89)
5	188	2.90 (1.68,4.99)	52	6.20 (3.00,12.61)	62	1.33 (0.32,5.41)	26	3.86 (1.26,11.56)	48	0.70 (0.10,4.89)
6	149	2.90 (1.68,4.99)	45	6.20 (3.00,12.61)	46	1.33 (0.32,5.41)	23	3.86 (1.26,11.56)	35	0.70 (0.10,4.89)
7	88	3.87 (2.05,7.26)	30	8.96 (4.12,18.92)	28	1.33 (0.32,5.41)	13	3.86 (1.26,11.56)	17	0.70 (0.10,4.89)
8	71	3.87 (2.05,7.26)	23	8.96 (4.12,18.92)	23	1.33 (0.32,5.41)	11	3.86 (1.26,11.56)	14	0.70 (0.10,4.89)
9	63	3.87 (2.05,7.26)	20	8.96 (4.12,18.92)	19	1.33 (0.32,5.41)	*	3.86 (1.26,11.56)	14	0.70 (0.10,4.89)
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 1142. Reasons for First Revision Following Primary TKA for GMK Sphere/GMK Primary Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	5	33.3
2	Implant Failure	3	20.0
3	Dislocation/Instability	2	13.3
4	Joint Infection	2	13.3
5	Pain	2	13.3
6	Arthrofibrosis	1	6.7

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1143. Reasons for First Revision Between 91 and 365 days Following Primary TKA for GMK Sphere/GMK Primary Combination Cases

Rank	Reason for Revision	N	Percent
1	Implant Failure	2	40.0
2	Dislocation/Instability	1	20.0
3	Joint Infection	1	20.0
4	Pain	1	20.0

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Table 1144. Descriptive Statistics of Cases Receiving the GMK Sphere/GMK Primary Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	373	59.4	
Age (years)	628	66.1 (9.6)	66.5 (14)
Height (cm)	628	167.8 (10.4)	167.6 (15.3)
Weight (kg)	628	93.7 (21.1)	92 (28.9)
BMI(kg/m^2)	628	33.3 (7.2)	32.6 (9.2)
Smoker - Never (%)	317	50.5	
Smoker - Previous (%)	237	37.7	
Smoker - Current (%)	67	10.7	
Smoker - Unknown (%)	7	1.1	

Table 1145. Distribution of Approach Used for GMK Sphere/GMK Primary Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	626	99.7
Mid-vastus	2	0.3
Sub-vastus	0	0.0
Lateral parapatellar	0	0.0
Missing/unknown/other	0	0.0

Table 1146. Distribution of Polyethylene Used for GMK Sphere/GMK Primary Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	519	82.6
XLPE	0	0.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	109	17.4

Table 1147. Volume of Cases by Surgeon and Site for the GMK Sphere/GMK Primary Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	62 (102)	24 (62)
Cases per site	52 (98)	4 (75)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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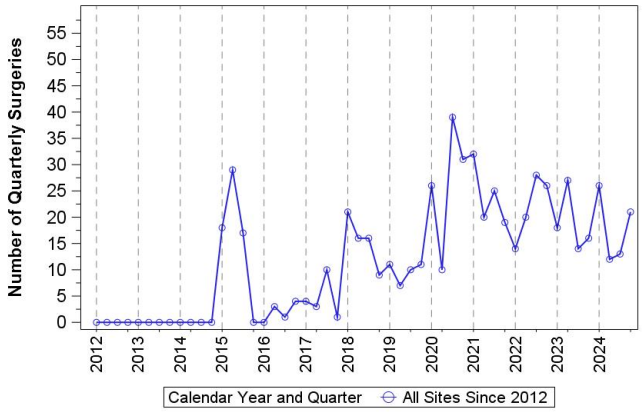


Figure 396. Utilization of the GMK Sphere/GMK Primary Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

02120003R	02120025R	02120026R
02120003L	02120006L	02120002L
02120023R	02120004R	02120007R
02120023L	02120025L	02120007L
02120005R	02120004L	02120021L
02120005L	02120006R	02120021R
02120024L	02120022R	
02120024R	02120002R	
02120022L	02120026L	

Catalog Numbers of Tibial Components Used in the Analysis

02071204R	02071205L	02071206R
02071203L	02071205R	02071206L
02071204L	02071202L	
02071203R	02071202R	

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3.5.10 iBalance/iBalance

N = 749 primary cases were used for this analysis. Fewer than ten surgeons used this implant combination at fewer than ten sites in primary TKA cases.

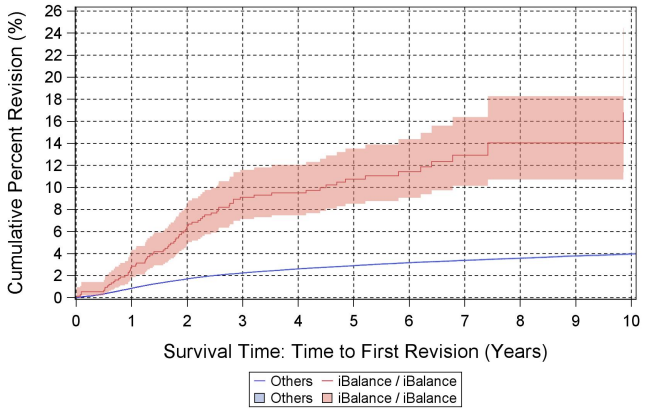


Figure 397. Cumulative Percent Revision Curve for the iBalance/iBalance Combination, Compared to All Other Implant Combinations in Primary TKA Cases

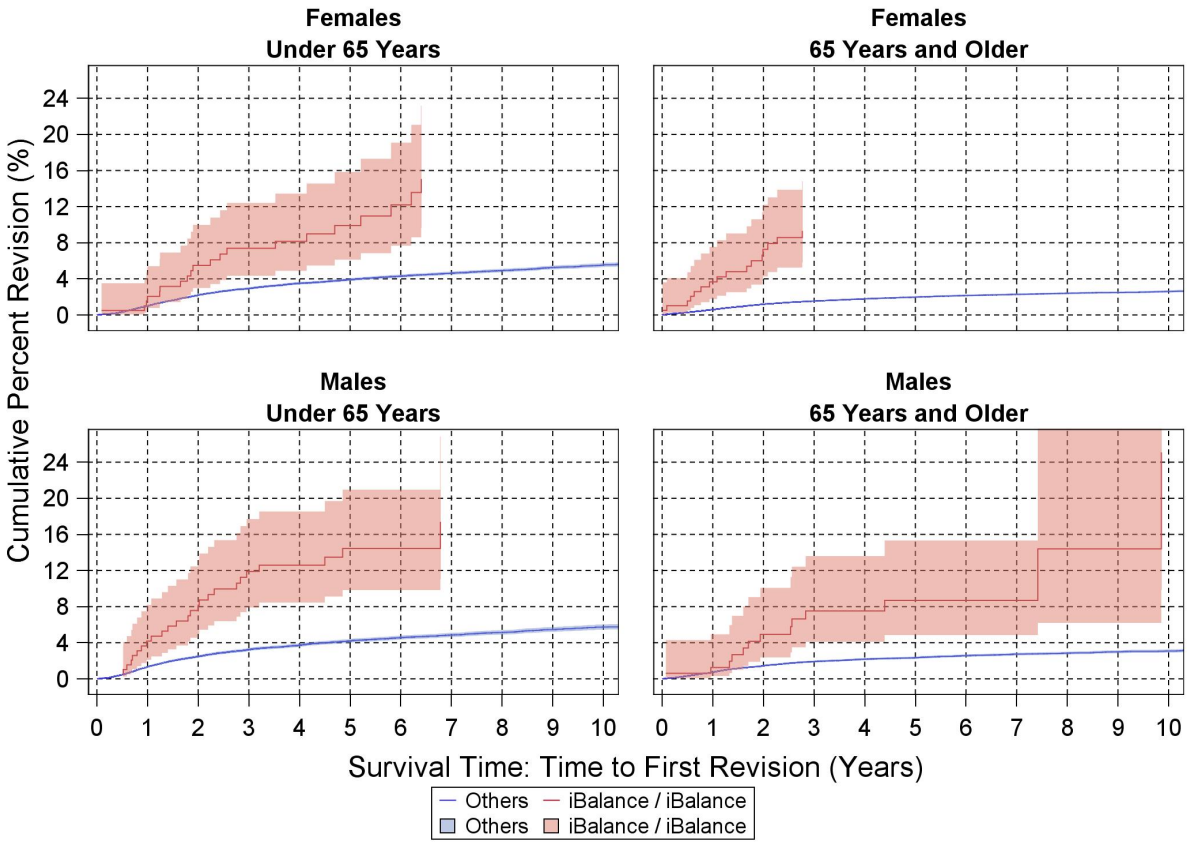


Figure 398. Cumulative Percent Revision Curve for the iBalance/iBalance Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1148. Cumulative Percent Revision and Number at Risk for the iBalance/iBalance Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	747	0.00 (0.00,0.00)	199	0.00 (0.00,0.00)	193	0.00 (0.00,0.00)	193	0.00 (0.00,0.00)	162	0.00 (0.00,0.00)
1	691	2.86 (1.87,4.35)	187	2.07 (0.78,5.41)	175	3.67 (1.77,7.55)	176	4.19 (2.11,8.20)	153	1.26 (0.32,4.94)
2	584	6.52 (4.90,8.64)	156	5.49 (2.99,9.98)	146	7.27 (4.28,12.21)	157	8.16 (4.99,13.18)	125	4.93 (2.37,10.08)
3	490	9.11 (7.13,11.59)	136	7.39 (4.35,12.42)	118	9.32 (5.79,14.83)	133	11.90 (7.91,17.70)	103	7.52 (4.10,13.60)
4	416	9.51 (7.47,12.05)	115	8.16 (4.89,13.44)	99	9.32 (5.79,14.83)	113	12.59 (8.45,18.54)	89	7.52 (4.10,13.60)
5	315	10.75 (8.52,13.53)	90	9.91 (6.13,15.84)	74	9.32 (5.79,14.83)	84	14.44 (9.83,20.95)	67	8.69 (4.85,15.32)
6	216	11.43 (9.06,14.38)	67	12.20 (7.68,19.09)	50	9.32 (5.79,14.83)	51	14.44 (9.83,20.95)	48	8.69 (4.85,15.32)
7	125	12.92 (10.15,16.39)	42	15.06 (9.61,23.18)	31	9.32 (5.79,14.83)	21	17.39 (11.03,26.83)	31	8.69 (4.85,15.32)
8	36	14.04 (10.72,18.28)	12	15.06 (9.61,23.18)	12	9.32 (5.79,14.83)	*	17.39 (11.03,26.83)	*	14.40 (6.20,31.44)
9	36	14.04 (10.72,18.28)	12	15.06 (9.61,23.18)	12	9.32 (5.79,14.83)	*	17.39 (11.03,26.83)	*	14.40 (6.20,31.44)
10	23	16.81 (11.37,24.48)	*	15.06 (9.61,23.18)	*	9.32 (5.79,14.83)	*	17.39 (11.03,26.83)	*	25.10 (9.86,55.28)

* Denotes that the number of cases is between 1 and 10.

Table 1149. Reasons for First Revision Following Primary TKA for iBalance/iBalance Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	27	36.5
2	Aseptic Loosening	22	29.7
3	Joint Infection	10	13.5
4	Arthrofibrosis	5	6.8
5	Implant Failure	3	4.1
6	Pain	2	2.7
7	Malalignment	1	1.4
8	Metal Reaction/Metallosis	1	1.4
9	Patellofemoral Joint	1	1.4
10	Peri-prosthetic fracture - Femur	1	1.4
	Unknown/missing/other	1	1.4

Table 1150. Reasons for First Revision in the First 90 Days Following Primary TKA for iBalance/iBalance Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	2	50.0
2	Aseptic Loosening	1	25.0
3	Joint Infection	1	25.0

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Table 1151. Reasons for First Revision Between 91 and 365 days Following Primary TKA for iBalance/iBalance Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	8	47.1
2	Arthrofibrosis	4	23.5
3	Joint Infection	2	11.8
4	Aseptic Loosening	1	5.9
5	Implant Failure	1	5.9
6	Malalignment	1	5.9

Table 1152. Descriptive Statistics of Cases Receiving the iBalance/iBalance Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	394	52.6	
Age (years)	749	63.7 (9.2)	64 (13)
Height (cm)	749	170.3 (10.9)	170.2 (15.2)
Weight (kg)	749	92.8 (20.8)	91.6 (28.1)
BMI(kg/m^2)	749	31.9 (6)	31.1 (8)
Smoker - Never (%)	433	57.8	
Smoker - Previous (%)	220	29.4	
Smoker - Current (%)	90	12	
Smoker - Unknown (%)	6	0.8	

Table 1153. Distribution of Approach Used for iBalance/iBalance Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	746	99.6
Mid-vastus	0	0.0
Sub-vastus	0	0.0
Lateral parapatellar	1	0.1
Missing/unknown/other	2	0.3

Table 1154. Distribution of Polyethylene Used for iBalance/iBalance Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	353	47.1
XLPE	0	0.0
Antioxidant XLPE	138	18.4
Missing/unknown/other	258	34.4

Table 1155. Volume of Cases by Surgeon and Site for the iBalance/iBalance Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	107 (260)	2 (43)
Cases per site	93 (191)	2 (94)

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The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

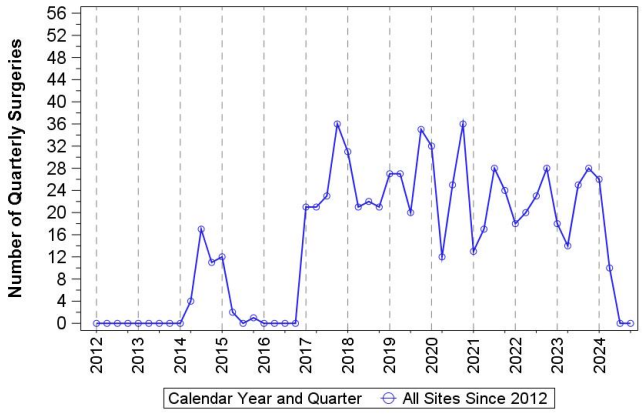


Figure 399. Utilization of the iBalance/iBalance Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

AR5174R	AR5172R	AR5167R
AR5175R	AR5166R	AR5168L
AR5175L	AR5179L	AR5162R
AR5177L	AR5165L	AR5163R
AR5174L	AR5164R	AR5166L
AR5176L	AR5172L	AR51710R
AR5176R	AR5179R	AR51710L
AR5178R	AR5165R	AR5171R
AR5173R	AR5167L	AR51610L
AR5178L	AR5163L	AR5162L
AR5177R	AR5164L	AR5169L
AR5173L	AR5168R	

Catalog Numbers of Tibial Components Used in the Analysis

AR513T4	AR513T9	AR503TTTH
AR513T5	AR513T2	AR503TTTJ
AR513T6	AR513T10	AR513T1
AR513T7	AR503TTTF	AR503TTTC
AR513T8	AR503TTTE	AR503TTTD
AR513T3	AR503TTTG	

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3.5.11 iTotal G2+

N = 733 primary cases were used for this analysis. Distribution of utilization: 13 surgeons across 12 sites used this implant combination in primary TKA cases.

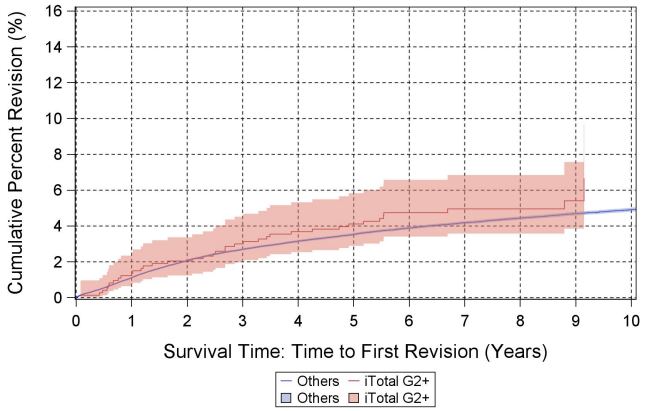


Figure 400. Cumulative Percent Revision Curve for the iTotal G2+ Combination, Compared to All Other Implant Combinations in Primary TKA Cases

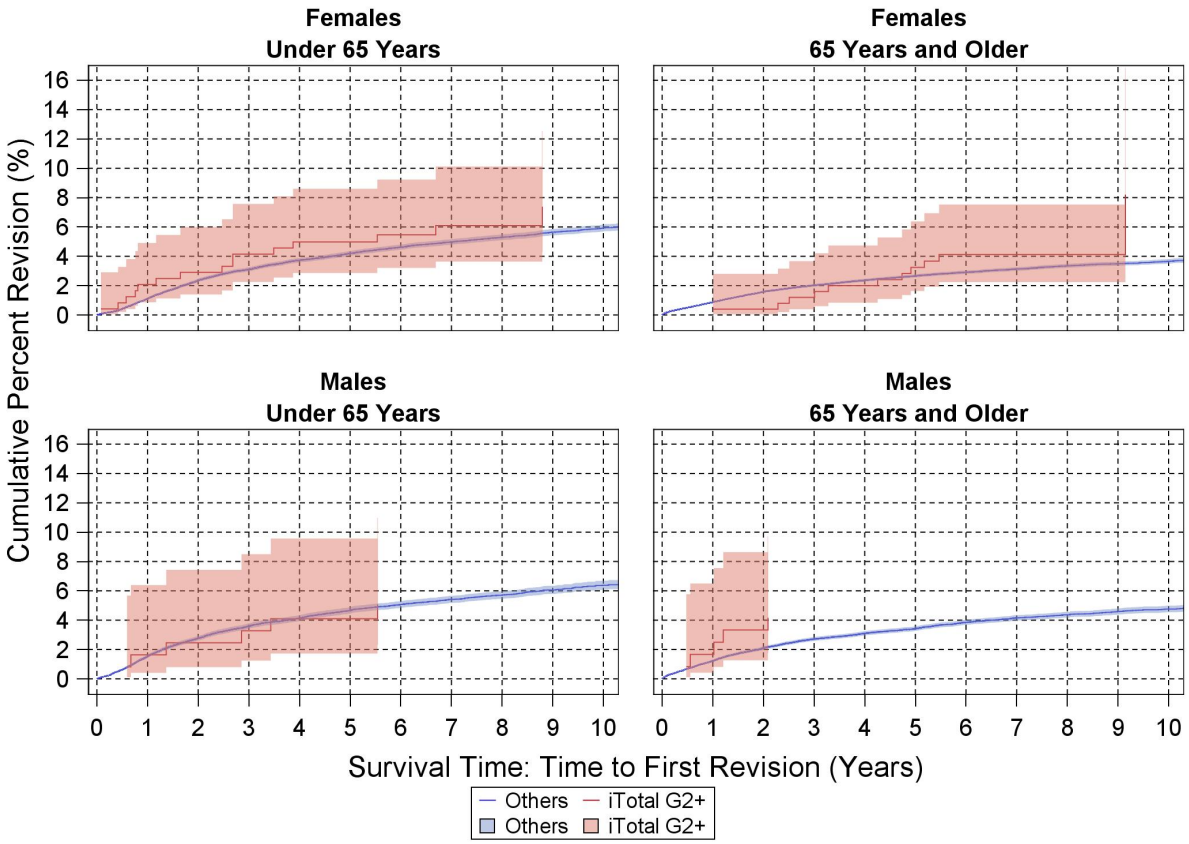


Figure 401. Cumulative Percent Revision Curve for the iTotal G2+ Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1156. Cumulative Percent Revision and Number at Risk for the iTotal G2+ Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	733	0.00 (0.00,0.00)	241	0.00 (0.00,0.00)	250	0.00 (0.00,0.00)	122	0.00 (0.00,0.00)	120	0.00 (0.00,0.00)
1	724	1.23 (0.64,2.35)	236	2.07 (0.87,4.91)	250	0.00 (0.00,0.00)	120	1.64 (0.41,6.40)	118	1.67 (0.42,6.50)
2	718	2.05 (1.24,3.37)	234	2.90 (1.40,6.00)	249	0.40 (0.06,2.81)	119	2.46 (0.80,7.43)	116	3.33 (1.26,8.64)
3	711	3.00 (1.99,4.52)	231	4.15 (2.25,7.57)	247	1.20 (0.39,3.67)	118	3.28 (1.24,8.50)	115	4.17 (1.76,9.72)
4	698	3.68 (2.54,5.33)	225	4.98 (2.86,8.60)	245	2.00 (0.84,4.74)	116	4.10 (1.73,9.57)	112	4.17 (1.76,9.72)
5	649	4.11 (2.89,5.83)	210	4.98 (2.86,8.60)	230	3.24 (1.63,6.38)	109	4.10 (1.73,9.57)	100	4.17 (1.76,9.72)
6	543	4.74 (3.41,6.58)	187	5.46 (3.21,9.23)	186	4.12 (2.24,7.53)	89	5.08 (2.31,10.98)	81	4.17 (1.76,9.72)
7	421	4.96 (3.58,6.85)	138	6.09 (3.64,10.12)	145	4.12 (2.24,7.53)	74	5.08 (2.31,10.98)	64	4.17 (1.76,9.72)
8	323	4.96 (3.58,6.85)	105	6.09 (3.64,10.12)	110	4.12 (2.24,7.53)	54	5.08 (2.31,10.98)	54	4.17 (1.76,9.72)
9	169	5.41 (3.85,7.57)	60	7.38 (4.29,12.55)	55	4.12 (2.24,7.53)	28	5.08 (2.31,10.98)	26	4.17 (1.76,9.72)
10	64	6.67 (4.57,9.68)	26	7.38 (4.29,12.55)	17	8.20 (3.89,16.84)	13	5.08 (2.31,10.98)	*	4.17 (1.76,9.72)

* Denotes that the number of cases is between 1 and 10.

Table 1157. Reasons for First Revision Following Primary TKA for iTotal G2+ Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	14	38.9
2	Aseptic Loosening	13	36.1
3	Pain	3	8.3
4	Metal Reaction/Metallosis	2	5.6
5	Arthrofibrosis	1	2.8
6	Implant Failure	1	2.8
7	Joint Infection	1	2.8
8	Malalignment	1	2.8

Table 1158. Reasons for First Revision in the First 90 Days Following Primary TKA for iTotal G2+ Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	100.0

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Table 1159. Reasons for First Revision Between 91 and 365 days Following Primary TKA for iTotal G2+ Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	2	25.0
2	Dislocation/Instability	2	25.0
3	Metal Reaction/Metallosis	1	12.5
4	Pain	1	12.5
5	Malalignment	1	12.5
6	Arthrofibrosis	1	12.5

Table 1160. Descriptive Statistics of Cases Receiving the iTotal G2+ Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	491	67	
Age (years)	733	64.4 (8.9)	65 (11)
Height (cm)	733	168.1 (10.1)	167.6 (15.3)
Weight (kg)	733	93 (22.6)	90.4 (27.9)
BMI(kg/m^2)	733	32.8 (7)	31.9 (8.6)
Smoker - Never (%)	398	54.3	
Smoker - Previous (%)	276	37.7	
Smoker - Current (%)	58	7.9	
Smoker - Unknown (%)	1	0.1	

Table 1161. Distribution of Approach Used for iTotal G2+ Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	513	70.0
Mid-vastus	209	28.5
Sub-vastus	0	0.0
Lateral parapatellar	0	0.0
Missing/unknown/other	11	1.5

Table 1162. Volume of Cases by Surgeon and Site for the iTotal G2+ Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	56 (86)	7 (69)
Cases per site	61 (91)	14 (76)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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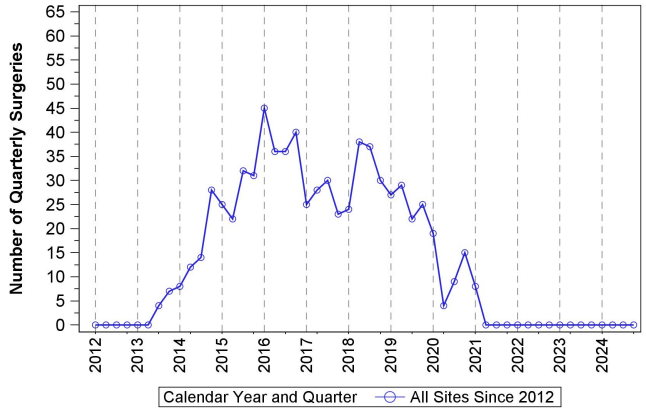


Figure 402. Utilization of the iTotal G2+ Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

TCR1111111FI	TPS1111111FI	M57250600010FI
xxxxxx	M57250600020FI	

Catalog Numbers of Tibial Components Used in the Analysis

TCR1111111TT	xxxxxx	M57250600010TT
TPS1111111TT	M57250600020TT	

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3.5.12 Journey II (Oxinium)/Journey

N = 1,761 primary cases were used for this analysis. Distribution of utilization: 70 surgeons across 45 sites used this implant combination in primary TKA cases.

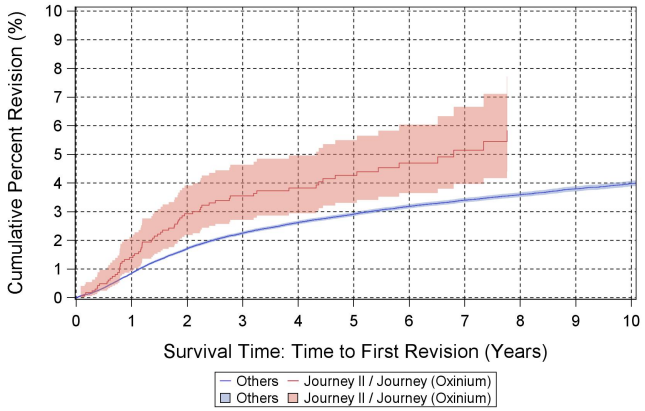


Figure 403. Cumulative Percent Revision Curve for the Journey II (Oxinium)/Journey Combination, Compared to All Other Implant Combinations in Primary TKA Cases

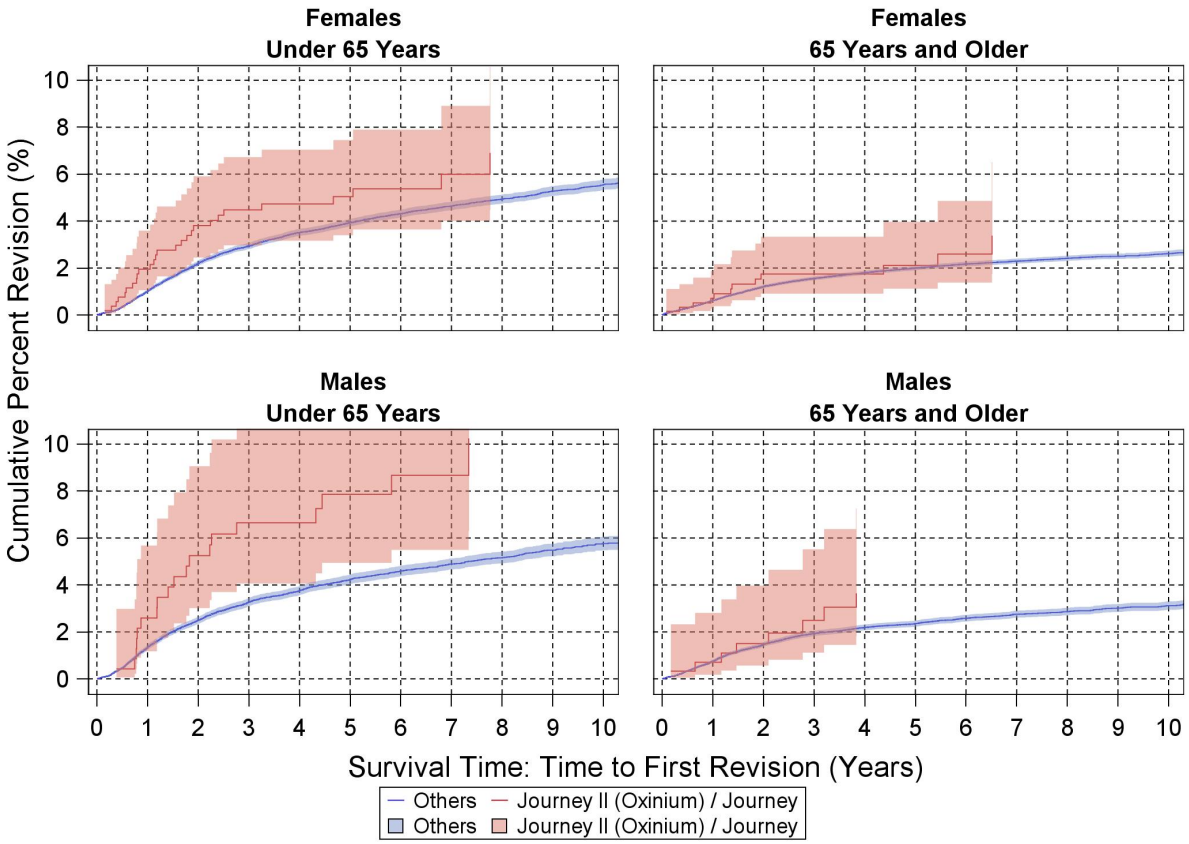


Figure 404. Cumulative Percent Revision Curve for the Journey II (Oxinium)/Journey Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1163. Cumulative Percent Revision and Number at Risk for the Journey II (Oxinium)/Journey Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,754	0.00 (0.00,0.00)	547	0.00 (0.00,0.00)	648	0.00 (0.00,0.00)	246	0.00 (0.00,0.00)	313	0.00 (0.00,0.00)
1	1,475	1.40 (0.92,2.12)	487	1.95 (1.05,3.60)	507	0.71 (0.27,1.88)	224	2.59 (1.17,5.68)	257	0.71 (0.18,2.81)
2	1,335	2.93 (2.18,3.91)	452	3.81 (2.44,5.91)	450	1.75 (0.91,3.34)	209	5.25 (3.01,9.06)	224	1.50 (0.57,3.97)
3	1,128	3.55 (2.71,4.64)	397	4.48 (2.97,6.73)	365	1.75 (0.91,3.34)	190	6.65 (4.06,10.79)	176	2.49 (1.12,5.52)
4	963	3.83 (2.95,4.96)	349	4.73 (3.17,7.04)	293	1.75 (0.91,3.34)	166	6.65 (4.06,10.79)	155	3.65 (1.81,7.26)
5	774	4.27 (3.31,5.50)	288	5.04 (3.40,7.45)	230	2.11 (1.12,3.97)	135	7.86 (4.94,12.39)	121	3.65 (1.81,7.26)
6	535	4.70 (3.65,6.04)	201	5.37 (3.64,7.90)	150	2.60 (1.38,4.86)	106	8.67 (5.49,13.55)	78	3.65 (1.81,7.26)
7	367	5.15 (3.97,6.66)	142	5.99 (4.01,8.91)	107	3.38 (1.74,6.51)	65	8.67 (5.49,13.55)	53	3.65 (1.81,7.26)
8	213	5.84 (4.41,7.71)	89	6.91 (4.48,10.57)	57	3.38 (1.74,6.51)	34	10.25 (6.30,16.43)	33	3.65 (1.81,7.26)
9	92	5.84 (4.41,7.71)	45	6.91 (4.48,10.57)	19	3.38 (1.74,6.51)	16	10.25 (6.30,16.43)	12	3.65 (1.81,7.26)
10	19	5.84 (4.41,7.71)	*	6.91 (4.48,10.57)	*	3.38 (1.74,6.51)	*	10.25 (6.30,16.43)	*	3.65 (1.81,7.26)

* Denotes that the number of cases is between 1 and 10.

Table 1164. Reasons for First Revision Following Primary TKA for Journey II (Oxinium)/Journey Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	30	45.5
2	Joint Infection	10	15.2
3	Aseptic Loosening	9	13.6
4	Arthrofibrosis	7	10.6
5	Pain	6	9.1
6	Implant Failure	2	3.0
7	Malalignment	1	1.5
8	Metal Reaction/Metallosis	1	1.5

Table 1165. Reasons for First Revision in the First 90 Days Following Primary TKA for Journey II (Oxinium)/Journey Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	33.3
2	Dislocation/Instability	1	33.3
3	Joint Infection	1	33.3

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Table 1166. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Journey II (Oxinium)/Journey Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	8	42.1
2	Joint Infection	5	26.3
3	Arthrofibrosis	3	15.8
4	Aseptic Loosening	2	10.5
5	Pain	1	5.3

Table 1167. Descriptive Statistics of Cases Receiving the Journey II (Oxinium)/Journey Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,197	68	
Age (years)	1,761	65.5 (9.3)	66 (13)
Height (cm)	1,760	167.8 (10.4)	167.6 (15.2)
Weight (kg)	1,760	95.4 (21.8)	93.3 (28.8)
BMI(kg/m^2)	1,760	33.8 (7)	33.1 (9.6)
Smoker - Never (%)	825	46.9	
Smoker - Previous (%)	696	39.5	
Smoker - Current (%)	220	12.5	
Smoker - Unknown (%)	20	1.1	

Table 1168. Distribution of Approach Used for Journey II (Oxinium)/Journey Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	1,688	95.9
Mid-vastus	50	2.8
Sub-vastus	15	0.9
Lateral parapatellar	4	0.2
Missing/unknown/other	4	0.2

Table 1169. Distribution of Polyethylene Used for Journey II (Oxinium)/Journey Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,637	93.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	124	7.0

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Table 1170. Volume of Cases by Surgeon and Site for the Journey II (Oxinium)/Journey Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	25 (61)	6 (17)
Cases per site	39 (84)	11 (37)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

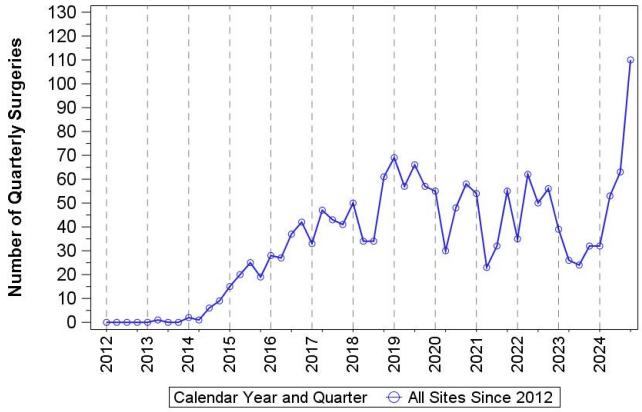


Figure 405. Utilization of the Journey II (Oxinium)/Journey Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

74021155	74021167	74021159
74021165	74021157	74021169
74021154	74021163	74021162
74021164	74021153	74021160
74021156	74021158	
74021166	74021168	

Catalog Numbers of Tibial Components Used in the Analysis

74022214	74022216	74022218
74022224	74022226	74022228
74022223	74022222	74022221
74022213	74022227	74022211
74022215	74022217	
74022225	74022212	

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3.5.13 Journey II BCS (CoCr)/Journey

N = 1,171 primary cases were used for this analysis. Distribution of utilization: 11 surgeons across 10 sites used this implant combination in primary TKA cases.

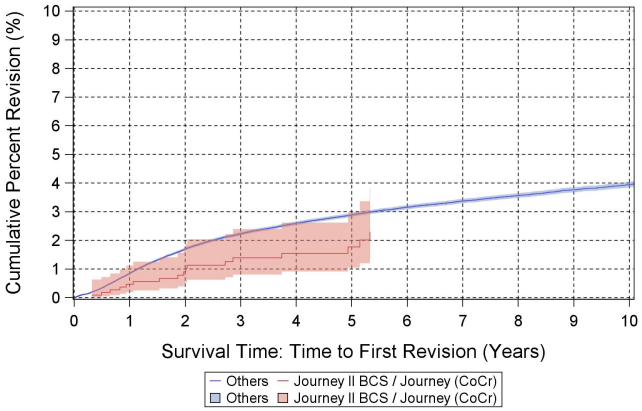


Figure 406. Cumulative Percent Revision Curve for the Journey II BCS (CoCr)/Journey Combination, Compared to All Other Implant Combinations in Primary TKA Cases

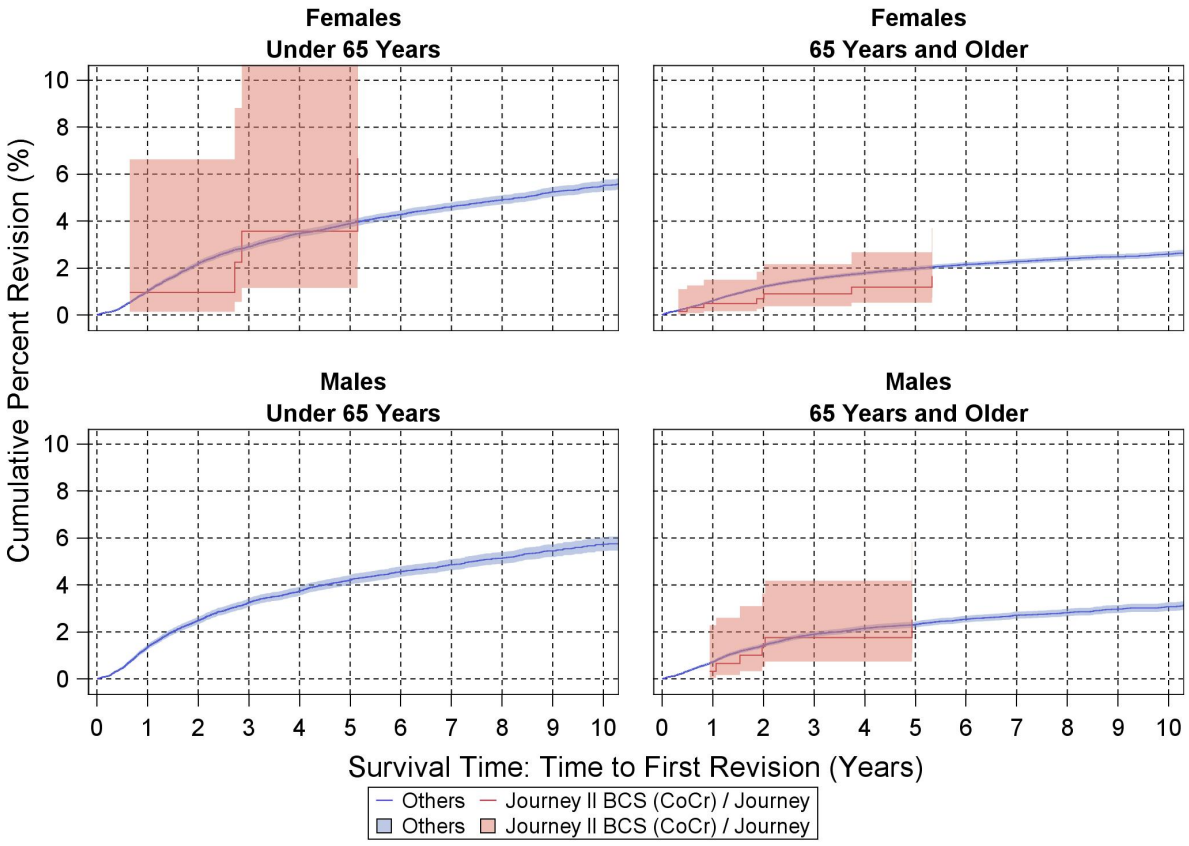


Figure 407. Cumulative Percent Revision Curve for the Journey II BCS (CoCr)/Journey Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1171. Cumulative Percent Revision and Number at Risk for the Journey II BCS (CoCr)/Journey Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,165	0.00 (0.00,0.00)	112	0.00 (0.00,0.00)	665	0.00 (0.00,0.00)	44	0.00 (0.00,0.00)	341	0.00 (0.00,0.00)
1	1,016	0.47 (0.19,1.12)	101	0.96 (0.14,6.63)	568	0.49 (0.16,1.50)	39	0.00 (0.00,0.00)	305	0.32 (0.05,2.28)
2	858	0.90 (0.47,1.73)	85	0.96 (0.14,6.63)	474	0.69 (0.26,1.84)	35	0.00 (0.00,0.00)	262	1.38 (0.52,3.64)
3	747	1.39 (0.81,2.39)	73	3.57 (1.15,10.77)	412	0.90 (0.37,2.17)	31	0.00 (0.00,0.00)	230	1.76 (0.73,4.18)
4	587	1.55 (0.91,2.62)	52	3.57 (1.15,10.77)	328	1.19 (0.52,2.67)	26	0.00 (0.00,0.00)	181	1.76 (0.73,4.18)
5	434	1.77 (1.05,2.98)	35	3.57 (1.15,10.77)	255	1.19 (0.52,2.67)	19	0.00 (0.00,0.00)	125	2.52 (1.08,5.82)
6	225	2.29 (1.38,3.82)	14	6.68 (2.26,18.87)	137	1.66 (0.74,3.69)	*	0.00 (0.00,0.00)	68	2.52 (1.08,5.82)
7	95	2.29 (1.38,3.82)	0	N/A	65	1.66 (0.74,3.69)	*	0.00 (0.00,0.00)	27	2.52 (1.08,5.82)
8	36	2.29 (1.38,3.82)	0	N/A	22	1.66 (0.74,3.69)	*	0.00 (0.00,0.00)	11	2.52 (1.08,5.82)
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 1172. Reasons for First Revision Following Primary TKA for Journey II BCS (CoCr)/Journey Combination Cases

Rank	Reason for Revision	N	Percent
1	Arthrofibrosis	5	27.8
2	Joint Infection	4	22.2
3	Aseptic Loosening	3	16.7
4	Dislocation/Instability	3	16.7
5	Implant Failure	1	5.6
6	Pain	1	5.6
7	Poly liner wear	1	5.6

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1173. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Journey II BCS (CoCr)/Journey Combination Cases

Rank	Reason for Revision	N	Percent
1	Arthrofibrosis	3	60.0
2	Aseptic Loosening	1	20.0
3	Joint Infection	1	20.0

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Table 1174. Descriptive Statistics of Cases Receiving the Journey II BCS (CoCr)/Journey Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	779	66.5	
Age (years)	1,171	71.7 (7)	72 (9)
Height (cm)	1,171	166.8 (10.3)	165.1 (15.2)
Weight (kg)	1,171	94.7 (21.8)	93 (30.9)
BMI(kg/m^2)	1,171	34.1 (7.4)	33.2 (10.3)
Smoker - Never (%)	646	55.2	
Smoker - Previous (%)	462	39.5	
Smoker - Current (%)	62	5.3	
Smoker - Unknown (%)	0	0.0	

Table 1175. Distribution of Approach Used for Journey II BCS (CoCr)/Journey Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	1,163	99.3
Mid-vastus	5	0.4
Sub-vastus	0	0.0
Lateral parapatellar	1	0.1
Missing/unknown/other	2	0.2

Table 1176. Distribution of Polyethylene Used for Journey II BCS (CoCr)/Journey Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,150	98.2
Antioxidant XLPE	0	0.0
Missing/unknown/other	21	1.8

Table 1177. Volume of Cases by Surgeon and Site for the Journey II BCS (CoCr)/Journey Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	106 (194)	12 (142)
Cases per site	117 (242)	10 (134)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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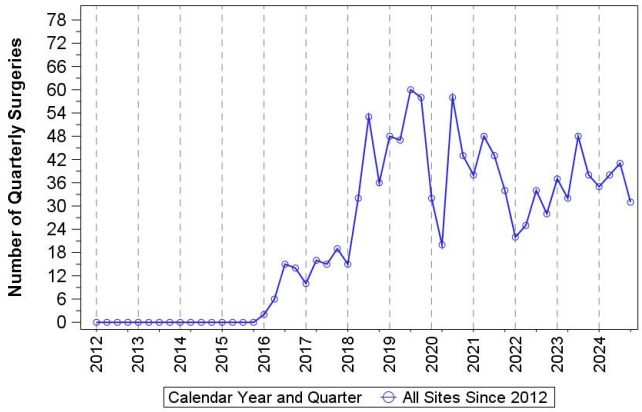


Figure 408. Utilization of the Journey II BCS (CoCr)/Journey Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

74024215	74024924	74024213
74024925	74024217	74024923
74024216	74024927	
74024926	74024218	
74024214	74024928	

Catalog Numbers of Tibial Components Used in the Analysis

74022224	74022216	74022228
74022214	74022226	74022218
74022213	74022217	74022211
74022223	74022227	74022221
74022215	74022212	
74022225	74022222	

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3.5.14 Journey II BCS (Oxinium)/Journey

N = 6,565 primary cases were used for this analysis. Distribution of utilization: 102 surgeons across 56 sites used this implant combination in primary TKA cases.

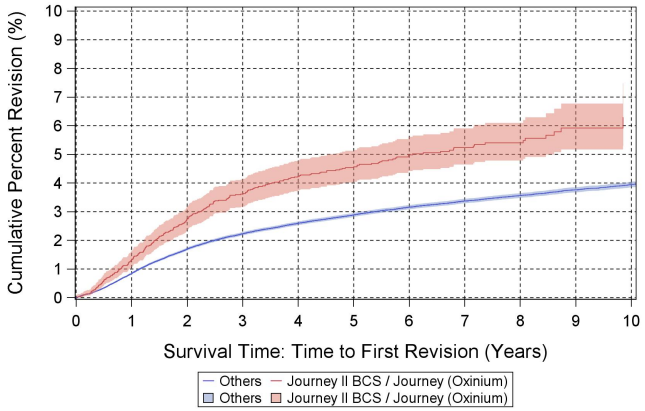


Figure 409. Cumulative Percent Revision Curve for the Journey II BCS (Oxinium)/Journey Combination, Compared to All Other Implant Combinations in Primary TKA Cases

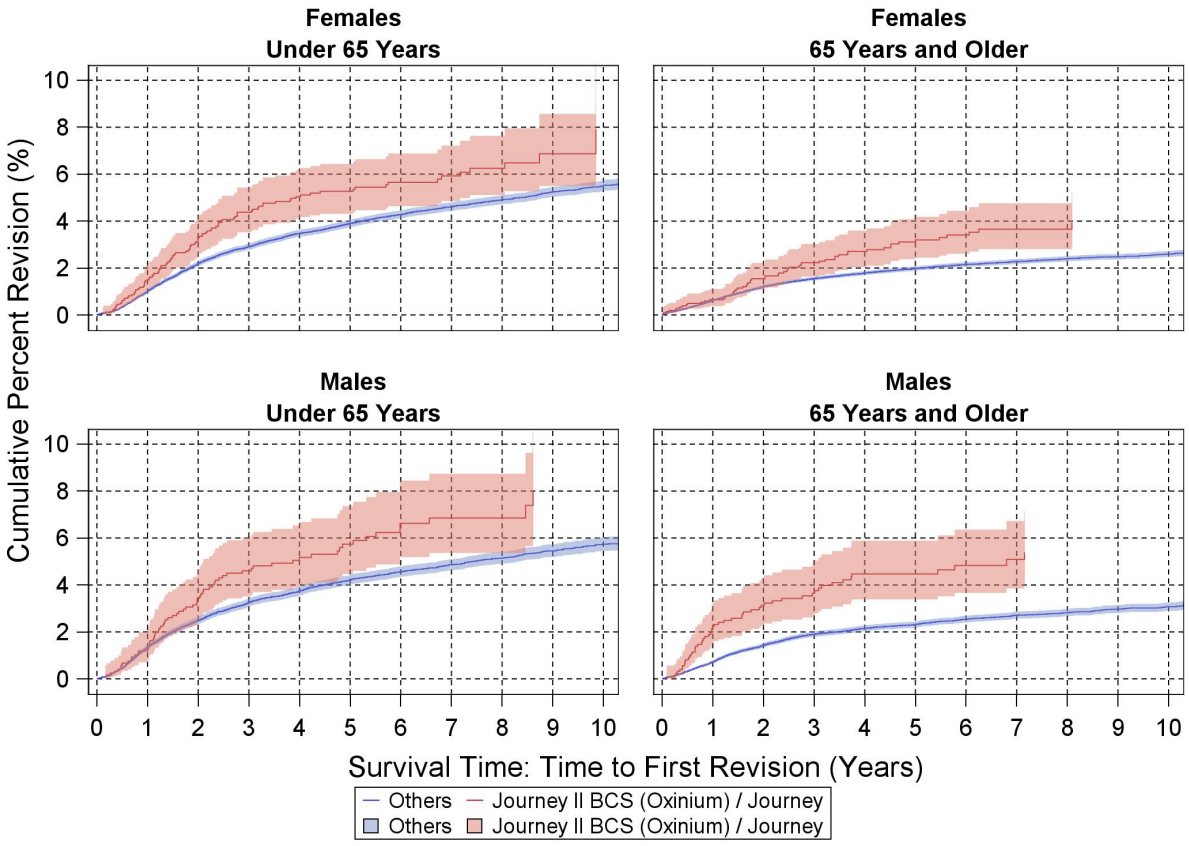


Figure 410. Cumulative Percent Revision Curve for the Journey II BCS (Oxinium)/Journey Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1178. Cumulative Percent Revision and Number at Risk for the Journey II BCS (Oxinium)/Journey Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	6,540	0.00 (0.00,0.00)	2,003	0.00 (0.00,0.00)	2,062	0.00 (0.00,0.00)	1,208	0.00 (0.00,0.00)	1,263	0.00 (0.00,0.00)
1	5,990	1.33 (1.08,1.65)	1,846	1.50 (1.05,2.16)	1,869	0.65 (0.38,1.12)	1,134	1.28 (0.77,2.11)	1,137	2.23 (1.54,3.24)
2	5,385	2.75 (2.36,3.19)	1,662	3.29 (2.57,4.21)	1,675	1.55 (1.08,2.22)	1,026	3.44 (2.52,4.67)	1,019	3.13 (2.28,4.30)
3	4,803	3.61 (3.17,4.13)	1,506	4.38 (3.52,5.43)	1,502	2.23 (1.64,3.03)	921	4.60 (3.52,6.02)	874	3.65 (2.70,4.91)
4	4,122	4.23 (3.74,4.79)	1,321	5.04 (4.11,6.18)	1,305	2.71 (2.04,3.60)	761	5.17 (4.00,6.68)	735	4.47 (3.39,5.89)
5	3,438	4.54 (4.02,5.12)	1,092	5.27 (4.31,6.43)	1,112	3.11 (2.37,4.08)	622	5.74 (4.47,7.35)	612	4.47 (3.39,5.89)
6	2,618	4.98 (4.42,5.61)	860	5.65 (4.64,6.88)	812	3.41 (2.61,4.44)	479	6.62 (5.19,8.44)	467	4.83 (3.67,6.36)
7	1,892	5.24 (4.64,5.91)	631	5.92 (4.86,7.22)	572	3.66 (2.81,4.76)	346	6.85 (5.36,8.74)	343	5.09 (3.85,6.72)
8	1,223	5.40 (4.78,6.10)	408	6.25 (5.11,7.63)	356	3.66 (2.81,4.76)	234	6.85 (5.36,8.74)	225	5.38 (4.05,7.14)
9	565	5.92 (5.17,6.77)	193	6.87 (5.49,8.57)	146	3.94 (2.97,5.22)	115	7.96 (5.99,10.55)	111	5.38 (4.05,7.14)
10	222	6.30 (5.30,7.48)	79	7.93 (5.73,10.91)	61	3.94 (2.97,5.22)	45	7.96 (5.99,10.55)	37	5.38 (4.05,7.14)

Table 1179. Reasons for First Revision Following Primary TKA for Journey II BCS (Oxinium)/Journey Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	88	31.3
2	Joint Infection	52	18.5
3	Aseptic Loosening	44	15.7
4	Arthrofibrosis	34	12.1
5	Pain	21	7.5
6	Implant Failure	12	4.3
7	Poly liner wear	11	3.9
8	Malalignment	9	3.2
9	Peri-prosthetic fracture - Femur	5	1.8
10	Patellofemoral Joint	4	1.4
	Unknown/missing/other	1	0.4

Table 1180. Reasons for First Revision in the First 90 Days Following Primary TKA for Journey II BCS (Oxinium)/Journey Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	4	40.0
2	Joint Infection	2	20.0
3	Arthrofibrosis	2	20.0
4	Malalignment	1	10.0
5	Extensor mechanism failure	1	10.0

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Table 1181. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Journey II BCS (Oxinium)/Journey Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	21	28.8
2	Joint Infection	18	24.7
3	Arthrofibrosis	17	23.3
4	Poly liner wear	4	5.5
5	Pain	4	5.5
6	Malalignment	4	5.5
7	Aseptic Loosening	2	2.7
8	Implant Failure	2	2.7
9	Patellofemoral Joint	1	1.4

Table 1182. Descriptive Statistics of Cases Receiving the Journey II BCS (Oxinium)/Journey Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	4,080	62.2	
Age (years)	6,565	64.7 (9.4)	65 (13)
Height (cm)	6,565	168.7 (10.5)	167.6 (16.5)
Weight (kg)	6,565	97.1 (22.2)	95.4 (29.4)
BMI(kg/m^2)	6,565	34.1 (7.1)	33.3 (9.4)
Smoker - Never (%)	3,342	50.9	
Smoker - Previous (%)	2,411	36.7	
Smoker - Current (%)	777	11.8	
Smoker - Unknown (%)	35	0.5	

Table 1183. Distribution of Approach Used for Journey II BCS (Oxinium)/Journey Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	6,014	91.6
Mid-vastus	516	7.9
Sub-vastus	12	0.2
Lateral parapatellar	11	0.2
Missing/unknown/other	12	0.2

Table 1184. Distribution of Polyethylene Used for Journey II BCS (Oxinium)/Journey Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	6,187	94.2
Antioxidant XLPE	0	0.0
Missing/unknown/other	378	5.8

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Table 1185. Volume of Cases by Surgeon and Site for the Journey II BCS (Oxinium)/Journey Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	64 (116)	7 (78)
Cases per site	117 (172)	51 (175)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

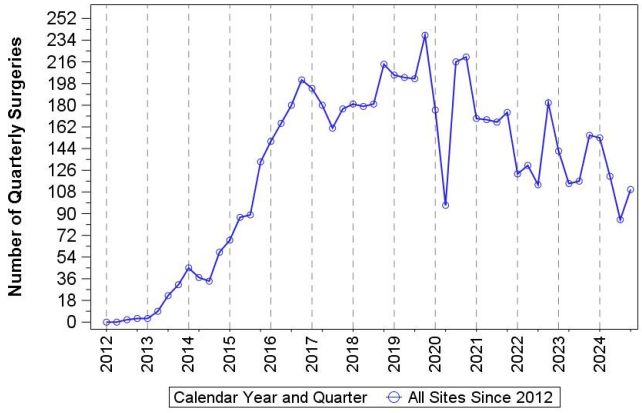


Figure 411. Utilization of the Journey II BCS (Oxinium)/Journey Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

74022125	74022127	74022122
74022115	74022118	74022112
74022116	74022128	74022110
74022126	74022113	74022120
74022114	74022123	
74022124	74022129	
74022117	74022119	

Catalog Numbers of Tibial Components Used in the Analysis

74022224	74022216	74022218
74022214	74022226	74022228
74022213	74022227	74022211
74022223	74022217	74022221
74022215	74022222	
74022225	74022212	

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3.5.15 LCS Complete/M.B.T.

N = 1,939 primary cases were used for this analysis. Fewer than ten surgeons across 12 sites used this implant combination in primary TKA cases.

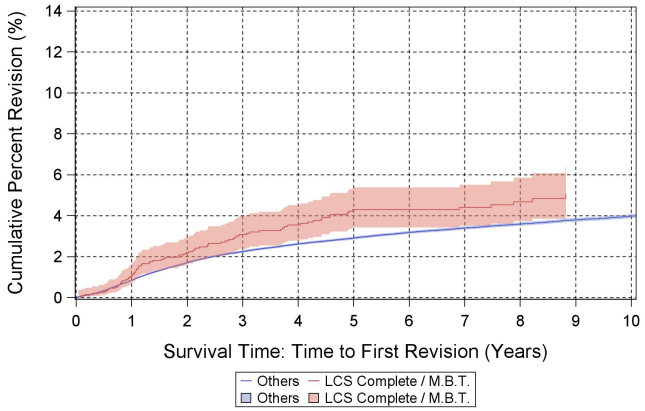


Figure 412. Cumulative Percent Revision Curve for the LCS Complete/M.B.T. Combination, Compared to All Other Implant Combinations in Primary TKA Cases

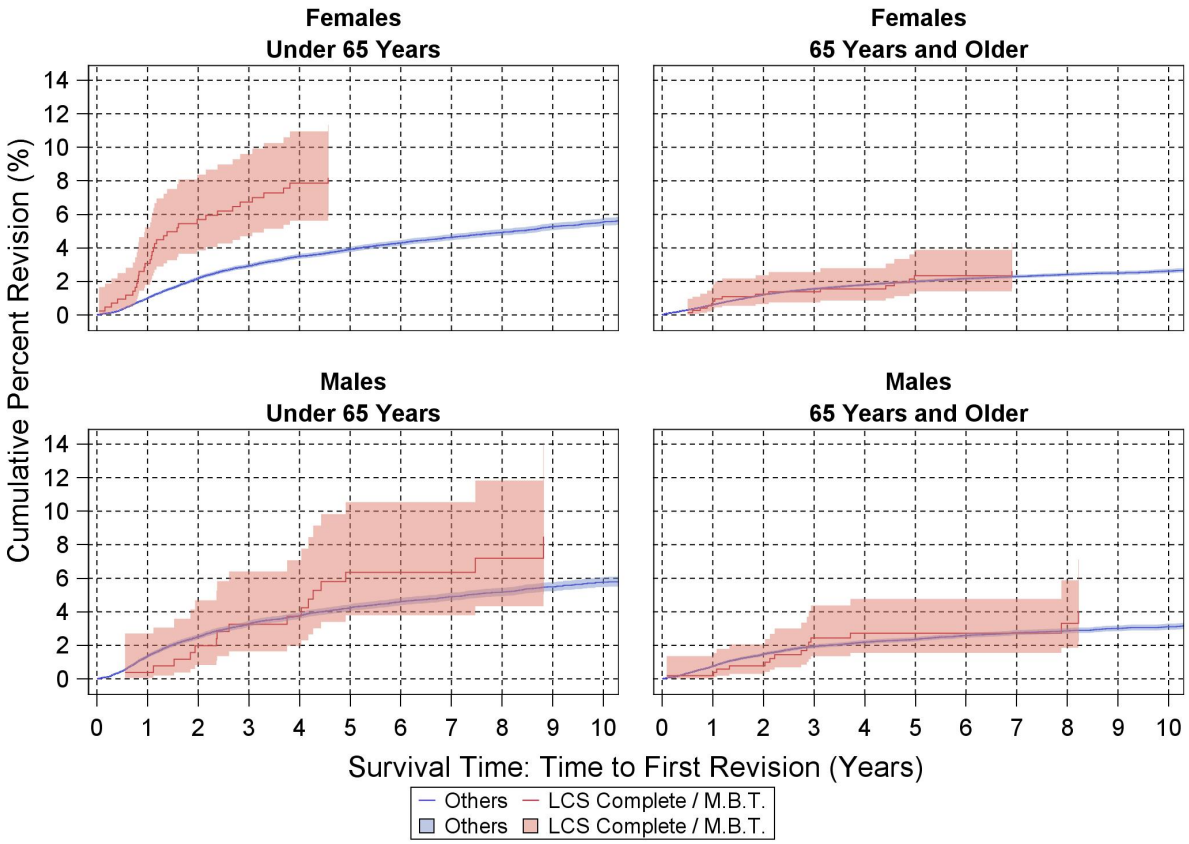


Figure 413. Cumulative Percent Revision Curve for the LCS Complete/M.B.T. Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1186. Cumulative Percent Revision and Number at Risk for the LCS Complete/MBT Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,930	0.00 (0.00,0.00)	423	0.00 (0.00,0.00)	730	0.00 (0.00,0.00)	259	0.00 (0.00,0.00)	518	0.00 (0.00,0.00)
1	1,907	1.04 (0.67,1.60)	410	3.07 (1.80,5.23)	725	0.68 (0.29,1.64)	257	0.39 (0.05,2.71)	515	0.19 (0.03,1.36)
2	1,763	2.20 (1.63,2.96)	384	5.69 (3.85,8.37)	676	1.24 (0.65,2.37)	242	1.98 (0.83,4.69)	461	0.78 (0.29,2.06)
3	1,545	3.08 (2.38,3.98)	347	6.73 (4.70,9.61)	603	1.39 (0.75,2.56)	212	3.25 (1.64,6.41)	383	2.44 (1.35,4.38)
4	1,347	3.55 (2.79,4.52)	307	7.86 (5.62,10.95)	522	1.55 (0.86,2.79)	192	3.74 (1.96,7.07)	326	2.72 (1.55,4.77)
5	1,212	4.30 (3.43,5.39)	276	8.18 (5.88,11.34)	483	2.34 (1.41,3.89)	167	6.35 (3.79,10.54)	286	2.72 (1.55,4.77)
6	1,064	4.30 (3.43,5.39)	256	8.18 (5.88,11.34)	416	2.34 (1.41,3.89)	148	6.35 (3.79,10.54)	244	2.72 (1.55,4.77)
7	877	4.41 (3.52,5.52)	217	8.18 (5.88,11.34)	340	2.62 (1.59,4.30)	127	6.35 (3.79,10.54)	193	2.72 (1.55,4.77)
8	621	4.68 (3.73,5.86)	143	8.18 (5.88,11.34)	231	2.62 (1.59,4.30)	93	7.20 (4.33,11.83)	154	3.31 (1.86,5.88)
9	386	5.07 (4.01,6.40)	95	8.18 (5.88,11.34)	131	2.62 (1.59,4.30)	64	8.48 (5.05,14.08)	96	4.00 (2.23,7.13)
10	226	5.07 (4.01,6.40)	57	8.18 (5.88,11.34)	77	2.62 (1.59,4.30)	35	8.48 (5.05,14.08)	57	4.00 (2.23,7.13)

Table 1187. Reasons for First Revision Following Primary TKA for LCS Complete/M.B.T. Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	28	37.8
2	Aseptic Loosening	22	29.7
3	Joint Infection	9	12.2
4	Pain	9	12.2
5	Implant Failure	4	5.4
6	Peri-prosthetic fracture - Femur	2	2.7

Table 1188. Reasons for First Revision in the First 90 Days Following Primary TKA for LCS Complete/M.B.T. Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	33.3
2	Joint Infection	1	33.3
3	Peri-prosthetic fracture - Femur	1	33.3

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Table 1189. Reasons for First Revision Between 91 and 365 days Following Primary TKA for LCS Complete/M.B.T. Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	9	56.2
2	Aseptic Loosening	2	12.5
3	Joint Infection	2	12.5
4	Pain	2	12.5
5	Implant Failure	1	6.2

Table 1190. Descriptive Statistics of Cases Receiving the LCS Complete/M.B.T. Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,158	59.7	
Age (years)	1,939	67.9 (9.5)	69 (14)
Height (cm)	1,939	168.3 (10.1)	167.6 (15.2)
Weight (kg)	1,939	96.1 (21.3)	94.1 (27.9)
BMI(kg/m^2)	1,939	33.9 (6.8)	33.2 (9)
Smoker - Never (%)	1,066	55	
Smoker - Previous (%)	661	34.1	
Smoker - Current (%)	155	8	
Smoker - Unknown (%)	57	2.9	

Table 1191. Distribution of Approach Used for LCS Complete/M.B.T. Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	1,932	99.6
Mid-vastus	1	0.1
Sub-vastus	0	0.0
Lateral parapatellar	1	0.1
Missing/unknown/other	5	0.3

Table 1192. Distribution of Polyethylene Used for LCS Complete/M.B.T. Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	1,937	99.9
XLPE	0	0.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	2	0.1

Table 1193. Volume of Cases by Surgeon and Site for the LCS Complete/M.B.T. Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	242 (498)	35 (191)
Cases per site	161 (415)	11 (67)

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The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

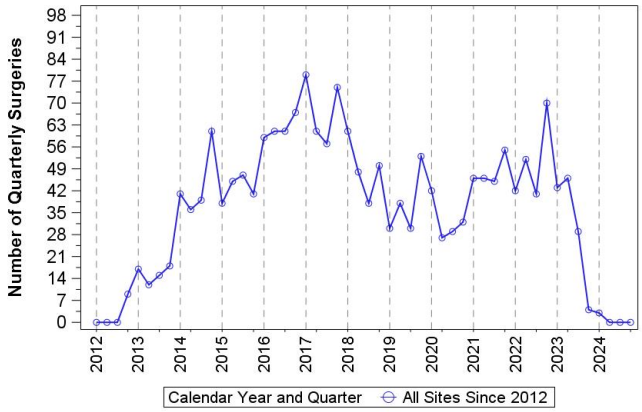


Figure 414. Utilization of the LCS Complete/M.B.T. Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

129401040	129403050	129404030
129402040	129401030	129428040
129401060	129402030	129428050
129402050	129402070	129411050
129401050	129401070	129411060
129402060	129404070	129411070
129403040	129403070	129412060
129404050	129411040	129429040
129404040	129403030	129429050
129403060	129412050	
129404060	129412040	

Catalog Numbers of Tibial Components Used in the Analysis

129431130	129431160	129435125
129431140	129431120	129435130
129431150	129432150	129433170
129433140	129433160	129434130
129433130	129432140	129435120
129433150	129432125	129435150
129431125	129433120	
129433125	129435140	

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3.5.16 Legion/Genesis II

N = 14,440 primary cases were used for this analysis. Distribution of utilization: 208 surgeons across 69 sites used this implant combination in primary TKA cases.

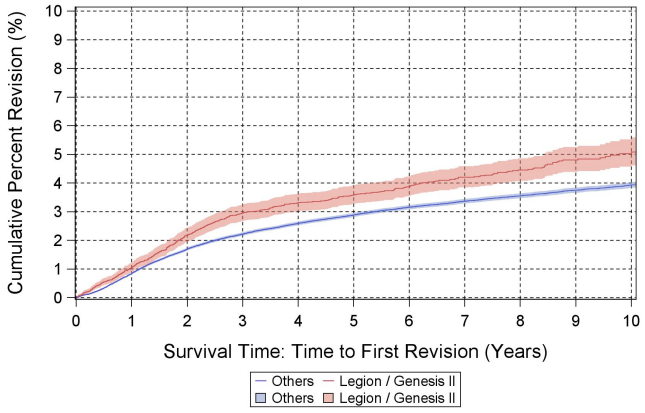


Figure 415. Cumulative Percent Revision Curve for the Legion/Genesis II Combination, Compared to All Other Implant Combinations in Primary TKA Cases

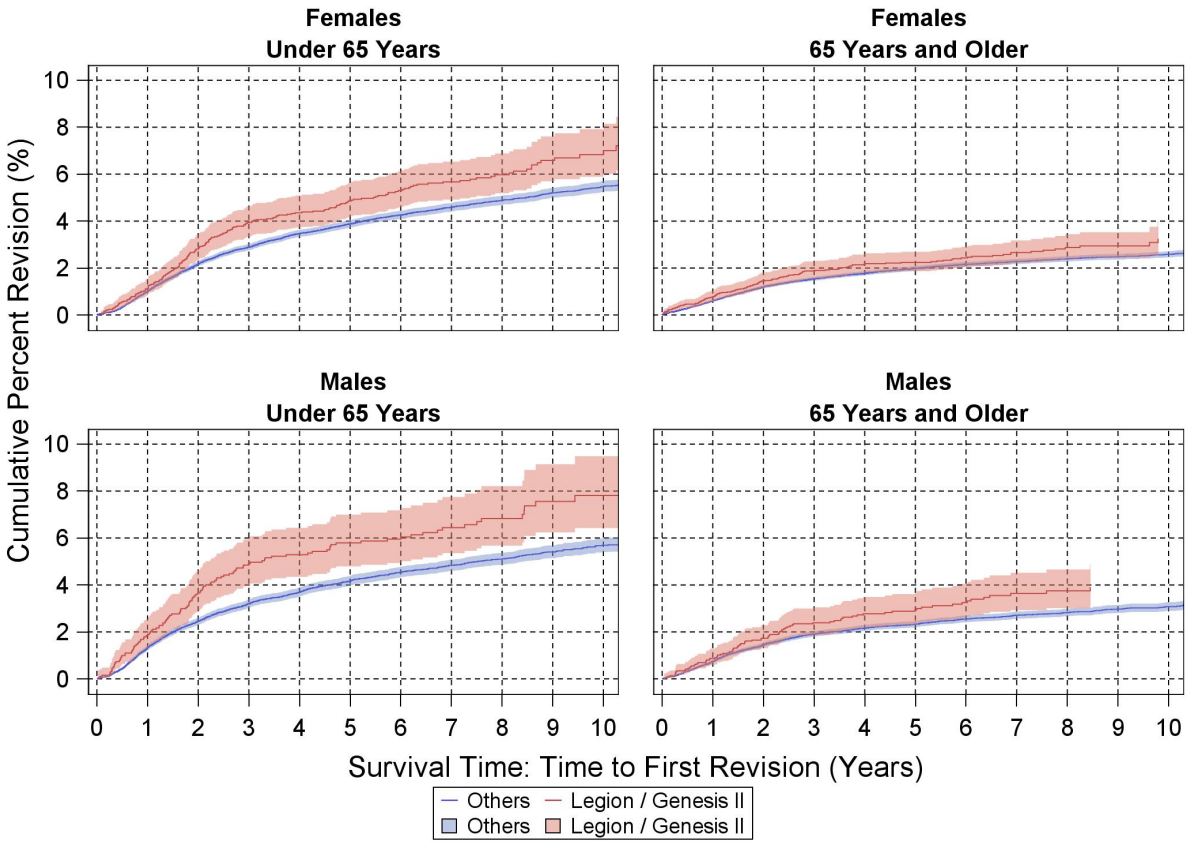


Figure 416. Cumulative Percent Revision Curve for the Legion/Genesis II Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1194. Cumulative Percent Revision and Number at Risk for the Legion/Genesis II Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	14,341	0.00 (0.00,0.00)	3,741	0.00 (0.00,0.00)	5,687	0.00 (0.00,0.00)	1,936	0.00 (0.00,0.00)	2,974	0.00 (0.00,0.00)
1	13,488	1.04 (0.88,1.22)	3,571	1.14 (0.85,1.54)	5,332	0.77 (0.57,1.04)	1,831	1.84 (1.33,2.56)	2,751	0.87 (0.59,1.29)
2	12,452	2.17 (1.94,2.43)	3,362	2.81 (2.32,3.40)	4,895	1.45 (1.16,1.81)	1,697	3.67 (2.90,4.63)	2,496	1.73 (1.31,2.29)
3	11,139	2.95 (2.68,3.26)	3,100	3.94 (3.35,4.64)	4,336	1.88 (1.54,2.28)	1,532	4.91 (4.00,6.01)	2,171	2.39 (1.87,3.05)
4	10,109	3.32 (3.02,3.64)	2,863	4.36 (3.73,5.09)	3,910	2.19 (1.82,2.63)	1,394	5.29 (4.34,6.43)	1,942	2.77 (2.21,3.49)
5	9,025	3.58 (3.27,3.92)	2,568	4.86 (4.18,5.63)	3,501	2.24 (1.86,2.69)	1,259	5.79 (4.79,7.00)	1,697	2.94 (2.35,3.68)
6	7,504	3.87 (3.54,4.22)	2,182	5.30 (4.59,6.12)	2,874	2.43 (2.03,2.91)	1,067	5.96 (4.93,7.18)	1,381	3.25 (2.61,4.05)
7	5,927	4.20 (3.85,4.59)	1,797	5.67 (4.92,6.53)	2,238	2.66 (2.23,3.18)	824	6.44 (5.35,7.75)	1,068	3.64 (2.93,4.52)
8	4,303	4.45 (4.08,4.86)	1,336	5.98 (5.19,6.88)	1,598	2.87 (2.40,3.44)	616	6.83 (5.67,8.21)	753	3.75 (3.01,4.66)
9	2,769	4.80 (4.39,5.26)	868	6.58 (5.69,7.61)	995	2.94 (2.45,3.53)	426	7.56 (6.24,9.14)	480	3.91 (3.12,4.88)
10	1,635	5.02 (4.57,5.52)	543	6.83 (5.89,7.92)	525	3.25 (2.63,4.01)	282	7.81 (6.43,9.49)	285	3.91 (3.12,4.88)

Table 1195. Reasons for First Revision Following Primary TKA for Legion/Genesis II Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	157	30.1
2	Aseptic Loosening	114	21.8
3	Joint Infection	97	18.6
4	Pain	41	7.9
5	Arthrofibrosis	39	7.5
6	Implant Failure	26	5.0
7	Malalignment	14	2.7
8	Peri-prosthetic fracture - Femur	13	2.5
9	Patellofemoral Joint	7	1.3
10	Osteolysis	5	1.0
	Unknown/missing/other	3	1.7

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Table 1196. Reasons for First Revision in the First 90 Days Following Primary TKA for Legion/Genesis II Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	13	40.6
2	Peri-prosthetic fracture - Femur	8	25.0
3	Dislocation/Instability	5	15.6
4	Pain	2	6.2
5	Aseptic Loosening	1	3.1
6	Poly liner wear	1	3.1
7	Malalignment	1	3.1
8	Extensor mechanism failure	1	3.1

Table 1197. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Legion/Genesis II Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	25	25.2
2	Joint Infection	25	25.2
3	Arthrofibrosis	13	13.1
4	Implant Failure	10	10.1
5	Aseptic Loosening	9	9.1
6	Pain	8	8.1
7	Malalignment	4	4.0
8	Peri-prosthetic fracture - Femur	2	2.0
9	Extensor mechanism failure	2	2.0
10	Patellofemoral Joint	1	1.0

Table 1198. Descriptive Statistics of Cases Receiving the Legion/Genesis II Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	9,479	65.6	
Age (years)	14,440	66.6 (9.2)	67 (12)
Height (cm)	14,440	168 (10.3)	167.6 (15.2)
Weight (kg)	14,440	94.6 (21.3)	93 (28.1)
BMI(kg/m^2)	14,440	33.5 (6.9)	32.6 (9.2)
Smoker - Never (%)	7,533	52.2	
Smoker - Previous (%)	5,595	38.8	
Smoker - Current (%)	1,276	8.8	
Smoker - Unknown (%)	36	0.3	

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Table 1199. Distribution of Approach Used for Legion/Genesis II Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	13,341	92.4
Mid-vastus	1,030	7.1
Sub-vastus	26	0.2
Lateral parapatellar	14	0.1
Missing/unknown/other	29	0.2

Table 1200. Distribution of Polyethylene Used for Legion/Genesis II Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	976	6.8
XLPE	13,120	90.9
Antioxidant XLPE	0	0.0
Missing/unknown/other	344	2.4

Table 1201. Volume of Cases by Surgeon and Site for the Legion/Genesis II Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	69 (161)	8 (45)
Cases per site	209 (399)	48 (197)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

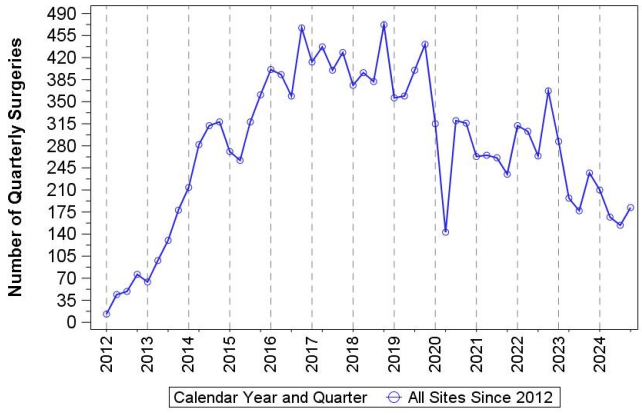


Figure 417. Utilization of the Legion/Genesis II Combination in Primary TKA Cases

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Catalog Numbers of Femoral Components Used in the Analysis

71421225	71421233	71421253
71421224	71421264	71423213
71421236	71423206	71423203
71421235	71421274	71421263
71421226	71421276	71933643
71421234	71421266	71421273
71421255	71423215	71423218
71421245	71423214	71933652
71421227	71423205	71423208
71421237	71423217	71933644
71421205	71423207	71421175
71421215	71423204	71421212
71421214	71421208	71933640
71421216	71933654	71933648
71421206	71933642	71421176
71421204	71933646	71421202
71421254	71421213	71421165
71421275	71421218	71421174
71423235	71933650	71421232
71421244	71421238	71421163
71421265	71421203	71421177
71421207	71421228	71426003
71423225	71423223	71421164
71423236	71933649	71421167
71423226	71423238	71421173
71421217	71423228	71421222
71423234	71933653	71423212
71423224	71423233	71423222
71423237	71933647	71423232
71421256	71933641	71425003
71421246	71933645	71426005
71421223	71933655	71426007
71423227	71933651	71426008
71423216	71421243	

Catalog Numbers of Tibial Components Used in the Analysis

71420184	71420174	71420298
71420182	71420312	71420314
71420166	71420240	71420234
71420164	71420304	71420386
71420186	71420248	71420328
71420168	71420160	71420368
71420170	71420176	71420384
71420188	71420320	71420264
71420190	71420232	71420378
71420172	71420256	71420446
71420180	71420250	71420242
71420162	71420296	71420308
71420191	71420306	71420322

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71420336
71420338
71420376
71420380
71926221
71420244
71420252
71420258
71420262
71420266
71420268
71420270
71420272
71420274
71420316
71420344
71420350
71420388
71420392
71420394
71420396
71420432
71420434
71420440
71420444
71420452
71420456
71420458
71420460
71420464

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3.5.17 NexGen GS/NexGen Pegged

N = 682 primary cases were used for this analysis. Distribution of utilization: 17 surgeons across 11 sites used this implant combination in primary TKA cases.

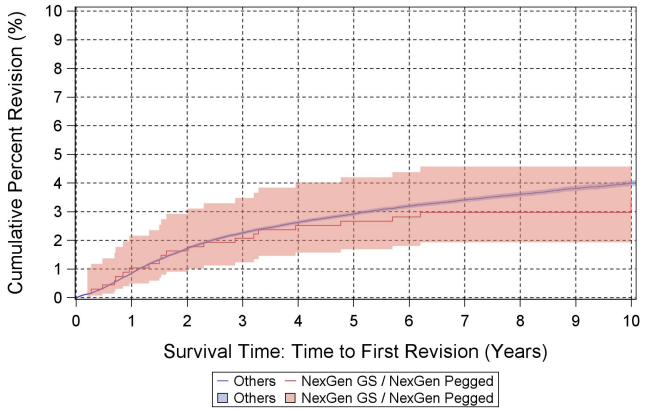


Figure 418. Cumulative Percent Revision Curve for the NexGen GS/NexGen Pegged Combination, Compared to All Other Implant Combinations in Primary TKA Cases

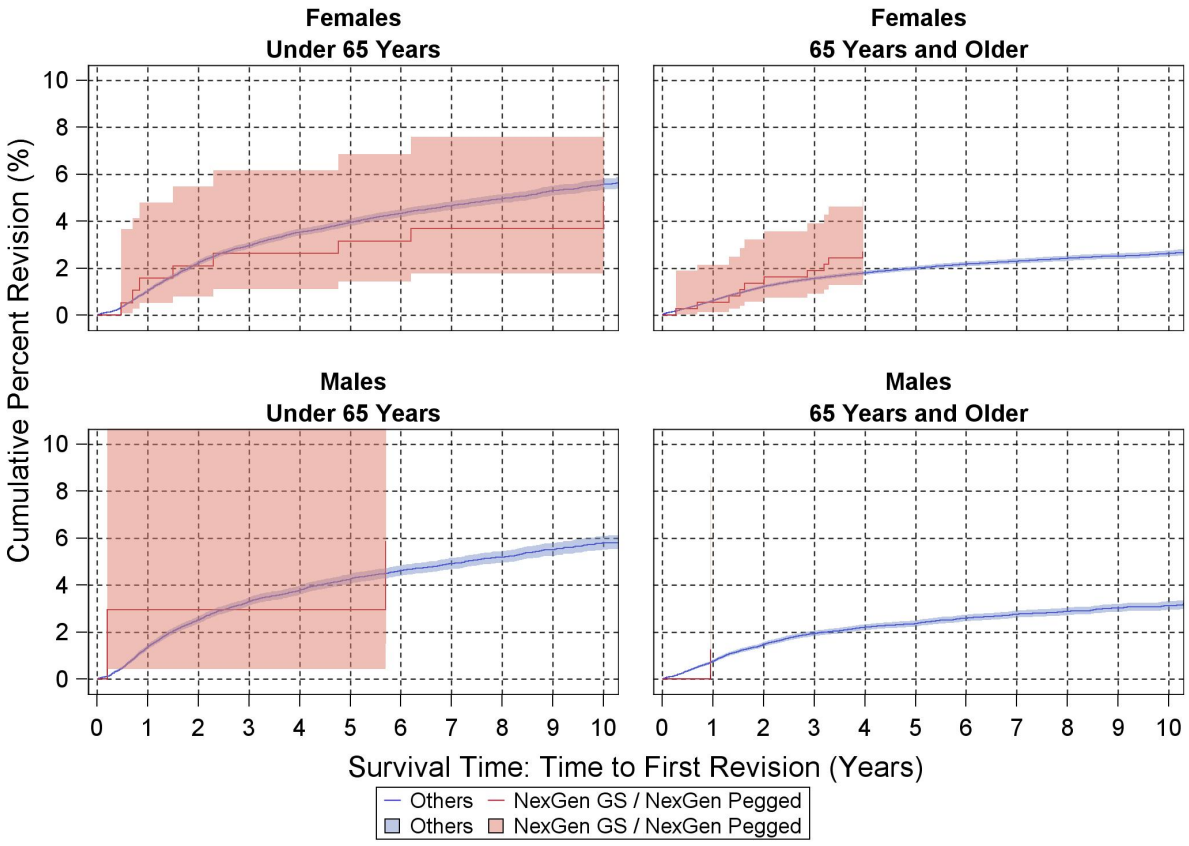


Figure 419. Cumulative Percent Revision Curve for the NexGen GS/NexGen Pegged Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1202. Cumulative Percent Revision and Number at Risk for the NexGen GS/NexGen Pegged Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	675	0.00 (0.00,0.00)	191	0.00 (0.00,0.00)	371	0.00 (0.00,0.00)	34	0.00 (0.00,0.00)	79	0.00 (0.00,0.00)
1	668	1.04 (0.50,2.16)	188	1.57 (0.51,4.79)	369	0.54 (0.14,2.14)	33	2.94 (0.42,19.10)	78	1.27 (0.18,8.65)
2	664	1.63 (0.91,2.92)	187	2.09 (0.79,5.48)	366	1.35 (0.56,3.21)	33	2.94 (0.42,19.10)	78	1.27 (0.18,8.65)
3	661	2.07 (1.23,3.48)	186	2.62 (1.10,6.17)	364	1.89 (0.90,3.92)	33	2.94 (0.42,19.10)	78	1.27 (0.18,8.65)
4	658	2.52 (1.57,4.02)	186	2.62 (1.10,6.17)	361	2.70 (1.46,4.95)	33	2.94 (0.42,19.10)	78	1.27 (0.18,8.65)
5	657	2.67 (1.69,4.20)	185	3.14 (1.42,6.86)	361	2.70 (1.46,4.95)	33	2.94 (0.42,19.10)	78	1.27 (0.18,8.65)
6	626	2.82 (1.81,4.38)	179	3.14 (1.42,6.86)	345	2.70 (1.46,4.95)	32	5.88 (1.50,21.53)	70	1.27 (0.18,8.65)
7	549	2.97 (1.93,4.57)	164	3.69 (1.78,7.59)	294	2.70 (1.46,4.95)	29	5.88 (1.50,21.53)	62	1.27 (0.18,8.65)
8	429	2.97 (1.93,4.57)	136	3.69 (1.78,7.59)	223	2.70 (1.46,4.95)	24	5.88 (1.50,21.53)	46	1.27 (0.18,8.65)
9	325	2.97 (1.93,4.57)	105	3.69 (1.78,7.59)	168	2.70 (1.46,4.95)	18	5.88 (1.50,21.53)	34	1.27 (0.18,8.65)
10	243	3.37 (2.16,5.25)	85	4.81 (2.34,9.74)	119	2.70 (1.46,4.95)	11	5.88 (1.50,21.53)	28	1.27 (0.18,8.65)

Table 1203. Reasons for First Revision Following Primary TKA for NexGen GS/NexGen Pegged Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	5	33.3
2	Dislocation/Instability	4	26.7
3	Poly liner wear	2	13.3
4	Arthrofibrosis	1	6.7
5	Joint Infection	1	6.7
6	Malalignment	1	6.7
7	Pain	1	6.7

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1204. Reasons for First Revision Between 91 and 365 days Following Primary TKA for NexGen GS/NexGen Pegged Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	50.0
2	Dislocation/Instability	1	50.0

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Table 1205. Descriptive Statistics of Cases Receiving the NexGen GS/NexGen Pegged Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	567	83.1	
Age (years)	682	68.2 (9.2)	68 (13)
Height (cm)	682	165.3 (8.8)	165 (10)
Weight (kg)	682	85.3 (18.3)	83.8 (25.7)
BMI(kg/m^2)	682	31.2 (6.3)	30.7 (8.8)
Smoker - Never (%)	398	58.4	
Smoker - Previous (%)	252	37	
Smoker - Current (%)	31	4.6	
Smoker - Unknown (%)	0	0.0	

Table 1206. Distribution of Approach Used for NexGen GS/NexGen Pegged Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	659	96.6
Mid-vastus	16	2.3
Sub-vastus	2	0.3
Lateral parapatellar	2	0.3
Missing/unknown/other	3	0.4

Table 1207. Distribution of Polyethylene Used for NexGen GS/NexGen Pegged Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	51	7.5
XLPE	625	91.6
Antioxidant XLPE	0	0.0
Missing/unknown/other	6	0.9

Table 1208. Volume of Cases by Surgeon and Site for the NexGen GS/NexGen Pegged Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	40 (110)	6 (8)
Cases per site	62 (134)	11 (40)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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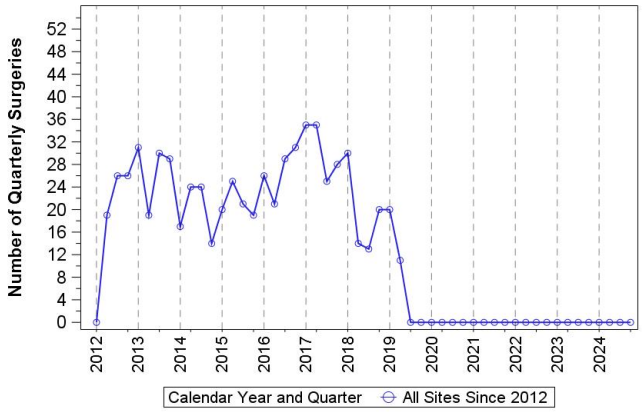


Figure 420. Utilization of the NexGen GS/NexGen Pegged Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

575001501	575001706	575201502
575001505	575001701	575201601
575001502	575001702	575001305
575001506	575001406	575201505
575001602	575001401	575201605
575001606	575001405	575201606
575001601	575001402	575001301
575001605	575201602	
575001705	575001306	

Catalog Numbers of Tibial Components Used in the Analysis

597003502	597004502
597004501	597002502
597003501	597005501

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3.5.18 NexGen GS/NexGen Precoat

N = 715 primary cases were used for this analysis. Distribution of utilization: 21 surgeons across 17 sites used this implant combination in primary TKA cases.

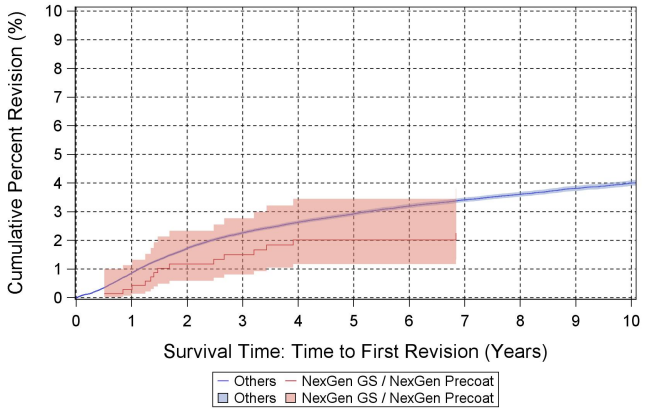


Figure 421. Cumulative Percent Revision Curve for the NexGen GS/NexGen Precoat Combination, Compared to All Other Implant Combinations in Primary TKA Cases

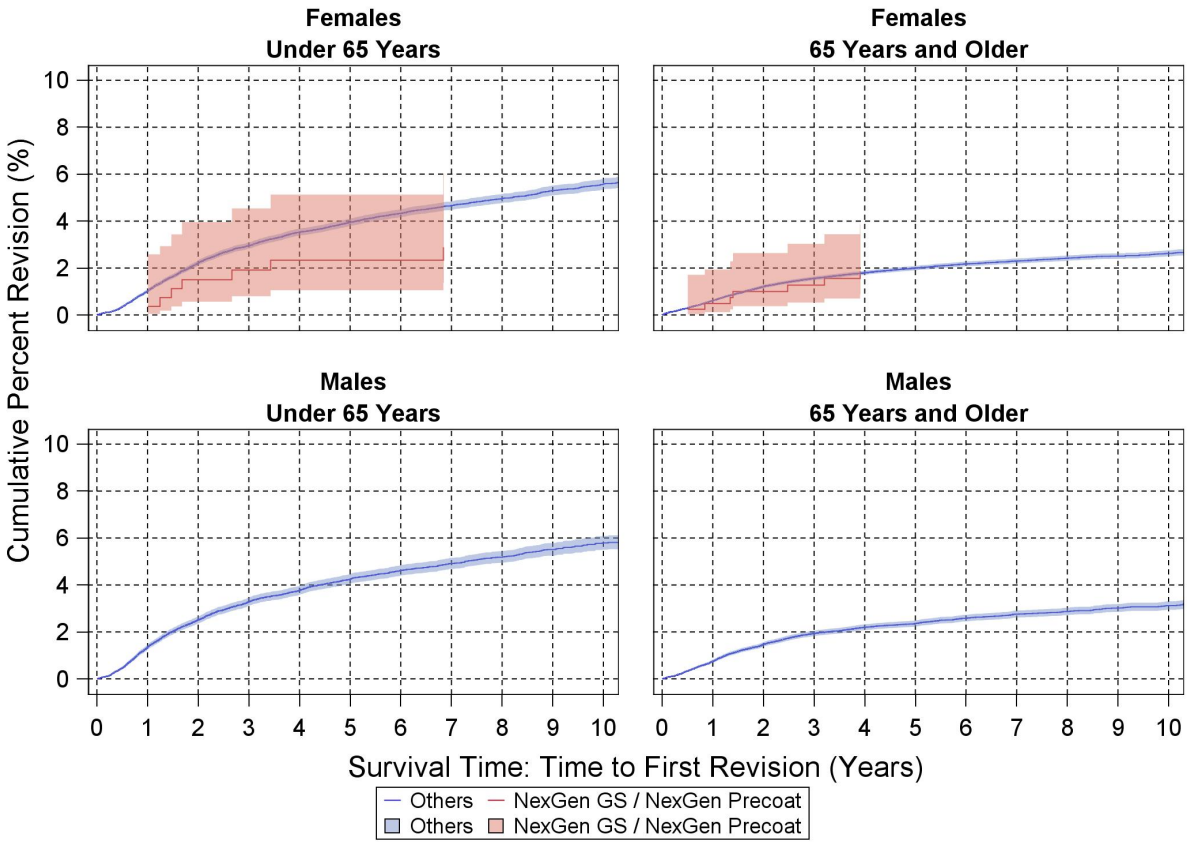


Figure 422. Cumulative Percent Revision Curve for the NexGen GS/NexGen Precoat Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1209. Cumulative Percent Revision and Number at Risk for the NexGen GS/NexGen Precoat Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	707	0.00 (0.00,0.00)	274	0.00 (0.00,0.00)	414	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	15	0.00 (0.00,0.00)
1	692	0.28 (0.07,1.13)	272	0.00 (0.00,0.00)	402	0.49 (0.12,1.94)	*	0.00 (0.00,0.00)	14	0.00 (0.00,0.00)
2	634	1.17 (0.59,2.34)	254	1.50 (0.57,3.95)	370	1.00 (0.38,2.64)	*	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)
3	593	1.50 (0.81,2.77)	235	1.91 (0.80,4.54)	351	1.27 (0.53,3.03)	*	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)
4	552	2.01 (1.17,3.45)	224	2.33 (1.05,5.13)	323	1.86 (0.89,3.87)	*	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)
5	510	2.01 (1.17,3.45)	213	2.33 (1.05,5.13)	292	1.86 (0.89,3.87)	*	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)
6	456	2.01 (1.17,3.45)	193	2.33 (1.05,5.13)	258	1.86 (0.89,3.87)	*	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)
7	398	2.25 (1.33,3.80)	172	2.89 (1.38,6.02)	221	1.86 (0.89,3.87)	*	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)
8	320	2.25 (1.33,3.80)	144	2.89 (1.38,6.02)	172	1.86 (0.89,3.87)	*	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)
9	236	2.25 (1.33,3.80)	109	2.89 (1.38,6.02)	123	1.86 (0.89,3.87)	*	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)
10	201	2.25 (1.33,3.80)	96	2.89 (1.38,6.02)	101	1.86 (0.89,3.87)	*	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)

* Denotes that the number of cases is between 1 and 10.

Table 1210. Reasons for First Revision Following Primary TKA for NexGen GS/NexGen Precoat Combination Cases

Rank	Reason for Revision	N	Percent
1	Metal Reaction/Metallosis	4	28.6
2	Arthrofibrosis	3	21.4
3	Aseptic Loosening	3	21.4
4	Joint Infection	2	14.3
5	Pain	1	7.1
6	Peri-prosthetic fracture - Femur	1	7.1

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1211. Reasons for First Revision Between 91 and 365 days Following Primary TKA for NexGen GS/NexGen Precoat Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	1	50.0
2	Pain	1	50.0

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Table 1212. Descriptive Statistics of Cases Receiving the NexGen GS/NexGen Precoat Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	694	97.1	
Age (years)	715	66.6 (9.2)	67 (12)
Height (cm)	714	162.5 (7.7)	162.6 (10.2)
Weight (kg)	715	86.6 (18.4)	85.2 (24.8)
BMI(kg/m^2)	714	32.7 (6.4)	32.4 (9)
Smoker - Never (%)	415	58	
Smoker - Previous (%)	217	30.4	
Smoker - Current (%)	81	11.3	
Smoker - Unknown (%)	2	0.3	

Table 1213. Distribution of Approach Used for NexGen GS/NexGen Precoat Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	691	96.6
Mid-vastus	11	1.5
Sub-vastus	3	0.4
Lateral parapatellar	1	0.1
Missing/unknown/other	9	1.3

Table 1214. Distribution of Polyethylene Used for NexGen GS/NexGen Precoat Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	71	9.9
XLPE	631	88.3
Antioxidant XLPE	0	0.0
Missing/unknown/other	13	1.8

Table 1215. Volume of Cases by Surgeon and Site for the NexGen GS/NexGen Precoat Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	34 (55)	8 (50)
Cases per site	42 (72)	19 (50)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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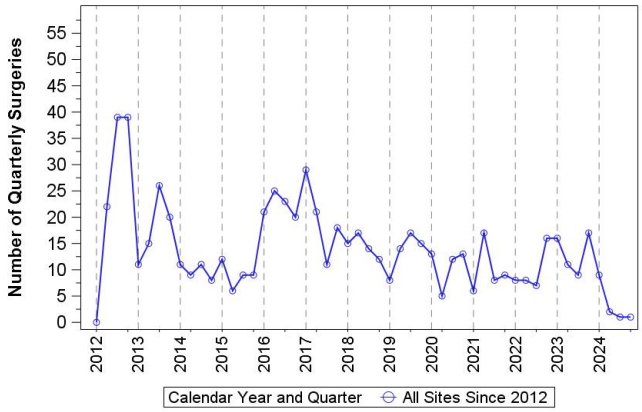


Figure 423. Utilization of the NexGen GS/NexGen Precoat Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

575001502	575001401	575001605
575001501	575001402	575001406
575001602	575001702	575001705
575001601	575001606	575001706
575001505	575001701	575001301
575001506	575001405	

Catalog Numbers of Tibial Components Used in the Analysis

598003701	598002702
598003702	598004702
598004701	598005701

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3.5.19 NexGen LPS GS/NexGen Precoat

N = 536 primary cases were used for this analysis. Distribution of utilization: 39 surgeons across 19 sites used this implant combination in primary TKA cases.

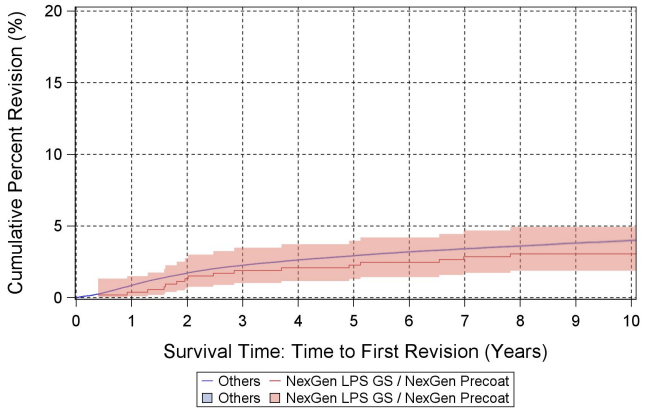


Figure 424. Cumulative Percent Revision Curve for the NexGen LPS GS/NexGen Precoat Combination, Compared to All Other Implant Combinations in Primary TKA Cases

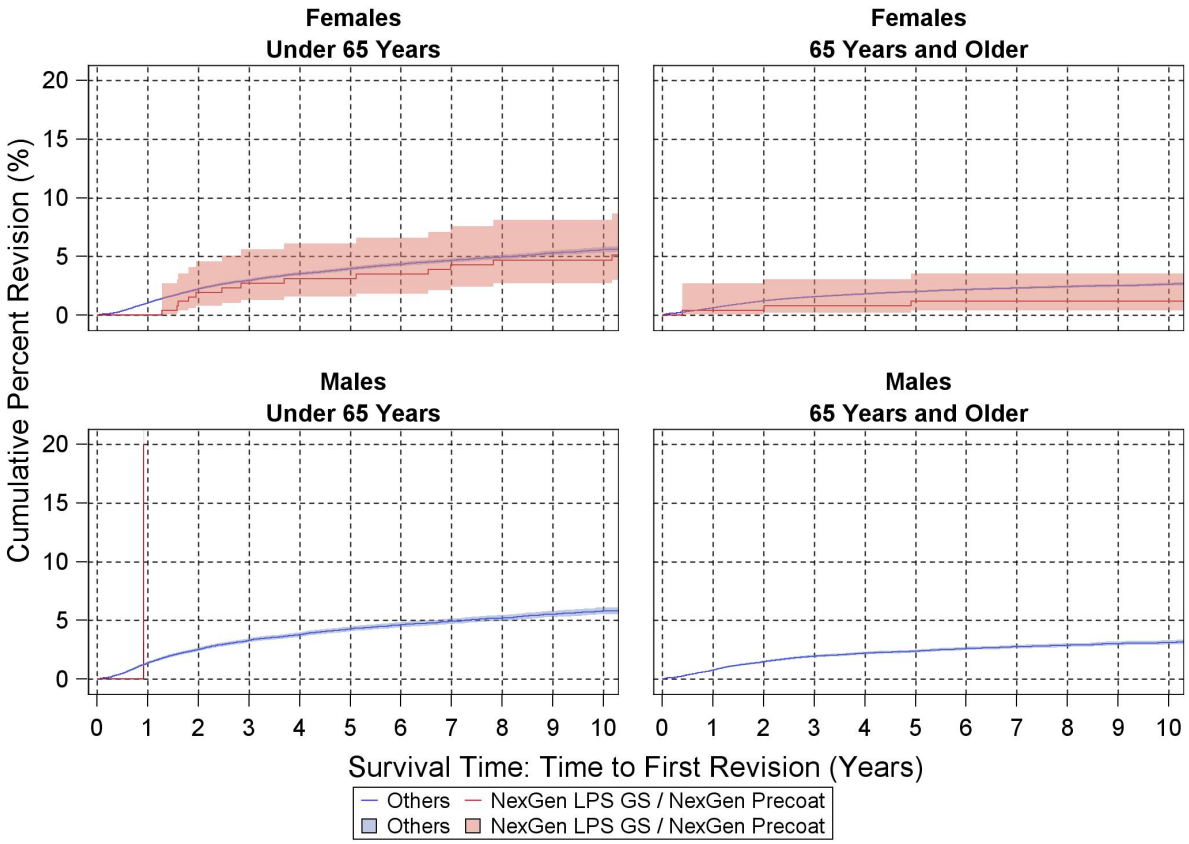


Figure 425. Cumulative Percent Revision Curve for the NexGen LPS GS/NexGen Precoat Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1216. Cumulative Percent Revision and Number at Risk for the NexGen LPS GS/NexGen Precoat Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	529	0.00 (0.00,0.00)	259	0.00 (0.00,0.00)	259	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)
1	526	0.38 (0.09,1.50)	259	0.00 (0.00,0.00)	257	0.39 (0.05,2.71)	*	20.00 (3.08,79.62)	*	0.00 (0.00,0.00)
2	521	1.33 (0.63,2.76)	254	1.93 (0.81,4.58)	257	0.39 (0.05,2.71)	*	20.00 (3.08,79.62)	*	0.00 (0.00,0.00)
3	518	1.89 (1.02,3.49)	252	2.70 (1.30,5.59)	256	0.77 (0.19,3.06)	*	20.00 (3.08,79.62)	*	0.00 (0.00,0.00)
4	517	2.08 (1.16,3.73)	251	3.09 (1.56,6.08)	256	0.77 (0.19,3.06)	*	20.00 (3.08,79.62)	*	0.00 (0.00,0.00)
5	515	2.27 (1.30,3.97)	250	3.09 (1.56,6.08)	255	1.16 (0.38,3.56)	*	20.00 (3.08,79.62)	*	0.00 (0.00,0.00)
6	508	2.46 (1.44,4.20)	244	3.48 (1.82,6.57)	254	1.16 (0.38,3.56)	*	20.00 (3.08,79.62)	*	0.00 (0.00,0.00)
7	493	2.85 (1.73,4.69)	238	4.28 (2.39,7.59)	247	1.16 (0.38,3.56)	*	20.00 (3.08,79.62)	*	0.00 (0.00,0.00)
8	483	3.05 (1.88,4.94)	235	4.68 (2.69,8.10)	240	1.16 (0.38,3.56)	*	20.00 (3.08,79.62)	*	0.00 (0.00,0.00)
9	469	3.05 (1.88,4.94)	231	4.68 (2.69,8.10)	231	1.16 (0.38,3.56)	*	20.00 (3.08,79.62)	*	0.00 (0.00,0.00)
10	462	3.05 (1.88,4.94)	228	4.68 (2.69,8.10)	227	1.16 (0.38,3.56)	*	20.00 (3.08,79.62)	*	0.00 (0.00,0.00)

* Denotes that the number of cases is between 1 and 10.

Table 1217. Reasons for First Revision Following Primary TKA for NexGen LPS GS/NexGen Precoat Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	4	33.3
2	Aseptic Loosening	3	25.0
3	Arthrofibrosis	1	8.3
4	Implant Failure	1	8.3
5	Pain	1	8.3
6	Peri-prosthetic fracture - Femur	1	8.3
7	Poly liner wear	1	8.3

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

There were no reasons for revision recorded between day 91 and day 365, so no table of reasons for revisions during this time period is included.

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Table 1218. Descriptive Statistics of Cases Receiving the NexGen LPS GS/NexGen Precoat Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	525	98	
Age (years)	536	65.5 (9.7)	65 (14)
Height (cm)	535	162.4 (7.6)	162.6 (10.2)
Weight (kg)	536	90.6 (21.1)	88.9 (29.6)
BMI(kg/m^2)	535	34.3 (7.4)	33.8 (11)
Smoker - Never (%)	318	59.3	
Smoker - Previous (%)	181	33.8	
Smoker - Current (%)	36	6.7	
Smoker - Unknown (%)	1	0.2	

Table 1219. Distribution of Approach Used for NexGen LPS GS/NexGen Precoat Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	520	97.0
Mid-vastus	5	0.9
Sub-vastus	0	0.0
Lateral parapatellar	4	0.7
Missing/unknown/other	7	1.3

Table 1220. Distribution of Polyethylene Used for NexGen LPS GS/NexGen Precoat Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	453	84.5
XLPE	73	13.6
Antioxidant XLPE	0	0.0
Missing/unknown/other	10	1.9

Table 1221. Volume of Cases by Surgeon and Site for the NexGen LPS GS/NexGen Precoat Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	13 (18)	6 (19)
Cases per site	28 (74)	6 (15)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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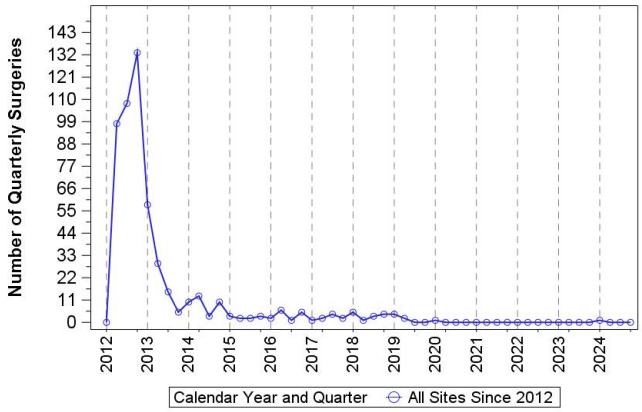


Figure 426. Utilization of the NexGen LPS GS/NexGen Precoat Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

576401552	576401452	576401351
576401652	576401451	
576401551	576401752	
576401651	576401751	

Catalog Numbers of Tibial Components Used in the Analysis

598003702	598004702	598002701
598004701	598002702	598005702
598003701	598005701	

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3.5.20 NexGen LPS Option/NexGen Precoat

N = 745 primary cases were used for this analysis. Distribution of utilization: 58 surgeons across 29 sites used this implant combination in primary TKA cases.

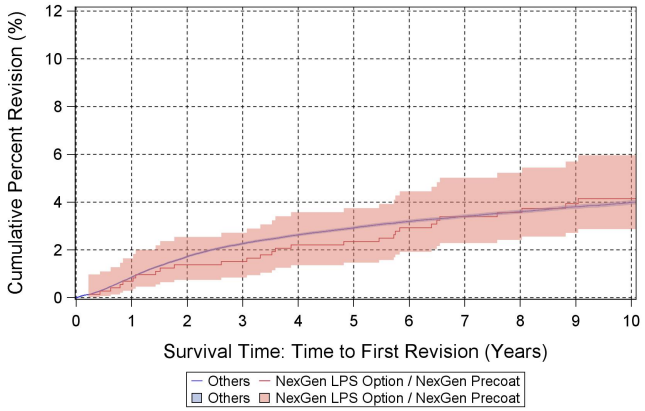


Figure 427. Cumulative Percent Revision Curve for the NexGen LPS Option/NexGen Precoat Combination, Compared to All Other Implant Combinations in Primary TKA Cases

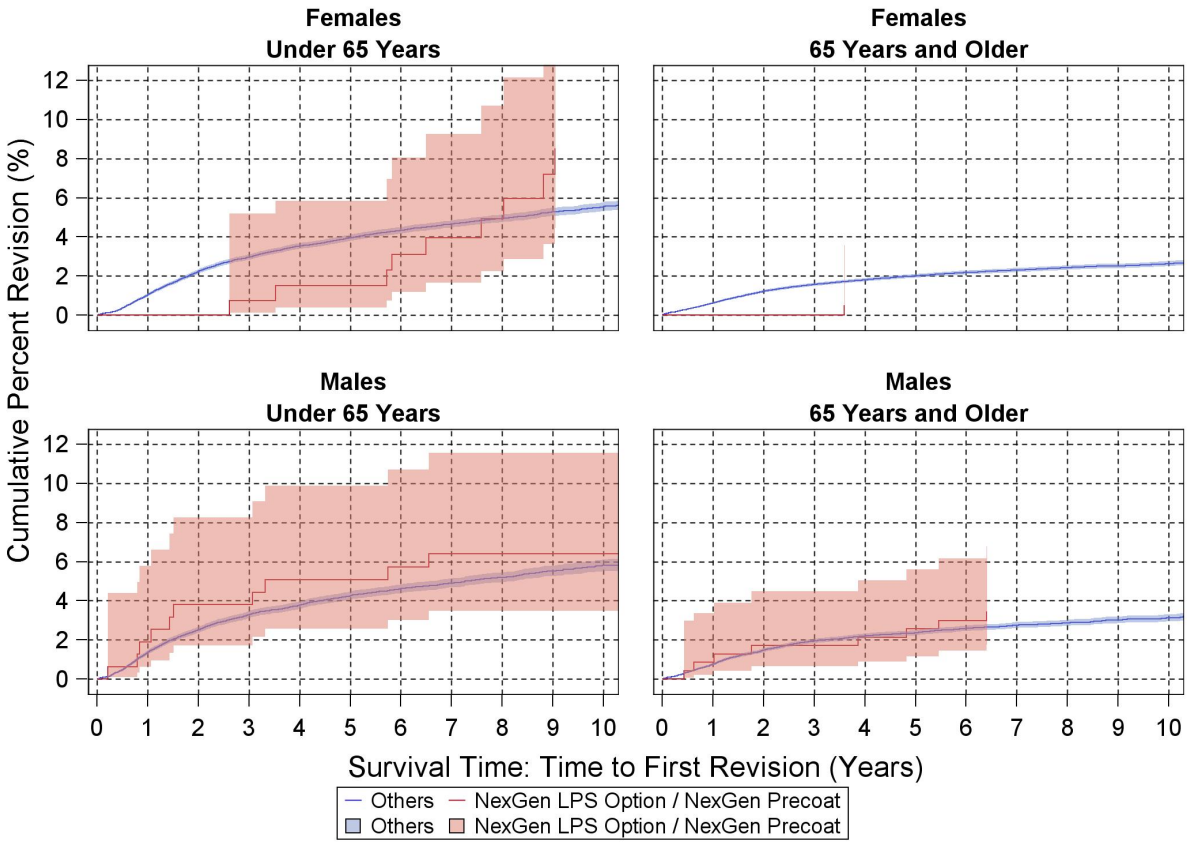


Figure 428. Cumulative Percent Revision Curve for the NexGen LPS Option/NexGen Precoat Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1222. Cumulative Percent Revision and Number at Risk for the NexGen LPS Option/NexGen Precoat Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	726	0.00 (0.00,0.00)	135	0.00 (0.00,0.00)	198	0.00 (0.00,0.00)	158	0.00 (0.00,0.00)	235	0.00 (0.00,0.00)
1	721	0.69 (0.29,1.65)	135	0.00 (0.00,0.00)	198	0.00 (0.00,0.00)	155	1.90 (0.62,5.77)	233	0.85 (0.21,3.36)
2	716	1.38 (0.74,2.54)	135	0.00 (0.00,0.00)	198	0.00 (0.00,0.00)	152	3.80 (1.72,8.26)	231	1.70 (0.64,4.47)
3	712	1.52 (0.84,2.72)	133	0.75 (0.11,5.18)	197	0.00 (0.00,0.00)	151	3.80 (1.72,8.26)	231	1.70 (0.64,4.47)
4	704	2.21 (1.36,3.58)	132	1.49 (0.38,5.84)	195	0.51 (0.07,3.57)	148	5.07 (2.57,9.89)	229	2.13 (0.89,5.04)
5	699	2.35 (1.47,3.75)	131	1.49 (0.38,5.84)	193	0.51 (0.07,3.57)	147	5.07 (2.57,9.89)	228	2.56 (1.16,5.60)
6	655	2.93 (1.92,4.45)	119	3.09 (1.17,8.04)	174	0.51 (0.07,3.57)	144	5.72 (3.02,10.71)	218	2.99 (1.44,6.17)
7	605	3.39 (2.29,5.02)	105	3.96 (1.66,9.27)	152	0.51 (0.07,3.57)	139	6.39 (3.49,11.55)	209	3.45 (1.74,6.78)
8	548	3.56 (2.42,5.23)	93	4.93 (2.24,10.69)	129	0.51 (0.07,3.57)	131	6.39 (3.49,11.55)	195	3.45 (1.74,6.78)
9	464	3.94 (2.71,5.70)	70	7.19 (3.61,14.03)	89	0.51 (0.07,3.57)	125	6.39 (3.49,11.55)	180	3.45 (1.74,6.78)
10	416	4.14 (2.87,5.96)	64	8.52 (4.44,15.99)	74	0.51 (0.07,3.57)	114	6.39 (3.49,11.55)	164	3.45 (1.74,6.78)

Table 1223. Reasons for First Revision Following Primary TKA for NexGen LPS Option/NexGen Precoat Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	7	30.4
2	Aseptic Loosening	6	26.1
3	Dislocation/Instability	3	13.0
4	Implant Failure	2	8.7
5	Arthrofibrosis	1	4.3
6	Malalignment	1	4.3
7	Metal Reaction/Metallosis	1	4.3
8	Pain	1	4.3
9	Patellofemoral Joint	1	4.3

Table 1224. Reasons for First Revision in the First 90 Days Following Primary TKA for NexGen LPS Option/NexGen Precoat Combination Cases

Rank	Reason for Revision	N	Percent
1	Arthrofibrosis	1	100.0

Table 1225. Reasons for First Revision Between 91 and 365 days Following Primary TKA for NexGen LPS Option/NexGen Precoat Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	1	100.0

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Table 1226. Descriptive Statistics of Cases Receiving the NexGen LPS Option/NexGen Precoat Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	340	45.6	
Age (years)	745	66.8 (10.5)	67 (14)
Height (cm)	745	170.2 (10.7)	170.2 (16)
Weight (kg)	745	95.4 (20.3)	93.7 (28.5)
BMI(kg/m^2)	745	33 (6.7)	32.3 (8.9)
Smoker - Never (%)	336	45.1	
Smoker - Previous (%)	318	42.7	
Smoker - Current (%)	88	11.8	
Smoker - Unknown (%)	3	0.4	

Table 1227. Distribution of Approach Used for NexGen LPS Option/NexGen Precoat Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	719	96.5
Mid-vastus	18	2.4
Sub-vastus	2	0.3
Lateral parapatellar	2	0.3
Missing/unknown/other	4	0.5

Table 1228. Distribution of Polyethylene Used for NexGen LPS Option/NexGen Precoat Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	607	81.5
XLPE	123	16.5
Antioxidant XLPE	0	0.0
Missing/unknown/other	15	2.0

Table 1229. Volume of Cases by Surgeon and Site for the NexGen LPS Option/NexGen Precoat Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	12 (19)	6 (12)
Cases per site	25 (38)	17 (32)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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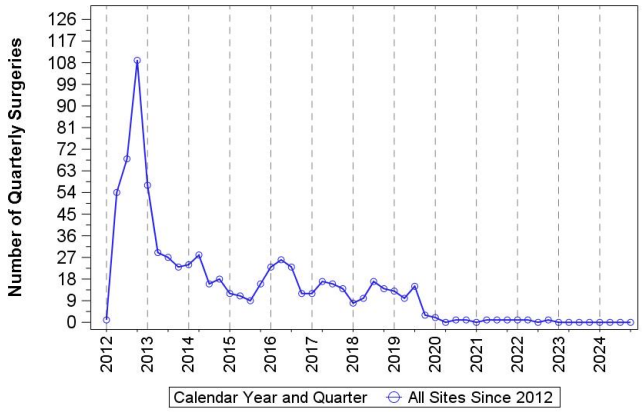


Figure 429. Utilization of the NexGen LPS Option/NexGen Precoat Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

596401751	599601751	596401352
596401752	599601752	599601352
599601552	596401551	599601851
599601551	599601452	599601852
596401651	596401652	596401351
599601651	599601451	599601351
596401552	596401451	
599601652	596401452	

Catalog Numbers of Tibial Components Used in the Analysis

598004702	598005702	598800300
598003702	598002702	598800700
598005701	598005703	
598004701	598002701	
598003701	598005704	

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3.5.21 NexGen LPS Option/NexGen TM

N = 1,440 primary cases were used for this analysis. Fewer than ten surgeons used this implant combination at fewer than ten sites in primary TKA cases.

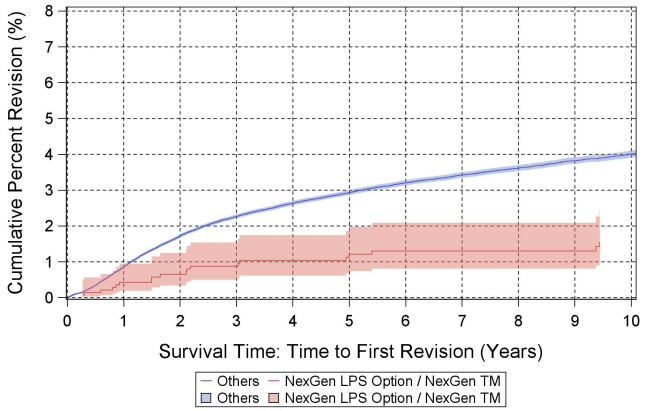


Figure 430. Cumulative Percent Revision Curve for the NexGen LPS Option/NexGen TM Combination, Compared to All Other Implant Combinations in Primary TKA Cases

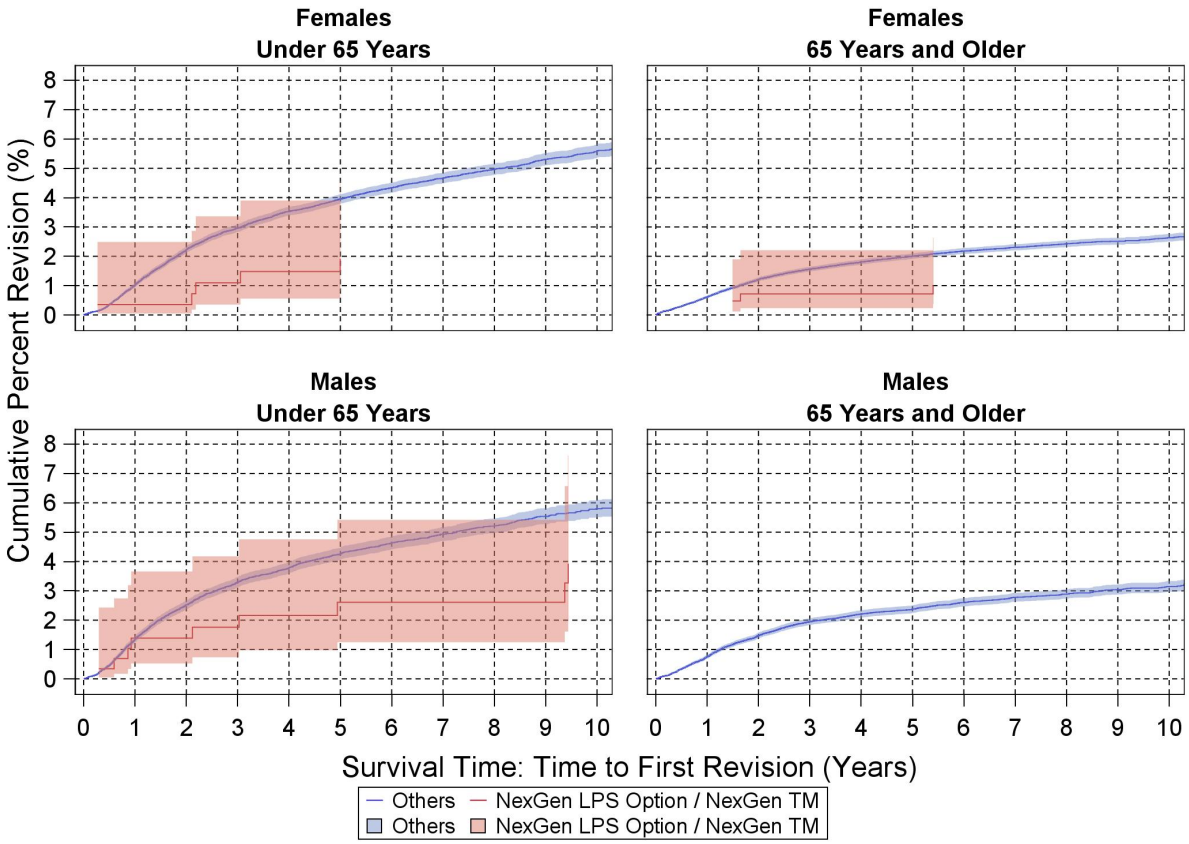


Figure 431. Cumulative Percent Revision Curve for the NexGen LPS Option/NexGen TM Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1230. Cumulative Percent Revision and Number at Risk for the NexGen LPS Option/NexGen TM Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,425	0.00 (0.00,0.00)	283	0.00 (0.00,0.00)	436	0.00 (0.00,0.00)	289	0.00 (0.00,0.00)	417	0.00 (0.00,0.00)
1	1,380	0.43 (0.19,0.95)	278	0.35 (0.05,2.49)	427	0.00 (0.00,0.00)	282	1.39 (0.52,3.66)	393	0.25 (0.04,1.77)
2	1,322	0.65 (0.34,1.25)	269	0.35 (0.05,2.49)	410	0.72 (0.23,2.21)	271	1.39 (0.52,3.66)	372	0.25 (0.04,1.77)
3	1,247	0.88 (0.50,1.54)	258	1.10 (0.35,3.36)	396	0.72 (0.23,2.21)	245	1.76 (0.74,4.18)	348	0.25 (0.04,1.77)
4	1,194	1.04 (0.62,1.75)	248	1.48 (0.56,3.90)	381	0.72 (0.23,2.21)	232	2.16 (0.98,4.76)	333	0.25 (0.04,1.77)
5	1,124	1.21 (0.74,1.97)	224	1.92 (0.80,4.56)	369	0.72 (0.23,2.21)	215	2.61 (1.25,5.42)	316	0.25 (0.04,1.77)
6	1,057	1.30 (0.81,2.09)	209	1.92 (0.80,4.56)	349	0.99 (0.37,2.63)	202	2.61 (1.25,5.42)	297	0.25 (0.04,1.77)
7	996	1.30 (0.81,2.09)	189	1.92 (0.80,4.56)	336	0.99 (0.37,2.63)	191	2.61 (1.25,5.42)	280	0.25 (0.04,1.77)
8	934	1.30 (0.81,2.09)	179	1.92 (0.80,4.56)	319	0.99 (0.37,2.63)	179	2.61 (1.25,5.42)	257	0.25 (0.04,1.77)
9	862	1.30 (0.81,2.09)	169	1.92 (0.80,4.56)	283	0.99 (0.37,2.63)	165	2.61 (1.25,5.42)	245	0.25 (0.04,1.77)
10	703	1.55 (0.98,2.44)	141	1.92 (0.80,4.56)	231	0.99 (0.37,2.63)	131	3.93 (2.01,7.61)	200	0.25 (0.04,1.77)

Table 1231. Reasons for First Revision Following Primary TKA for NexGen LPS Option/NexGen TM Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	4	28.6
2	Dislocation/Instability	4	28.6
3	Joint Infection	4	28.6
4	Arthrofibrosis	2	14.3

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1232. Reasons for First Revision Between 91 and 365 days Following Primary TKA for NexGen LPS Option/NexGen TM Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	2	66.7
2	Aseptic Loosening	1	33.3

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Table 1233. Descriptive Statistics of Cases Receiving the NexGen LPS Option/NexGen TM Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	726	50.4	
Age (years)	1,440	66.2 (8.1)	67 (11)
Height (cm)	1,440	170.6 (10.4)	170.2 (15.2)
Weight (kg)	1,440	93 (19.7)	92.1 (25.4)
BMI(kg/m^2)	1,440	31.9 (5.9)	31.3 (7.2)
Smoker - Never (%)	808	56.1	
Smoker - Previous (%)	576	40	
Smoker - Current (%)	54	3.8	
Smoker - Unknown (%)	2	0.1	

Table 1234. Distribution of Approach Used for NexGen LPS Option/NexGen TM Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	813	56.5
Mid-vastus	616	42.8
Sub-vastus	4	0.3
Lateral parapatellar	2	0.1
Missing/unknown/other	5	0.3

Table 1235. Distribution of Polyethylene Used for NexGen LPS Option/NexGen TM Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	1,438	99.9
XLPE	1	0.1
Antioxidant XLPE	0	0.0
Missing/unknown/other	1	0.1

Table 1236. Volume of Cases by Surgeon and Site for the NexGen LPS Option/NexGen TM Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	180 (305)	24 (326)
Cases per site	205 (307)	13 (601)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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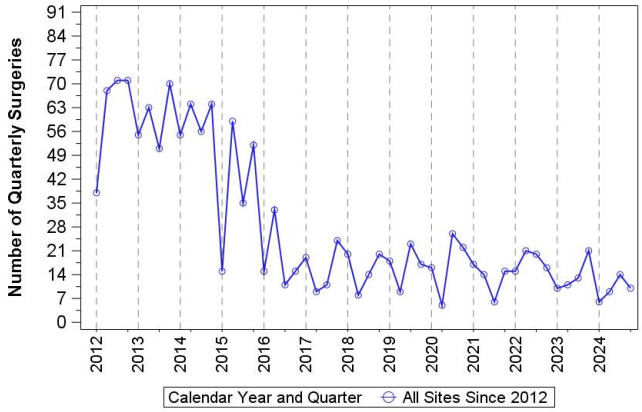


Figure 432. Utilization of the NexGen LPS Option/NexGen TM Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

599601651	596401452	599601452
596401551	599601552	599601451
596401552	599601551	596401352
599601652	596401451	596401351
599601751	596401752	599601352
599601752	596401751	
596401651	599601851	
596401652	599601852	

Catalog Numbers of Tibial Components Used in the Analysis

588606410	588605314	588605617
588606310	588605410	588606417
588606610	588605712	588606514
588605510	588606512	588606617
588606412	588606614	595403702
588605512	588606314	595404702
588606510	588605614	588605417
588605310	588605810	588606710
588605312	588605812	595403701
588605710	588605412	595405701
588605610	588605317	588605717
588606612	595402702	588606712
588606312	588605714	588607512
588605514	588605414	588605814
588606414	588605517	
588605612	595404701	

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3.5.22 NexGen Option/NexGen Option

N = 1,324 primary cases were used for this analysis. Distribution of utilization: 11 surgeons used this implant combination at fewer than 10 sites in primary TKA cases.

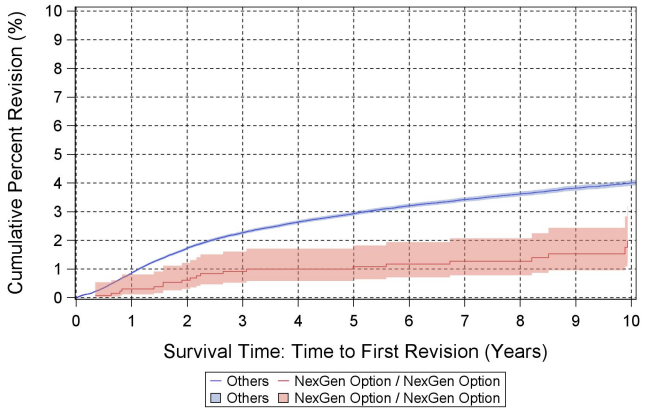


Figure 433. Cumulative Percent Revision Curve for the NexGen Option/NexGen Option Combination, Compared to All Other Implant Combinations in Primary TKA Cases

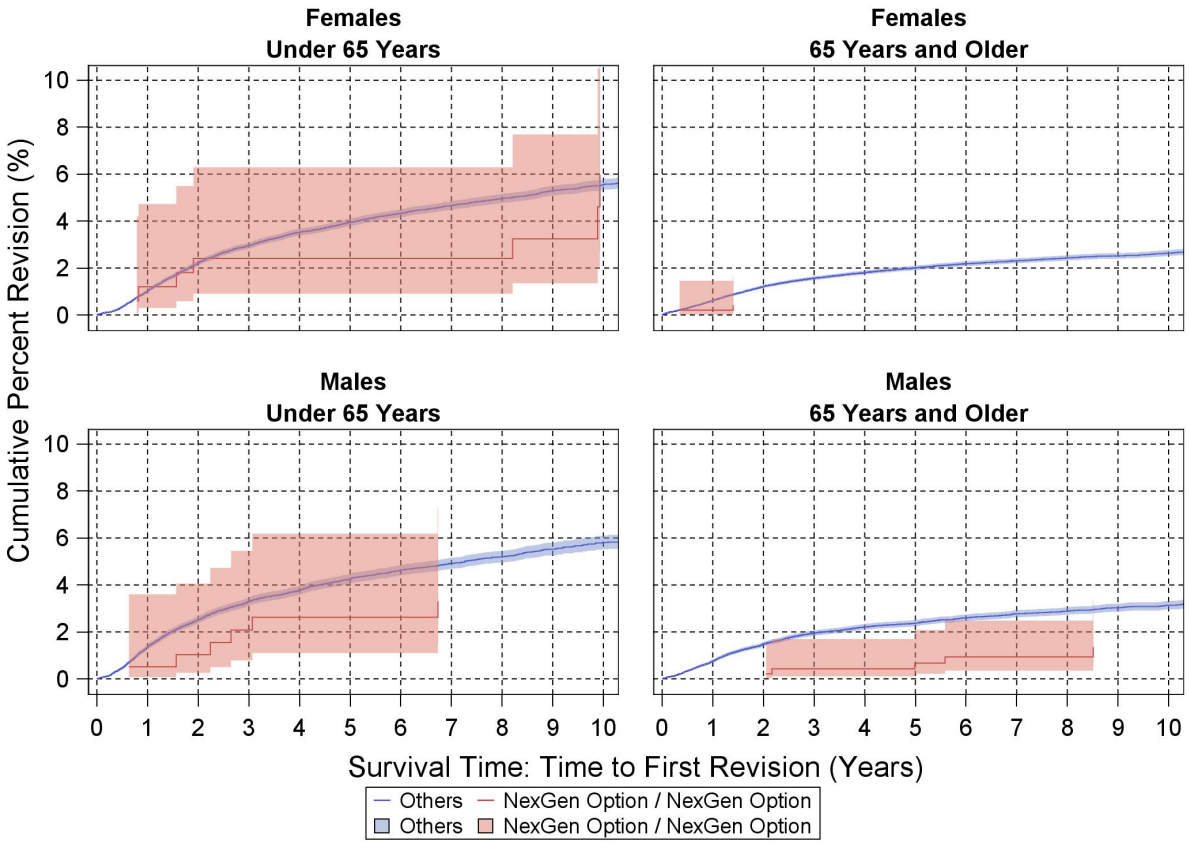


Figure 434. Cumulative Percent Revision Curve for the NexGen Option/NexGen Option Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1237. Cumulative Percent Revision and Number at Risk for the NexGen Option/NexGen Option Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,313	0.00 (0.00,0.00)	166	0.00 (0.00,0.00)	483	0.00 (0.00,0.00)	194	0.00 (0.00,0.00)	470	0.00 (0.00,0.00)
1	1,309	0.30 (0.11,0.81)	164	1.20 (0.30,4.73)	482	0.21 (0.03,1.46)	193	0.52 (0.07,3.60)	470	0.00 (0.00,0.00)
2	1,305	0.61 (0.31,1.21)	162	2.41 (0.91,6.29)	481	0.41 (0.10,1.65)	192	1.03 (0.26,4.06)	470	0.00 (0.00,0.00)
3	1,233	0.92 (0.52,1.61)	157	2.41 (0.91,6.29)	457	0.41 (0.10,1.65)	181	2.08 (0.79,5.45)	438	0.43 (0.11,1.70)
4	1,202	1.00 (0.58,1.71)	156	2.41 (0.91,6.29)	446	0.41 (0.10,1.65)	177	2.62 (1.10,6.19)	423	0.43 (0.11,1.70)
5	1,159	1.08 (0.64,1.82)	154	2.41 (0.91,6.29)	435	0.41 (0.10,1.65)	169	2.62 (1.10,6.19)	401	0.67 (0.22,2.08)
6	1,075	1.17 (0.71,1.94)	149	2.41 (0.91,6.29)	404	0.41 (0.10,1.65)	155	2.62 (1.10,6.19)	367	0.94 (0.35,2.48)
7	972	1.27 (0.78,2.07)	134	2.41 (0.91,6.29)	374	0.41 (0.10,1.65)	139	3.30 (1.49,7.24)	325	0.94 (0.35,2.48)
8	840	1.27 (0.78,2.07)	123	2.41 (0.91,6.29)	317	0.41 (0.10,1.65)	123	3.30 (1.49,7.24)	277	0.94 (0.35,2.48)
9	639	1.53 (0.96,2.44)	105	3.24 (1.35,7.69)	256	0.41 (0.10,1.65)	84	3.30 (1.49,7.24)	194	1.36 (0.55,3.34)
10	409	1.99 (1.23,3.21)	67	5.97 (2.73,12.80)	160	0.41 (0.10,1.65)	62	3.30 (1.49,7.24)	120	1.36 (0.55,3.34)

Table 1238. Reasons for First Revision Following Primary TKA for NexGen Option/NexGen Option Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	7	36.8
2	Dislocation/Instability	4	21.1
3	Joint Infection	2	10.5
4	Osteolysis	2	10.5
5	Pain	2	10.5
6	Arthrofibrosis	1	5.3
7	Implant Failure	1	5.3

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1239. Reasons for First Revision Between 91 and 365 days Following Primary TKA for NexGen Option/NexGen Option Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	1	33.3
2	Dislocation/Instability	1	33.3
3	Joint Infection	1	33.3

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Table 1240. Descriptive Statistics of Cases Receiving the NexGen Option/NexGen Option Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	654	49.4	
Age (years)	1,324	69.6 (8.3)	70 (11)
Height (cm)	1,324	170.1 (10.3)	170.2 (15.2)
Weight (kg)	1,324	92.9 (19)	91.8 (24.5)
BMI(kg/m^2)	1,324	32.1 (5.8)	31.4 (7.8)
Smoker - Never (%)	621	46.9	
Smoker - Previous (%)	612	46.2	
Smoker - Current (%)	90	6.8	
Smoker - Unknown (%)	1	0.1	

Table 1241. Distribution of Approach Used for NexGen Option/NexGen Option Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	1,308	98.8
Mid-vastus	12	0.9
Sub-vastus	0	0.0
Lateral parapatellar	4	0.3
Missing/unknown/other	0	0.0

Table 1242. Distribution of Polyethylene Used for NexGen Option/NexGen Option Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	154	11.6
XLPE	1,165	88.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	5	0.4

Table 1243. Volume of Cases by Surgeon and Site for the NexGen Option/NexGen Option Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	120 (167)	49 (141)
Cases per site	220 (410)	54 (141)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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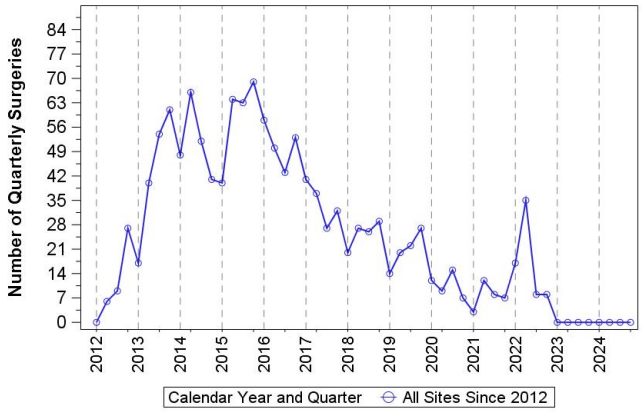


Figure 435. Utilization of the NexGen Option/NexGen Option Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

595601502	595601506	595601401
595601501	595601505	595601705
595601701	595601605	595601405
595601601	595601706	595601406
595601702	595601402	595601302
595601602	595601606	

Catalog Numbers of Tibial Components Used in the Analysis

598604702	598605701
598603702	598603701
598604701	598605702

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3.5.23 NexGen Option/NexGen Pegged

N = 623 primary cases were used for this analysis. Fewer than ten surgeons used this implant combination at fewer than ten sites in primary TKA cases.

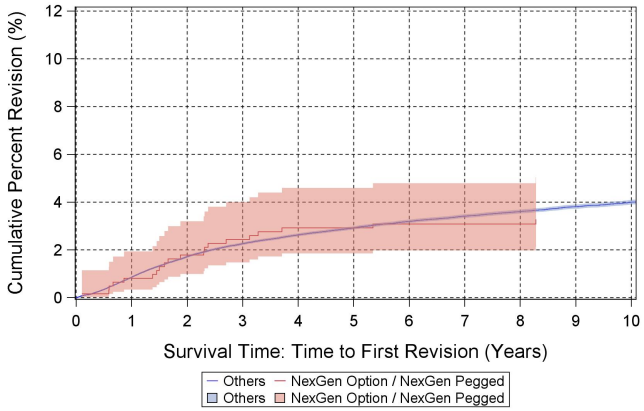


Figure 436. Cumulative Percent Revision Curve for the NexGen Option/NexGen Pegged Combination, Compared to All Other Implant Combinations in Primary TKA Cases

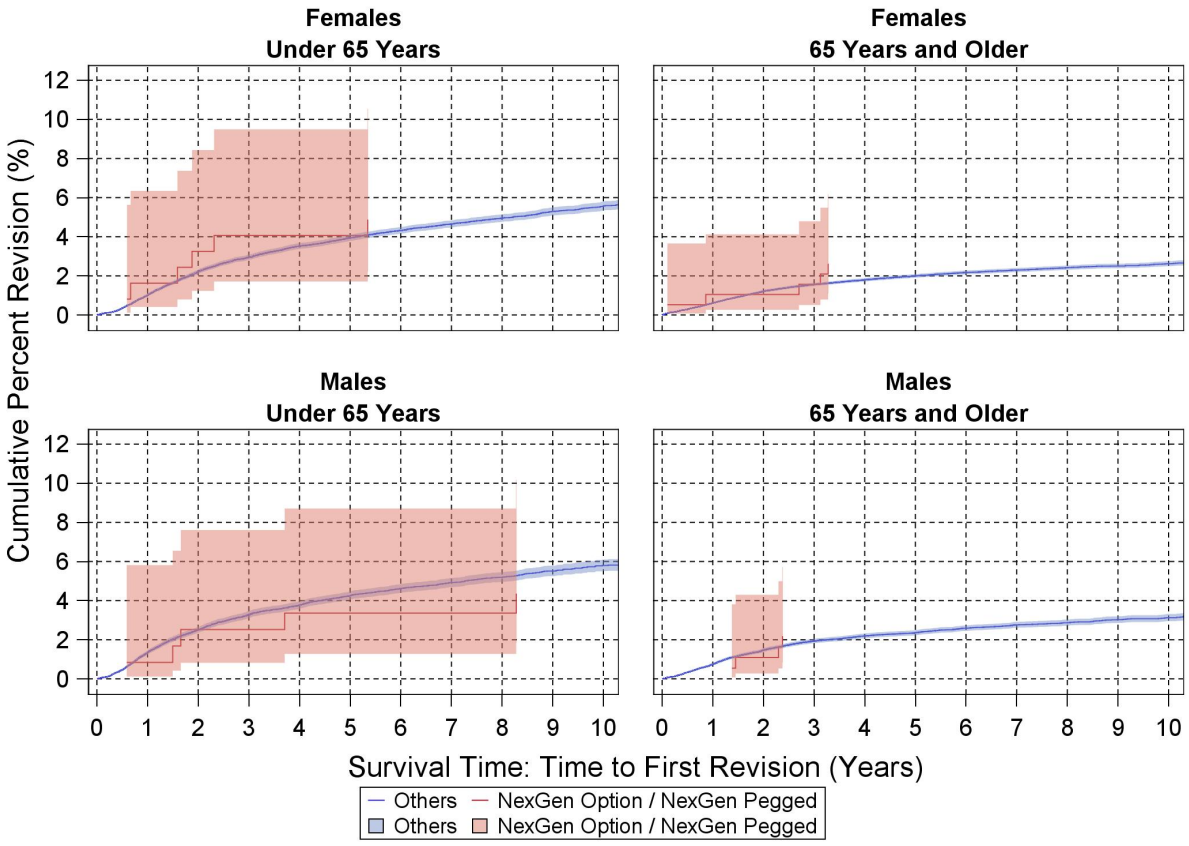


Figure 437. Cumulative Percent Revision Curve for the NexGen Option/NexGen Pegged Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1244. Cumulative Percent Revision and Number at Risk for the NexGen Option/NexGen Pegged Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	616	0.00 (0.00,0.00)	123	0.00 (0.00,0.00)	191	0.00 (0.00,0.00)	119	0.00 (0.00,0.00)	183	0.00 (0.00,0.00)
1	611	0.81 (0.34,1.94)	121	1.63 (0.41,6.34)	189	1.05 (0.26,4.12)	118	0.84 (0.12,5.81)	183	0.00 (0.00,0.00)
2	605	1.79 (0.99,3.20)	119	3.25 (1.23,8.43)	189	1.05 (0.26,4.12)	116	2.52 (0.82,7.61)	181	1.09 (0.27,4.30)
3	601	2.44 (1.48,4.01)	118	4.07 (1.71,9.49)	188	1.57 (0.51,4.79)	116	2.52 (0.82,7.61)	179	2.19 (0.83,5.72)
4	598	2.92 (1.85,4.60)	118	4.07 (1.71,9.49)	186	2.62 (1.10,6.17)	115	3.36 (1.28,8.71)	179	2.19 (0.83,5.72)
5	598	2.92 (1.85,4.60)	118	4.07 (1.71,9.49)	186	2.62 (1.10,6.17)	115	3.36 (1.28,8.71)	179	2.19 (0.83,5.72)
6	597	3.08 (1.98,4.79)	117	4.88 (2.22,10.54)	186	2.62 (1.10,6.17)	115	3.36 (1.28,8.71)	179	2.19 (0.83,5.72)
7	578	3.08 (1.98,4.79)	116	4.88 (2.22,10.54)	177	2.62 (1.10,6.17)	114	3.36 (1.28,8.71)	171	2.19 (0.83,5.72)
8	505	3.08 (1.98,4.79)	110	4.88 (2.22,10.54)	150	2.62 (1.10,6.17)	99	3.36 (1.28,8.71)	146	2.19 (0.83,5.72)
9	441	3.28 (2.13,5.04)	101	4.88 (2.22,10.54)	127	2.62 (1.10,6.17)	89	4.36 (1.83,10.18)	124	2.19 (0.83,5.72)
10	316	3.28 (2.13,5.04)	72	4.88 (2.22,10.54)	91	2.62 (1.10,6.17)	69	4.36 (1.83,10.18)	84	2.19 (0.83,5.72)

Table 1245. Reasons for First Revision Following Primary TKA for NexGen Option/NexGen Pegged Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	6	37.5
2	Pain	3	18.8
3	Dislocation/Instability	2	12.5
4	Joint Infection	2	12.5
5	Arthrofibrosis	1	6.2
6	Implant Failure	1	6.2
7	Peri-prosthetic fracture - Tibia	1	6.2

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1246. Reasons for First Revision Between 91 and 365 days Following Primary TKA for NexGen Option/NexGen Pegged Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Tibia	1	100.0

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Table 1247. Descriptive Statistics of Cases Receiving the NexGen Option/NexGen Pegged Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	315	50.6	
Age (years)	623	67.1 (8.9)	67 (12)
Height (cm)	623	169.9 (10.5)	169 (16)
Weight (kg)	623	95.7 (19.7)	94.7 (28.4)
BMI(kg/m^2)	623	33.1 (5.8)	32.4 (8.8)
Smoker - Never (%)	279	44.8	
Smoker - Previous (%)	274	44	
Smoker - Current (%)	68	10.9	
Smoker - Unknown (%)	2	0.3	

Table 1248. Distribution of Approach Used for NexGen Option/NexGen Pegged Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	611	98.1
Mid-vastus	2	0.3
Sub-vastus	0	0.0
Lateral parapatellar	10	1.6
Missing/unknown/other	0	0.0

Table 1249. Distribution of Polyethylene Used for NexGen Option/NexGen Pegged Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	1	0.2
XLPE	621	99.7
Antioxidant XLPE	0	0.0
Missing/unknown/other	1	0.2

Table 1250. Volume of Cases by Surgeon and Site for the NexGen Option/NexGen Pegged Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	77 (130)	42 (33)
Cases per site	124 (191)	25 (109)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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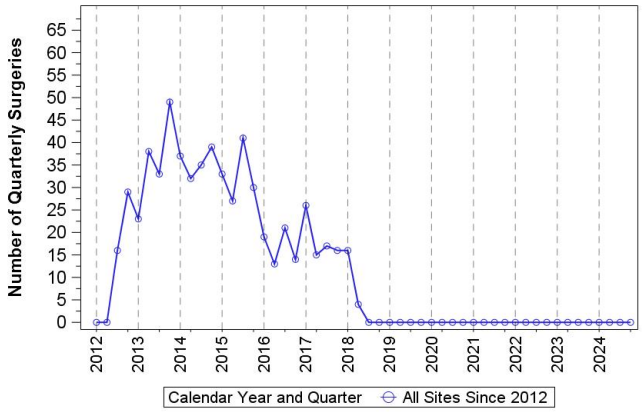


Figure 438. Utilization of the NexGen Option/NexGen Pegged Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

595601501	595601605	595601302
595601502	595601606	595601305
595601506	595601401	596601701
595601702	595601705	596601401
595601602	595601405	596601402
595601505	595601406	595601301
595601701	596601602	595601306
595601706	596601501	
595601402	596601601	
595601601	596601502	

Catalog Numbers of Tibial Components Used in the Analysis

597003502	597005501	597002502
597004501	597003501	597005503
597004502	597005502	

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3.5.24 NexGen Precoat/NexGen Precoat

N = 679 primary cases were used for this analysis. Distribution of utilization: 16 surgeons across 19 sites used this implant combination in primary TKA cases.

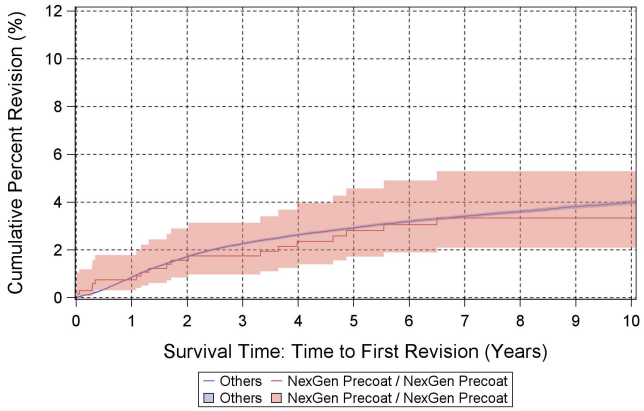


Figure 439. Cumulative Percent Revision Curve for the NexGen Precoat/NexGen Precoat Combination, Compared to All Other Implant Combinations in Primary TKA Cases

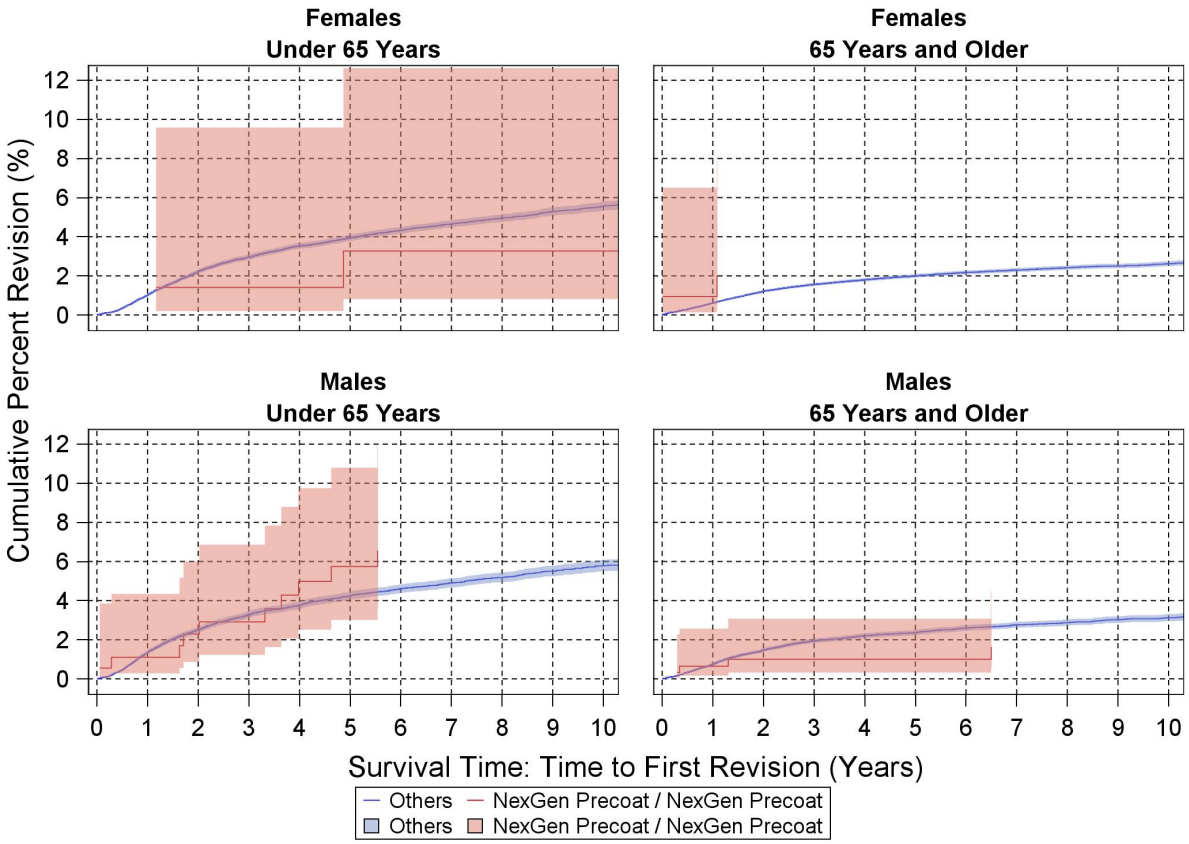


Figure 440. Cumulative Percent Revision Curve for the NexGen Precoat/NexGen Precoat Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1251. Cumulative Percent Revision and Number at Risk for the NexGen Precoat/NexGen Precoat Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	671	0.00 (0.00,0.00)	73	0.00 (0.00,0.00)	106	0.00 (0.00,0.00)	181	0.00 (0.00,0.00)	311	0.00 (0.00,0.00)
1	635	0.75 (0.31,1.78)	73	0.00 (0.00,0.00)	92	0.94 (0.13,6.51)	177	1.10 (0.28,4.35)	293	0.65 (0.16,2.57)
2	547	1.57 (0.85,2.90)	63	1.41 (0.20,9.58)	71	2.02 (0.51,7.86)	158	2.29 (0.87,6.00)	255	1.00 (0.32,3.08)
3	517	1.75 (0.97,3.14)	62	1.41 (0.20,9.58)	70	2.02 (0.51,7.86)	150	2.91 (1.22,6.86)	235	1.00 (0.32,3.08)
4	463	2.36 (1.40,3.97)	54	1.41 (0.20,9.58)	60	2.02 (0.51,7.86)	134	4.98 (2.51,9.75)	215	1.00 (0.32,3.08)
5	425	2.81 (1.72,4.58)	51	3.27 (0.82,12.62)	56	2.02 (0.51,7.86)	124	5.74 (3.02,10.80)	194	1.00 (0.32,3.08)
6	370	3.06 (1.90,4.91)	41	3.27 (0.82,12.62)	48	2.02 (0.51,7.86)	111	6.56 (3.56,11.93)	170	1.00 (0.32,3.08)
7	307	3.34 (2.09,5.30)	35	3.27 (0.82,12.62)	43	2.02 (0.51,7.86)	92	6.56 (3.56,11.93)	137	1.62 (0.58,4.47)
8	233	3.34 (2.09,5.30)	29	3.27 (0.82,12.62)	36	2.02 (0.51,7.86)	67	6.56 (3.56,11.93)	101	1.62 (0.58,4.47)
9	143	3.34 (2.09,5.30)	17	3.27 (0.82,12.62)	20	2.02 (0.51,7.86)	46	6.56 (3.56,11.93)	60	1.62 (0.58,4.47)
10	118	3.34 (2.09,5.30)	13	3.27 (0.82,12.62)	14	2.02 (0.51,7.86)	42	6.56 (3.56,11.93)	49	1.62 (0.58,4.47)

Table 1252. Reasons for First Revision Following Primary TKA for NexGen Precoat/NexGen Precoat Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	5	29.4
2	Aseptic Loosening	4	23.5
3	Dislocation/Instability	3	17.6
4	Arthrofibrosis	2	11.8
5	Osteolysis	1	5.9
6	Pain	1	5.9
7	Patellofemoral Joint	1	5.9

Table 1253. Reasons for First Revision in the First 90 Days Following Primary TKA for NexGen Precoat/NexGen Precoat Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	100.0

Table 1254. Reasons for First Revision Between 91 and 365 days Following Primary TKA for NexGen Precoat/NexGen Precoat Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	2	100.0

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Table 1255. Descriptive Statistics of Cases Receiving the NexGen Precoat/NexGen Precoat Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	181	26.7	
Age (years)	679	67.3 (8.6)	67 (12)
Height (cm)	679	175.3 (10.6)	175.3 (15.2)
Weight (kg)	679	101.1 (21.2)	99.3 (27.8)
BMI(kg/m^2)	679	32.8 (6)	32.2 (8)
Smoker - Never (%)	294	43.3	
Smoker - Previous (%)	300	44.2	
Smoker - Current (%)	77	11.3	
Smoker - Unknown (%)	8	1.2	

Table 1256. Distribution of Approach Used for NexGen Precoat/NexGen Precoat Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	659	97.1
Mid-vastus	4	0.6
Sub-vastus	11	1.6
Lateral parapatellar	2	0.3
Missing/unknown/other	3	0.4

Table 1257. Distribution of Polyethylene Used for NexGen Precoat/NexGen Precoat Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	12	1.8
XLPE	655	96.5
Antioxidant XLPE	0	0.0
Missing/unknown/other	12	1.8

Table 1258. Volume of Cases by Surgeon and Site for the NexGen Precoat/NexGen Precoat Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	42 (59)	13 (47)
Cases per site	35 (57)	12 (46)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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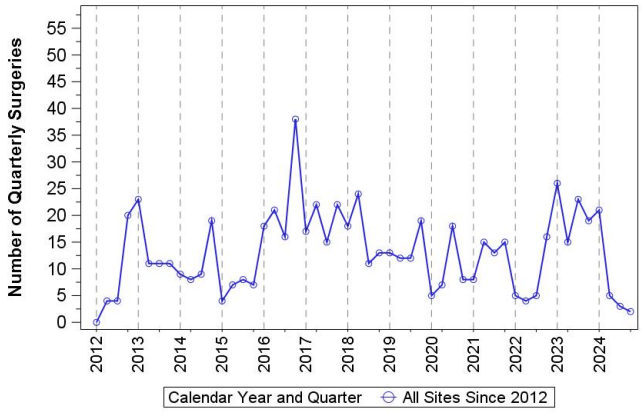


Figure 441. Utilization of the NexGen Precoat/NexGen Precoat Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

595001701	597001801	597001401
595001702	597001701	597001402
595001602	597001802	595001402
595001601	595001502	595001705
597001502	595001505	595001506
597001602	595001606	595001401
597001501	595001501	595001406
597001601	595001605	595001302
597001702	595001706	

Catalog Numbers of Tibial Components Used in the Analysis

598004702	598003702	598002701
598004701	598005702	
598005701	598005703	
598003701	598002702	

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3.5.25 NK II/NK II

N = 994 primary cases were used for this analysis. Fewer than ten surgeons used this implant combination at fewer than ten sites in primary TKA cases.

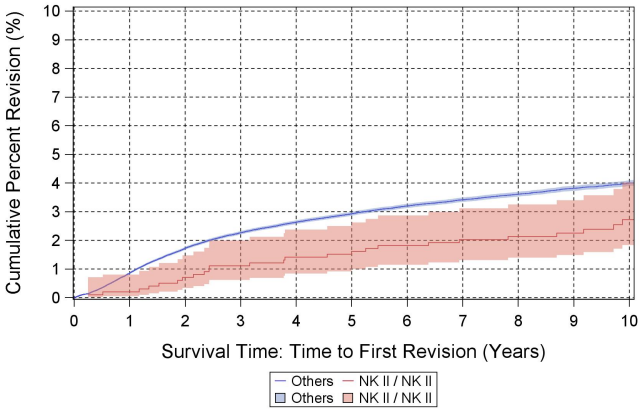


Figure 442. Cumulative Percent Revision Curve for the NK II/NK II Combination, Compared to All Other Implant Combinations in Primary TKA Cases

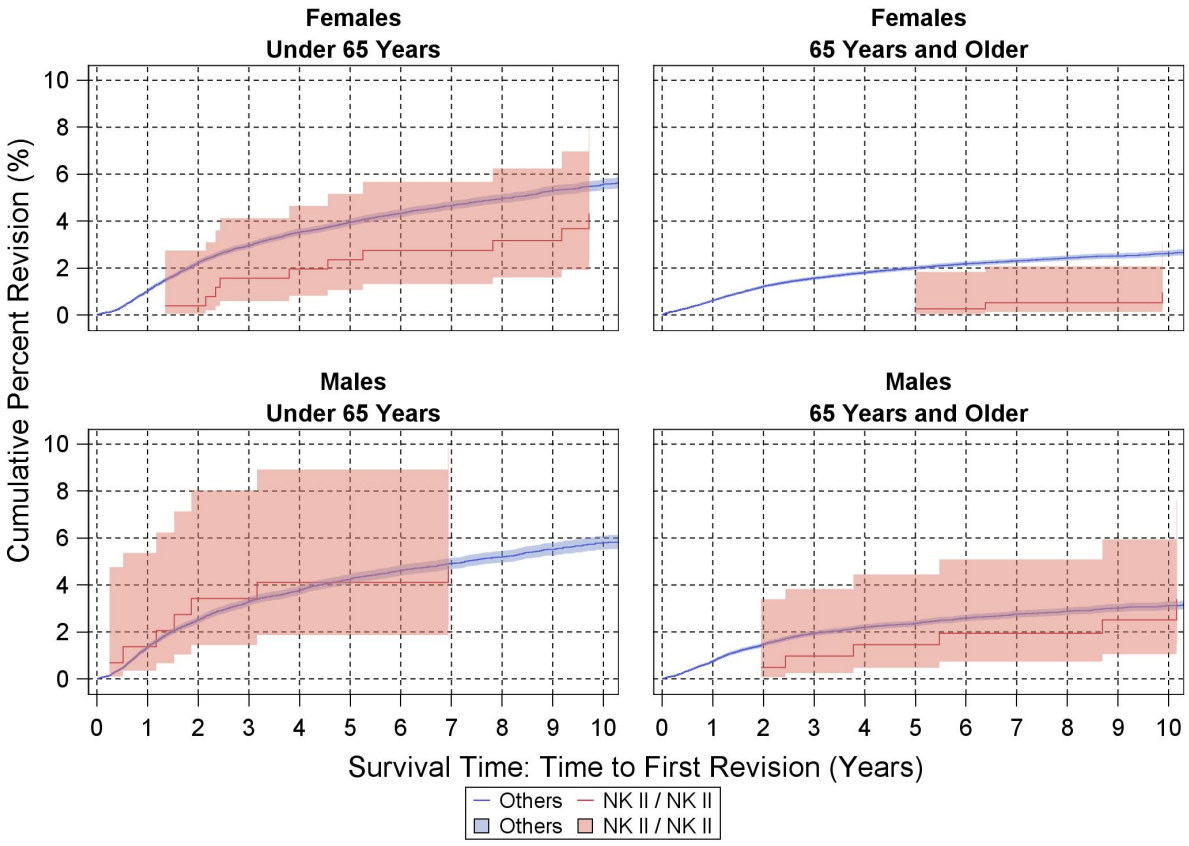


Figure 443. Cumulative Percent Revision Curve for the NK II/NK II Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1259. Cumulative Percent Revision and Number at Risk for the NK II/NK II Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	990	0.00 (0.00,0.00)	255	0.00 (0.00,0.00)	383	0.00 (0.00,0.00)	146	0.00 (0.00,0.00)	206	0.00 (0.00,0.00)
1	988	0.20 (0.05,0.81)	255	0.00 (0.00,0.00)	383	0.00 (0.00,0.00)	144	1.37 (0.34,5.37)	206	0.00 (0.00,0.00)
2	983	0.71 (0.34,1.48)	254	0.39 (0.06,2.75)	383	0.00 (0.00,0.00)	141	3.42 (1.44,8.03)	205	0.49 (0.07,3.40)
3	979	1.11 (0.62,2.00)	251	1.57 (0.59,4.13)	383	0.00 (0.00,0.00)	141	3.42 (1.44,8.03)	204	0.97 (0.24,3.83)
4	976	1.41 (0.84,2.38)	250	1.96 (0.82,4.65)	383	0.00 (0.00,0.00)	140	4.11 (1.87,8.92)	203	1.46 (0.47,4.45)
5	974	1.62 (0.99,2.62)	249	2.35 (1.06,5.16)	382	0.26 (0.04,1.84)	140	4.11 (1.87,8.92)	203	1.46 (0.47,4.45)
6	969	1.82 (1.15,2.87)	247	2.75 (1.32,5.67)	381	0.26 (0.04,1.84)	140	4.11 (1.87,8.92)	201	1.94 (0.73,5.09)
7	935	2.02 (1.31,3.12)	236	2.75 (1.32,5.67)	371	0.52 (0.13,2.07)	134	4.80 (2.32,9.81)	194	1.94 (0.73,5.09)
8	878	2.13 (1.40,3.25)	226	3.17 (1.60,6.24)	343	0.52 (0.13,2.07)	126	4.80 (2.32,9.81)	183	1.94 (0.73,5.09)
9	787	2.25 (1.49,3.40)	205	3.17 (1.60,6.24)	301	0.52 (0.13,2.07)	118	4.80 (2.32,9.81)	163	2.51 (1.05,5.94)
10	545	2.72 (1.84,4.03)	132	4.33 (2.32,7.98)	215	0.97 (0.30,3.09)	84	4.80 (2.32,9.81)	114	2.51 (1.05,5.94)

Table 1260. Reasons for First Revision Following Primary TKA for NK II/NK II Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	7	29.2
2	Joint Infection	5	20.8
3	Implant Failure	4	16.7
4	Aseptic Loosening	3	12.5
5	Pain	2	8.3
6	Poly liner wear	2	8.3
7	Peri-prosthetic fracture - Femur	1	4.2

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1261. Reasons for First Revision Between 91 and 365 days Following Primary TKA for NK II/NK II Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	100.0

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Table 1262. Descriptive Statistics of Cases Receiving the NK II/NK II Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	642	64.6	
Age (years)	994	66.9 (9.2)	67 (14)
Height (cm)	991	168.3 (10.1)	167.6 (15.2)
Weight (kg)	991	93.7 (21.4)	90.7 (28.6)
BMI(kg/m^2)	991	33 (6.8)	32.1 (8.9)
Smoker - Never (%)	538	54.1	
Smoker - Previous (%)	376	37.8	
Smoker - Current (%)	76	7.7	
Smoker - Unknown (%)	4	0.4	

Table 1263. Distribution of Approach Used for NK II/NK II Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	925	93.1
Mid-vastus	38	3.8
Sub-vastus	12	1.2
Lateral parapatellar	5	0.5
Missing/unknown/other	14	1.4

Table 1264. Distribution of Polyethylene Used for NK II/NK II Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	497	50.0
XLPE	487	49.0
Antioxidant XLPE	0	0.0
Missing/unknown/other	10	1.0

Table 1265. Volume of Cases by Surgeon and Site for the NK II/NK II Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	110 (181)	11 (104)
Cases per site	198 (166)	129 (247)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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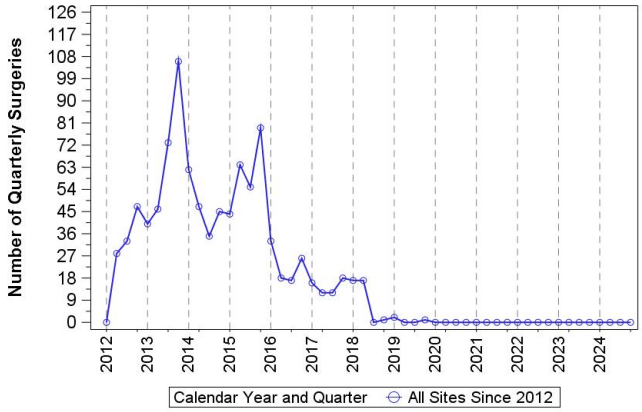


Figure 444. Utilization of the NK II/NK II Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

630700021	621200021	630700008
630700020	621200041	632000103
630700030	621200040	632000203
630700031	630700040	630700009
621200031	621200010	632000102
621200030	621200050	632000202
621200020	621200011	621200008
630700041	621200051	632000101
630700011	630700051	
630700010	630700050	

Catalog Numbers of Tibial Components Used in the Analysis

630701210	630700240	642001240
630700210	630701240	642000100
630700220	642000210	630700002
630701220	642001210	642000240
630701230	642001220	630700250
630700230	642001230	630701002
630700200	642000230	
630701200	642000220	

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3.5.26 NK II GS/NK II

N = 4,200 primary cases were used for this analysis. Distribution of utilization: 12 surgeons across 11 sites used this implant combination in primary TKA cases.

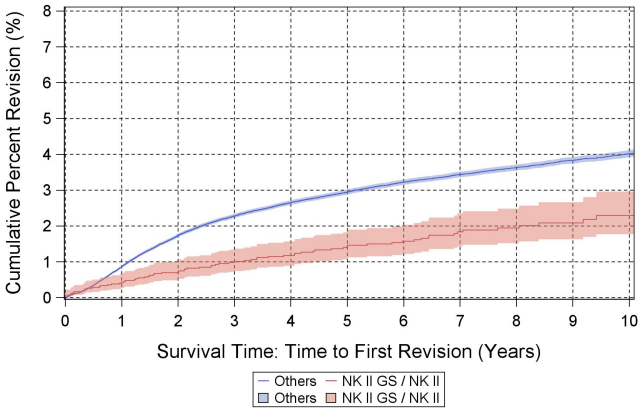


Figure 445. Cumulative Percent Revision Curve for the NK II GS/NK II Combination, Compared to All Other Implant Combinations in Primary TKA Cases

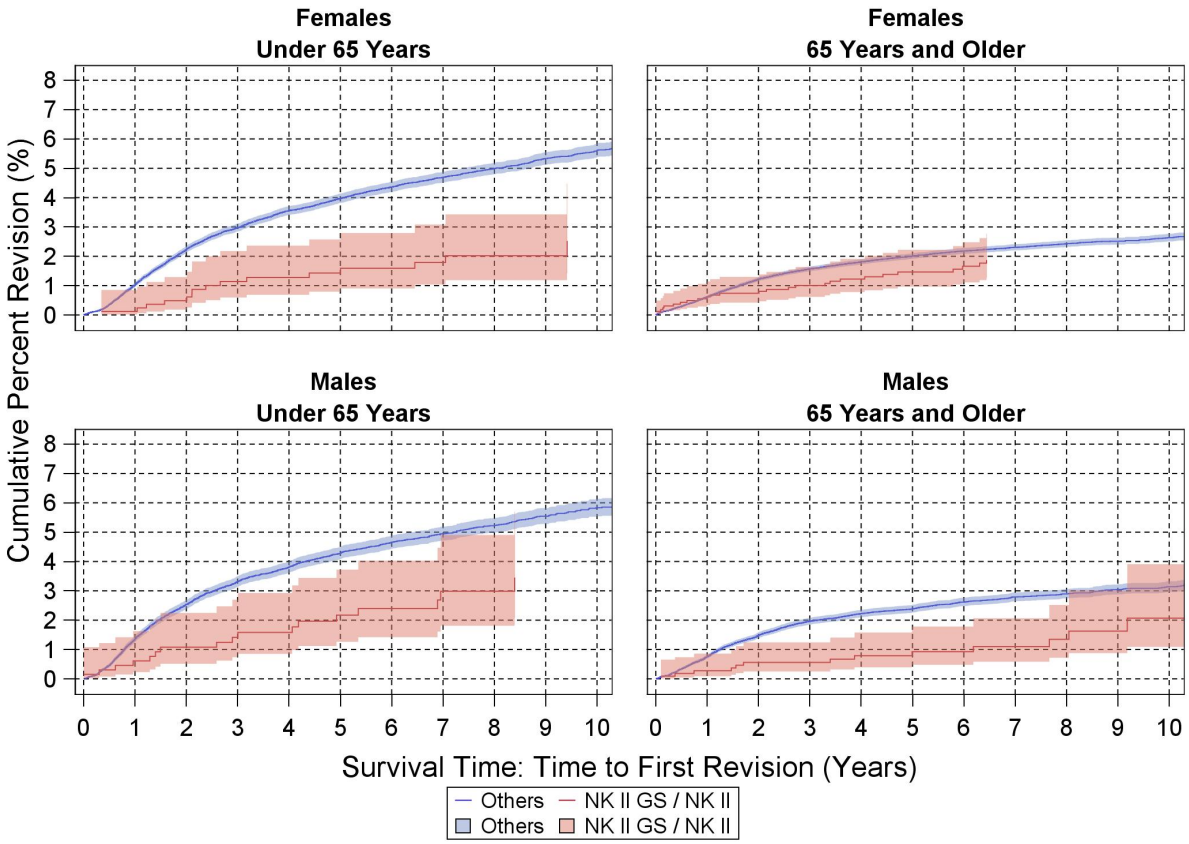


Figure 446. Cumulative Percent Revision Curve for the NK II GS/NK II Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1266. Cumulative Percent Revision and Number at Risk for the NK II GS/NK II Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	4,184	0.00 (0.00,0.00)	829	0.00 (0.00,0.00)	1,623	0.00 (0.00,0.00)	653	0.00 (0.00,0.00)	1,079	0.00 (0.00,0.00)
1	4,135	0.43 (0.27,0.68)	821	0.12 (0.02,0.85)	1,600	0.62 (0.33,1.14)	644	0.61 (0.23,1.63)	1,070	0.28 (0.09,0.86)
2	3,950	0.70 (0.48,1.00)	778	0.49 (0.18,1.29)	1,537	0.74 (0.42,1.30)	616	1.08 (0.52,2.25)	1,019	0.56 (0.25,1.24)
3	3,672	0.98 (0.72,1.34)	726	1.14 (0.59,2.18)	1,438	1.01 (0.62,1.64)	576	1.41 (0.74,2.70)	932	0.56 (0.25,1.24)
4	3,297	1.18 (0.89,1.57)	669	1.28 (0.69,2.36)	1,279	1.22 (0.78,1.92)	524	1.58 (0.85,2.93)	825	0.79 (0.39,1.58)
5	2,978	1.43 (1.10,1.86)	610	1.43 (0.79,2.57)	1,164	1.47 (0.97,2.22)	471	2.17 (1.26,3.72)	733	0.93 (0.48,1.78)
6	2,510	1.58 (1.22,2.03)	531	1.59 (0.90,2.79)	989	1.66 (1.11,2.48)	392	2.39 (1.42,4.03)	598	0.93 (0.48,1.78)
7	2,016	1.84 (1.44,2.35)	431	1.79 (1.04,3.08)	793	1.88 (1.27,2.76)	318	2.99 (1.81,4.90)	474	1.10 (0.58,2.07)
8	1,529	1.95 (1.52,2.49)	324	2.02 (1.19,3.43)	616	1.88 (1.27,2.76)	234	2.99 (1.81,4.90)	355	1.35 (0.72,2.52)
9	1,063	2.08 (1.63,2.67)	227	2.02 (1.19,3.43)	428	1.88 (1.27,2.76)	170	3.45 (2.08,5.70)	238	1.63 (0.88,3.02)
10	684	2.29 (1.77,2.96)	150	2.52 (1.42,4.47)	274	1.88 (1.27,2.76)	113	3.45 (2.08,5.70)	147	2.07 (1.09,3.91)

Table 1267. Reasons for First Revision Following Primary TKA for NK II GS/NK II Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	20	26.3
2	Aseptic Loosening	12	15.8
3	Dislocation/Instability	12	15.8
4	Pain	10	13.2
5	Implant Failure	7	9.2
6	Malalignment	6	7.9
7	Arthrofibrosis	3	3.9
8	Poly liner wear	2	2.6
9	Metal Reaction/Metallosis	1	1.3
10	Osteolysis	1	1.3
	Unknown/missing/other	1	2.6

Table 1268. Reasons for First Revision in the First 90 Days Following Primary TKA for NK II GS/NK II Combination Cases

Rank	Reason for Revision	N	Percent
1	Implant Failure	3	42.9
2	Dislocation/Instability	1	14.3
3	Joint Infection	1	14.3
4	Malalignment	1	14.3
5	Peri-prosthetic fracture - Tibia	1	14.3

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Table 1269. Reasons for First Revision Between 91 and 365 days Following Primary TKA for NK II GS/NK II Combination Cases

Rank	Reason for Revision	N	Percent
1	Pain	4	30.8
2	Dislocation/Instability	2	15.4
3	Joint Infection	2	15.4
4	Arthrofibrosis	2	15.4
5	Aseptic Loosening	1	7.7
6	Peri-prosthetic fracture - Femur	1	7.7
7	Malalignment	1	7.7

Table 1270. Descriptive Statistics of Cases Receiving the NK II GS/NK II Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,458	58.5	
Age (years)	4,200	67.9 (8.9)	68 (12)
Height (cm)	4,199	169.5 (10.7)	167.6 (15.7)
Weight (kg)	4,198	93.7 (21)	92.1 (28.2)
BMI(kg/m^2)	4,198	32.5 (6.1)	31.9 (8.8)
Smoker - Never (%)	2,196	52.3	
Smoker - Previous (%)	1,721	41	
Smoker - Current (%)	281	6.7	
Smoker - Unknown (%)	0	0.0	

Table 1271. Distribution of Approach Used for NK II GS/NK II Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	4,011	95.5
Mid-vastus	65	1.5
Sub-vastus	108	2.6
Lateral parapatellar	5	0.1
Missing/unknown/other	11	0.3

Table 1272. Distribution of Polyethylene Used for NK II GS/NK II Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	4,169	99.3
Antioxidant XLPE	0	0.0
Missing/unknown/other	31	0.7

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Table 1273. Volume of Cases by Surgeon and Site for the NK II GS/NK II Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	350 (528)	59 (674)
Cases per site	381 (497)	119 (862)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

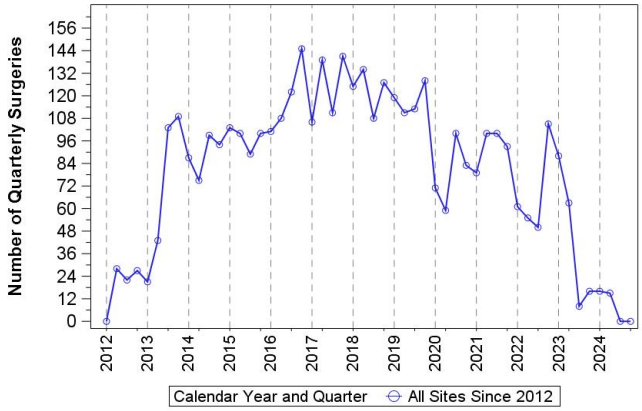


Figure 447. Utilization of the NK II GS/NK II Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

541401501	541401402	541601602
541401502	541401401	541401702
541001602	541401601	541201401
541001601	541001501	541001801
541001702	541601502	541601601
541001701	541601501	541001802
541201602	541001402	541401302
541201701	541001401	541601701
541201501	541201802	541401301
541201502	541201402	541601302
541201702	541401701	541601702
541201601	541201801	541601301
541401602	541601402	
541001502	541601401	

Catalog Numbers of Tibial Components Used in the Analysis

630701210	630701200	621200210
630700210	630700240	621201220
630701220	630701240	621201230
630700230	630700200	621200230
630701230	621201210	621201200
630700220	621200220	621200200

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621200240	621201002	621201250
621201240	630700250	642001220
630701250	621200250	

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3.5.27 Persona CR (Cemented)/Persona (Cemented)

N = 55,979 primary cases were used for this analysis. Distribution of utilization: 246 surgeons across 83 sites used this implant combination in primary TKA cases.

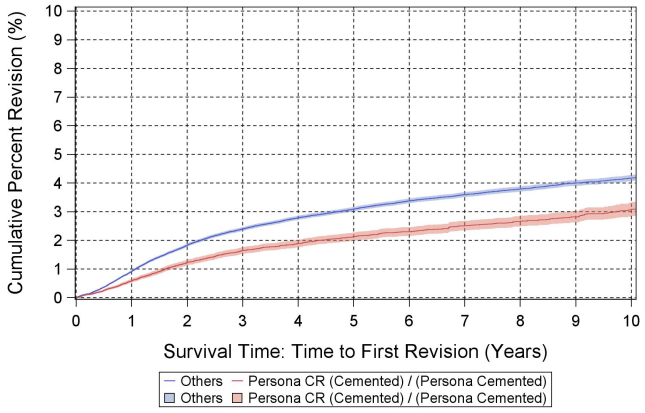


Figure 448. Cumulative Percent Revision Curve for the Persona CR (Cemented)/Persona (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases

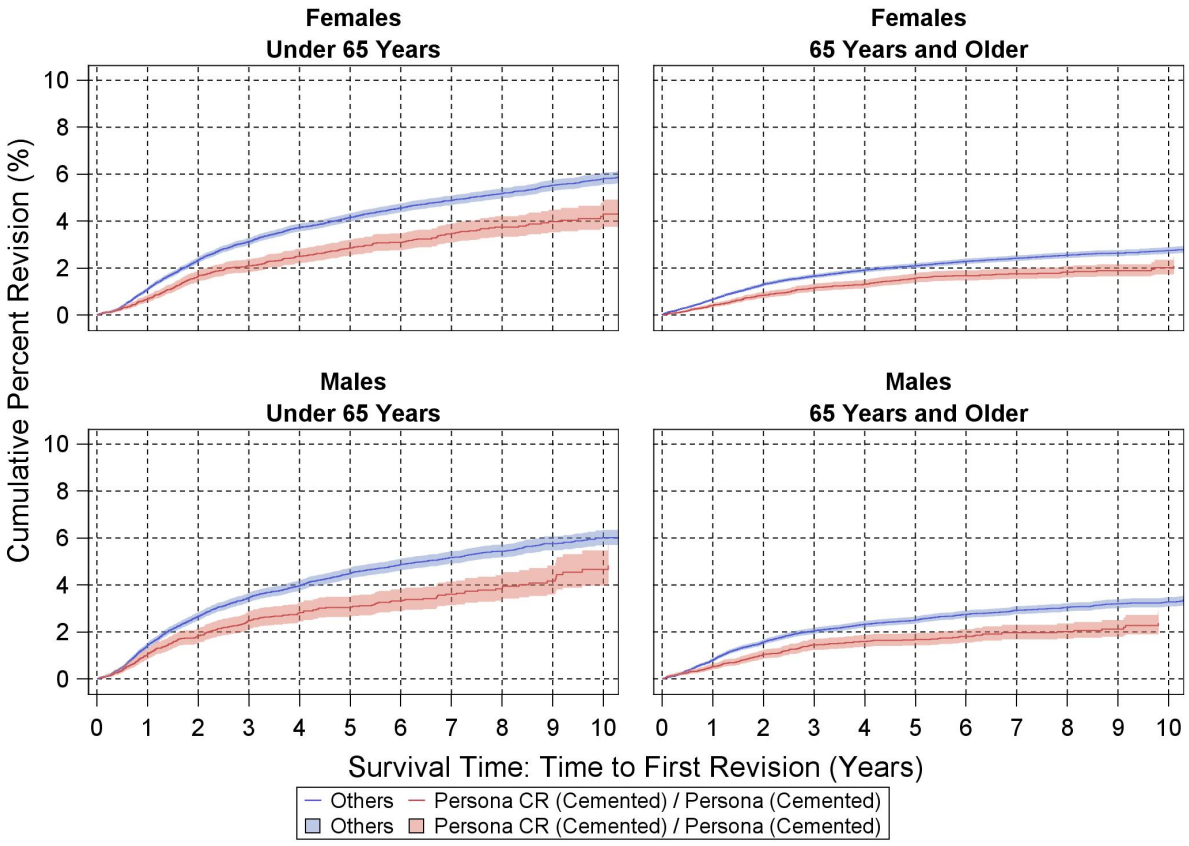


Figure 449. Cumulative Percent Revision Curve for the Persona CR (Cemented)/Persona (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1274. Cumulative Percent Revision and Number at Risk for the Persona CR (Cemented)/Persona (Cemented) Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	55,743	0.00 (0.00,0.00)	12,895	0.00 (0.00,0.00)	21,795	0.00 (0.00,0.00)	8,022	0.00 (0.00,0.00)	13,029	0.00 (0.00,0.00)
1	47,126	0.58 (0.52,0.65)	11,153	0.68 (0.54,0.84)	18,153	0.40 (0.32,0.49)	6,964	1.04 (0.83,1.29)	10,855	0.52 (0.40,0.66)
2	39,310	1.22 (1.13,1.33)	9,587	1.65 (1.43,1.91)	14,885	0.84 (0.72,0.99)	5,973	1.83 (1.55,2.17)	8,864	1.02 (0.85,1.23)
3	33,018	1.64 (1.53,1.76)	8,249	2.10 (1.84,2.39)	12,352	1.15 (1.00,1.32)	5,085	2.47 (2.13,2.88)	7,331	1.44 (1.23,1.70)
4	28,011	1.89 (1.76,2.02)	7,058	2.49 (2.21,2.82)	10,431	1.31 (1.15,1.50)	4,332	2.80 (2.42,3.24)	6,189	1.59 (1.36,1.87)
5	24,019	2.13 (1.99,2.28)	6,049	2.85 (2.53,3.21)	8,952	1.58 (1.39,1.80)	3,756	3.04 (2.63,3.50)	5,261	1.68 (1.43,1.96)
6	19,082	2.30 (2.15,2.46)	4,905	3.09 (2.75,3.47)	7,023	1.67 (1.47,1.90)	3,062	3.32 (2.89,3.82)	4,091	1.81 (1.55,2.11)
7	14,491	2.51 (2.35,2.69)	3,774	3.48 (3.10,3.90)	5,269	1.75 (1.54,1.99)	2,391	3.61 (3.14,4.14)	3,056	1.97 (1.68,2.31)
8	10,246	2.66 (2.48,2.84)	2,675	3.74 (3.33,4.21)	3,687	1.83 (1.60,2.08)	1,739	3.84 (3.33,4.42)	2,144	2.01 (1.71,2.36)
9	6,542	2.82 (2.63,3.03)	1,741	3.98 (3.52,4.49)	2,346	1.89 (1.65,2.16)	1,073	4.17 (3.60,4.83)	1,381	2.12 (1.79,2.51)
10	3,604	3.09 (2.85,3.34)	976	4.30 (3.76,4.92)	1,222	2.01 (1.73,2.35)	604	4.66 (3.97,5.47)	801	2.38 (1.96,2.89)

Table 1275. Reasons for First Revision Following Primary TKA for Persona CR (Cemented)/Persona (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	271	27.1
2	Joint Infection	253	25.3
3	Aseptic Loosening	208	20.8
4	Arthrofibrosis	93	9.3
5	Pain	61	6.1
6	Implant Failure	22	2.2
7	Malalignment	22	2.2
8	Poly liner wear	21	2.1
9	Peri-prosthetic fracture - Femur	18	1.8
10	Patellofemoral Joint	11	1.1
	Unknown/missing/other	9	2.0

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Table 1276. Reasons for First Revision in the First 90 Days Following Primary TKA for Persona CR (Cemented)/Persona (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	38	60.3
2	Dislocation/Instability	8	12.7
3	Peri-prosthetic fracture - Femur	5	7.9
4	Pain	3	4.8
5	Aseptic Loosening	2	3.2
6	Implant Failure	2	3.2
7	Malalignment	2	3.2
8	Poly liner wear	1	1.6
9	Peri-prosthetic fracture - Tibia	1	1.6
10	Arthrofibrosis	1	1.6

Table 1277. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Persona CR (Cemented)/Persona (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	85	36.3
2	Dislocation/Instability	41	17.5
3	Arthrofibrosis	35	15.0
4	Aseptic Loosening	31	13.2
5	Pain	19	8.1
6	Malalignment	8	3.4
7	Extensor mechanism failure	4	1.7
8	Implant Failure	3	1.3
9	Poly liner wear	2	0.8
10	Peri-prosthetic fracture - Femur	2	0.8
	Unknown/missing/other	1	1.7

Table 1278. Descriptive Statistics of Cases Receiving the Persona CR (Cemented)/Persona (Cemented) Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	34,808	62.2	
Age (years)	55,979	67.2 (9.1)	67 (13)
Height (cm)	55,452	168.5 (10.5)	167.6 (16)
Weight (kg)	55,452	93.7 (20.8)	92.1 (27.6)
BMI(kg/m^2)	55,452	32.9 (6.5)	32.3 (8.8)
Smoker - Never (%)	30,051	53.7	
Smoker - Previous (%)	21,272	38	
Smoker - Current (%)	4,435	7.9	
Smoker - Unknown (%)	221	0.4	

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Table 1279. Distribution of Approach Used for Persona CR (Cemented)/Persona (Cemented) Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	49,484	88.4
Mid-vastus	4,813	8.6
Sub-vastus	1,048	1.9
Lateral parapatellar	61	0.1
Missing/unknown/other	573	1.0

Table 1280. Distribution of Polyethylene Used for Persona CR (Cemented)/Persona (Cemented) Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	13,603	24.3
XLPE	1	0.0
Antioxidant XLPE	42,008	75.0
Missing/unknown/other	367	0.7

Table 1281. Volume of Cases by Surgeon and Site for the Persona CR (Cemented)/Persona (Cemented) Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	227 (433)	59 (252)
Cases per site	674 (882)	315 (854)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

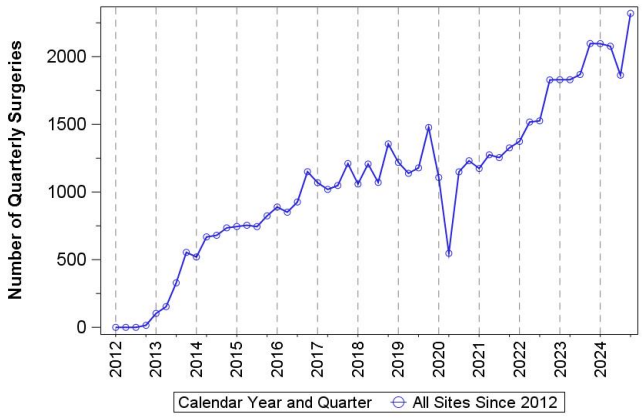


Figure 450. Utilization of the Persona CR (Cemented)/Persona (Cemented) Combination in Primary TKA Cases

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Catalog Numbers of Femoral Components Used in the Analysis

42502006202	42502607402	42572006001
42502006402	42502607401	42572606601
42502607002	42502605802	42572606001
42502606802	42502006802	42572606002
42502606202	42502605801	42502605401
42502607001	42502006801	42572605802
42502606402	42502007002	42502605402
42502606602	42502005802	42572606802
42502006201	42502007001	42572005801
42502606201	42502005801	42572605801
42502606801	42502605602	42572005802
42502606601	42502605601	42572607001
42502006401	42502005602	42502005401
42502606401	42502005601	42572607002
42502606002	42572606202	42502005402
42502606001	42572606201	42572605601
42502006602	42572606402	42504605411
42502006002	42572606401	42572605602
42502006601	42572006002	
42502006001	42572606602	

Catalog Numbers of Tibial Components Used in the Analysis

42532007102	42532008302	42542006401
42532007101	42532008301	42542006702
42532006702	42532008802	42542007501
42532006701	42532008801	42542007902
42532007502	42532006101	42532005801
42532007501	42532006102	42542006402
42532007902	42532005802	42542007502
42532007901	42542007102	42542007901
42532006402	42542007101	
42532006401	42542006701	

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3.5.28 Persona CR (Cementless)/Persona (Cementless)

N = 2,181 primary cases were used for this analysis. Distribution of utilization: 74 surgeons across 56 sites used this implant combination in primary TKA cases.

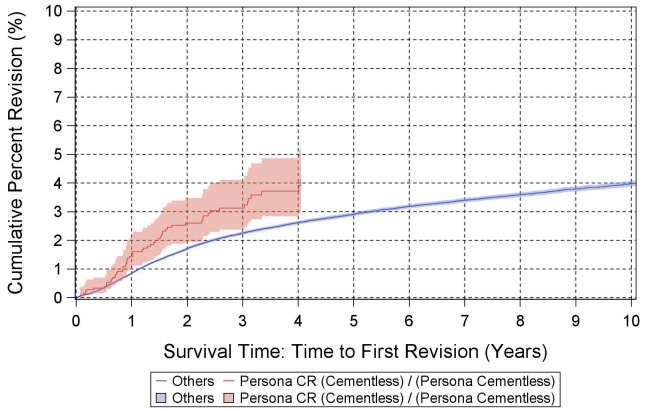


Figure 451. Cumulative Percent Revision Curve for the Persona CR (Cementless)/Persona (Cementless) Combination, Compared to All Other Implant Combinations in Primary TKA Cases

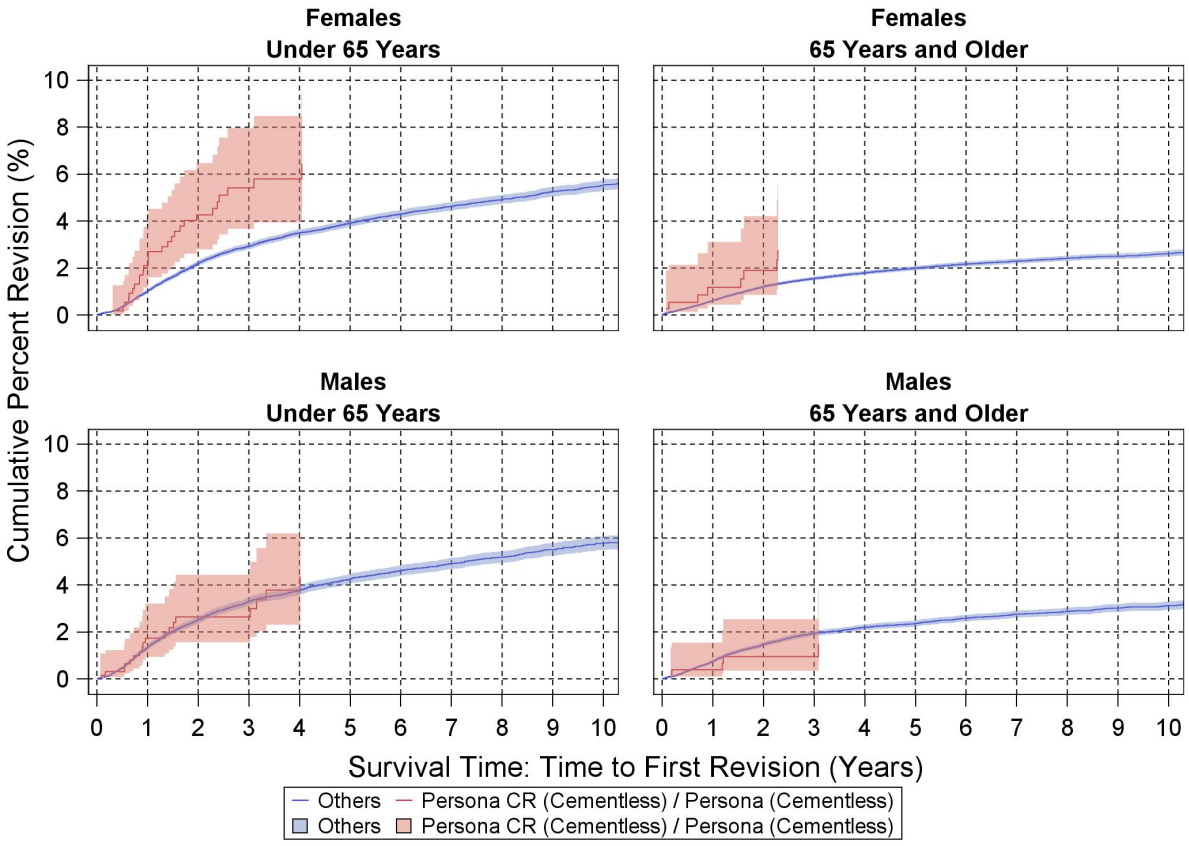


Figure 452. Cumulative Percent Revision Curve for the Persona CR (Cementless)/Persona (Cementless) Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1282. Cumulative Percent Revision and Number at Risk for the Persona CR (Cementless)/Persona (Cementless) Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	2,171	0.00 (0.00,0.00)	593	0.00 (0.00,0.00)	373	0.00 (0.00,0.00)	659	0.00 (0.00,0.00)	546	0.00 (0.00,0.00)
1	1,683	1.43 (0.98,2.08)	490	2.10 (1.17,3.76)	299	1.18 (0.44,3.12)	509	1.74 (0.94,3.21)	385	0.39 (0.10,1.55)
2	1,308	2.60 (1.94,3.48)	398	4.26 (2.79,6.47)	250	1.90 (0.85,4.21)	384	2.64 (1.56,4.44)	276	0.95 (0.35,2.54)
3	887	3.12 (2.37,4.11)	261	5.42 (3.67,7.96)	161	2.77 (1.38,5.52)	275	2.64 (1.56,4.44)	190	0.95 (0.35,2.54)
4	490	3.72 (2.84,4.86)	146	5.80 (3.95,8.48)	85	2.77 (1.38,5.52)	167	3.78 (2.30,6.20)	92	1.50 (0.58,3.86)
5	289	4.12 (3.12,5.42)	96	6.45 (4.34,9.53)	48	2.77 (1.38,5.52)	94	4.37 (2.64,7.18)	51	1.50 (0.58,3.86)
6	139	4.12 (3.12,5.42)	44	6.45 (4.34,9.53)	27	2.77 (1.38,5.52)	45	4.37 (2.64,7.18)	23	1.50 (0.58,3.86)
7	43	4.12 (3.12,5.42)	18	6.45 (4.34,9.53)	*	2.77 (1.38,5.52)	14	4.37 (2.64,7.18)	*	1.50 (0.58,3.86)
8	43	4.12 (3.12,5.42)	18	6.45 (4.34,9.53)	*	2.77 (1.38,5.52)	14	4.37 (2.64,7.18)	*	1.50 (0.58,3.86)
9	43	4.12 (3.12,5.42)	18	6.45 (4.34,9.53)	*	2.77 (1.38,5.52)	14	4.37 (2.64,7.18)	*	1.50 (0.58,3.86)
10	35	4.12 (3.12,5.42)	17	6.45 (4.34,9.53)	*	2.77 (1.38,5.52)	12	4.37 (2.64,7.18)	*	1.50 (0.58,3.86)

* Denotes that the number of cases is between 1 and 10.

Table 1283. Reasons for First Revision Following Primary TKA for Persona CR (Cementless)/Persona (Cementless) Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	25	43.1
2	Dislocation/Instability	14	24.1
3	Implant Failure	8	13.8
4	Arthrofibrosis	4	6.9
5	Joint Infection	3	5.2
6	Pain	2	3.4
7	Malalignment	1	1.7
8	Patellofemoral Joint	1	1.7

Table 1284. Reasons for First Revision in the First 90 Days Following Primary TKA for Persona CR (Cementless)/Persona (Cementless) Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	3	50.0
2	Implant Failure	1	16.7
3	Pain	1	16.7
4	Patellofemoral Joint	1	16.7

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Table 1285. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Persona CR (Cementless)/Persona (Cementless) Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	9	42.9
2	Dislocation/Instability	6	28.6
3	Implant Failure	2	9.5
4	Arthrofibrosis	2	9.5
5	Joint Infection	1	4.8
6	Malalignment	1	4.8

Table 1286. Descriptive Statistics of Cases Receiving the Persona CR (Cementless)/Persona (Cementless) Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	971	44.5	
Age (years)	2,181	63.1 (8.9)	63 (12)
Height (cm)	2,181	172.2 (10.1)	172.7 (15.2)
Weight (kg)	2,181	100 (20.7)	98.4 (26.6)
BMI(kg/m^2)	2,181	33.8 (6.6)	32.9 (8.5)
Smoker - Never (%)	1,171	53.7	
Smoker - Previous (%)	786	36	
Smoker - Current (%)	218	10	
Smoker - Unknown (%)	6	0.3	

Table 1287. Distribution of Approach Used for Persona CR (Cementless)/Persona (Cementless) Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	1,994	91.4
Mid-vastus	157	7.2
Sub-vastus	28	1.3
Lateral parapatellar	2	0.1
Missing/unknown/other	0	0.0

Table 1288. Distribution of Polyethylene Used for Persona CR (Cementless)/Persona (Cementless) Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	46	2.1
XLPE	0	0.0
Antioxidant XLPE	2,120	97.2
Missing/unknown/other	15	0.7

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Table 1289. Volume of Cases by Surgeon and Site for the Persona CR (Cementless)/Persona (Cementless) Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	29 (63)	6 (23)
Cases per site	39 (81)	15 (37)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

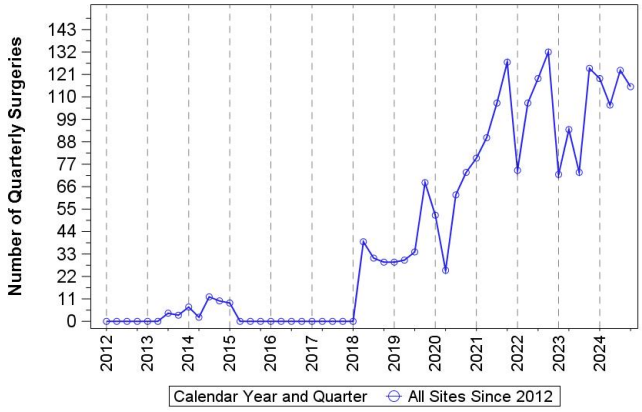


Figure 453. Utilization of the Persona CR (Cementless)/Persona (Cementless) Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

42502806601	42508606402	42502805802
42502806801	42508606201	42508006401
42502806802	42502206201	42502207001
42502806602	42502806001	42508006802
42502807001	42508606602	42508006202
42502806401	42502206601	42508606001
42502807002	42502807402	42502205802
42502806201	42502206602	42502207002
42502806402	42502206202	42508006801
42508606601	42502206002	42502205801
42502807401	42502806002	42502805602
42508606401	42508606802	42508607002
42508606801	42502206001	42502805601
42502806202	42502206801	42508006201
42502206402	42508006602	42508007002
42502206401	42502206802	42502205602
42508607001	42502805801	

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Catalog Numbers of Tibial Components Used in the Analysis

42530007101	42530007901	42535007102
42530007102	42530006702	42530008302
42530007502	42535007502	42530008301
42530007501	42535007901	42530006401
42530006701	42535007101	42530006402
42535007501	42530007902	

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3.5.29 Persona PS (Cemented)/Persona (Cemented)

N = 29,722 primary cases were used for this analysis. Distribution of utilization: 227 surgeons across 81 sites used this implant combination in primary TKA cases.

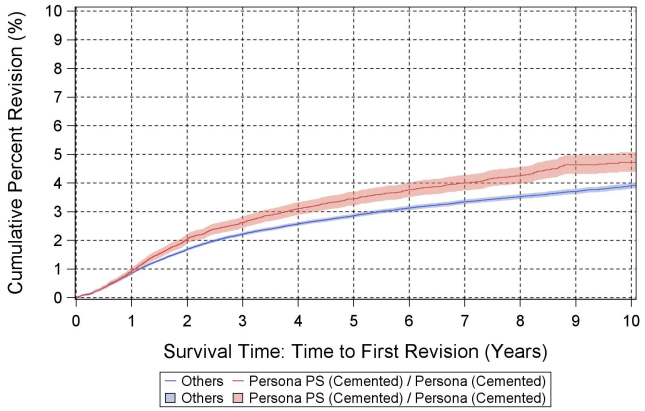


Figure 454. Cumulative Percent Revision Curve for the Persona PS (Cemented)/Persona (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases

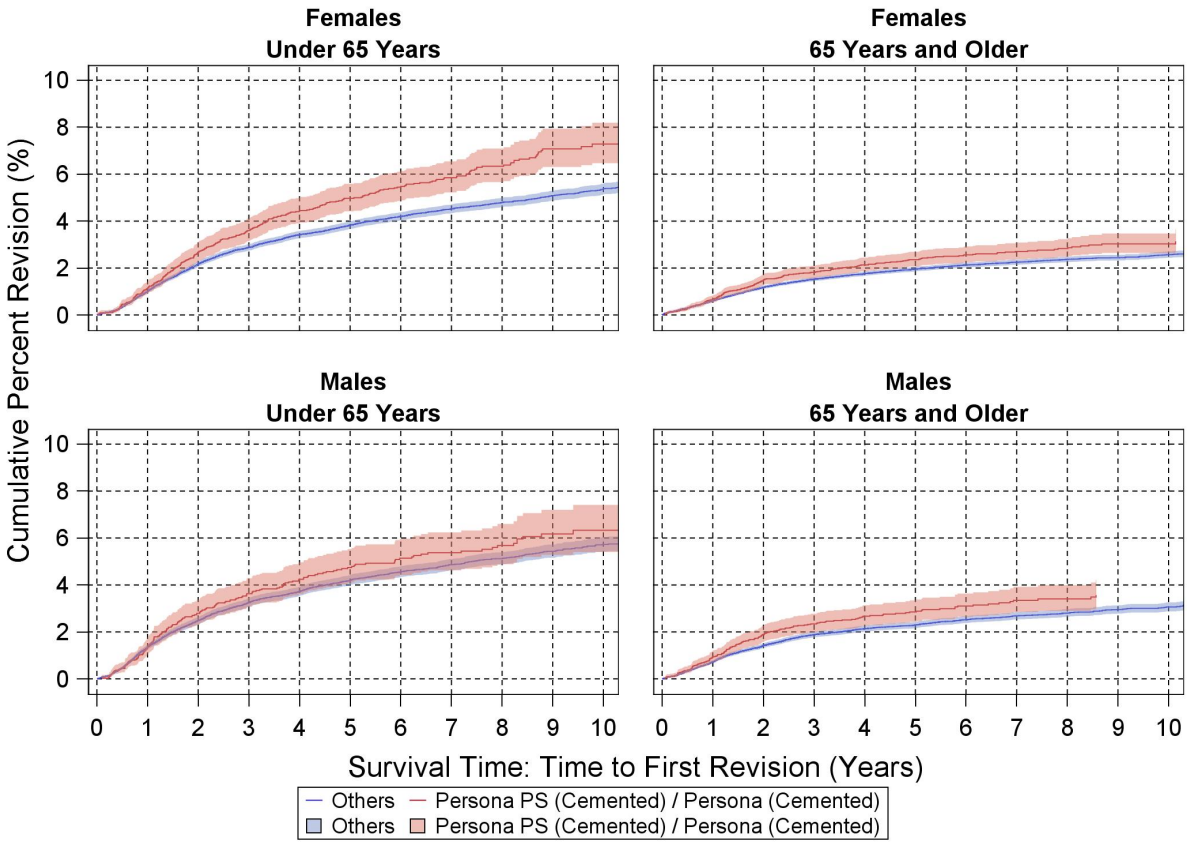


Figure 455. Cumulative Percent Revision Curve for the Persona PS (Cemented)/Persona (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1290. Cumulative Percent Revision and Number at Risk for the Persona PS (Cemented)/Persona (Cemented) Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	29,496	0.00 (0.00,0.00)	6,665	0.00 (0.00,0.00)	11,871	0.00 (0.00,0.00)	4,176	0.00 (0.00,0.00)	6,782	0.00 (0.00,0.00)
1	26,139	0.94 (0.83,1.06)	6,057	1.14 (0.90,1.43)	10,407	0.67 (0.53,0.83)	3,756	1.37 (1.05,1.78)	5,917	0.93 (0.72,1.20)
2	22,790	2.03 (1.87,2.21)	5,384	2.66 (2.28,3.10)	9,014	1.47 (1.25,1.72)	3,342	2.79 (2.31,3.36)	5,048	1.89 (1.57,2.27)
3	19,567	2.62 (2.43,2.82)	4,762	3.60 (3.15,4.11)	7,695	1.82 (1.57,2.10)	2,871	3.63 (3.07,4.29)	4,237	2.34 (1.98,2.77)
4	16,668	3.11 (2.89,3.34)	4,139	4.43 (3.92,5.00)	6,518	2.13 (1.86,2.44)	2,471	4.24 (3.62,4.97)	3,539	2.67 (2.27,3.14)
5	14,436	3.45 (3.22,3.69)	3,680	4.97 (4.42,5.59)	5,657	2.36 (2.06,2.69)	2,110	4.74 (4.07,5.52)	2,988	2.85 (2.43,3.34)
6	11,825	3.76 (3.51,4.02)	3,092	5.45 (4.86,6.11)	4,608	2.56 (2.25,2.92)	1,761	5.14 (4.42,5.97)	2,363	3.10 (2.65,3.63)
7	9,413	4.01 (3.74,4.29)	2,528	5.85 (5.22,6.54)	3,611	2.71 (2.37,3.09)	1,445	5.37 (4.63,6.24)	1,829	3.34 (2.85,3.92)
8	7,175	4.25 (3.97,4.55)	1,951	6.34 (5.66,7.09)	2,735	2.83 (2.48,3.23)	1,125	5.68 (4.88,6.60)	1,364	3.41 (2.90,4.00)
9	4,773	4.64 (4.32,4.97)	1,306	7.07 (6.30,7.94)	1,802	3.03 (2.64,3.47)	741	6.17 (5.29,7.20)	924	3.57 (3.03,4.21)
10	2,502	4.72 (4.39,5.07)	708	7.28 (6.47,8.19)	941	3.03 (2.64,3.47)	398	6.33 (5.40,7.41)	455	3.57 (3.03,4.21)

Table 1291. Reasons for First Revision Following Primary TKA for Persona PS (Cemented)/Persona (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	259	28.2
2	Joint Infection	231	25.2
3	Aseptic Loosening	215	23.4
4	Pain	63	6.9
5	Arthrofibrosis	47	5.1
6	Implant Failure	37	4.0
7	Peri-prosthetic fracture - Femur	17	1.9
8	Malalignment	14	1.5
9	Poly liner wear	11	1.2
10	Metal Reaction/Metallosis	8	0.9
	Unknown/missing/other	6	1.7

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Table 1292. Reasons for First Revision in the First 90 Days Following Primary TKA for Persona PS (Cemented)/Persona (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	13	35.1
2	Peri-prosthetic fracture - Femur	9	24.3
3	Aseptic Loosening	5	13.5
4	Dislocation/Instability	4	10.8
5	Pain	2	5.4
6	Peri-prosthetic fracture - Tibia	2	5.4
7	Implant Failure	1	2.7
8	Extensor mechanism failure	1	2.7

Table 1293. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Persona PS (Cemented)/Persona (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	76	36.0
2	Dislocation/Instability	56	26.5
3	Aseptic Loosening	23	10.9
4	Pain	19	9.0
5	Arthrofibrosis	18	8.5
6	Implant Failure	9	4.3
7	Malalignment	3	1.4
8	Poly liner wear	2	1.0
9	Peri-prosthetic fracture - Femur	2	1.0
10	Extensor mechanism failure	2	1.0
	Unknown/missing/other	1	0.5

Table 1294. Descriptive Statistics of Cases Receiving the Persona PS (Cemented)/Persona (Cemented) Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	18,652	62.8	
Age (years)	29,722	67.4 (9.2)	68 (13)
Height (cm)	29,721	168.4 (10.6)	167.6 (15.3)
Weight (kg)	29,721	93.2 (20.8)	91.6 (27.6)
BMI(kg/m^2)	29,721	32.8 (6.5)	32.2 (8.8)
Smoker - Never (%)	16,099	54.2	
Smoker - Previous (%)	11,229	37.8	
Smoker - Current (%)	2,338	7.9	
Smoker - Unknown (%)	56	0.2	

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Table 1295. Distribution of Approach Used for Persona PS (Cemented)/Persona (Cemented) Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	26,162	88.0
Mid-vastus	3,445	11.6
Sub-vastus	41	0.1
Lateral parapatellar	24	0.1
Missing/unknown/other	50	0.2

Table 1296. Distribution of Polyethylene Used for Persona PS (Cemented)/Persona (Cemented) Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	14,356	48.3
XLPE	1	0.0
Antioxidant XLPE	15,103	50.8
Missing/unknown/other	262	0.9

Table 1297. Volume of Cases by Surgeon and Site for the Persona PS (Cemented)/Persona (Cemented) Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	130 (359)	10 (58)
Cases per site	366 (807)	52 (219)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

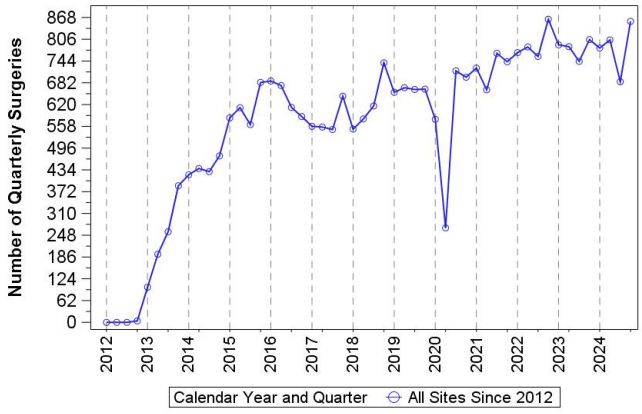


Figure 456. Utilization of the Persona PS (Cemented)/Persona (Cemented) Combination in Primary TKA Cases

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Catalog Numbers of Femoral Components Used in the Analysis

42500606202	42500006802	42504607002
42500606802	42500006801	42504605802
42500606602	42500005801	42570606002
42500607002	42500005802	42500005401
42500606402	42500605602	42570606601
42500606601	42500007001	42570606001
42500606801	42500605601	42500005402
42500606201	42500007002	42504606211
42500607001	42500005601	42504606212
42500606401	42500005602	42504605811
42500006401	42504606202	42504606611
42500006402	42500605402	42570605802
42500006201	42504606601	42504606612
42500006202	42504606602	42570606602
42500606002	42500605401	42504607012
42500606001	42504606201	42570606802
42500006002	42570606201	42570607001
42500006601	42570606202	42504605812
42500006001	42570606402	42502005001
42500006602	42570606401	42502005002
42500605802	42570006001	42502005202
42500605801	42504607001	42504605402
42500607402	42570006002	42504607011
42500607401	42504605801	

Catalog Numbers of Tibial Components Used in the Analysis

42532007102	42532008301	42542006402
42532007101	42532008802	42542006401
42532006702	42532008801	42542007901
42532006701	42542007102	42542007902
42532007502	42532006101	42542008301
42532007501	42542006701	42532005802
42532007902	42542007101	42532005801
42532007901	42532006102	42542008302
42532006402	42542006702	
42532006401	42542007502	
42532008302	42542007501	

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3.5.30 Scorpio/Series 7000

N = 656 primary cases were used for this analysis. Fewer than ten surgeons used this implant combination at fewer than ten sites in primary TKA cases.

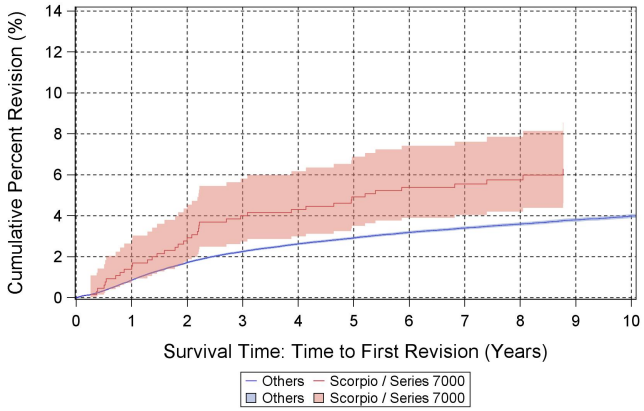


Figure 457. Cumulative Percent Revision Curve for the Scorpio/Series 7000 Combination, Compared to All Other Implant Combinations in Primary TKA Cases

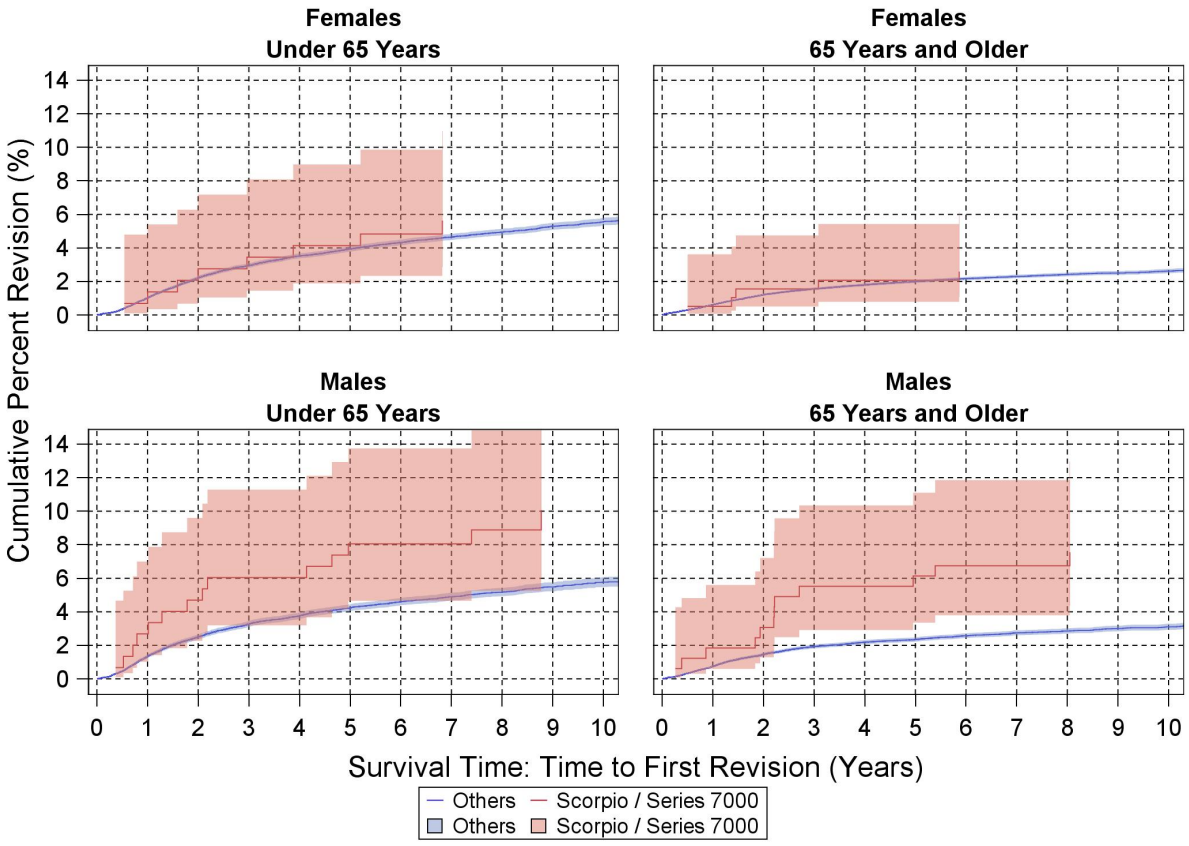


Figure 458. Cumulative Percent Revision Curve for the Scorpio/Series 7000 Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1298. Cumulative Percent Revision and Number at Risk for the Scorpio/Series 7000 Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	650	0.00 (0.00,0.00)	145	0.00 (0.00,0.00)	193	0.00 (0.00,0.00)	149	0.00 (0.00,0.00)	163	0.00 (0.00,0.00)
1	641	1.38 (0.72,2.64)	144	0.69 (0.10,4.79)	192	0.52 (0.07,3.62)	145	2.68 (1.02,6.99)	160	1.84 (0.60,5.60)
2	631	2.92 (1.87,4.54)	141	2.76 (1.04,7.18)	190	1.55 (0.50,4.74)	142	4.70 (2.27,9.60)	158	3.07 (1.29,7.21)
3	624	4.00 (2.74,5.82)	140	3.45 (1.45,8.09)	190	1.55 (0.50,4.74)	140	6.04 (3.19,11.29)	154	5.52 (2.91,10.34)
4	622	4.31 (2.99,6.18)	139	4.14 (1.88,8.98)	189	2.07 (0.78,5.43)	140	6.04 (3.19,11.29)	154	5.52 (2.91,10.34)
5	618	4.92 (3.51,6.89)	139	4.14 (1.88,8.98)	189	2.07 (0.78,5.43)	137	8.05 (4.66,13.75)	153	6.13 (3.35,11.10)
6	615	5.38 (3.90,7.42)	138	4.83 (2.33,9.86)	188	2.59 (1.09,6.11)	137	8.05 (4.66,13.75)	152	6.75 (3.80,11.85)
7	537	5.55 (4.04,7.62)	112	5.63 (2.85,10.96)	153	2.59 (1.09,6.11)	130	8.05 (4.66,13.75)	142	6.75 (3.80,11.85)
8	411	5.75 (4.20,7.86)	87	5.63 (2.85,10.96)	108	2.59 (1.09,6.11)	99	8.88 (5.25,14.83)	117	6.75 (3.80,11.85)
9	278	6.29 (4.61,8.56)	59	5.63 (2.85,10.96)	53	2.59 (1.09,6.11)	73	10.07 (6.02,16.58)	93	7.56 (4.35,12.96)
10	169	6.29 (4.61,8.56)	20	5.63 (2.85,10.96)	25	2.59 (1.09,6.11)	47	10.07 (6.02,16.58)	77	7.56 (4.35,12.96)

Table 1299. Reasons for First Revision Following Primary TKA for Scorpio/Series 7000 Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	12	30.8
2	Aseptic Loosening	7	17.9
3	Dislocation/Instability	7	17.9
4	Pain	5	12.8
5	Arthrofibrosis	3	7.7
6	Poly liner wear	2	5.1
7	Implant Failure	1	2.6
8	Malalignment	1	2.6
9	Peri-prosthetic fracture - Tibia	1	2.6

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1300. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Scorpio/Series 7000 Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	3	37.5
2	Pain	2	25.0
3	Arthrofibrosis	2	25.0
4	Dislocation/Instability	1	12.5

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Table 1301. Descriptive Statistics of Cases Receiving the Scorpio/Series 7000 Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	340	51.8	
Age (years)	656	66 (9.5)	65 (14)
Height (cm)	656	169.8 (10.5)	170 (15.4)
Weight (kg)	656	97.4 (21.3)	96 (28)
BMI(kg/m^2)	656	33.8 (7)	32.7 (9.5)
Smoker - Never (%)	350	53.4	
Smoker - Previous (%)	251	38.3	
Smoker - Current (%)	53	8.1	
Smoker - Unknown (%)	2	0.3	

Table 1302. Distribution of Approach Used for Scorpio/Series 7000 Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	13	2.0
Mid-vastus	643	98.0
Sub-vastus	0	0.0
Lateral parapatellar	0	0.0
Missing/unknown/other	0	0.0

Table 1303. Distribution of Polyethylene Used for Scorpio/Series 7000 Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	653	99.5
Antioxidant XLPE	0	0.0
Missing/unknown/other	3	0.5

Table 1304. Volume of Cases by Surgeon and Site for the Scorpio/Series 7000 Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	93 (190)	13 (80)
Cases per site	164 (195)	75 (215)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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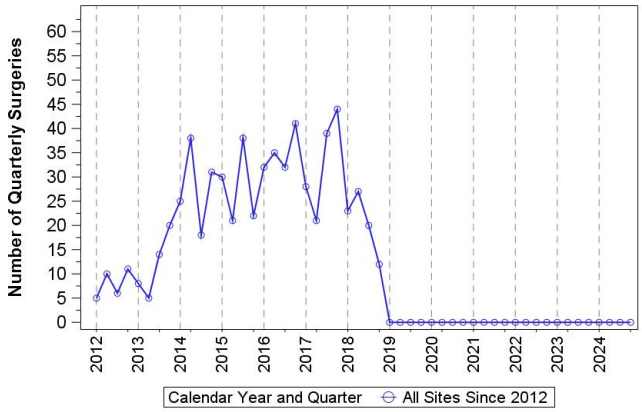


Figure 459. Utilization of the Scorpio/Series 7000 Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

704107R	713009L	704113L
704107L	713009R	713007L
704109L	714509L	713007R
704109R	704105L	714511L
704111R	714509R	714505L
704111L	704113R	714511R
713011L	714507R	714507L
713011R	704105R	

Catalog Numbers of Tibial Components Used in the Analysis

71150007	71150005	71150003
71150009	71150013	71150004
71150011	71150006	

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3.5.31 Sigma/M.B.T.

N = 1,053 primary cases were used for this analysis. Distribution of utilization: 46 surgeons across 31 sites used this implant combination in primary TKA cases.

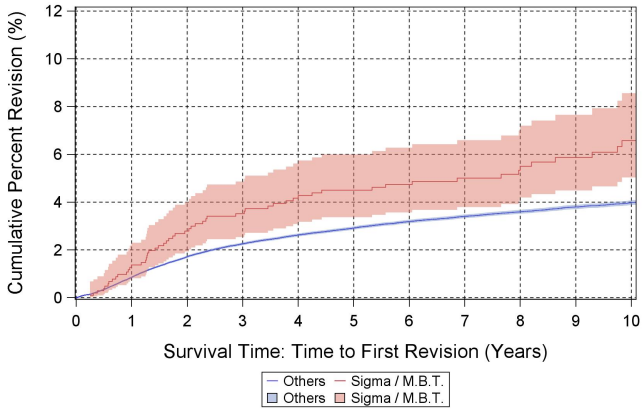


Figure 460. Cumulative Percent Revision Curve for the Sigma/M.B.T. Combination, Compared to All Other Implant Combinations in Primary TKA Cases

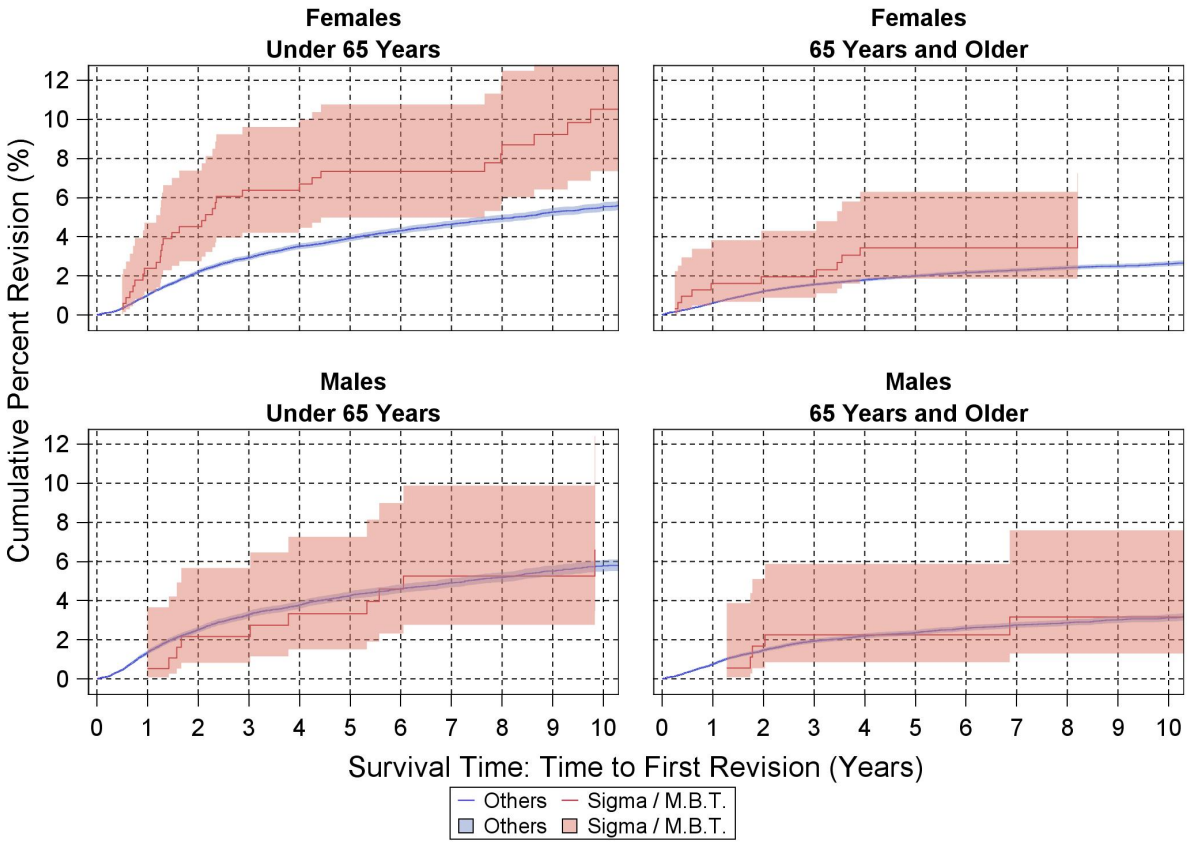


Figure 461. Cumulative Percent Revision Curve for the Sigma/M.B.T. Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1305. Cumulative Percent Revision and Number at Risk for the Sigma/MBT Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,049	0.00 (0.00,0.00)	341	0.00 (0.00,0.00)	320	0.00 (0.00,0.00)	198	0.00 (0.00,0.00)	190	0.00 (0.00,0.00)
1	995	1.37 (0.81,2.30)	324	2.39 (1.20,4.72)	300	1.61 (0.67,3.83)	190	0.52 (0.07,3.66)	181	0.00 (0.00,0.00)
2	945	2.79 (1.93,4.01)	311	4.52 (2.75,7.38)	286	1.95 (0.88,4.30)	176	2.17 (0.82,5.67)	172	1.68 (0.54,5.11)
3	909	3.51 (2.54,4.86)	298	6.37 (4.20,9.61)	274	1.95 (0.88,4.30)	170	2.17 (0.82,5.67)	167	2.25 (0.85,5.88)
4	867	4.28 (3.18,5.74)	291	6.70 (4.46,9.99)	257	3.43 (1.86,6.29)	162	3.33 (1.51,7.26)	157	2.25 (0.85,5.88)
5	836	4.50 (3.37,6.00)	281	7.34 (4.98,10.76)	244	3.43 (1.86,6.29)	157	3.33 (1.51,7.26)	154	2.25 (0.85,5.88)
6	756	4.74 (3.57,6.28)	259	7.34 (4.98,10.76)	219	3.43 (1.86,6.29)	145	4.59 (2.32,8.99)	133	2.25 (0.85,5.88)
7	657	5.01 (3.79,6.60)	225	7.34 (4.98,10.76)	197	3.43 (1.86,6.29)	129	5.25 (2.76,9.88)	106	3.16 (1.30,7.59)
8	563	5.50 (4.19,7.20)	199	8.70 (6.02,12.48)	167	3.43 (1.86,6.29)	108	5.25 (2.76,9.88)	89	3.16 (1.30,7.59)
9	448	5.87 (4.49,7.66)	158	9.23 (6.42,13.18)	140	4.02 (2.22,7.24)	80	5.25 (2.76,9.88)	70	3.16 (1.30,7.59)
10	357	6.57 (5.03,8.56)	120	10.52 (7.35,14.93)	107	4.02 (2.22,7.24)	67	6.61 (3.46,12.41)	63	3.16 (1.30,7.59)

Table 1306. Reasons for First Revision Following Primary TKA for Sigma/M.B.T. Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	21	38.2
2	Joint Infection	10	18.2
3	Dislocation/Instability	8	14.5
4	Pain	5	9.1
5	Malalignment	3	5.5
6	Arthrofibrosis	2	3.6
7	Implant Failure	2	3.6
8	Metal Reaction/Metallosis	2	3.6
9	Extensor mechanism failure	1	1.8
10	Poly liner wear	1	1.8

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1307. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Sigma/M.B.T. Combination Cases

Rank	Reason for Revision	N	Percent
1	Pain	3	42.9
2	Aseptic Loosening	1	14.3
3	Joint Infection	1	14.3
4	Arthrofibrosis	1	14.3
5	Extensor mechanism failure	1	14.3

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Table 1308. Descriptive Statistics of Cases Receiving the Sigma/M.B.T. Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	662	62.9	
Age (years)	1,053	64.4 (10.1)	64 (13)
Height (cm)	1,053	168.5 (10.8)	167.6 (17.8)
Weight (kg)	1,053	98.5 (22.5)	97.3 (31.4)
BMI(kg/m^2)	1,053	34.7 (7.2)	34.3 (9.8)
Smoker - Never (%)	524	49.8	
Smoker - Previous (%)	373	35.4	
Smoker - Current (%)	119	11.3	
Smoker - Unknown (%)	37	3.5	

Table 1309. Distribution of Approach Used for Sigma/M.B.T. Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	718	68.2
Mid-vastus	322	30.6
Sub-vastus	1	0.1
Lateral parapatellar	1	0.1
Missing/unknown/other	11	1.0

Table 1310. Distribution of Polyethylene Used for Sigma/M.B.T. Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	796	75.6
XLPE	12	1.1
Antioxidant XLPE	240	22.8
Missing/unknown/other	5	0.5

Table 1311. Volume of Cases by Surgeon and Site for the Sigma/M.B.T. Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	22 (53)	2 (19)
Cases per site	34 (55)	11 (36)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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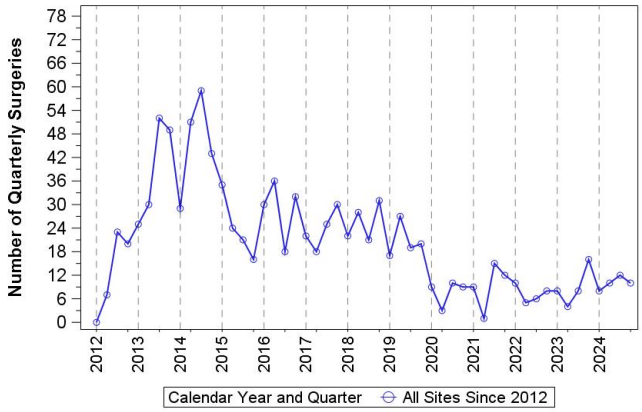


Figure 462. Utilization of the Sigma/M.B.T. Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

196050300	196040600	196030450
196040300	196050600	196040150
196050500	940023	196020400
196050400	940015	196020450
196040400	940013	196030400
196050250	940029	196064500
196040500	940019	196074500
196050450	940018	940012
196040250	940025	940016
196040450	940014	940022
196050200	196050150	940024
196040200	940028	

Catalog Numbers of Tibial Components Used in the Analysis

129433130	129435125	129433115
129433140	129435130	129434120
129433150	129434125	129431130
129433125	129435140	129433110
129433120	129434150	129433170
129433160	129435150	129435115
129434130	129435120	
129434140	129431140	

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3.5.32 Sigma/Sigma

N = 1,826 primary cases were used for this analysis. Distribution of utilization: 39 surgeons across 28 sites used this implant combination in primary TKA cases.

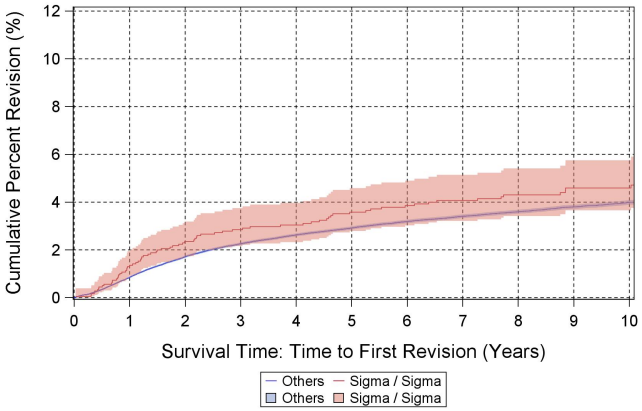


Figure 463. Cumulative Percent Revision Curve for the Sigma/Sigma Combination, Compared to All Other Implant Combinations in Primary TKA Cases

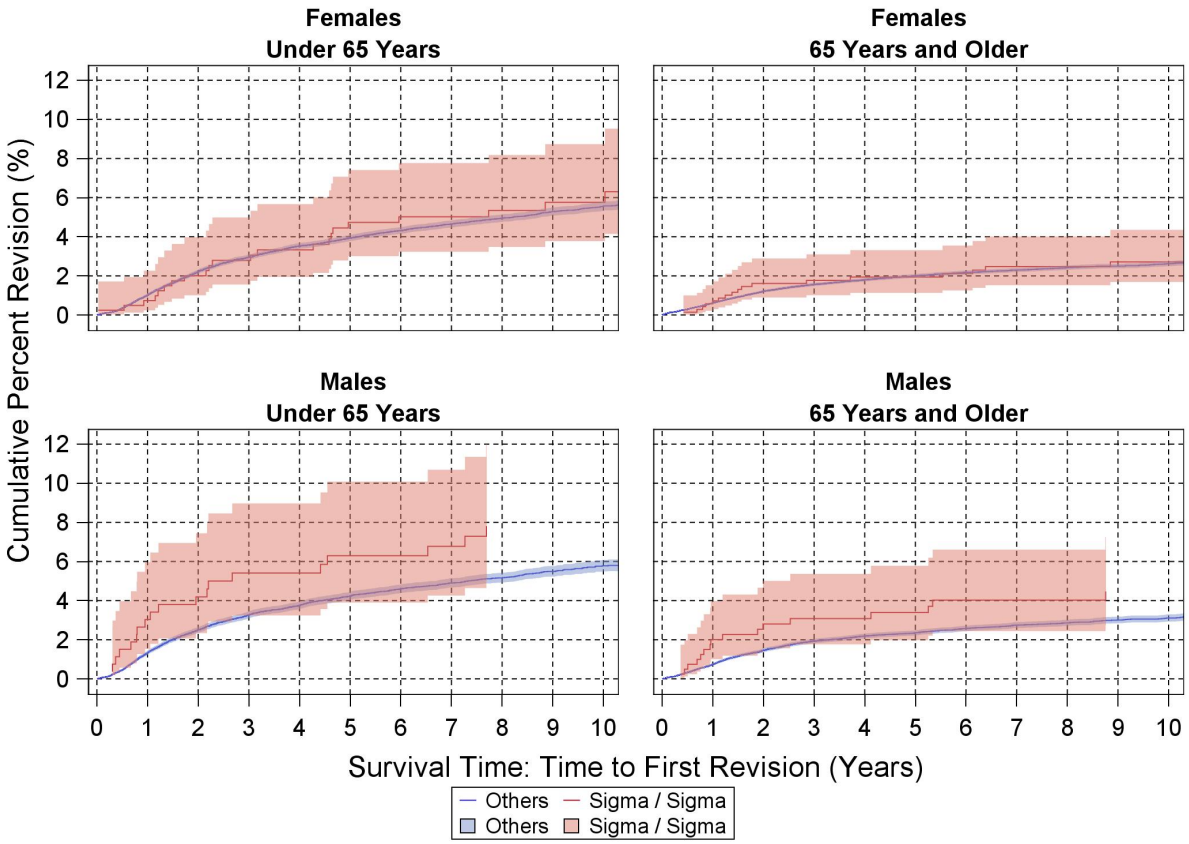


Figure 464. Cumulative Percent Revision Curve for the Sigma/Sigma Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1312. Cumulative Percent Revision and Number at Risk for the Sigma/Sigma Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,803	0.00 (0.00,0.00)	411	0.00 (0.00,0.00)	717	0.00 (0.00,0.00)	267	0.00 (0.00,0.00)	408	0.00 (0.00,0.00)
1	1,718	1.36 (0.91,2.02)	399	0.74 (0.24,2.26)	681	0.72 (0.30,1.72)	253	3.03 (1.53,5.97)	385	2.01 (1.01,3.98)
2	1,623	2.36 (1.74,3.19)	378	2.01 (1.01,3.97)	642	1.61 (0.90,2.89)	243	4.19 (2.34,7.44)	360	2.80 (1.56,5.01)
3	1,537	2.85 (2.16,3.75)	363	2.79 (1.55,4.98)	607	1.77 (1.01,3.10)	226	5.41 (3.24,8.97)	341	3.08 (1.76,5.37)
4	1,456	3.04 (2.33,3.97)	349	3.33 (1.95,5.67)	577	1.94 (1.13,3.32)	217	5.41 (3.24,8.97)	313	3.08 (1.76,5.37)
5	1,424	3.58 (2.79,4.59)	338	4.73 (3.01,7.41)	567	1.94 (1.13,3.32)	211	6.30 (3.90,10.08)	308	3.39 (1.98,5.78)
6	1,381	3.85 (3.03,4.90)	328	5.02 (3.23,7.77)	551	2.11 (1.26,3.55)	205	6.30 (3.90,10.08)	297	4.02 (2.44,6.60)
7	1,283	4.07 (3.21,5.14)	308	5.02 (3.23,7.77)	519	2.47 (1.52,4.01)	184	6.77 (4.26,10.69)	272	4.02 (2.44,6.60)
8	1,173	4.30 (3.42,5.41)	288	5.35 (3.48,8.18)	468	2.47 (1.52,4.01)	168	7.81 (5.03,12.01)	249	4.02 (2.44,6.60)
9	953	4.59 (3.66,5.75)	221	5.76 (3.78,8.73)	394	2.71 (1.69,4.35)	133	7.81 (5.03,12.01)	205	4.47 (2.74,7.25)
10	775	4.59 (3.66,5.75)	174	5.76 (3.78,8.73)	324	2.71 (1.69,4.35)	104	7.81 (5.03,12.01)	173	4.47 (2.74,7.25)

Table 1313. Reasons for First Revision Following Primary TKA for Sigma/Sigma Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	23	31.9
2	Aseptic Loosening	19	26.4
3	Dislocation/Instability	12	16.7
4	Arthrofibrosis	5	6.9
5	Pain	5	6.9
6	Implant Failure	3	4.2
7	Peri-prosthetic fracture - Femur	2	2.8
8	Extensor mechanism failure	1	1.4
9	Malalignment	1	1.4
10	Poly liner wear	1	1.4

Table 1314. Reasons for First Revision in the First 90 Days Following Primary TKA for Sigma/Sigma Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	100.0

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Table 1315. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Sigma/Sigma Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	8	40.0
2	Pain	3	15.0
3	Arthrofibrosis	3	15.0
4	Dislocation/Instability	2	10.0
5	Aseptic Loosening	1	5.0
6	Peri-prosthetic fracture - Femur	1	5.0
7	Malalignment	1	5.0
8	Extensor mechanism failure	1	5.0

Table 1316. Descriptive Statistics of Cases Receiving the Sigma/Sigma Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,143	62.6	
Age (years)	1,826	67.8 (9.9)	68 (14)
Height (cm)	1,789	167.8 (10.4)	167.6 (15.3)
Weight (kg)	1,789	90.2 (20.1)	88.5 (25.9)
BMI(kg/m^2)	1,789	32 (6.1)	31.3 (8.5)
Smoker - Never (%)	980	53.7	
Smoker - Previous (%)	697	38.2	
Smoker - Current (%)	140	7.7	
Smoker - Unknown (%)	9	0.5	

Table 1317. Distribution of Approach Used for Sigma/Sigma Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	1,742	95.4
Mid-vastus	32	1.8
Sub-vastus	0	0.0
Lateral parapatellar	1	0.1
Missing/unknown/other	51	2.8

Table 1318. Distribution of Polyethylene Used for Sigma/Sigma Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	523	28.6
XLPE	1,286	70.4
Antioxidant XLPE	0	0.0
Missing/unknown/other	17	0.9

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Table 1319. Volume of Cases by Surgeon and Site for the Sigma/Sigma Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	46 (81)	4 (37)
Cases per site	65 (133)	21 (38)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

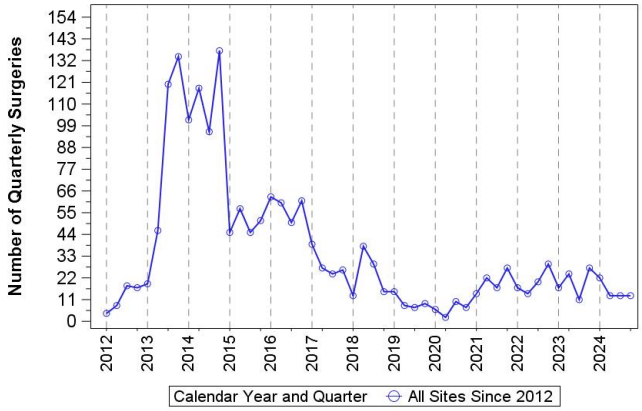


Figure 465. Utilization of the Sigma/Sigma Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

196050300	196030450	940014
196040300	196020250	940025
196050500	196074500	196062500
196040450	196075500	940013
196050450	196040600	940015
196040500	196064500	196020600
196040400	196063500	196066500
196050400	196030400	196072500
196020500	196065500	940024
196050250	196020400	196020200
196030500	196079500	196030600
196040250	196040200	196076500
196020300	196050200	940019
196030300	196068500	940029
196020450	196078500	940028
196050600	196069500	
196073500	196030200	
196030250	940023	

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Catalog Numbers of Tibial Components Used in the Analysis

158130000	158150000	158115000
158140000	158120000	
158125000	158160000	

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3.5.33 Sigma PFC/Sigma

N = 4,042 primary cases were used for this analysis. Distribution of utilization: 49 surgeons across 28 sites used this implant combination in primary TKA cases.

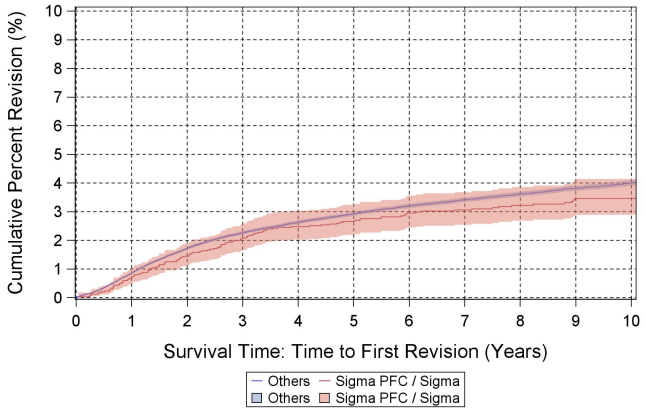


Figure 466. Cumulative Percent Revision Curve for the Sigma PFC/Sigma Combination, Compared to All Other Implant Combinations in Primary TKA Cases

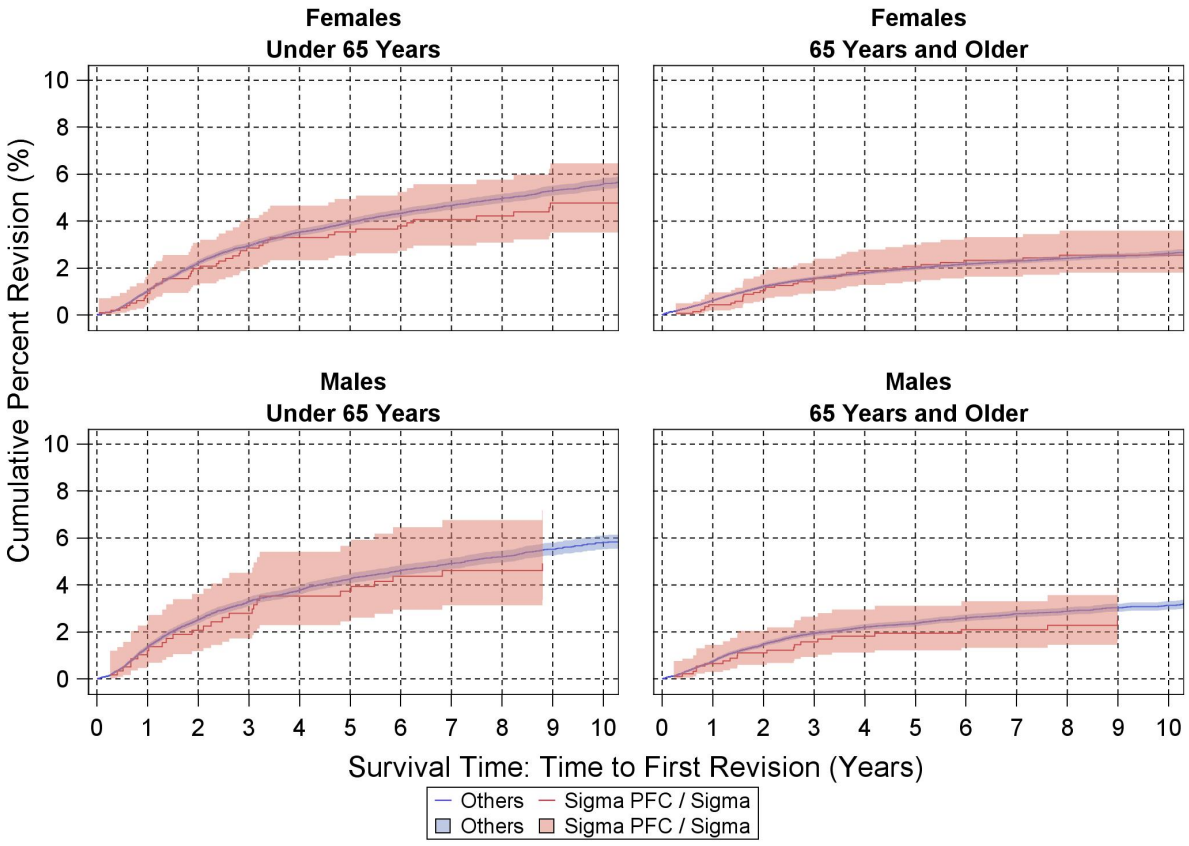


Figure 467. Cumulative Percent Revision Curve for the Sigma PFC/Sigma Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1320. Cumulative Percent Revision and Number at Risk for the Sigma PFC/Sigma Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	3,955	0.00 (0.00,0.00)	992	0.00 (0.00,0.00)	1,430	0.00 (0.00,0.00)	597	0.00 (0.00,0.00)	934	0.00 (0.00,0.00)
1	3,786	0.73 (0.50,1.05)	956	0.92 (0.48,1.77)	1,360	0.43 (0.20,0.97)	572	1.20 (0.57,2.50)	896	0.65 (0.29,1.45)
2	3,647	1.44 (1.11,1.88)	918	1.97 (1.26,3.08)	1,314	1.03 (0.61,1.74)	555	2.07 (1.18,3.62)	858	1.11 (0.60,2.05)
3	3,472	2.08 (1.67,2.59)	872	2.85 (1.96,4.13)	1,254	1.57 (1.03,2.40)	532	2.79 (1.72,4.52)	812	1.58 (0.94,2.65)
4	3,328	2.48 (2.03,3.03)	841	3.30 (2.33,4.66)	1,202	1.89 (1.28,2.79)	501	3.53 (2.29,5.42)	782	1.82 (1.12,2.96)
5	3,124	2.66 (2.19,3.24)	795	3.54 (2.53,4.94)	1,135	2.06 (1.42,2.99)	468	3.73 (2.45,5.67)	724	1.95 (1.21,3.11)
6	2,873	2.95 (2.45,3.56)	729	3.79 (2.73,5.24)	1,054	2.33 (1.63,3.32)	428	4.37 (2.95,6.46)	660	2.09 (1.32,3.31)
7	2,596	3.06 (2.54,3.68)	655	4.06 (2.96,5.57)	958	2.33 (1.63,3.32)	388	4.61 (3.13,6.76)	593	2.09 (1.32,3.31)
8	2,253	3.22 (2.68,3.86)	571	4.22 (3.08,5.76)	832	2.55 (1.80,3.59)	347	4.61 (3.13,6.76)	501	2.28 (1.45,3.57)
9	1,931	3.46 (2.89,4.14)	500	4.77 (3.51,6.46)	716	2.55 (1.80,3.59)	297	4.92 (3.36,7.18)	416	2.51 (1.61,3.92)
10	1,565	3.46 (2.89,4.14)	433	4.77 (3.51,6.46)	567	2.55 (1.80,3.59)	236	4.92 (3.36,7.18)	327	2.51 (1.61,3.92)

Table 1321. Reasons for First Revision Following Primary TKA for Sigma PFC/Sigma Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	36	29.5
2	Aseptic Loosening	34	27.9
3	Dislocation/Instability	19	15.6
4	Arthrofibrosis	12	9.8
5	Pain	8	6.6
6	Implant Failure	4	3.3
7	Malalignment	3	2.5
8	Peri-prosthetic fracture - Femur	2	1.6
9	Poly liner wear	2	1.6
10	Extensor mechanism failure	1	0.8
	Unknown/missing/other	1	0.8

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

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Table 1322. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Sigma PFC/Sigma Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	12	48.0
2	Arthrofibrosis	6	24.0
3	Aseptic Loosening	3	12.0
4	Dislocation/Instability	1	4.0
5	Implant Failure	1	4.0
6	Pain	1	4.0
7	Extensor mechanism failure	1	4.0

Table 1323. Descriptive Statistics of Cases Receiving the Sigma PFC/Sigma Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,457	60.8	
Age (years)	4,042	66.9 (9.1)	67 (12)
Height (cm)	3,904	168.4 (10.6)	167.6 (17)
Weight (kg)	3,903	94.1 (21.1)	93 (28)
BMI(kg/m^2)	3,903	33.1 (6.5)	32.3 (8.7)
Smoker - Never (%)	2,057	50.9	
Smoker - Previous (%)	1,599	39.6	
Smoker - Current (%)	373	9.2	
Smoker - Unknown (%)	13	0.3	

Table 1324. Distribution of Approach Used for Sigma PFC/Sigma Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	3,755	92.9
Mid-vastus	137	3.4
Sub-vastus	1	0.0
Lateral parapatellar	6	0.1
Missing/unknown/other	143	3.5

Table 1325. Distribution of Polyethylene Used for Sigma PFC/Sigma Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	251	6.2
XLPE	3,780	93.5
Antioxidant XLPE	1	0.0
Missing/unknown/other	10	0.2

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Table 1326. Volume of Cases by Surgeon and Site for the Sigma PFC/Sigma Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	82 (190)	17 (60)
Cases per site	144 (293)	29 (65)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

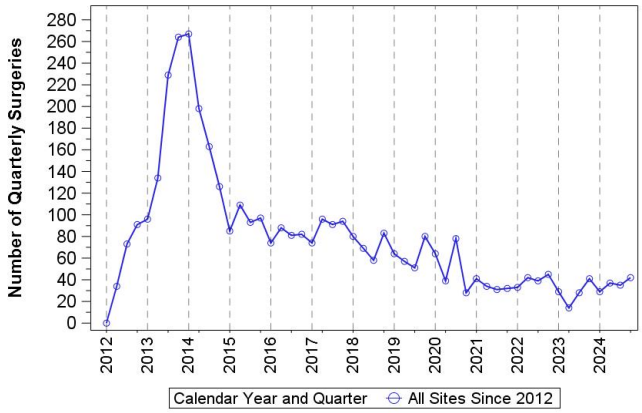


Figure 468. Utilization of the Sigma PFC/Sigma Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

960013	196001400	960012
960003	196000400	960002
960005	960008	960007
960015	960018	960017
960004	960016	
960014	960006	

Catalog Numbers of Tibial Components Used in the Analysis

158130000	158150000	158115000
158140000	158120000	
158125000	158160000	

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3.5.34 Sigma PFC/Sigma PFC All-Poly

N = 554 primary cases were used for this analysis. Fewer than ten surgeons used this implant combination at fewer than ten sites in primary TKA cases.

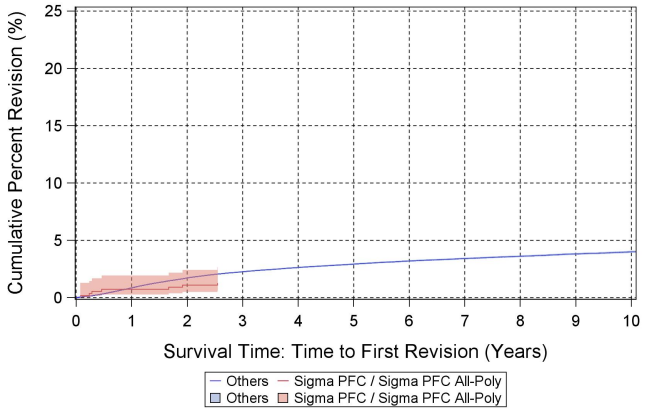


Figure 469. Cumulative Percent Revision Curve for the Sigma PFC/Sigma PFC All-Poly Combination, Compared to All Other Implant Combinations in Primary TKA Cases

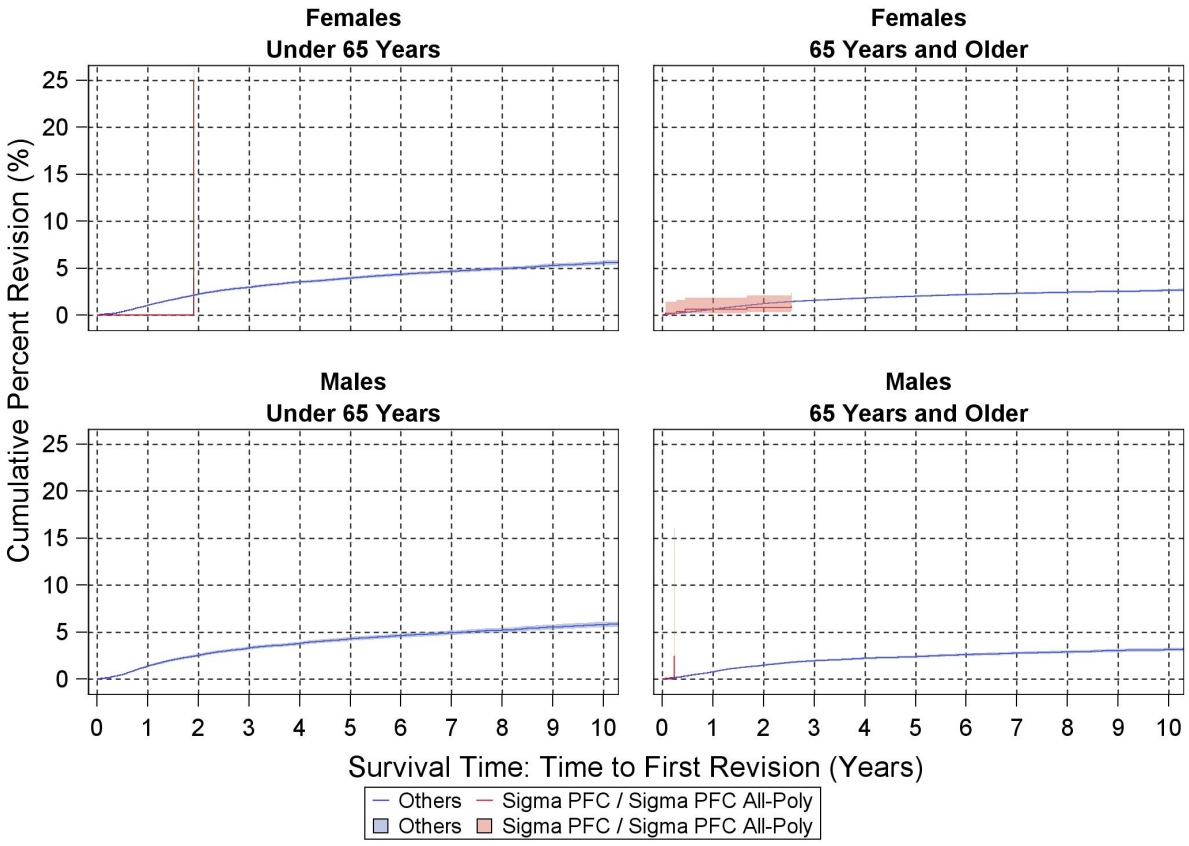


Figure 470. Cumulative Percent Revision Curve for the Sigma PFC/Sigma PFC All-Poly Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1327. Cumulative Percent Revision and Number at Risk for the Sigma PFC/Sigma PFC All-Poly Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	547	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	501	0.00 (0.00,0.00)	*	0.00 (0.00,0.00)	41	0.00 (0.00,0.00)
1	543	0.73 (0.28,1.94)	*	0.00 (0.00,0.00)	498	0.60 (0.19,1.84)	*	0.00 (0.00,0.00)	40	2.44 (0.35,16.08)
2	541	1.10 (0.49,2.43)	*	25.00 (3.95,87.21)	497	0.80 (0.30,2.11)	*	0.00 (0.00,0.00)	40	2.44 (0.35,16.08)
3	538	1.28 (0.61,2.67)	*	25.00 (3.95,87.21)	494	1.00 (0.42,2.38)	*	0.00 (0.00,0.00)	40	2.44 (0.35,16.08)
4	531	1.28 (0.61,2.67)	*	25.00 (3.95,87.21)	487	1.00 (0.42,2.38)	*	0.00 (0.00,0.00)	40	2.44 (0.35,16.08)
5	497	1.28 (0.61,2.67)	*	25.00 (3.95,87.21)	453	1.00 (0.42,2.38)	*	0.00 (0.00,0.00)	40	2.44 (0.35,16.08)
6	457	1.28 (0.61,2.67)	*	25.00 (3.95,87.21)	414	1.00 (0.42,2.38)	*	0.00 (0.00,0.00)	39	2.44 (0.35,16.08)
7	376	1.28 (0.61,2.67)	*	25.00 (3.95,87.21)	339	1.00 (0.42,2.38)	0	N/A	35	2.44 (0.35,16.08)
8	276	1.28 (0.61,2.67)	*	25.00 (3.95,87.21)	246	1.00 (0.42,2.38)	0	N/A	28	2.44 (0.35,16.08)
9	191	1.28 (0.61,2.67)	*	25.00 (3.95,87.21)	168	1.00 (0.42,2.38)	0	N/A	22	2.44 (0.35,16.08)
10	114	1.28 (0.61,2.67)	*	25.00 (3.95,87.21)	96	1.00 (0.42,2.38)	0	N/A	17	2.44 (0.35,16.08)

* Denotes that the number of cases is between 1 and 10.

Table 1328. Reasons for First Revision Following Primary TKA for Sigma PFC/Sigma PFC All-Poly Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	3	42.9
2	Joint Infection	3	42.9
3	Peri-prosthetic fracture - Tibia	1	14.3

Table 1329. Reasons for First Revision in the First 90 Days Following Primary TKA for Sigma PFC/Sigma PFC All-Poly Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	1	50.0
2	Peri-prosthetic fracture - Tibia	1	50.0

Table 1330. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Sigma PFC/Sigma PFC All-Poly Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	2	100.0

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Table 1331. Descriptive Statistics of Cases Receiving the Sigma PFC/Sigma PFC All-Poly Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	511	92.2	
Age (years)	554	78.5 (5.4)	78 (7)
Height (cm)	554	161.3 (7.4)	160 (8.1)
Weight (kg)	554	78.4 (15.9)	77.3 (21.4)
BMI(kg/m^2)	554	30.2 (5.9)	29.6 (8.3)
Smoker - Never (%)	330	59.6	
Smoker - Previous (%)	191	34.5	
Smoker - Current (%)	11	2	
Smoker - Unknown (%)	22	4	

Table 1332. Distribution of Approach Used for Sigma PFC/Sigma PFC All-Poly Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	60	10.8
Mid-vastus	492	88.8
Sub-vastus	1	0.2
Lateral parapatellar	0	0.0
Missing/unknown/other	1	0.2

Table 1333. Distribution of Polyethylene Used for Sigma PFC/Sigma PFC All-Poly Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	3	0.5
XLPE	4	0.7
Antioxidant XLPE	0	0.0
Missing/unknown/other	547	98.7

Table 1334. Volume of Cases by Surgeon and Site for the Sigma PFC/Sigma PFC All-Poly Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	61 (165)	1 (1)
Cases per site	69 (167)	1 (32)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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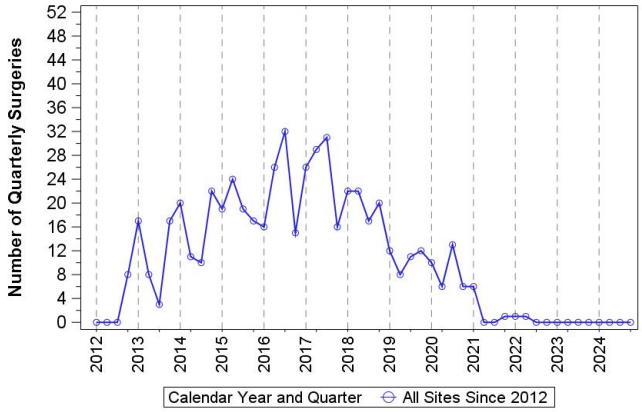


Figure 471. Utilization of the Sigma PFC/Sigma PFC All-Poly Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

960013	960004	960002
960003	960008	960006
196001400	960018	960012
196000400	960015	960016
960014	960005	

Catalog Numbers of Tibial Components Used in the Analysis

960640	960660	960621
960630	960632	960622
960650	960652	960661
960641	960642	962630
960620	860123	
960631	860124	
960651	860127	

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3.5.35 Triathlon CR (Cemented)/Triathlon (Cemented)

N = 21,539 primary cases were used for this analysis. Distribution of utilization: 122 surgeons across 58 sites used this implant combination in primary TKA cases.

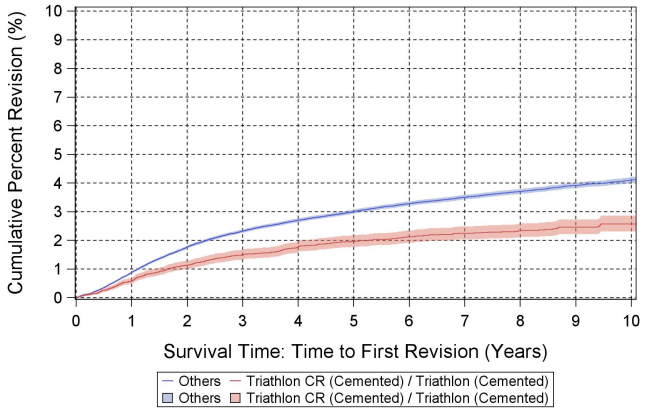


Figure 472. Cumulative Percent Revision Curve for the Triathlon CR (Cemented)/Triathlon (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases

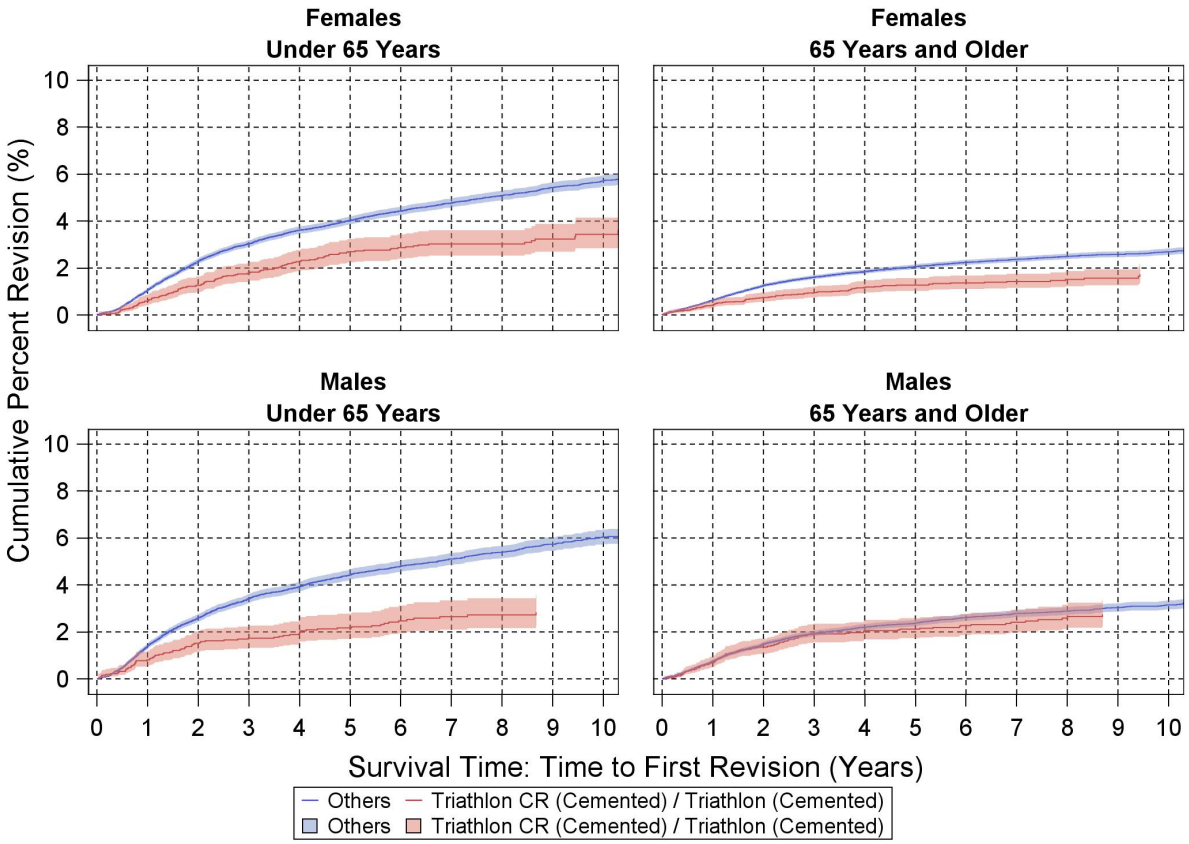


Figure 473. Cumulative Percent Revision Curve for the Triathlon CR (Cemented)/Triathlon (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1335. Cumulative Percent Revision and Number at Risk for the Triathlon CR (Cemented)/Triathlon (Cemented) Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	21,372	0.00 (0.00,0.00)	4,707	0.00 (0.00,0.00)	8,206	0.00 (0.00,0.00)	3,146	0.00 (0.00,0.00)	5,309	0.00 (0.00,0.00)
1	19,705	0.58 (0.48,0.69)	4,481	0.59 (0.40,0.86)	7,392	0.42 (0.30,0.59)	2,998	0.81 (0.55,1.19)	4,830	0.67 (0.48,0.94)
2	17,927	1.14 (1.00,1.29)	4,225	1.27 (0.98,1.64)	6,567	0.75 (0.57,0.97)	2,827	1.52 (1.14,2.02)	4,305	1.35 (1.06,1.72)
3	16,099	1.50 (1.34,1.68)	3,902	1.77 (1.42,2.21)	5,791	0.96 (0.75,1.21)	2,643	1.73 (1.32,2.27)	3,760	1.91 (1.56,2.35)
4	14,681	1.77 (1.59,1.97)	3,614	2.27 (1.86,2.76)	5,239	1.17 (0.94,1.46)	2,455	1.93 (1.49,2.49)	3,370	2.06 (1.68,2.51)
5	12,995	1.96 (1.77,2.18)	3,222	2.70 (2.25,3.24)	4,611	1.27 (1.03,1.57)	2,204	2.17 (1.70,2.78)	2,956	2.12 (1.73,2.59)
6	10,362	2.12 (1.92,2.35)	2,631	2.87 (2.40,3.43)	3,599	1.36 (1.11,1.68)	1,797	2.47 (1.95,3.13)	2,333	2.27 (1.86,2.76)
7	8,433	2.25 (2.03,2.49)	2,213	3.02 (2.53,3.61)	2,889	1.43 (1.16,1.76)	1,429	2.65 (2.10,3.34)	1,900	2.41 (1.98,2.93)
8	6,338	2.33 (2.11,2.58)	1,691	3.02 (2.53,3.61)	2,140	1.51 (1.22,1.87)	1,077	2.72 (2.16,3.43)	1,428	2.59 (2.12,3.16)
9	4,345	2.46 (2.22,2.73)	1,186	3.24 (2.70,3.88)	1,465	1.57 (1.26,1.94)	734	2.84 (2.24,3.59)	958	2.75 (2.24,3.37)
10	2,521	2.57 (2.31,2.86)	687	3.44 (2.84,4.15)	845	1.73 (1.37,2.19)	435	2.84 (2.24,3.59)	552	2.75 (2.24,3.37)

Table 1336. Reasons for First Revision Following Primary TKA for Triathlon CR (Cemented)/Triathlon (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	150	36.9
2	Dislocation/Instability	87	21.4
3	Aseptic Loosening	65	16.0
4	Arthrofibrosis	29	7.1
5	Pain	24	5.9
6	Implant Failure	15	3.7
7	Peri-prosthetic fracture - Femur	9	2.2
8	Malalignment	8	2.0
9	Poly liner wear	7	1.7
10	Peri-prosthetic fracture - Tibia	5	1.2
	Unknown/missing/other	4	2.0

Table 1337. Reasons for First Revision in the First 90 Days Following Primary TKA for Triathlon CR (Cemented)/Triathlon (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	7	31.8
2	Dislocation/Instability	6	27.3
3	Peri-prosthetic fracture - Tibia	4	18.2
4	Implant Failure	2	9.1
5	Pain	2	9.1
6	Aseptic Loosening	1	4.6

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Table 1338. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Triathlon CR (Cemented)/Triathlon (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	44	50.0
2	Dislocation/Instability	16	18.2
3	Arthrofibrosis	8	9.1
4	Aseptic Loosening	7	8.0
5	Pain	5	5.7
6	Malalignment	2	2.3
7	Extensor mechanism failure	2	2.3
8	Poly liner wear	1	1.1
9	Implant Failure	1	1.1
10	Metal Reaction/Metallosis	1	1.1
	Unknown/missing/other	1	1.1

Table 1339. Descriptive Statistics of Cases Receiving the Triathlon CR (Cemented)/Triathlon (Cemented) Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	13,003	60.4	
Age (years)	21,538	67.6 (9.4)	68 (13)
Height (cm)	21,539	168.6 (10.5)	167.6 (17)
Weight (kg)	21,539	93.4 (20.7)	91.6 (27.2)
BMI(kg/m^2)	21,539	32.8 (6.4)	32.2 (8.6)
Smoker - Never (%)	11,493	53.4	
Smoker - Previous (%)	8,176	38	
Smoker - Current (%)	1,800	8.4	
Smoker - Unknown (%)	70	0.3	

Table 1340. Distribution of Approach Used for Triathlon CR (Cemented)/Triathlon (Cemented) Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	18,462	85.7
Mid-vastus	2,354	10.9
Sub-vastus	646	3.0
Lateral parapatellar	37	0.2
Missing/unknown/other	40	0.2

Table 1341. Distribution of Polyethylene Used for Triathlon CR (Cemented)/Triathlon (Cemented) Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	20,732	96.3
Antioxidant XLPE	0	0.0
Missing/unknown/other	807	3.7

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Table 1342. Volume of Cases by Surgeon and Site for the Triathlon CR (Cemented)/Triathlon (Cemented) Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	176 (382)	26 (134)
Cases per site	371 (696)	46 (435)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

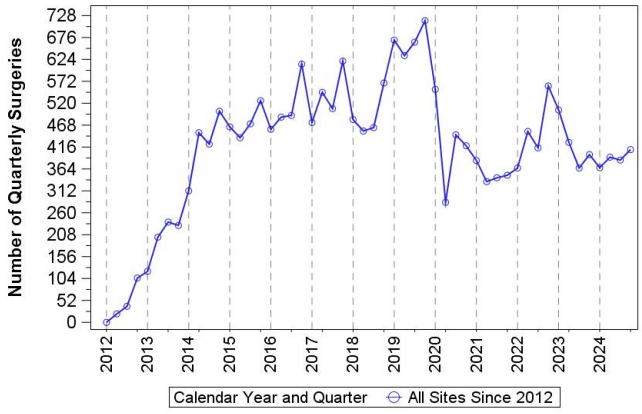


Figure 474. Utilization of the Triathlon CR (Cemented)/Triathlon (Cemented) Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

5510F402	5510F601	5510F801
5510F401	5510F602	5510F802
5510F502	5510F702	5510F102
5510F501	5510F701	5510F101
5510F302	5510F201	
5510F301	5510F202	

Catalog Numbers of Tibial Components Used in the Analysis

5520B400	5520B100	5534A411
5520B500	5534A509	5534A511
5520B300	5534A409	5526B200
5520B600	5534A309	5526B300
5520B700	5534A809	5526B500
5520B200	5534A209	5534A416
5520B800	5534A611	5534A716
5534A609	5520M400	5534A811
5534A709	5534A711	

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3.5.36 Triathlon CR (Cemented)/Triathlon TS (Cemented)

N = 17,754 primary cases were used for this analysis. Distribution of utilization: 161 surgeons across 66 sites used this implant combination in primary TKA cases.

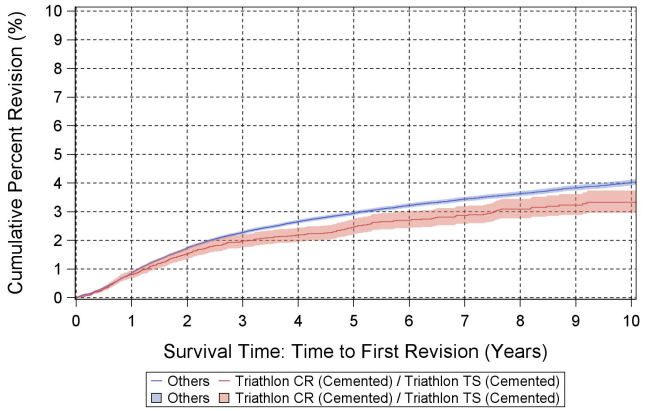


Figure 475. Cumulative Percent Revision Curve for the Triathlon CR (Cemented)/Triathlon TS (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases

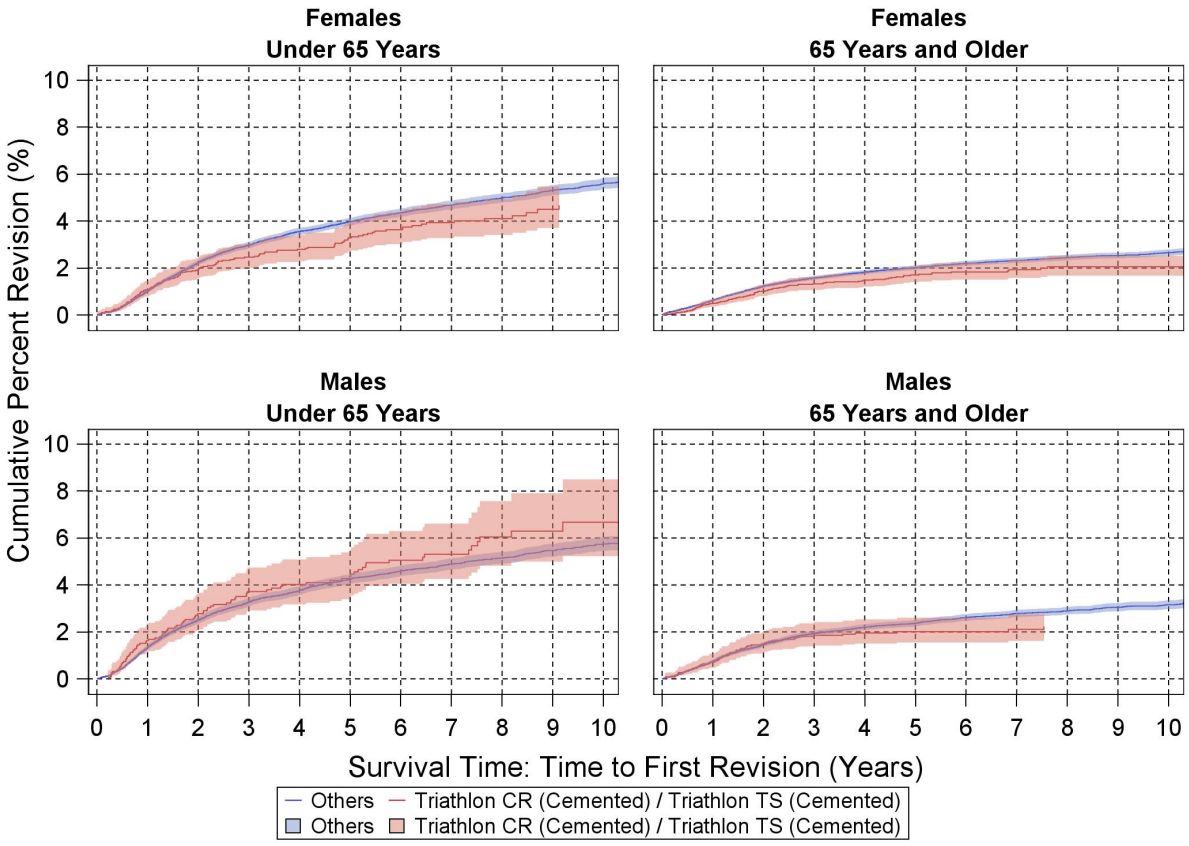


Figure 476. Cumulative Percent Revision Curve for the Triathlon CR (Cemented)/Triathlon TS (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1343. Cumulative Percent Revision and Number at Risk for the Triathlon CR (Cemented)/Triathlon TS (Cemented) Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	17,637	0.00 (0.00,0.00)	4,094	0.00 (0.00,0.00)	8,092	0.00 (0.00,0.00)	1,964	0.00 (0.00,0.00)	3,486	0.00 (0.00,0.00)
1	15,129	0.80 (0.68,0.95)	3,578	1.07 (0.79,1.46)	6,838	0.50 (0.36,0.69)	1,715	1.63 (1.14,2.32)	2,997	0.71 (0.47,1.07)
2	12,952	1.53 (1.34,1.74)	3,176	1.94 (1.54,2.45)	5,689	1.01 (0.80,1.28)	1,535	2.78 (2.10,3.66)	2,551	1.48 (1.11,1.99)
3	11,099	1.98 (1.77,2.22)	2,761	2.46 (2.00,3.03)	4,791	1.33 (1.07,1.64)	1,360	3.72 (2.91,4.74)	2,186	1.86 (1.42,2.42)
4	9,553	2.19 (1.96,2.45)	2,438	2.80 (2.29,3.41)	3,985	1.49 (1.21,1.83)	1,206	4.02 (3.17,5.09)	1,923	1.95 (1.50,2.54)
5	8,104	2.46 (2.21,2.74)	2,097	3.28 (2.71,3.97)	3,353	1.71 (1.40,2.08)	1,036	4.37 (3.47,5.50)	1,617	2.01 (1.55,2.61)
6	6,444	2.70 (2.42,3.00)	1,688	3.63 (3.02,4.37)	2,597	1.83 (1.50,2.23)	852	5.05 (4.05,6.30)	1,306	2.01 (1.55,2.61)
7	4,698	2.87 (2.58,3.19)	1,273	3.93 (3.27,4.72)	1,868	1.93 (1.58,2.36)	618	5.31 (4.26,6.62)	938	2.11 (1.62,2.74)
8	3,262	3.09 (2.77,3.44)	891	4.11 (3.41,4.94)	1,317	2.06 (1.67,2.52)	411	6.05 (4.82,7.57)	643	2.24 (1.70,2.94)
9	2,108	3.23 (2.89,3.61)	565	4.50 (3.70,5.47)	839	2.06 (1.67,2.52)	269	6.29 (5.00,7.91)	435	2.24 (1.70,2.94)
10	1,252	3.33 (2.96,3.74)	319	4.68 (3.82,5.72)	508	2.06 (1.67,2.52)	159	6.67 (5.23,8.50)	266	2.24 (1.70,2.94)

Table 1344. Reasons for First Revision Following Primary TKA for Triathlon CR (Cemented)/Triathlon TS (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	122	32.2
2	Dislocation/Instability	113	29.8
3	Aseptic Loosening	50	13.2
4	Arthrofibrosis	32	8.4
5	Pain	17	4.5
6	Implant Failure	11	2.9
7	Malalignment	10	2.6
8	Peri-prosthetic fracture - Femur	8	2.1
9	Patellofemoral Joint	6	1.6
10	Poly liner wear	4	1.1
	Unknown/missing/other	3	1.6

Table 1345. Reasons for First Revision in the First 90 Days Following Primary TKA for Triathlon CR (Cemented)/Triathlon TS (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	7	46.7
2	Dislocation/Instability	3	20.0
3	Extensor mechanism failure	2	13.3
4	Aseptic Loosening	1	6.7
5	Peri-prosthetic fracture - Femur	1	6.7
6	Pain	1	6.7

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Table 1346. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Triathlon CR (Cemented)/Triathlon TS (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	50	43.9
2	Dislocation/Instability	24	21.0
3	Arthrofibrosis	15	13.2
4	Aseptic Loosening	8	7.0
5	Pain	8	7.0
6	Peri-prosthetic fracture - Femur	4	3.5
7	Poly liner wear	1	0.9
8	Implant Failure	1	0.9
9	Malalignment	1	0.9
10	Peri-prosthetic fracture - Tibia	1	0.9
	Unknown/missing/other	1	0.9

Table 1347. Descriptive Statistics of Cases Receiving the Triathlon CR (Cemented)/Triathlon TS (Cemented) Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	12,243	69	
Age (years)	17,754	68 (9.5)	68 (13)
Height (cm)	17,753	167.2 (10.2)	165.1 (15)
Weight (kg)	17,753	93 (21.8)	90.7 (29.5)
BMI(kg/m^2)	17,753	33.2 (7)	32.4 (9.5)
Smoker - Never (%)	9,827	55.4	
Smoker - Previous (%)	6,403	36.1	
Smoker - Current (%)	1,425	8	
Smoker - Unknown (%)	99	0.6	

Table 1348. Distribution of Approach Used for Triathlon CR (Cemented)/Triathlon TS (Cemented) Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	15,183	85.5
Mid-vastus	2,409	13.6
Sub-vastus	89	0.5
Lateral parapatellar	23	0.1
Missing/unknown/other	50	0.3

Table 1349. Distribution of Polyethylene Used for Triathlon CR (Cemented)/Triathlon TS (Cemented) Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	17,663	99.5
Antioxidant XLPE	0	0.0
Missing/unknown/other	91	0.5

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Table 1350. Volume of Cases by Surgeon and Site for the Triathlon CR (Cemented)/Triathlon TS (Cemented) Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	110 (221)	18 (71)
Cases per site	269 (507)	51 (292)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

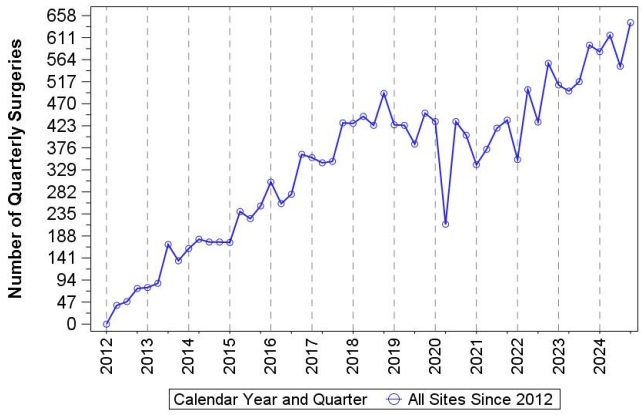


Figure 477. Utilization of the Triathlon CR (Cemented)/Triathlon TS (Cemented) Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

5510F402	5510F602	5510F802
5510F401	5510F601	5510F801
5510F302	5510F202	5510F101
5510F301	5510F201	5510F102
5510F502	5510F702	
5510F501	5510F701	

Catalog Numbers of Tibial Components Used in the Analysis

5521B400	5521B600	5521B100
5521B300	5521B200	5521B800
5521B500	5521B700	

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3.5.37 Triathlon CR (Cementless)/Triathlon (Cemented)

N = 524 primary cases were used for this analysis. Distribution of utilization: 26 surgeons across 17 sites used this implant combination in primary TKA cases.

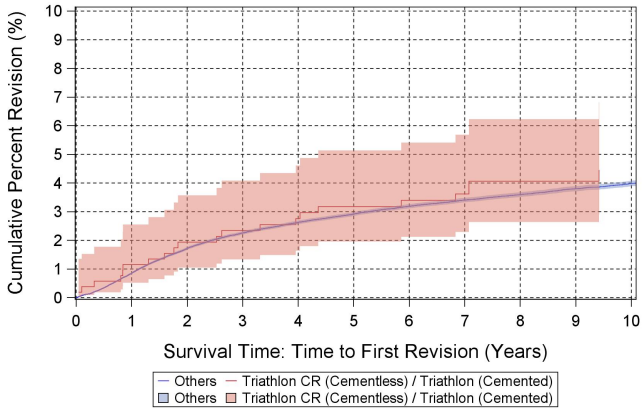


Figure 478. Cumulative Percent Revision Curve for the Triathlon CR (Cementless)/Triathlon (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases

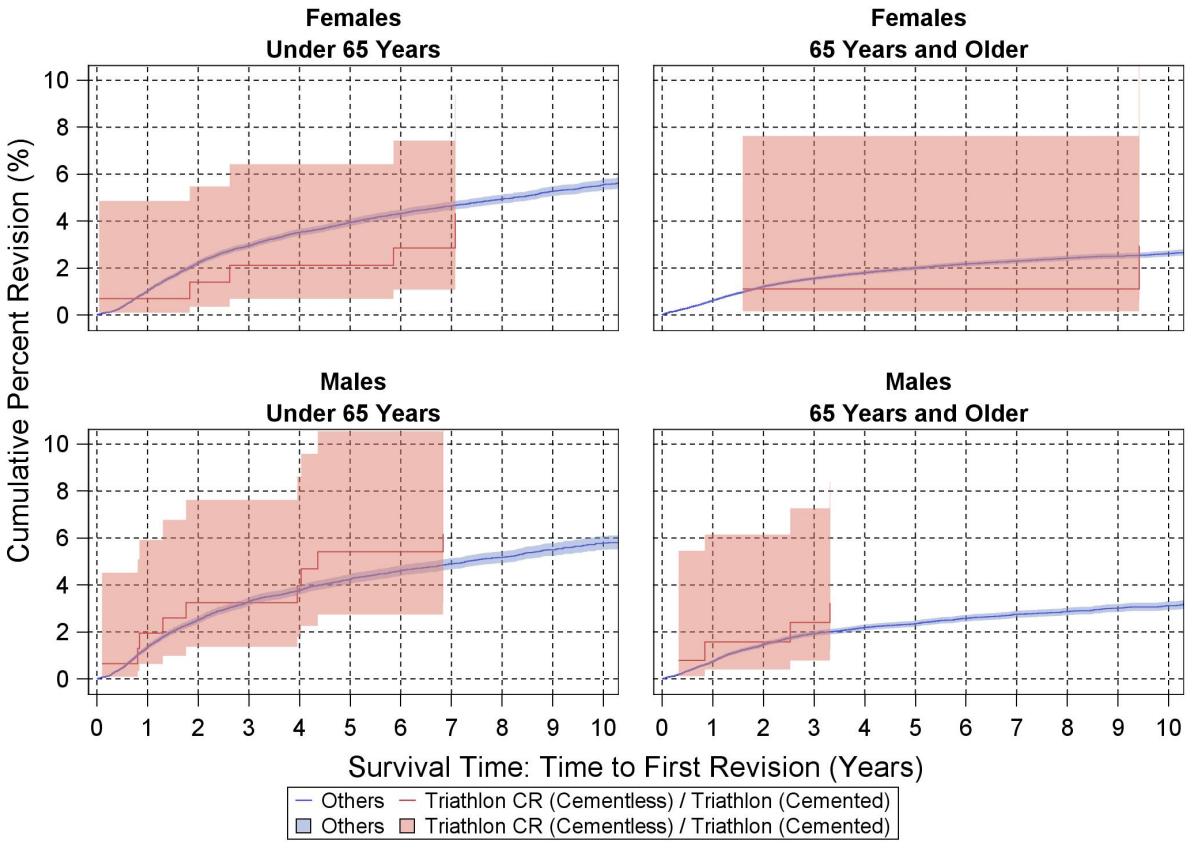


Figure 479. Cumulative Percent Revision Curve for the Triathlon CR (Cementless)/Triathlon (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1351. Cumulative Percent Revision and Number at Risk for the Triathlon CR (Cementless)/Triathlon (Cemented) Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	521	0.00 (0.00,0.00)	143	0.00 (0.00,0.00)	96	0.00 (0.00,0.00)	154	0.00 (0.00,0.00)	128	0.00 (0.00,0.00)
1	512	1.16 (0.52,2.55)	142	0.70 (0.10,4.86)	94	0.00 (0.00,0.00)	151	1.95 (0.63,5.92)	125	1.57 (0.40,6.15)
2	494	1.94 (1.05,3.57)	140	1.40 (0.35,5.48)	88	1.11 (0.16,7.63)	147	3.25 (1.36,7.62)	119	1.57 (0.40,6.15)
3	476	2.34 (1.34,4.09)	136	2.12 (0.69,6.42)	84	1.11 (0.16,7.63)	139	3.25 (1.36,7.62)	117	2.40 (0.78,7.26)
4	464	2.76 (1.64,4.61)	135	2.12 (0.69,6.42)	83	1.11 (0.16,7.63)	133	3.96 (1.80,8.62)	113	3.24 (1.23,8.40)
5	450	3.18 (1.96,5.14)	134	2.12 (0.69,6.42)	82	1.11 (0.16,7.63)	127	5.41 (2.74,10.55)	107	3.24 (1.23,8.40)
6	441	3.40 (2.12,5.41)	132	2.85 (1.08,7.43)	79	1.11 (0.16,7.63)	125	5.41 (2.74,10.55)	105	3.24 (1.23,8.40)
7	436	3.62 (2.29,5.69)	131	2.85 (1.08,7.43)	79	1.11 (0.16,7.63)	123	6.18 (3.26,11.55)	103	3.24 (1.23,8.40)
8	413	4.06 (2.64,6.23)	122	4.34 (1.97,9.40)	76	1.11 (0.16,7.63)	118	6.18 (3.26,11.55)	97	3.24 (1.23,8.40)
9	287	4.06 (2.64,6.23)	77	4.34 (1.97,9.40)	60	1.11 (0.16,7.63)	91	6.18 (3.26,11.55)	59	3.24 (1.23,8.40)
10	165	4.46 (2.90,6.82)	49	4.34 (1.97,9.40)	35	2.94 (0.71,11.72)	51	6.18 (3.26,11.55)	30	3.24 (1.23,8.40)

Table 1352. Reasons for First Revision Following Primary TKA for Triathlon CR (Cementless)/Triathlon (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	6	30.0
2	Dislocation/Instability	5	25.0
3	Aseptic Loosening	4	20.0
4	Poly liner wear	3	15.0
5	Pain	1	5.0
6	Peri-prosthetic fracture - Tibia	1	5.0

Table 1353. Reasons for First Revision in the First 90 Days Following Primary TKA for Triathlon CR (Cementless)/Triathlon (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	1	50.0
2	Peri-prosthetic fracture - Tibia	1	50.0

Table 1354. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Triathlon CR (Cementless)/Triathlon (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	33.3
2	Joint Infection	1	33.3
3	Pain	1	33.3

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Table 1355. Descriptive Statistics of Cases Receiving the Triathlon CR (Cementless)/Triathlon (Cemented) Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	240	45.8	
Age (years)	524	62.7 (9.7)	62.5 (13)
Height (cm)	524	171.4 (10.8)	170.2 (17.4)
Weight (kg)	524	102.2 (22.9)	99.7 (29.5)
BMI(kg/m^2)	524	34.8 (7.1)	33.6 (9.2)
Smoker - Never (%)	255	48.7	
Smoker - Previous (%)	206	39.3	
Smoker - Current (%)	60	11.5	
Smoker - Unknown (%)	3	0.6	

Table 1356. Distribution of Approach Used for Triathlon CR (Cementless)/Triathlon (Cemented) Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	304	58.0
Mid-vastus	83	15.8
Sub-vastus	137	26.1
Lateral parapatellar	0	0.0
Missing/unknown/other	0	0.0

Table 1357. Distribution of Polyethylene Used for Triathlon CR (Cementless)/Triathlon (Cemented) Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	522	99.6
Antioxidant XLPE	0	0.0
Missing/unknown/other	2	0.4

Table 1358. Volume of Cases by Surgeon and Site for the Triathlon CR (Cementless)/Triathlon (Cemented) Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	20 (47)	3 (7)
Cases per site	30 (57)	5 (12)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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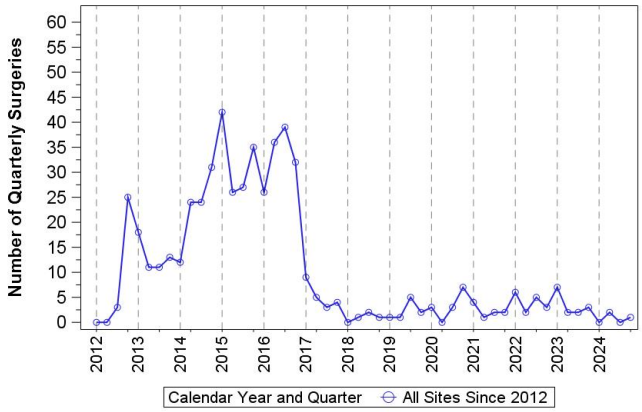


Figure 480. Utilization of the Triathlon CR (Cementless)/Triathlon (Cemented) Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

5517F501	5517F602	5517F802
5517F502	5517F601	5517F101
5517F402	5517F702	5517F801
5517F301	5517F701	5517F102
5517F401	5517F202	
5517F302	5517F201	

Catalog Numbers of Tibial Components Used in the Analysis

5527B400	5520B400	5520B200
5520B300	5527B600	5527B200
5520B600	5526B400	5520B100
5527B500	5526B700	5520B800
5526B600	5520B700	5526B200
5520B500	5527B800	5534A413
5526B500	5527B300	5534A509
5527B700	5526B300	

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3.5.38 Triathlon CR (Cementless)/Triathlon (Cementless)

N = 21,507 primary cases were used for this analysis. Distribution of utilization: 119 surgeons across 51 sites used this implant combination in primary TKA cases.

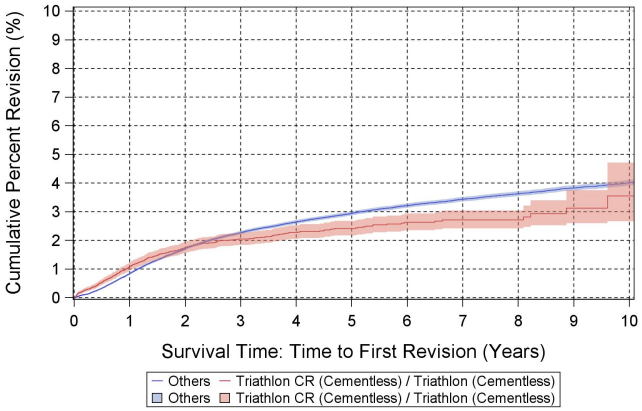


Figure 481. Cumulative Percent Revision Curve for the Triathlon CR (Cementless)/Triathlon (Cementless) Combination, Compared to All Other Implant Combinations in Primary TKA Cases

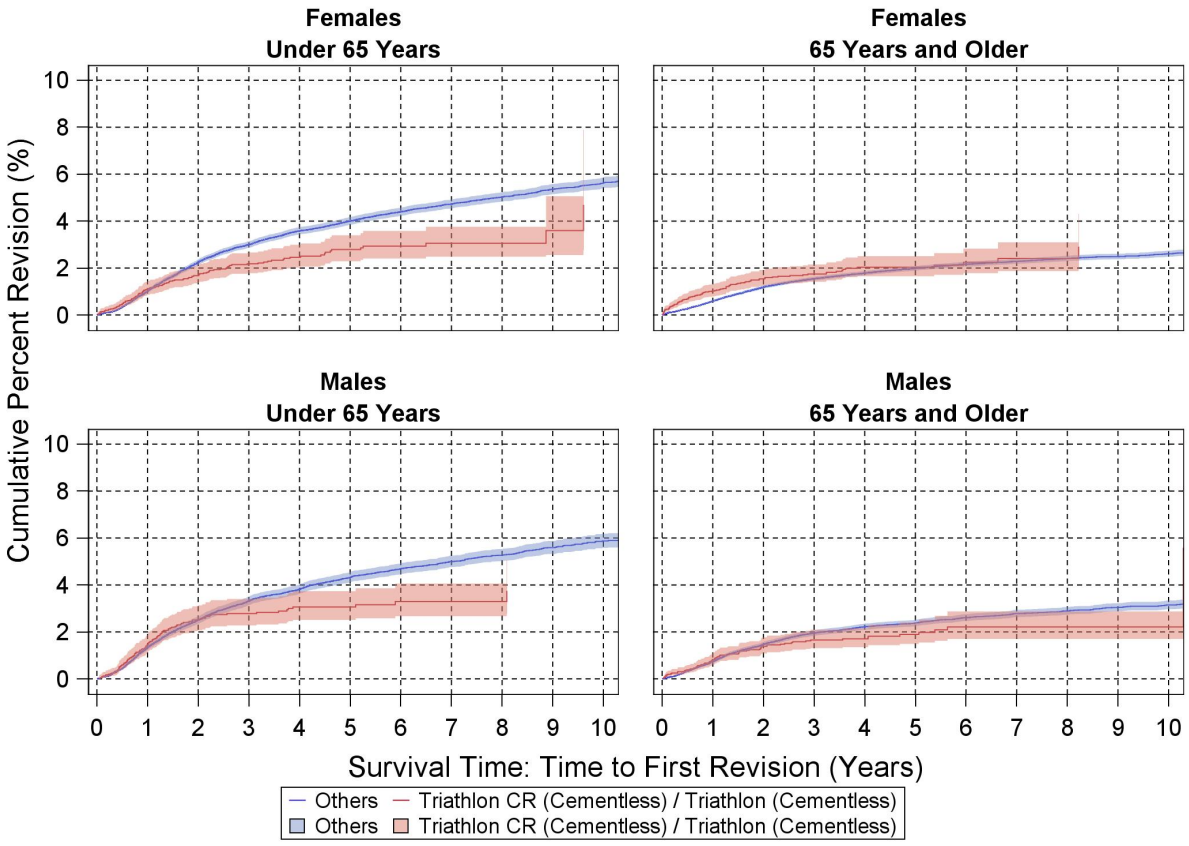


Figure 482. Cumulative Percent Revision Curve for the Triathlon CR (Cementless)/Triathlon (Cementless) Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1359. Cumulative Percent Revision and Number at Risk for the Triathlon CR (Cementless)/Triathlon (Cementless) Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	21,446	0.00 (0.00,0.00)	5,499	0.00 (0.00,0.00)	6,051	0.00 (0.00,0.00)	4,158	0.00 (0.00,0.00)	5,735	0.00 (0.00,0.00)
1	17,231	1.09 (0.95,1.24)	4,542	1.12 (0.86,1.45)	4,896	1.02 (0.79,1.32)	3,352	1.45 (1.11,1.89)	4,439	0.83 (0.61,1.12)
2	13,370	1.74 (1.56,1.94)	3,618	1.68 (1.35,2.09)	3,765	1.54 (1.24,1.92)	2,628	2.55 (2.07,3.13)	3,357	1.39 (1.08,1.77)
3	10,344	2.05 (1.84,2.27)	2,867	2.18 (1.78,2.66)	2,866	1.75 (1.41,2.15)	2,096	2.78 (2.28,3.40)	2,513	1.66 (1.31,2.10)
4	7,418	2.27 (2.05,2.52)	2,107	2.46 (2.02,2.99)	1,977	2.04 (1.65,2.51)	1,542	3.06 (2.51,3.74)	1,790	1.71 (1.35,2.16)
5	5,128	2.41 (2.17,2.68)	1,523	2.79 (2.29,3.40)	1,340	2.04 (1.65,2.51)	1,090	3.06 (2.51,3.74)	1,175	1.89 (1.49,2.40)
6	3,047	2.63 (2.35,2.94)	979	2.93 (2.40,3.58)	781	2.25 (1.78,2.83)	666	3.29 (2.67,4.06)	621	2.21 (1.70,2.87)
7	1,976	2.71 (2.42,3.04)	634	3.06 (2.49,3.76)	518	2.41 (1.87,3.10)	428	3.29 (2.67,4.06)	396	2.21 (1.70,2.87)
8	1,010	2.71 (2.42,3.04)	356	3.06 (2.49,3.76)	235	2.41 (1.87,3.10)	225	3.29 (2.67,4.06)	194	2.21 (1.70,2.87)
9	436	3.12 (2.60,3.75)	157	3.60 (2.55,5.06)	81	2.91 (1.96,4.31)	116	3.75 (2.78,5.06)	82	2.21 (1.70,2.87)
10	164	3.55 (2.67,4.72)	66	4.69 (2.77,7.89)	31	2.91 (1.96,4.31)	36	3.75 (2.78,5.06)	31	2.21 (1.70,2.87)

Table 1360. Reasons for First Revision Following Primary TKA for Triathlon CR (Cementless)/Triathlon (Cementless) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	139	34.9
2	Dislocation/Instability	73	18.3
3	Aseptic Loosening	63	15.8
4	Arthrofibrosis	53	13.3
5	Pain	17	4.3
6	Implant Failure	13	3.3
7	Malalignment	13	3.3
8	Peri-prosthetic fracture - Tibia	12	3.0
9	Extensor mechanism failure	5	1.3
10	Osteolysis	3	0.8
	Unknown/missing/other	3	1.8

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Table 1361. Reasons for First Revision in the First 90 Days Following Primary TKA for Triathlon CR (Cementless)/Triathlon (Cementless) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	32	50.8
2	Peri-prosthetic fracture - Tibia	10	15.9
3	Aseptic Loosening	9	14.3
4	Dislocation/Instability	5	7.9
5	Osteolysis	2	3.2
6	Malalignment	2	3.2
7	Extensor mechanism failure	2	3.2
8	Implant Failure	1	1.6

Table 1362. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Triathlon CR (Cementless)/Triathlon (Cementless) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	58	38.9
2	Arthrofibrosis	26	17.4
3	Aseptic Loosening	24	16.1
4	Dislocation/Instability	21	14.1
5	Malalignment	5	3.4
6	Implant Failure	4	2.7
7	Pain	4	2.7
8	Patellofemoral Joint	3	2.0
9	Peri-prosthetic fracture - Tibia	2	1.3
10	Extensor mechanism failure	2	1.3

Table 1363. Descriptive Statistics of Cases Receiving the Triathlon CR (Cementless)/Triathlon (Cementless) Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	11,569	53.8	
Age (years)	21,507	65.3 (9)	66 (13)
Height (cm)	21,507	170.5 (10.6)	170.2 (15.2)
Weight (kg)	21,507	97.2 (20.9)	95.5 (28)
BMI(kg/m^2)	21,507	33.4 (6.4)	32.8 (8.8)
Smoker - Never (%)	11,788	54.8	
Smoker - Previous (%)	7,506	34.9	
Smoker - Current (%)	2,154	10	
Smoker - Unknown (%)	59	0.3	

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Table 1364. Distribution of Approach Used for Triathlon CR (Cementless)/Triathlon (Cementless) Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	17,691	82.3
Mid-vastus	2,669	12.4
Sub-vastus	918	4.3
Lateral parapatellar	13	0.1
Missing/unknown/other	216	1.0

Table 1365. Distribution of Polyethylene Used for Triathlon CR (Cementless)/Triathlon (Cementless) Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	21,360	99.3
Antioxidant XLPE	0	0.0
Missing/unknown/other	147	0.7

Table 1366. Volume of Cases by Surgeon and Site for the Triathlon CR (Cementless)/Triathlon (Cementless) Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	180 (292)	42 (220)
Cases per site	421 (720)	118 (425)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

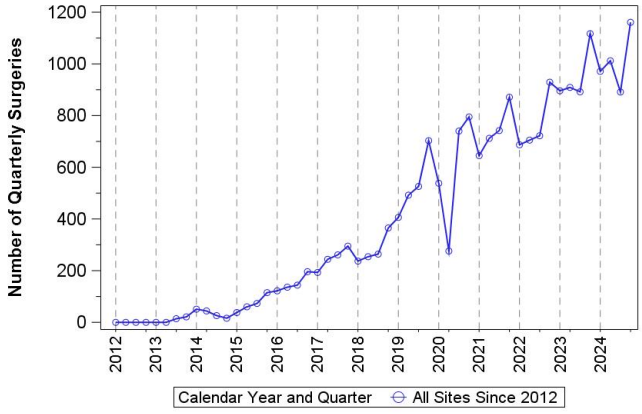


Figure 483. Utilization of the Triathlon CR (Cementless)/Triathlon (Cementless) Combination in Primary TKA Cases

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Catalog Numbers of Femoral Components Used in the Analysis

5517F402	5517F602	5517F802
5517F401	5517F601	5517F801
5517F502	5517F702	5517F101
5517F501	5517F701	5517F102
5517F302	5517F201	
5517F301	5517F202	

Catalog Numbers of Tibial Components Used in the Analysis

5536B400	5536B300	5536B800
5536B500	5536B700	5536B100
5536B600	5536B200	

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3.5.39 Triathlon CR (Cementless)/Triathlon TS (Cemented)

N = 539 primary cases were used for this analysis. Distribution of utilization: 34 surgeons across 22 sites used this implant combination in primary TKA cases.

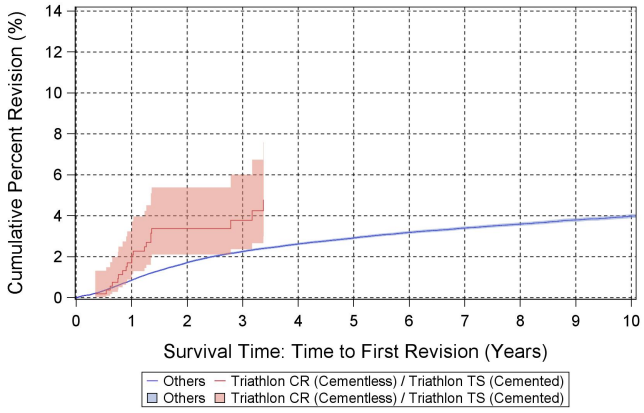


Figure 484. Cumulative Percent Revision Curve for the Triathlon CR (Cementless)/Triathlon TS (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases

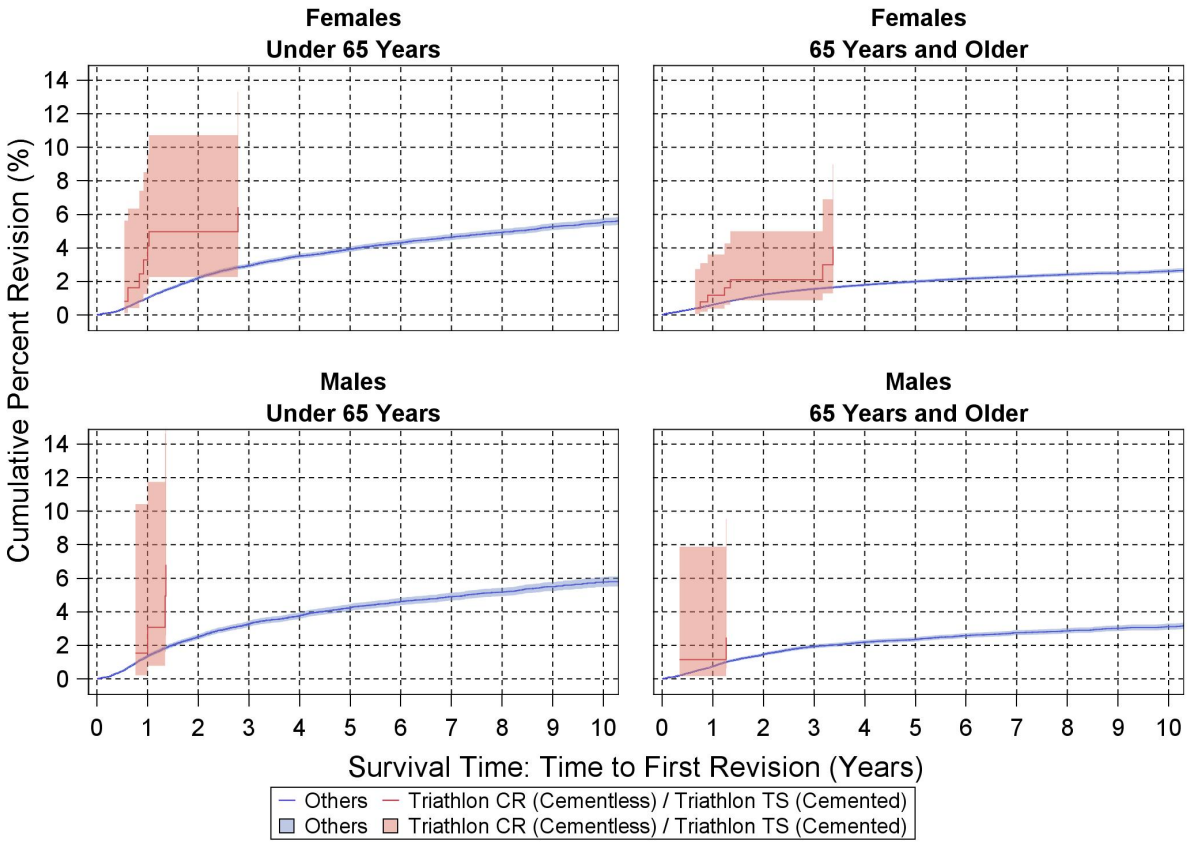


Figure 485. Cumulative Percent Revision Curve for the Triathlon CR (Cementless)/Triathlon TS (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1367. Cumulative Percent Revision and Number at Risk for the Triathlon CR (Cementless)/Triathlon TS (Cemented) Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	539	0.00 (0.00,0.00)	127	0.00 (0.00,0.00)	259	0.00 (0.00,0.00)	66	0.00 (0.00,0.00)	87	0.00 (0.00,0.00)
1	516	1.70 (0.89,3.24)	116	3.29 (1.25,8.52)	250	1.18 (0.38,3.61)	64	1.54 (0.22,10.42)	86	1.15 (0.16,7.88)
2	343	3.38 (2.11,5.39)	86	4.97 (2.26,10.73)	166	2.10 (0.88,4.99)	41	6.80 (2.59,17.22)	50	2.47 (0.62,9.54)
3	210	3.78 (2.37,6.01)	61	6.43 (3.04,13.31)	111	2.10 (0.88,4.99)	15	6.80 (2.59,17.22)	23	2.47 (0.62,9.54)
4	80	4.78 (2.99,7.60)	23	6.43 (3.04,13.31)	40	4.08 (1.82,8.99)	*	6.80 (2.59,17.22)	*	2.47 (0.62,9.54)
5	23	4.78 (2.99,7.60)	*	6.43 (3.04,13.31)	*	4.08 (1.82,8.99)	*	6.80 (2.59,17.22)	*	2.47 (0.62,9.54)
6	15	4.78 (2.99,7.60)	*	6.43 (3.04,13.31)	*	4.08 (1.82,8.99)	*	6.80 (2.59,17.22)	*	2.47 (0.62,9.54)
7	*	4.78 (2.99,7.60)	*	6.43 (3.04,13.31)	*	4.08 (1.82,8.99)	*	6.80 (2.59,17.22)	*	2.47 (0.62,9.54)
8	*	4.78 (2.99,7.60)	*	6.43 (3.04,13.31)	*	4.08 (1.82,8.99)	*	6.80 (2.59,17.22)	*	2.47 (0.62,9.54)
9	*	4.78 (2.99,7.60)	*	6.43 (3.04,13.31)	*	4.08 (1.82,8.99)	*	6.80 (2.59,17.22)	0	N/A
10	*	4.78 (2.99,7.60)	0	N/A	*	4.08 (1.82,8.99)	0	N/A	0	N/A

* Denotes that the number of cases is between 1 and 10.

Table 1368. Reasons for First Revision Following Primary TKA for Triathlon CR (Cementless)/Triathlon TS (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	10	50.0
2	Arthrofibrosis	3	15.0
3	Joint Infection	3	15.0
4	Aseptic Loosening	1	5.0
5	Metal Reaction/Metallosis	1	5.0
6	Pain	1	5.0
7	Poly liner wear	1	5.0

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1369. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Triathlon CR (Cementless)/Triathlon TS (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	4	44.4
2	Joint Infection	2	22.2
3	Poly liner wear	1	11.1
4	Metal Reaction/Metallosis	1	11.1
5	Arthrofibrosis	1	11.1

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Table 1370. Descriptive Statistics of Cases Receiving the Triathlon CR (Cementless)/Triathlon TS (Cemented) Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	386	71.6	
Age (years)	539	67 (9.5)	68 (12)
Height (cm)	539	167.2 (10.2)	165.7 (15.3)
Weight (kg)	539	99.3 (24.1)	98.4 (30.9)
BMI(kg/m^2)	539	35.4 (8)	34.7 (10)
Smoker - Never (%)	317	58.8	
Smoker - Previous (%)	181	33.6	
Smoker - Current (%)	41	7.6	
Smoker - Unknown (%)	0	0.0	

Table 1371. Distribution of Approach Used for Triathlon CR (Cementless)/Triathlon TS (Cemented) Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	127	23.6
Mid-vastus	398	73.8
Sub-vastus	7	1.3
Lateral parapatellar	0	0.0
Missing/unknown/other	7	1.3

Table 1372. Distribution of Polyethylene Used for Triathlon CR (Cementless)/Triathlon TS (Cemented) Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	536	99.4
Antioxidant XLPE	0	0.0
Missing/unknown/other	3	0.6

Table 1373. Volume of Cases by Surgeon and Site for the Triathlon CR (Cementless)/Triathlon TS (Cemented) Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	15 (68)	1 (3)
Cases per site	24 (98)	2 (6)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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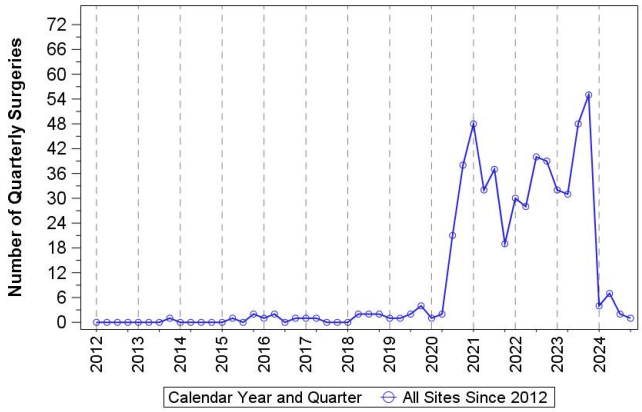


Figure 486. Utilization of the Triathlon CR (Cementless)/Triathlon TS (Cemented) Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

5517F302	5517F202	5517F601
5517F401	5517F501	5517F702
5517F402	5517F602	5517F802
5517F301	5517F101	5517F801
5517F201	5517F701	
5517F502	5517F102	

Catalog Numbers of Tibial Components Used in the Analysis

5521B400	5521B600	5521B100
5521B300	5521B500	5521B800
5521B200	5521B700	

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3.5.40 Triathlon PS (Cemented)/Triathlon (Cemented)

N = 3,857 primary cases were used for this analysis. Distribution of utilization: 85 surgeons across 40 sites used this implant combination in primary TKA cases.

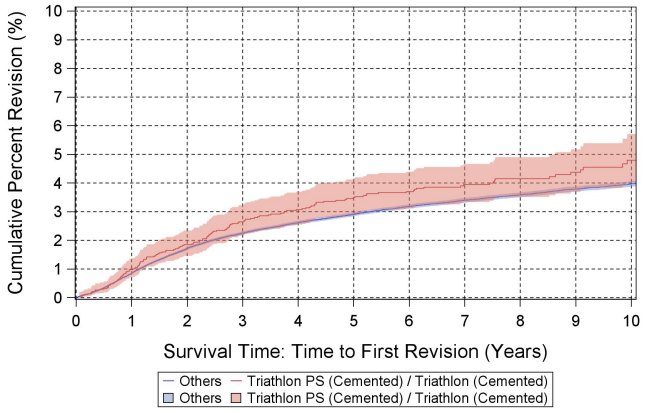


Figure 487. Cumulative Percent Revision Curve for the Triathlon PS (Cemented)/Triathlon (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases

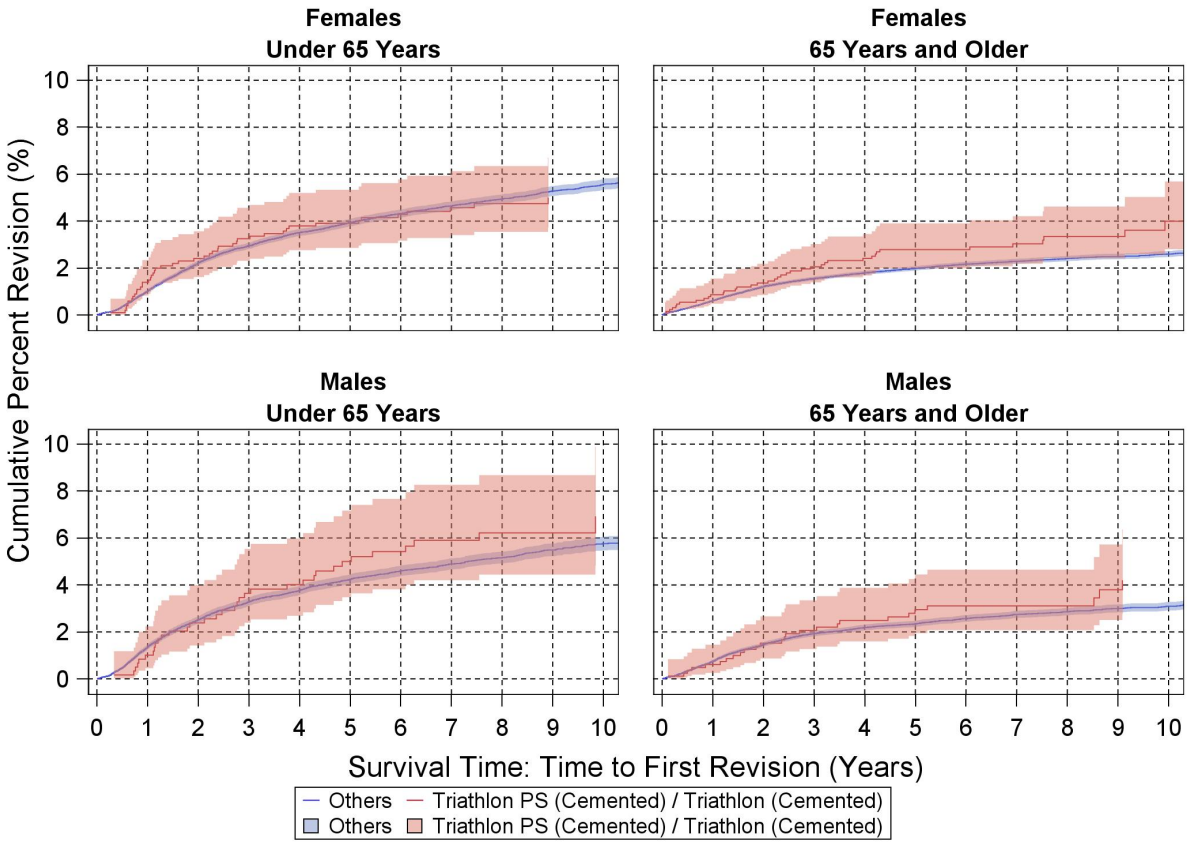


Figure 488. Cumulative Percent Revision Curve for the Triathlon PS (Cemented)/Triathlon (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1374. Cumulative Percent Revision and Number at Risk for the Triathlon PS (Cemented)/Triathlon (Cemented) Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	3,780	0.00 (0.00,0.00)	1,030	0.00 (0.00,0.00)	1,296	0.00 (0.00,0.00)	606	0.00 (0.00,0.00)	848	0.00 (0.00,0.00)
1	3,583	0.98 (0.71,1.35)	988	1.39 (0.83,2.34)	1,228	0.86 (0.48,1.56)	582	1.01 (0.46,2.24)	785	0.61 (0.25,1.46)
2	3,396	1.85 (1.46,2.35)	935	2.40 (1.62,3.57)	1,163	1.36 (0.85,2.18)	558	2.38 (1.42,3.99)	740	1.52 (0.87,2.66)
3	3,249	2.65 (2.17,3.23)	907	3.25 (2.31,4.57)	1,111	2.05 (1.39,3.02)	527	3.64 (2.39,5.53)	704	2.06 (1.27,3.35)
4	3,085	3.07 (2.55,3.70)	867	3.79 (2.76,5.20)	1,048	2.41 (1.68,3.45)	504	4.01 (2.68,5.98)	666	2.49 (1.59,3.88)
5	2,890	3.49 (2.93,4.16)	811	3.91 (2.86,5.33)	992	2.79 (1.99,3.90)	464	5.00 (3.48,7.17)	623	2.95 (1.95,4.45)
6	2,562	3.70 (3.12,4.39)	722	4.28 (3.17,5.77)	875	2.79 (1.99,3.90)	414	5.42 (3.82,7.67)	551	3.11 (2.07,4.65)
7	2,098	3.95 (3.34,4.67)	604	4.57 (3.40,6.13)	710	3.03 (2.18,4.21)	334	5.90 (4.20,8.27)	450	3.11 (2.07,4.65)
8	1,613	4.15 (3.51,4.90)	477	4.74 (3.54,6.34)	551	3.34 (2.42,4.62)	250	6.22 (4.44,8.68)	335	3.11 (2.07,4.65)
9	1,149	4.38 (3.70,5.17)	348	5.01 (3.73,6.71)	377	3.34 (2.42,4.62)	176	6.22 (4.44,8.68)	248	3.80 (2.51,5.72)
10	730	4.80 (4.02,5.71)	210	5.01 (3.73,6.71)	240	4.00 (2.80,5.69)	122	6.92 (4.83,9.89)	158	4.20 (2.77,6.37)

Table 1375. Reasons for First Revision Following Primary TKA for Triathlon PS (Cemented)/Triathlon (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	41	29.5
2	Aseptic Loosening	34	24.5
3	Dislocation/Instability	28	20.1
4	Arthrofibrosis	10	7.2
5	Pain	5	3.6
6	Peri-prosthetic fracture - Femur	4	2.9
7	Implant Failure	3	2.2
8	Malalignment	3	2.2
9	Peri-prosthetic fracture - Tibia	3	2.2
10	Metal Reaction/Metallosis	2	1.4
	Unknown/missing/other	2	4.3

Table 1376. Reasons for First Revision in the First 90 Days Following Primary TKA for Triathlon PS (Cemented)/Triathlon (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	3	50.0
2	Peri-prosthetic fracture - Tibia	2	33.3
3	Aseptic Loosening	1	16.7

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Table 1377. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Triathlon PS (Cemented)/Triathlon (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	8	36.4
2	Aseptic Loosening	4	18.2
3	Arthrofibrosis	4	18.2
4	Dislocation/Instability	3	13.6
5	Metal Reaction/Metallosis	1	4.6
6	Pain	1	4.6
7	Peri-prosthetic fracture - Tibia	1	4.6

Table 1378. Descriptive Statistics of Cases Receiving the Triathlon PS (Cemented)/Triathlon (Cemented) Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,357	61.1	
Age (years)	3,857	66.3 (9.7)	66 (14)
Height (cm)	3,857	168.3 (10.5)	167.6 (16)
Weight (kg)	3,857	96.1 (22.1)	94 (28.6)
BMI(kg/m^2)	3,857	33.9 (7.2)	33.2 (9.4)
Smoker - Never (%)	2,014	52.2	
Smoker - Previous (%)	1,413	36.6	
Smoker - Current (%)	399	10.3	
Smoker - Unknown (%)	31	0.8	

Table 1379. Distribution of Approach Used for Triathlon PS (Cemented)/Triathlon (Cemented) Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	3,352	86.9
Mid-vastus	462	12.0
Sub-vastus	33	0.9
Lateral parapatellar	6	0.2
Missing/unknown/other	4	0.1

Table 1380. Distribution of Polyethylene Used for Triathlon PS (Cemented)/Triathlon (Cemented) Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	3,808	98.7
Antioxidant XLPE	0	0.0
Missing/unknown/other	49	1.3

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Table 1381. Volume of Cases by Surgeon and Site for the Triathlon PS (Cemented)/Triathlon (Cemented) Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	45 (112)	4 (18)
Cases per site	96 (193)	8 (52)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

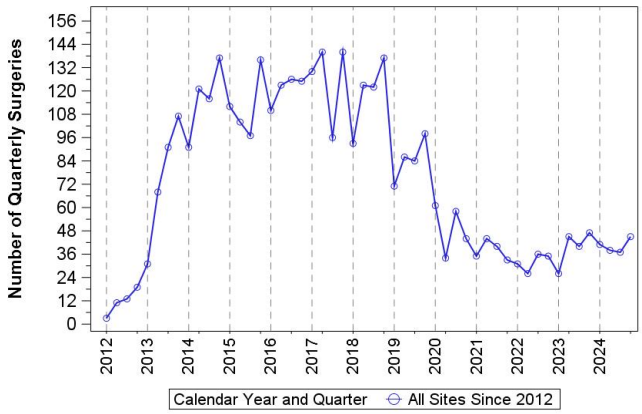


Figure 489. Utilization of the Triathlon PS (Cemented)/Triathlon (Cemented) Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

5515F402	5515F601	5515F202
5515F401	5515F302	5515F801
5515F502	5515F702	5515F102
5515F501	5515F701	5515F101
5515F602	5515F802	
5515F301	5515F201	

Catalog Numbers of Tibial Components Used in the Analysis

5520B400	5535A709	5527B200
5520B500	5535A609	5527B300
5520B600	5535A509	5527B800
5520B300	5535A809	5535A611
5520B700	5527B600	5535A711
5520B200	5527B700	
5520B800	5535A409	
5520B100	5523B500	

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3.5.41 Triathlon PS (Cemented)/Triathlon TS (Cemented)

N = 17,731 primary cases were used for this analysis. Distribution of utilization: 178 surgeons across 56 sites used this implant combination in primary TKA cases.

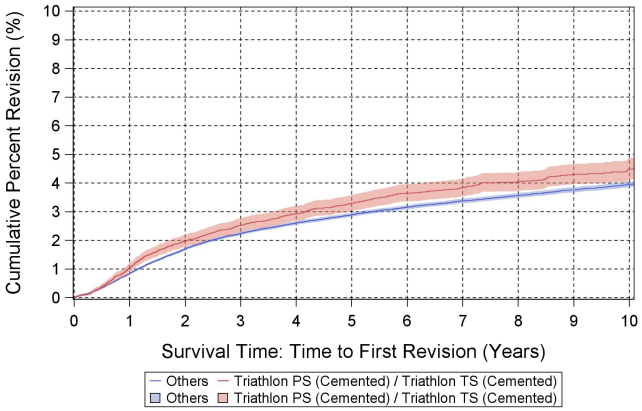


Figure 490. Cumulative Percent Revision Curve for the Triathlon PS (Cemented)/Triathlon TS (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases

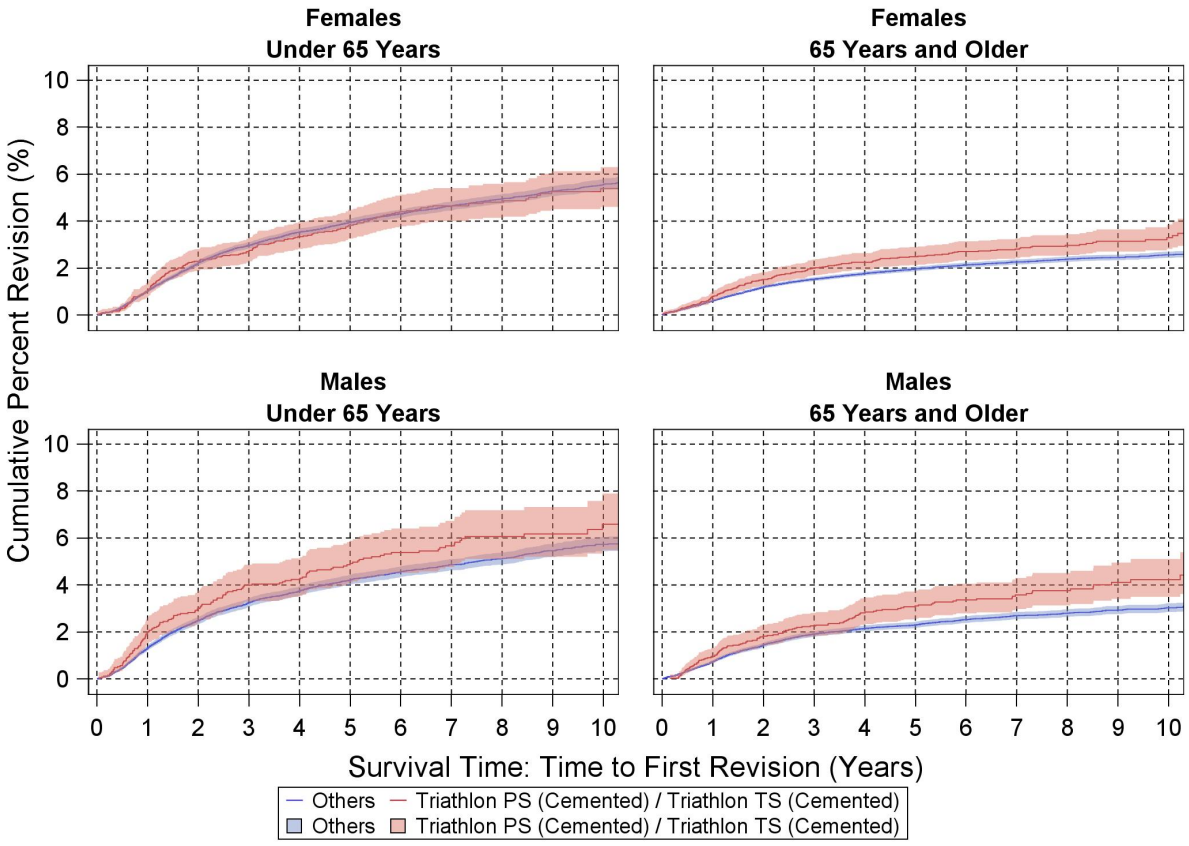


Figure 491. Cumulative Percent Revision Curve for the Triathlon PS (Cemented)/Triathlon TS (Cemented) Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1382. Cumulative Percent Revision and Number at Risk for the Triathlon PS (Cemented)/Triathlon TS (Cemented) Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	17,594	0.00 (0.00,0.00)	4,182	0.00 (0.00,0.00)	7,141	0.00 (0.00,0.00)	2,519	0.00 (0.00,0.00)	3,751	0.00 (0.00,0.00)
1	16,662	1.05 (0.91,1.21)	3,988	1.00 (0.74,1.36)	6,753	0.79 (0.61,1.03)	2,376	1.99 (1.51,2.62)	3,544	0.96 (0.69,1.33)
2	15,435	1.98 (1.78,2.20)	3,738	2.29 (1.87,2.80)	6,211	1.52 (1.25,1.84)	2,226	3.00 (2.39,3.76)	3,259	1.82 (1.43,2.31)
3	14,172	2.52 (2.29,2.77)	3,466	2.73 (2.26,3.28)	5,672	2.00 (1.68,2.36)	2,048	3.99 (3.28,4.86)	2,986	2.26 (1.81,2.81)
4	12,925	2.92 (2.67,3.20)	3,147	3.34 (2.81,3.95)	5,163	2.25 (1.91,2.64)	1,899	4.24 (3.49,5.13)	2,716	2.81 (2.30,3.43)
5	11,769	3.30 (3.03,3.59)	2,849	3.82 (3.25,4.49)	4,724	2.48 (2.13,2.90)	1,731	4.92 (4.10,5.89)	2,465	3.11 (2.57,3.76)
6	10,161	3.65 (3.36,3.96)	2,459	4.40 (3.77,5.13)	4,088	2.70 (2.32,3.14)	1,495	5.38 (4.52,6.41)	2,119	3.36 (2.79,4.05)
7	8,366	3.84 (3.54,4.17)	2,026	4.65 (4.00,5.41)	3,368	2.81 (2.42,3.26)	1,252	5.67 (4.77,6.73)	1,720	3.58 (2.97,4.30)
8	6,479	4.04 (3.72,4.38)	1,573	4.81 (4.14,5.59)	2,606	2.97 (2.55,3.44)	990	6.06 (5.11,7.19)	1,310	3.76 (3.13,4.51)
9	4,468	4.31 (3.97,4.67)	1,098	5.26 (4.51,6.12)	1,784	3.14 (2.70,3.65)	673	6.17 (5.20,7.32)	913	4.11 (3.41,4.95)
10	2,794	4.49 (4.12,4.88)	702	5.39 (4.61,6.30)	1,106	3.29 (2.81,3.85)	408	6.59 (5.49,7.90)	578	4.23 (3.49,5.11)

Table 1383. Reasons for First Revision Following Primary TKA for Triathlon PS (Cemented)/Triathlon TS (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	199	32.2
2	Joint Infection	176	28.5
3	Aseptic Loosening	79	12.8
4	Arthrofibrosis	66	10.7
5	Pain	28	4.5
6	Peri-prosthetic fracture - Femur	24	3.9
7	Implant Failure	14	2.3
8	Malalignment	8	1.3
9	Peri-prosthetic fracture - Tibia	7	1.1
10	Extensor mechanism failure	5	0.8
	Unknown/missing/other	4	1.9

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Table 1384. Reasons for First Revision in the First 90 Days Following Primary TKA for Triathlon PS (Cemented)/Triathlon TS (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	9	40.9
2	Joint Infection	6	27.3
3	Dislocation/Instability	2	9.1
4	Aseptic Loosening	1	4.6
5	Malalignment	1	4.6
6	Peri-prosthetic fracture - Tibia	1	4.6
7	Arthrofibrosis	1	4.6
8	Extensor mechanism failure	1	4.6

Table 1385. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Triathlon PS (Cemented)/Triathlon TS (Cemented) Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	53	34.6
2	Dislocation/Instability	49	32.0
3	Arthrofibrosis	24	15.7
4	Aseptic Loosening	9	5.9
5	Pain	8	5.2
6	Implant Failure	4	2.6
7	Peri-prosthetic fracture - Femur	2	1.3
8	Malalignment	1	0.6
9	Peri-prosthetic fracture - Tibia	1	0.6
10	Extensor mechanism failure	1	0.6
	Unknown/missing/other	1	0.7

Table 1386. Descriptive Statistics of Cases Receiving the Triathlon PS (Cemented)/Triathlon TS (Cemented) Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	11,387	64.2	
Age (years)	17,731	67.1 (9.5)	67 (13)
Height (cm)	17,731	168 (10.7)	167.6 (15.3)
Weight (kg)	17,731	93 (22.2)	90.7 (29.5)
BMI(kg/m^2)	17,731	32.9 (7.1)	32 (9.5)
Smoker - Never (%)	9,869	55.7	
Smoker - Previous (%)	6,388	36	
Smoker - Current (%)	1,439	8.1	
Smoker - Unknown (%)	35	0.2	

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Table 1387. Distribution of Approach Used for Triathlon PS (Cemented)/Triathlon TS (Cemented) Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	13,671	77.1
Mid-vastus	3,950	22.3
Sub-vastus	49	0.3
Lateral parapatellar	17	0.1
Missing/unknown/other	44	0.2

Table 1388. Distribution of Polyethylene Used for Triathlon PS (Cemented)/Triathlon TS (Cemented) Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	17,593	99.2
Antioxidant XLPE	0	0.0
Missing/unknown/other	138	0.8

Table 1389. Volume of Cases by Surgeon and Site for the Triathlon PS (Cemented)/Triathlon TS (Cemented) Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	99 (343)	10 (45)
Cases per site	316 (937)	32 (287)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.



Figure 492. Utilization of the Triathlon PS (Cemented)/Triathlon TS (Cemented) Combination in Primary TKA Cases

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Catalog Numbers of Femoral Components Used in the Analysis

5515F402	5515F602	5515F802
5515F401	5515F601	5515F801
5515F502	5515F702	5515F102
5515F501	5515F701	5515F101
5515F302	5515F202	
5515F301	5515F201	

Catalog Numbers of Tibial Components Used in the Analysis

5521B400	5521B600	5521B800
5521B300	5521B700	5521B100
5521B500	5521B200	

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3.5.42 Triathlon PS (Cementless)/Triathlon (Cementless)

N = 4,654 primary cases were used for this analysis. Distribution of utilization: 56 surgeons across 31 sites used this implant combination in primary TKA cases.

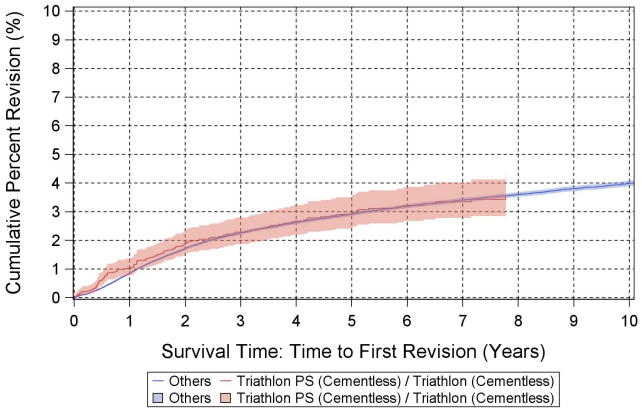


Figure 493. Cumulative Percent Revision Curve for the Triathlon PS (Cementless)/Triathlon (Cementless) Combination, Compared to All Other Implant Combinations in Primary TKA Cases

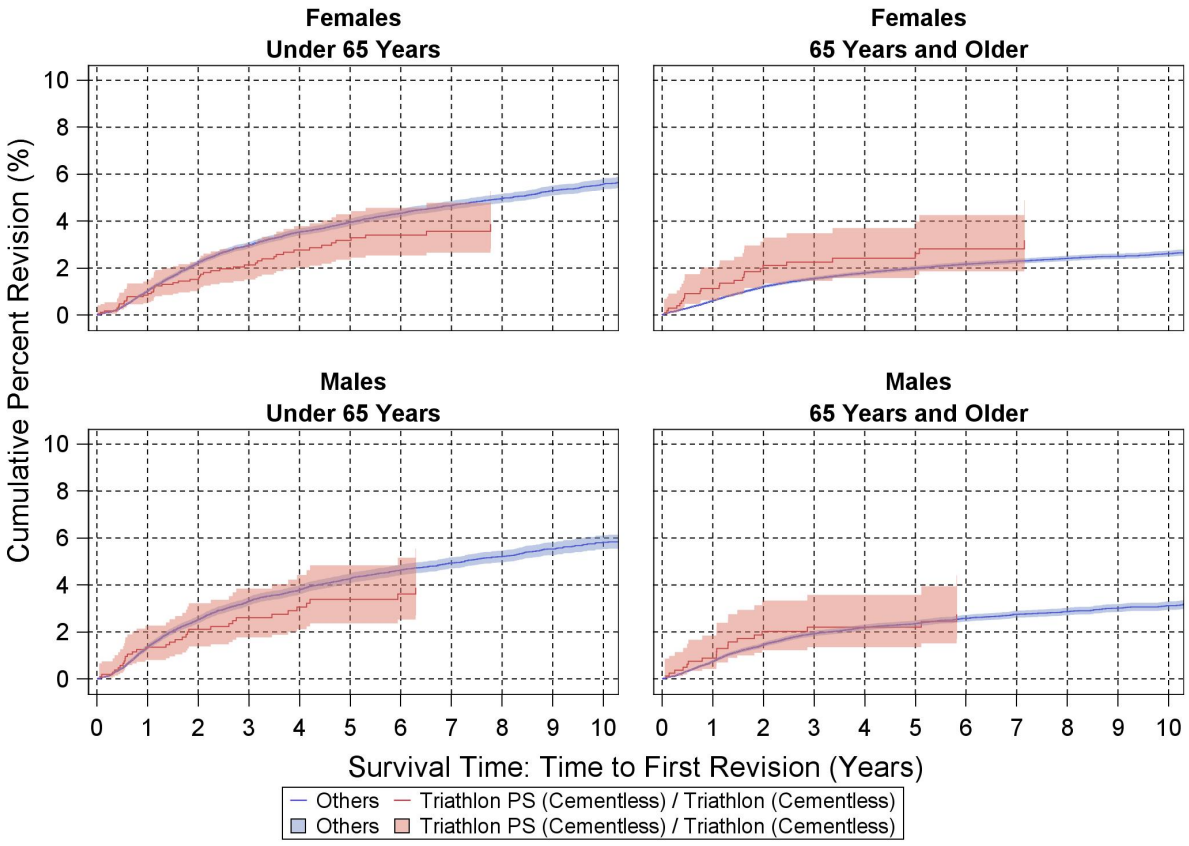


Figure 494. Cumulative Percent Revision Curve for the Triathlon PS (Cementless)/Triathlon (Cementless) Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1390. Cumulative Percent Revision and Number at Risk for the Triathlon PS (Cementless)/Triathlon (Cementless) Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	4,640	0.00 (0.00,0.00)	1,726	0.00 (0.00,0.00)	1,024	0.00 (0.00,0.00)	1,071	0.00 (0.00,0.00)	819	0.00 (0.00,0.00)
1	4,119	1.03 (0.77,1.38)	1,532	0.85 (0.50,1.43)	881	1.13 (0.63,2.03)	972	1.35 (0.80,2.27)	734	0.88 (0.42,1.84)
2	3,566	1.87 (1.51,2.33)	1,341	1.52 (1.02,2.26)	740	2.11 (1.35,3.30)	854	2.11 (1.38,3.22)	631	2.02 (1.22,3.34)
3	3,046	2.29 (1.87,2.80)	1,149	2.13 (1.51,3.01)	632	2.25 (1.46,3.48)	732	2.61 (1.77,3.84)	533	2.20 (1.35,3.58)
4	2,626	2.67 (2.20,3.23)	1,003	2.77 (2.02,3.78)	549	2.42 (1.58,3.70)	614	3.06 (2.11,4.43)	460	2.20 (1.35,3.58)
5	2,326	2.95 (2.44,3.55)	890	3.18 (2.35,4.29)	490	2.62 (1.72,3.98)	533	3.38 (2.36,4.84)	413	2.20 (1.35,3.58)
6	1,816	3.22 (2.68,3.87)	712	3.40 (2.53,4.56)	397	2.82 (1.86,4.26)	409	3.62 (2.53,5.16)	298	2.74 (1.70,4.41)
7	1,217	3.34 (2.78,4.02)	482	3.56 (2.65,4.78)	278	2.82 (1.86,4.26)	268	3.89 (2.71,5.55)	189	2.74 (1.70,4.41)
8	665	3.55 (2.93,4.29)	253	3.87 (2.83,5.28)	143	3.19 (2.07,4.89)	153	3.89 (2.71,5.55)	116	2.74 (1.70,4.41)
9	233	3.55 (2.93,4.29)	66	3.87 (2.83,5.28)	58	3.19 (2.07,4.89)	56	3.89 (2.71,5.55)	53	2.74 (1.70,4.41)
10	64	3.55 (2.93,4.29)	13	3.87 (2.83,5.28)	16	3.19 (2.07,4.89)	21	3.89 (2.71,5.55)	14	2.74 (1.70,4.41)

Table 1391. Reasons for First Revision Following Primary TKA for Triathlon PS (Cementless)/Triathlon (Cementless) Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	39	32.0
2	Joint Infection	22	18.0
3	Aseptic Loosening	19	15.6
4	Arthrofibrosis	12	9.8
5	Implant Failure	11	9.0
6	Peri-prosthetic fracture - Femur	8	6.6
7	Peri-prosthetic fracture - Tibia	4	3.3
8	Malalignment	3	2.5
9	Metal Reaction/Metallosis	2	1.6
10	Pain	2	1.6

Table 1392. Reasons for First Revision in the First 90 Days Following Primary TKA for Triathlon PS (Cementless)/Triathlon (Cementless) Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	4	40.0
2	Peri-prosthetic fracture - Tibia	2	20.0
3	Aseptic Loosening	1	10.0
4	Joint Infection	1	10.0
5	Implant Failure	1	10.0
6	Malalignment	1	10.0

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Table 1393. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Triathlon PS (Cementless)/Triathlon (Cementless) Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	14	38.9
2	Joint Infection	5	13.9
3	Aseptic Loosening	4	11.1
4	Implant Failure	3	8.3
5	Arthrofibrosis	3	8.3
6	Peri-prosthetic fracture - Femur	2	5.6
7	Pain	2	5.6
8	Metal Reaction/Metallosis	1	2.8
9	Malalignment	1	2.8
10	Peri-prosthetic fracture - Tibia	1	2.8

Table 1394. Descriptive Statistics of Cases Receiving the Triathlon PS (Cementless)/Triathlon (Cementless) Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	2,760	59.3	
Age (years)	4,654	62.2 (9.2)	62 (13)
Height (cm)	4,654	169.4 (10.5)	168.5 (15.8)
Weight (kg)	4,654	98.8 (22.5)	96.1 (30.5)
BMI(kg/m^2)	4,654	34.4 (7.2)	33.6 (9.6)
Smoker - Never (%)	2,306	49.6	
Smoker - Previous (%)	1,440	30.9	
Smoker - Current (%)	903	19.4	
Smoker - Unknown (%)	5	0.1	

Table 1395. Distribution of Approach Used for Triathlon PS (Cementless)/Triathlon (Cementless) Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	4,049	87.0
Mid-vastus	553	11.9
Sub-vastus	22	0.5
Lateral parapatellar	2	0.0
Missing/unknown/other	28	0.6

Table 1396. Distribution of Polyethylene Used for Triathlon PS (Cementless)/Triathlon (Cementless) Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	4,611	99.1
Antioxidant XLPE	0	0.0
Missing/unknown/other	43	0.9

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Table 1397. Volume of Cases by Surgeon and Site for the Triathlon PS (Cementless)/Triathlon (Cementless) Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	83 (333)	9 (40)
Cases per site	150 (434)	18 (110)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

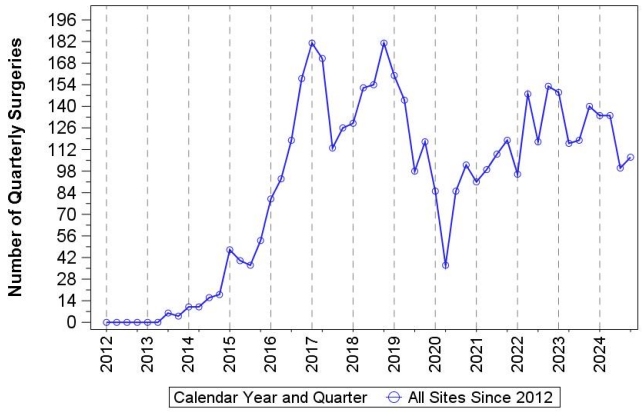


Figure 495. Utilization of the Triathlon PS (Cementless)/Triathlon (Cementless) Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

5516F402	5516F601	5516F101
5516F401	5516F202	5516F802
5516F502	5516F201	5514F502
5516F302	5516F702	5514F302
5516F501	5516F701	5514F602
5516F301	5516F102	
5516F602	5516F801	

Catalog Numbers of Tibial Components Used in the Analysis

5536B400	5536B600	5536B100
5536B300	5536B200	5536B800
5536B500	5536B700	

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3.5.43 Vanguard CR (Cemented)/Maxim

N = 15,771 primary cases were used for this analysis. Distribution of utilization: 85 surgeons across 46 sites used this implant combination in primary TKA cases.

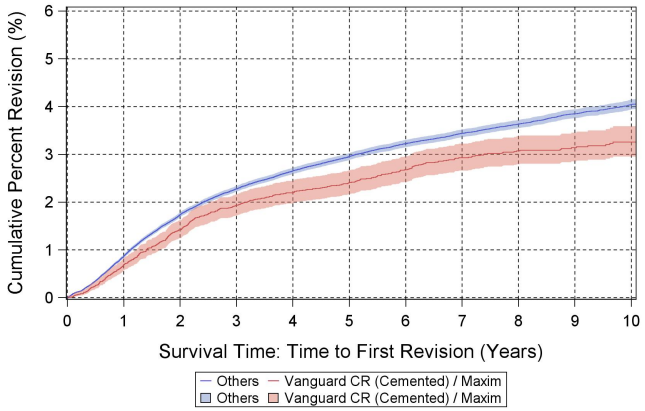


Figure 496. Cumulative Percent Revision Curve for the Vanguard CR (Cemented)/Maxim Combination, Compared to All Other Implant Combinations in Primary TKA Cases

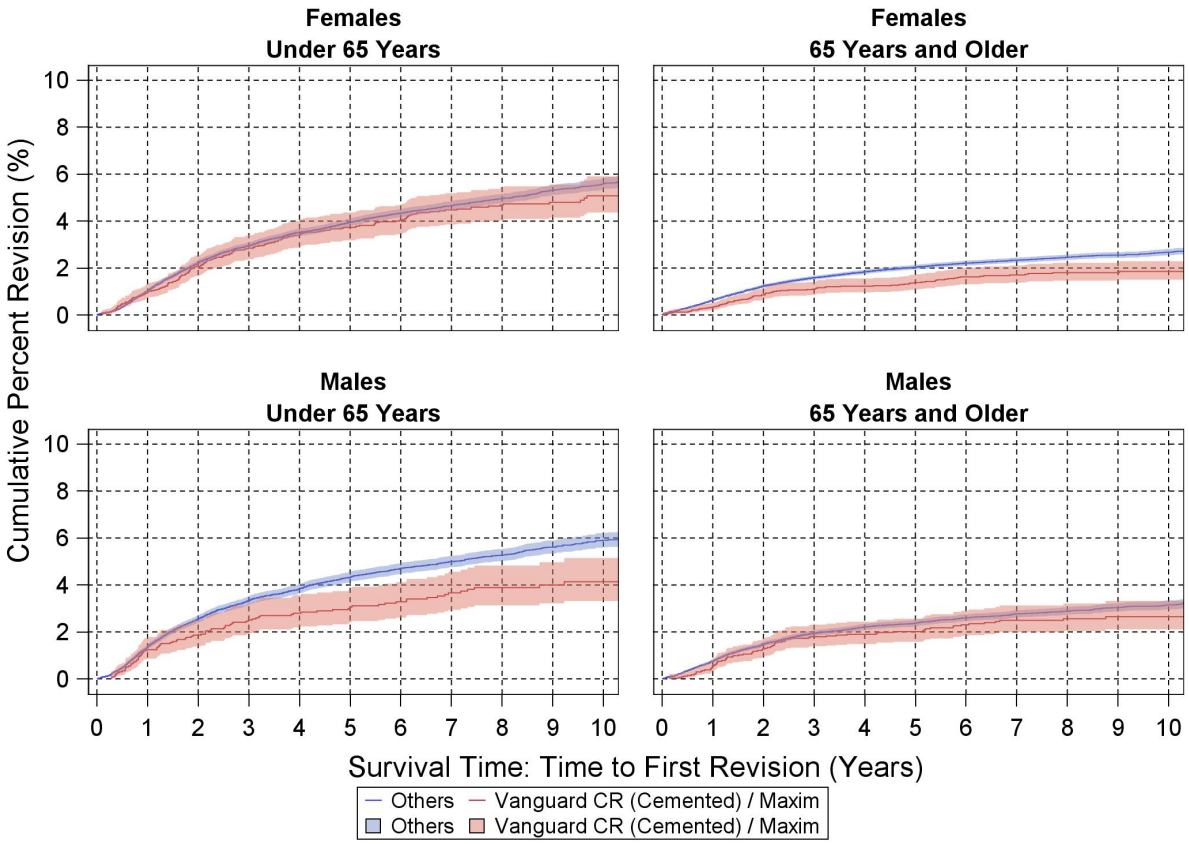


Figure 497. Cumulative Percent Revision Curve for the Vanguard CR (Cemented)/Maxim Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1398. Cumulative Percent Revision and Number at Risk for the Vanguard CR (Cemented)/Maxim Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	15,692	0.00 (0.00,0.00)	4,194	0.00 (0.00,0.00)	5,676	0.00 (0.00,0.00)	2,373	0.00 (0.00,0.00)	3,438	0.00 (0.00,0.00)
1	15,175	0.69 (0.57,0.84)	4,061	0.99 (0.73,1.34)	5,517	0.34 (0.22,0.53)	2,281	1.24 (0.87,1.78)	3,305	0.54 (0.34,0.85)
2	14,424	1.42 (1.24,1.62)	3,895	2.05 (1.66,2.54)	5,242	0.86 (0.64,1.14)	2,172	1.86 (1.38,2.50)	3,104	1.27 (0.94,1.72)
3	13,621	1.94 (1.73,2.17)	3,709	2.85 (2.38,3.41)	4,940	1.11 (0.86,1.42)	2,074	2.50 (1.94,3.24)	2,887	1.79 (1.39,2.31)
4	12,691	2.20 (1.98,2.45)	3,467	3.41 (2.89,4.03)	4,601	1.23 (0.96,1.56)	1,937	2.79 (2.19,3.56)	2,675	1.90 (1.48,2.44)
5	11,881	2.41 (2.17,2.67)	3,272	3.73 (3.18,4.37)	4,323	1.38 (1.10,1.74)	1,803	3.06 (2.42,3.86)	2,472	2.01 (1.58,2.57)
6	10,721	2.68 (2.42,2.96)	2,983	4.04 (3.46,4.71)	3,883	1.62 (1.31,2.01)	1,640	3.28 (2.61,4.12)	2,204	2.30 (1.83,2.90)
7	9,044	2.93 (2.66,3.23)	2,514	4.47 (3.86,5.19)	3,286	1.71 (1.38,2.11)	1,400	3.67 (2.94,4.57)	1,833	2.49 (1.99,3.13)
8	7,151	3.07 (2.79,3.38)	2,023	4.69 (4.05,5.42)	2,588	1.80 (1.46,2.22)	1,097	3.89 (3.13,4.83)	1,432	2.56 (2.04,3.21)
9	5,061	3.14 (2.85,3.45)	1,394	4.80 (4.14,5.56)	1,842	1.80 (1.46,2.22)	798	4.00 (3.22,4.97)	1,016	2.65 (2.11,3.32)
10	3,133	3.26 (2.95,3.59)	842	5.08 (4.36,5.91)	1,150	1.86 (1.50,2.29)	489	4.14 (3.32,5.15)	641	2.65 (2.11,3.32)

Table 1399. Reasons for First Revision Following Primary TKA for Vanguard CR (Cemented)/Maxim Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	127	30.5
2	Joint Infection	88	21.1
3	Aseptic Loosening	84	20.1
4	Pain	33	7.9
5	Implant Failure	28	6.7
6	Arthrofibrosis	21	5.0
7	Metal Reaction/Metallosis	11	2.6
8	Poly liner wear	9	2.2
9	Peri-prosthetic fracture - Femur	7	1.7
10	Malalignment	6	1.4
	Unknown/missing/other	3	0.7

Table 1400. Reasons for First Revision in the First 90 Days Following Primary TKA for Vanguard CR (Cemented)/Maxim Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	5	41.7
2	Dislocation/Instability	3	25.0
3	Pain	2	16.7
4	Aseptic Loosening	1	8.3
5	Arthrofibrosis	1	8.3

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Table 1401. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Vanguard CR (Cemented)/Maxim Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	26	32.1
2	Joint Infection	22	27.2
3	Pain	13	16.0
4	Arthrofibrosis	6	7.4
5	Aseptic Loosening	4	4.9
6	Implant Failure	3	3.7
7	Metal Reaction/Metallosis	3	3.7
8	Peri-prosthetic fracture - Femur	2	2.5
9	Malalignment	1	1.2
10	Patellofemoral Joint	1	1.2

Table 1402. Descriptive Statistics of Cases Receiving the Vanguard CR (Cemented)/Maxim Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	9,914	62.9	
Age (years)	15,771	66.4 (9.5)	66 (13)
Height (cm)	15,771	168.3 (10.4)	167.6 (15.3)
Weight (kg)	15,771	95.8 (21.9)	93.8 (29.1)
BMI(kg/m^2)	15,771	33.7 (7)	33 (9.5)
Smoker - Never (%)	8,085	51.3	
Smoker - Previous (%)	5,953	37.8	
Smoker - Current (%)	1,585	10.1	
Smoker - Unknown (%)	148	0.9	

Table 1403. Distribution of Approach Used for Vanguard CR (Cemented)/Maxim Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	15,263	96.8
Mid-vastus	261	1.7
Sub-vastus	181	1.1
Lateral parapatellar	34	0.2
Missing/unknown/other	32	0.2

Table 1404. Distribution of Polyethylene Used for Vanguard CR (Cemented)/Maxim Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	8,272	52.5
XLPE	0	0.0
Antioxidant XLPE	6,992	44.3
Missing/unknown/other	507	3.2

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Table 1405. Volume of Cases by Surgeon and Site for the Vanguard CR (Cemented)/Maxim Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	185 (334)	40 (168)
Cases per site	342 (589)	82 (473)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

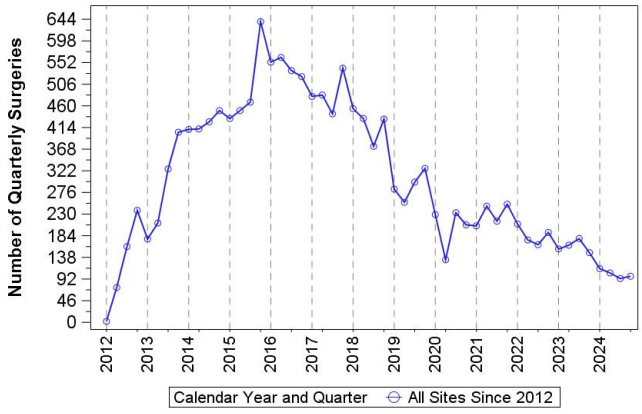


Figure 498. Utilization of the Vanguard CR (Cemented)/Maxim Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

183008	183032	183002
183028	183004	183022
183006	183013	183016
183026	183024	183036
183010	183033	183020
183030	183014	
183012	183034	

Catalog Numbers of Tibial Components Used in the Analysis

141233	141225	141228
141232	141231	141220
141234	141226	141273
141235	141237	141266
141236	141221	141272
141223	141227	141274
141224	141230	141276
141222	141238	

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3.5.44 Vanguard CR Porous (Cementless)/Maxim

N = 1,554 primary cases were used for this analysis. Distribution of utilization: 18 surgeons across 20 sites used this implant combination in primary TKA cases.

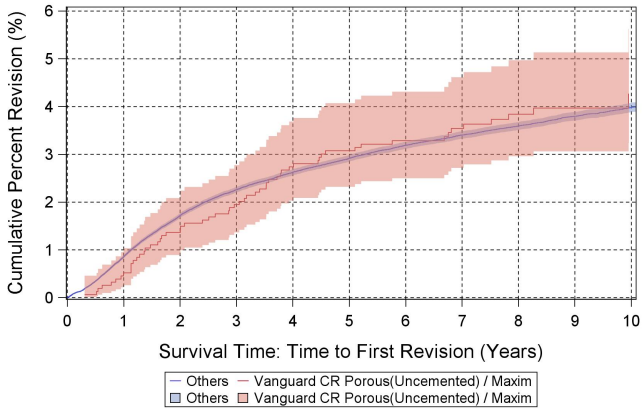


Figure 499. Cumulative Percent Revision Curve for the Vanguard CR Porous (Cementless)/Maxim Combination, Compared to All Other Implant Combinations in Primary TKA Cases

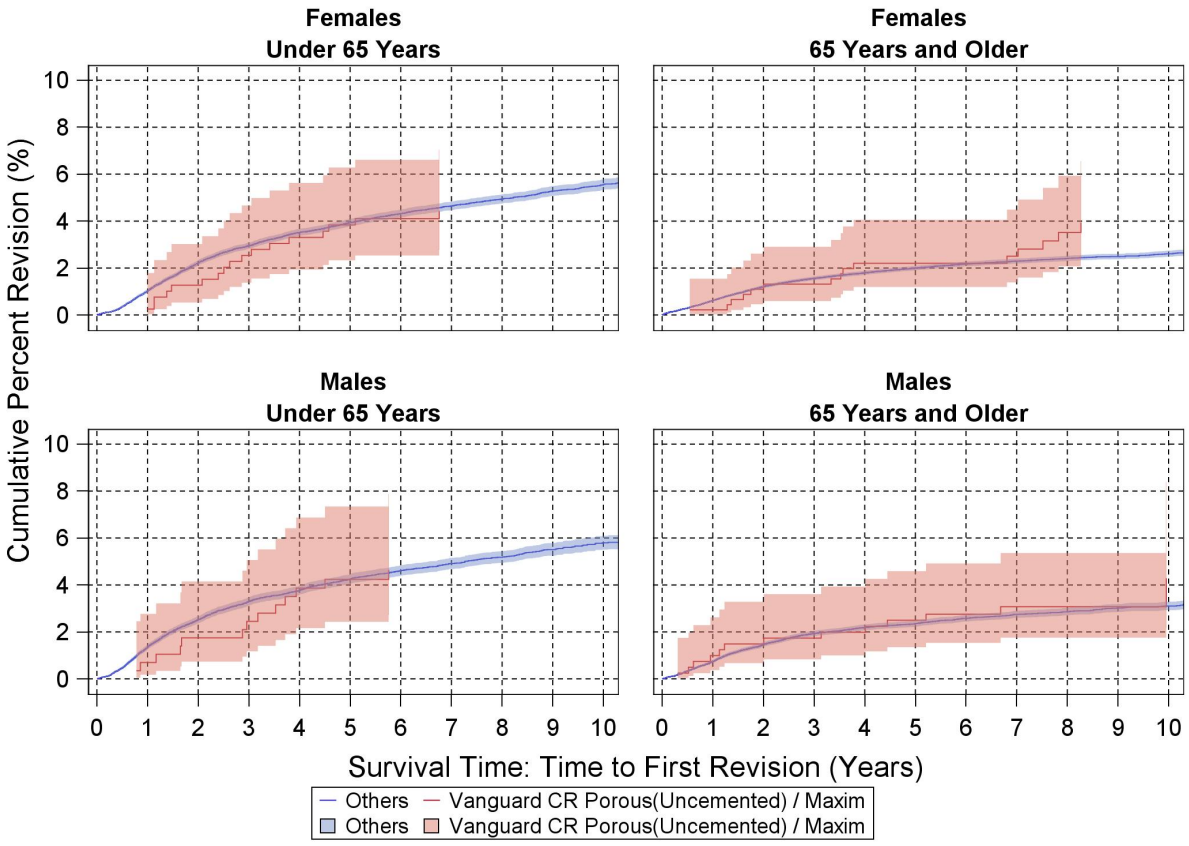


Figure 500. Cumulative Percent Revision Curve for the Vanguard CR Porous (Cementless)/Maxim Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1406. Cumulative Percent Revision and Number at Risk for the Vanguard CR Porous (Cementless)/Maxim Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,539	0.00 (0.00,0.00)	394	0.00 (0.00,0.00)	456	0.00 (0.00,0.00)	286	0.00 (0.00,0.00)	403	0.00 (0.00,0.00)
1	1,531	0.52 (0.26,1.04)	393	0.25 (0.04,1.79)	455	0.22 (0.03,1.55)	284	0.70 (0.18,2.77)	399	0.99 (0.37,2.62)
2	1,518	1.36 (0.89,2.09)	389	1.27 (0.53,3.02)	451	1.10 (0.46,2.61)	281	1.75 (0.73,4.15)	397	1.49 (0.67,3.28)
3	1,508	1.95 (1.37,2.78)	384	2.54 (1.37,4.67)	450	1.32 (0.59,2.91)	279	2.45 (1.17,5.07)	395	1.74 (0.83,3.61)
4	1,463	2.74 (2.03,3.69)	375	3.31 (1.93,5.63)	436	2.20 (1.19,4.06)	267	3.87 (2.16,6.87)	385	1.99 (1.00,3.93)
5	1,420	3.08 (2.32,4.07)	360	3.84 (2.33,6.28)	427	2.20 (1.19,4.06)	254	4.24 (2.43,7.34)	379	2.50 (1.35,4.59)
6	1,289	3.29 (2.50,4.31)	339	4.10 (2.53,6.61)	388	2.20 (1.19,4.06)	223	4.65 (2.72,7.87)	339	2.75 (1.53,4.92)
7	1,081	3.54 (2.72,4.62)	279	4.43 (2.77,7.04)	321	2.50 (1.39,4.49)	190	4.65 (2.72,7.87)	291	3.08 (1.75,5.36)
8	848	3.84 (2.96,4.97)	217	4.43 (2.77,7.04)	254	3.52 (2.07,5.93)	148	4.65 (2.72,7.87)	229	3.08 (1.75,5.36)
9	530	3.97 (3.06,5.14)	136	4.43 (2.77,7.04)	156	3.94 (2.36,6.56)	94	4.65 (2.72,7.87)	144	3.08 (1.75,5.36)
10	311	4.27 (3.24,5.63)	75	4.43 (2.77,7.04)	102	3.94 (2.36,6.56)	56	4.65 (2.72,7.87)	78	4.29 (2.17,8.39)

Table 1407. Reasons for First Revision Following Primary TKA for Vanguard CR Porous (Cementless)/Maxim Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	15	26.3
2	Joint Infection	13	22.8
3	Dislocation/Instability	12	21.1
4	Implant Failure	7	12.3
5	Poly liner wear	4	7.0
6	Pain	3	5.3
7	Arthrofibrosis	2	3.5
8	Peri-prosthetic fracture - Femur	1	1.8

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1408. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Vanguard CR Porous (Cementless)/Maxim Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	5	62.5
2	Dislocation/Instability	3	37.5

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Table 1409. Descriptive Statistics of Cases Receiving the Vanguard CR Porous (Cementless)/Maxim Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	861	55.4	
Age (years)	1,554	66.2 (9.1)	66 (13)
Height (cm)	1,554	169.3 (10.4)	168 (16.5)
Weight (kg)	1,554	96.8 (21.9)	95 (29.2)
BMI(kg/m^2)	1,554	33.7 (6.9)	32.8 (9.5)
Smoker - Never (%)	702	45.2	
Smoker - Previous (%)	702	45.2	
Smoker - Current (%)	147	9.5	
Smoker - Unknown (%)	3	0.2	

Table 1410. Distribution of Approach Used for Vanguard CR Porous (Cementless)/Maxim Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	1,545	99.4
Mid-vastus	2	0.1
Sub-vastus	0	0.0
Lateral parapatellar	3	0.2
Missing/unknown/other	4	0.3

Table 1411. Distribution of Polyethylene Used for Vanguard CR Porous (Cementless)/Maxim Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	354	22.8
XLPE	0	0.0
Antioxidant XLPE	1,182	76.1
Missing/unknown/other	18	1.2

Table 1412. Volume of Cases by Surgeon and Site for the Vanguard CR Porous (Cementless)/Maxim Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	86 (235)	9 (58)
Cases per site	77 (206)	18 (52)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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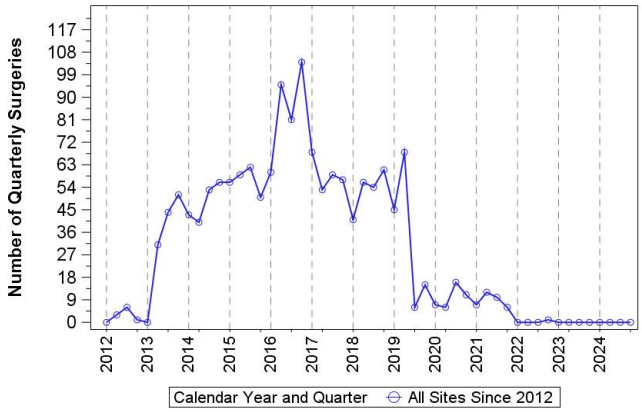


Figure 501. Utilization of the Vanguard CR Porous (Cementless)/Maxim Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

183048	183046	183062
183050	183073	183042
183068	183053	183056
183070	183044	183076
183052	183064	183060
183072	183054	
183066	183074	

Catalog Numbers of Tibial Components Used in the Analysis

141233	141276	141221
141234	141237	141226
141235	141222	141227
141232	141223	141238
141236	141265	141262
141273	141271	141264
141275	141224	141266
141274	141225	141270
141272	141230	
141231	141263	

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3.5.45 Vanguard/Maxim Mono-Lock

N = 1,313 primary cases were used for this analysis. Distribution of utilization: 68 surgeons across 36 sites used this implant combination in primary TKA cases.

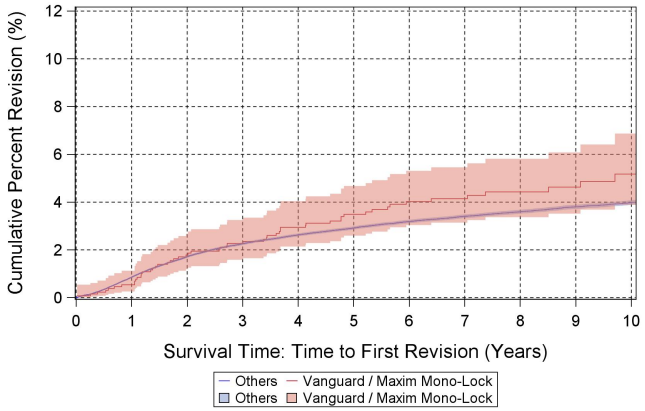


Figure 502. Cumulative Percent Revision Curve for the Vanguard/Maxim Mono-Lock Combination, Compared to All Other Implant Combinations in Primary TKA Cases

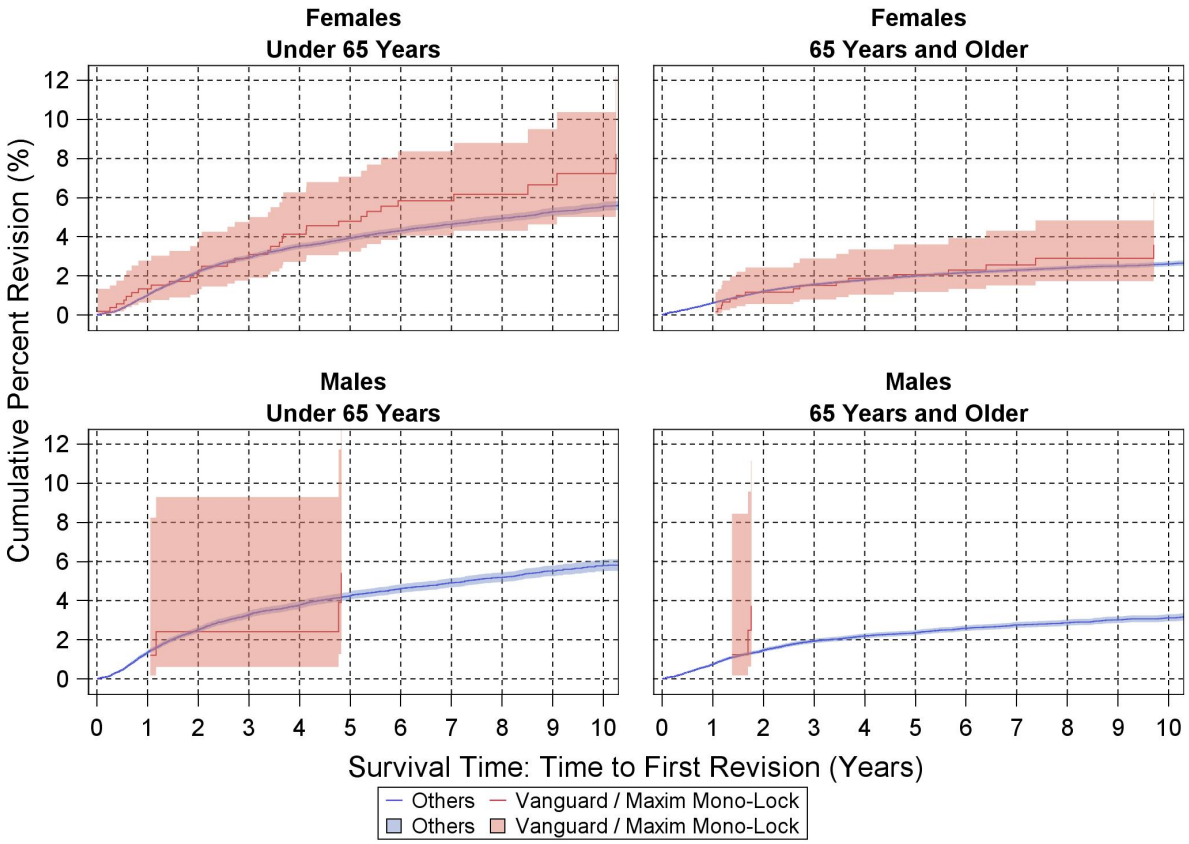


Figure 503. Cumulative Percent Revision Curve for the Vanguard/Maxim Mono-Lock Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1413. Cumulative Percent Revision and Number at Risk for the Vanguard/Maxim Mono-Lock Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	1,300	0.00 (0.00,0.00)	527	0.00 (0.00,0.00)	608	0.00 (0.00,0.00)	84	0.00 (0.00,0.00)	81	0.00 (0.00,0.00)
1	1,283	0.54 (0.26,1.13)	515	1.33 (0.64,2.78)	604	0.00 (0.00,0.00)	83	0.00 (0.00,0.00)	81	0.00 (0.00,0.00)
2	1,241	1.79 (1.19,2.68)	505	2.10 (1.17,3.77)	584	1.17 (0.56,2.43)	75	2.41 (0.61,9.29)	77	3.73 (1.22,11.13)
3	1,189	2.27 (1.58,3.25)	480	2.89 (1.75,4.76)	562	1.51 (0.79,2.89)	73	2.41 (0.61,9.29)	74	3.73 (1.22,11.13)
4	1,118	2.94 (2.14,4.04)	449	4.13 (2.71,6.27)	535	1.87 (1.04,3.35)	69	2.41 (0.61,9.29)	65	3.73 (1.22,11.13)
5	1,010	3.49 (2.60,4.68)	406	4.79 (3.23,7.07)	485	2.07 (1.18,3.61)	62	5.41 (2.05,13.87)	57	3.73 (1.22,11.13)
6	845	4.02 (3.04,5.31)	341	5.84 (4.05,8.37)	400	2.30 (1.34,3.93)	54	5.41 (2.05,13.87)	50	3.73 (1.22,11.13)
7	706	4.14 (3.14,5.46)	285	5.84 (4.05,8.37)	328	2.56 (1.51,4.31)	51	5.41 (2.05,13.87)	42	3.73 (1.22,11.13)
8	541	4.43 (3.37,5.81)	219	6.17 (4.31,8.80)	246	2.90 (1.73,4.83)	44	5.41 (2.05,13.87)	32	3.73 (1.22,11.13)
9	409	4.63 (3.52,6.08)	165	6.65 (4.63,9.50)	183	2.90 (1.73,4.83)	36	5.41 (2.05,13.87)	25	3.73 (1.22,11.13)
10	266	5.18 (3.89,6.87)	110	7.23 (5.01,10.37)	118	3.59 (2.05,6.25)	23	5.41 (2.05,13.87)	15	3.73 (1.22,11.13)

Table 1414. Reasons for First Revision Following Primary TKA for Vanguard/Maxim Mono-Lock Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	14	27.5
2	Dislocation/Instability	8	15.7
3	Joint Infection	6	11.8
4	Pain	5	9.8
5	Implant Failure	4	7.8
6	Metal Reaction/Metallosis	4	7.8
7	Peri-prosthetic fracture - Femur	4	7.8
8	Arthrofibrosis	3	5.9
9	Poly liner wear	2	3.9
10	Malalignment	1	2.0

Table 1415. Reasons for First Revision in the First 90 Days Following Primary TKA for Vanguard/Maxim Mono-Lock Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	1	100.0

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Table 1416. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Vanguard/Maxim Mono-Lock Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	2	50.0
2	Dislocation/Instability	1	25.0
3	Implant Failure	1	25.0

Table 1417. Descriptive Statistics of Cases Receiving the Vanguard/Maxim Mono-Lock Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,147	87.4	
Age (years)	1,313	64.9 (9.2)	65 (12)
Height (cm)	1,313	164.8 (8.6)	164 (10.2)
Weight (kg)	1,313	93.3 (22.4)	90.7 (30.1)
BMI(kg/m^2)	1,313	34.3 (7.4)	33.4 (10.1)
Smoker - Never (%)	653	49.7	
Smoker - Previous (%)	491	37.4	
Smoker - Current (%)	166	12.6	
Smoker - Unknown (%)	3	0.2	

Table 1418. Distribution of Approach Used for Vanguard/Maxim Mono-Lock Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	1,184	90.2
Mid-vastus	126	9.6
Sub-vastus	1	0.1
Lateral parapatellar	2	0.2
Missing/unknown/other	0	0.0

Table 1419. Distribution of Polyethylene Used for Vanguard/Maxim Mono-Lock Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	591	45.0
XLPE	0	0.0
Antioxidant XLPE	697	53.1
Missing/unknown/other	25	1.9

Table 1420. Volume of Cases by Surgeon and Site for the Vanguard/Maxim Mono-Lock Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	19 (39)	4 (14)
Cases per site	36 (74)	7 (17)

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The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

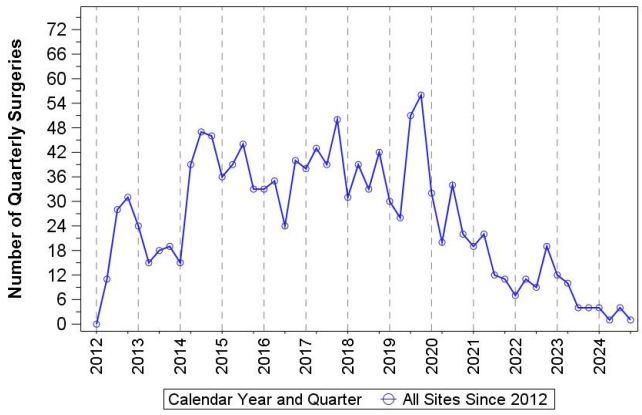


Figure 504. Utilization of the Vanguard/Maxim Mono-Lock Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

CP113617	CP113641	183014
CP113616	183130	183122
CP113618	183064	183133
CP113619	183124	CP113624
CP113614	183128	183034
CP113615	183006	183053
CP113621	183026	183054
CP113620	CP113632	CP113630
CP113634	CP113640	183013
CP113635	CP113633	183056
CP113639	183010	183062
183048	183028	183102
CP113636	183032	183114
183068	183012	CP113625
CP113638	183073	CP113627
183052	183104	183022
183126	183110	183033
CP113612	CP113643	183042
CP113622	183004	183060
183070	183024	183112
183106	183044	183113
CP113613	183108	183120
183072	CP113631	183132
CP113623	183008	183134
CP113637	183030	CP113611
183046	183074	CP113626
183050	CP113610	
183066	CP113642	

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Catalog Numbers of Tibial Components Used in the Analysis

141213	141211	141217
141212	141215	141210
141214	141216	

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3.5.46 Vanguard PS (Cemented)/Maxim

N = 6,398 primary cases were used for this analysis. Distribution of utilization: 71 surgeons across 39 sites used this implant combination in primary TKA cases.

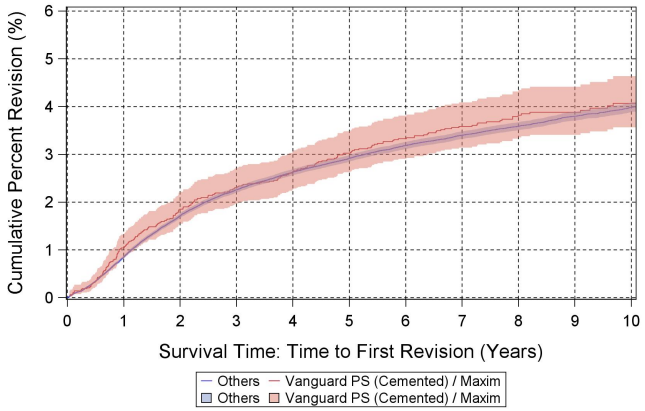


Figure 505. Cumulative Percent Revision Curve for the Vanguard PS (Cemented)/Maxim Combination, Compared to All Other Implant Combinations in Primary TKA Cases

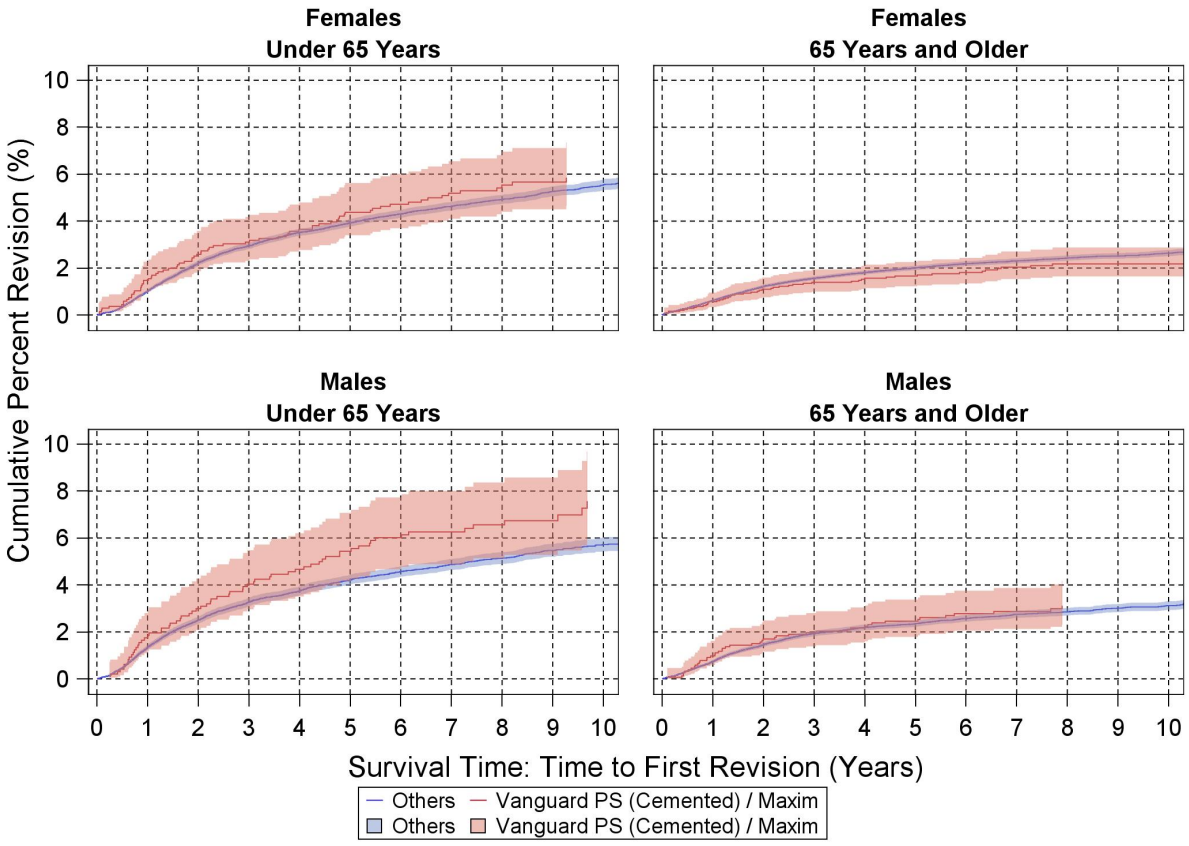


Figure 506. Cumulative Percent Revision Curve for the Vanguard PS (Cemented)/Maxim Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1421. Cumulative Percent Revision and Number at Risk for the Vanguard PS (Cemented)/Maxim Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	6,352	0.00 (0.00,0.00)	1,362	0.00 (0.00,0.00)	2,479	0.00 (0.00,0.00)	973	0.00 (0.00,0.00)	1,538	0.00 (0.00,0.00)
1	6,263	1.04 (0.82,1.32)	1,336	1.47 (0.95,2.27)	2,459	0.57 (0.34,0.95)	953	1.75 (1.09,2.80)	1,515	0.98 (0.59,1.62)
2	6,112	1.85 (1.55,2.22)	1,308	2.58 (1.86,3.58)	2,382	1.10 (0.75,1.60)	937	2.99 (2.09,4.28)	1,485	1.70 (1.16,2.49)
3	5,980	2.31 (1.96,2.71)	1,287	3.11 (2.31,4.18)	2,328	1.39 (1.00,1.94)	912	4.04 (2.96,5.48)	1,453	1.97 (1.38,2.80)
4	5,732	2.64 (2.27,3.07)	1,227	3.65 (2.77,4.80)	2,229	1.57 (1.14,2.15)	891	4.67 (3.51,6.20)	1,385	2.17 (1.55,3.04)
5	5,337	3.03 (2.63,3.48)	1,157	4.37 (3.40,5.62)	2,065	1.66 (1.22,2.26)	840	5.44 (4.17,7.07)	1,275	2.46 (1.79,3.38)
6	4,815	3.33 (2.91,3.81)	1,077	4.72 (3.70,6.01)	1,838	1.81 (1.34,2.43)	775	6.01 (4.67,7.73)	1,125	2.78 (2.05,3.76)
7	4,182	3.58 (3.14,4.09)	958	5.19 (4.10,6.55)	1,581	2.04 (1.53,2.71)	670	6.26 (4.88,8.01)	973	2.87 (2.13,3.87)
8	3,334	3.82 (3.35,4.35)	771	5.53 (4.39,6.96)	1,277	2.17 (1.64,2.88)	540	6.56 (5.14,8.36)	746	3.11 (2.31,4.18)
9	2,401	3.88 (3.41,4.42)	562	5.66 (4.50,7.11)	898	2.17 (1.64,2.88)	398	6.74 (5.28,8.58)	543	3.11 (2.31,4.18)
10	1,538	4.07 (3.57,4.64)	374	5.85 (4.65,7.36)	566	2.17 (1.64,2.88)	255	7.57 (5.91,9.69)	343	3.11 (2.31,4.18)

Table 1422. Reasons for First Revision Following Primary TKA for Vanguard PS (Cemented)/Maxim Combination Cases

Rank	Reason for Revision	N	Percent
1	Dislocation/Instability	49	24.0
2	Joint Infection	48	23.5
3	Aseptic Loosening	34	16.7
4	Arthrofibrosis	17	8.3
5	Implant Failure	13	6.4
6	Pain	11	5.4
7	Peri-prosthetic fracture - Femur	11	5.4
8	Malalignment	6	2.9
9	Poly liner wear	5	2.5
10	Extensor mechanism failure	3	1.5
	Unknown/missing/other	3	3.4

Table 1423. Reasons for First Revision in the First 90 Days Following Primary TKA for Vanguard PS (Cemented)/Maxim Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	4	44.4
2	Implant Failure	2	22.2
3	Joint Infection	1	11.1
4	Malalignment	1	11.1
5	Peri-prosthetic fracture - Tibia	1	11.1

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Table 1424. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Vanguard PS (Cemented)/Maxim Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	14	35.0
2	Dislocation/Instability	8	20.0
3	Arthrofibrosis	4	10.0
4	Extensor mechanism failure	3	7.5
5	Aseptic Loosening	2	5.0
6	Implant Failure	2	5.0
7	Peri-prosthetic fracture - Femur	2	5.0
8	Pain	2	5.0
9	Osteolysis	1	2.5
10	Malalignment	1	2.5
	Unknown/missing/other	1	2.5

Table 1425. Descriptive Statistics of Cases Receiving the Vanguard PS (Cemented)/Maxim Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	3,868	60.5	
Age (years)	6,398	67.6 (9.5)	68 (13)
Height (cm)	6,398	168.9 (10.8)	167.6 (17.8)
Weight (kg)	6,398	94.1 (21.4)	91.8 (28.1)
BMI(kg/m^2)	6,398	33 (7.1)	32.1 (9)
Smoker - Never (%)	3,491	54.6	
Smoker - Previous (%)	2,394	37.4	
Smoker - Current (%)	450	7	
Smoker - Unknown (%)	63	1	

Table 1426. Distribution of Approach Used for Vanguard PS (Cemented)/Maxim Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	4,533	70.9
Mid-vastus	1,798	28.1
Sub-vastus	24	0.4
Lateral parapatellar	16	0.3
Missing/unknown/other	27	0.4

Table 1427. Distribution of Polyethylene Used for Vanguard PS (Cemented)/Maxim Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	4,159	65.0
XLPE	0	0.0
Antioxidant XLPE	2,164	33.8
Missing/unknown/other	75	1.2

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Table 1428. Volume of Cases by Surgeon and Site for the Vanguard PS (Cemented)/Maxim Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	90 (228)	9 (63)
Cases per site	164 (391)	18 (91)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

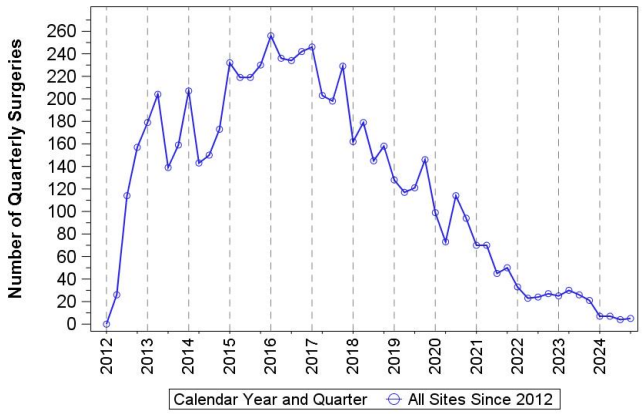


Figure 507. Utilization of the Vanguard PS (Cemented)/Maxim Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

183108	183132	183102
183128	183104	183122
183106	183124	183120
183110	183133	183116
183130	183113	183136
183126	183114	
183112	183134	

Catalog Numbers of Tibial Components Used in the Analysis

141233	141222	141238
141234	141224	141230
141232	141237	141272
141235	141225	141273
141236	141226	
141231	141221	
141223	141227	

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3.5.47 Vanguard XP/Vanguard XP

N = 547 primary cases were used for this analysis. Distribution of utilization: 13 surgeons across 13 sites used this implant combination in primary TKA cases.

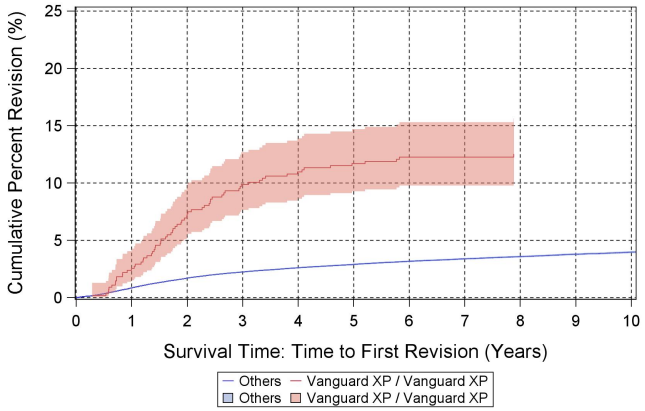


Figure 508. Cumulative Percent Revision Curve for the Vanguard XP/Vanguard XP Combination, Compared to All Other Implant Combinations in Primary TKA Cases

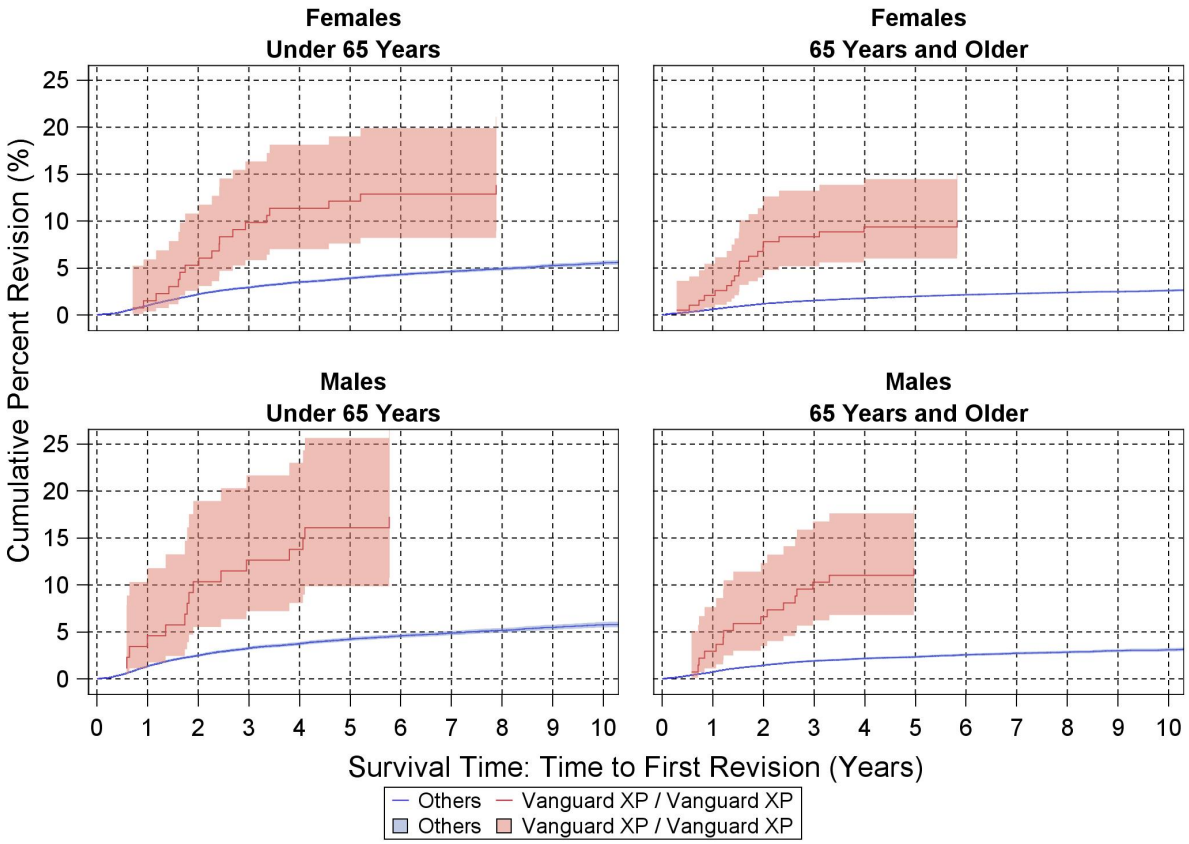


Figure 509. Cumulative Percent Revision Curve for the Vanguard XP/Vanguard XP Combination, Compared to All Other Implant Combinations in Primary TKA Cases by Age and Sex

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Table 1429. Cumulative Percent Revision and Number at Risk for the Vanguard XP/Vanguard XP Combination in Primary TKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	547	0.00 (0.00,0.00)	132	0.00 (0.00,0.00)	192	0.00 (0.00,0.00)	87	0.00 (0.00,0.00)	136	0.00 (0.00,0.00)
1	533	2.56 (1.52,4.28)	130	1.52 (0.38,5.92)	188	2.08 (0.79,5.46)	83	4.60 (1.75,11.79)	132	2.94 (1.11,7.65)
2	507	7.31 (5.42,9.84)	125	5.30 (2.56,10.80)	177	7.81 (4.79,12.62)	78	10.34 (5.52,18.94)	127	6.62 (3.50,12.33)
3	493	9.87 (7.65,12.69)	119	9.85 (5.84,16.36)	176	8.33 (5.19,13.24)	76	12.64 (7.21,21.67)	122	10.29 (6.23,16.76)
4	487	10.97 (8.62,13.90)	117	11.36 (7.01,18.14)	174	9.38 (6.01,14.47)	75	13.79 (8.08,23.01)	121	11.03 (6.80,17.63)
5	483	11.70 (9.28,14.70)	116	12.12 (7.61,19.02)	174	9.38 (6.01,14.47)	73	16.09 (9.86,25.65)	120	11.76 (7.38,18.48)
6	443	12.26 (9.78,15.31)	107	12.88 (8.21,19.90)	158	9.92 (6.44,15.11)	68	17.26 (10.78,26.98)	110	11.76 (7.38,18.48)
7	380	12.26 (9.78,15.31)	97	12.88 (8.21,19.90)	138	9.92 (6.44,15.11)	58	17.26 (10.78,26.98)	87	11.76 (7.38,18.48)
8	313	12.53 (10.01,15.63)	88	13.85 (8.95,21.10)	100	9.92 (6.44,15.11)	58	17.26 (10.78,26.98)	67	11.76 (7.38,18.48)
9	290	12.53 (10.01,15.63)	81	13.85 (8.95,21.10)	94	9.92 (6.44,15.11)	50	17.26 (10.78,26.98)	65	11.76 (7.38,18.48)
10	220	12.53 (10.01,15.63)	61	13.85 (8.95,21.10)	81	9.92 (6.44,15.11)	28	17.26 (10.78,26.98)	50	11.76 (7.38,18.48)

Table 1430. Reasons for First Revision Following Primary TKA for Vanguard XP/Vanguard XP Combination Cases

Rank	Reason for Revision	N	Percent
1	Arthrofibrosis	16	25.8
2	Pain	16	25.8
3	Dislocation/Instability	11	17.7
4	Aseptic Loosening	9	14.5
5	Joint Infection	7	11.3
6	Implant Failure	2	3.2
7	Extensor mechanism failure	1	1.6

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

Table 1431. Reasons for First Revision Between 91 and 365 days Following Primary TKA for Vanguard XP/Vanguard XP Combination Cases

Rank	Reason for Revision	N	Percent
1	Pain	3	37.5
2	Joint Infection	2	25.0
3	Aseptic Loosening	1	12.5
4	Dislocation/Instability	1	12.5
5	Arthrofibrosis	1	12.5

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Table 1432. Descriptive Statistics of Cases Receiving the Vanguard XP/Vanguard XP Combination in Primary TKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	324	59.2	
Age (years)	547	66.3 (9.1)	67 (12)
Height (cm)	547	169.2 (9.8)	168 (12.7)
Weight (kg)	547	88.5 (18.9)	86.4 (24.3)
BMI(kg/m^2)	547	30.8 (5.7)	29.8 (7.9)
Smoker - Never (%)	273	49.9	
Smoker - Previous (%)	220	40.2	
Smoker - Current (%)	52	9.5	
Smoker - Unknown (%)	2	0.4	

Table 1433. Distribution of Approach Used for Vanguard XP/Vanguard XP Combination in Primary TKA Cases

Approach	N	Percent
Medial parapatellar	345	63.1
Mid-vastus	1	0.2
Sub-vastus	201	36.7
Lateral parapatellar	0	0.0
Missing/unknown/other	0	0.0

Table 1434. Distribution of Polyethylene Used for Vanguard XP/Vanguard XP Combination Cases in Which Polyethylene Was Used in Primary TKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	0	0.0
Antioxidant XLPE	545	99.6
Missing/unknown/other	2	0.4

Table 1435. Volume of Cases by Surgeon and Site for the Vanguard XP/Vanguard XP Combination in Primary TKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	42 (123)	4 (12)
Cases per site	42 (121)	5 (9)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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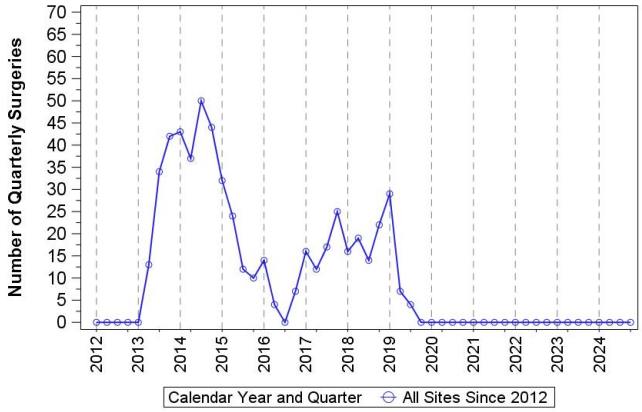


Figure 510. Utilization of the Vanguard XP/Vanguard XP Combination in Primary TKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

195203	195206	195207
195214	195910	195924
195204	195205	195202
195908	195912	195208
195215	195923	195219
195909	195922	195913
195920	195907	195925
195911	195216	195213
195919	195217	195914
195921	195218	

Catalog Numbers of Tibial Components Used in the Analysis

195755	195253	195270
195250	195252	195753
195758	195248	195247
195272	195251	195752
195757	195756	195246
195271	195759	195751
195273	195754	195245
195276	195269	
195249	195274	
195275	195277	

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3.6 UKA

The discrepancy between the number of cases listed at the beginning of an implant combination and N at year 0 in the table following the CPR figures is due to deaths. The former number is the total number of cases; the latter is the number of cases used to estimate the CPR considering deaths as censored events.

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3.6.1 Oxford/Oxford

N = 3,305 primary cases were used for this analysis. 79 surgeons across 47 sites used this implant combination in primary UKA cases.

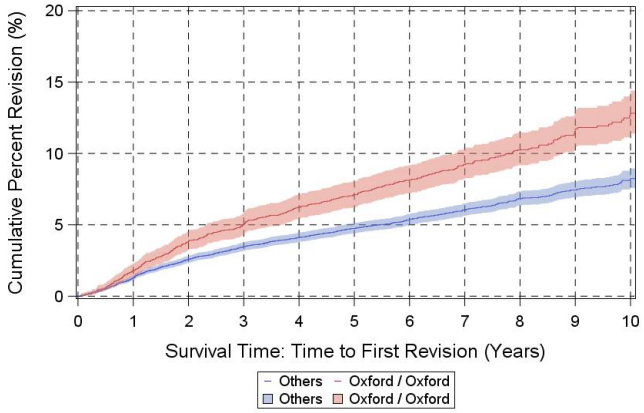


Figure 511. Cumulative Percent Revision Curve for the Oxford/Oxford Combination, Compared to All Other Implant Combinations in Primary UKA Cases

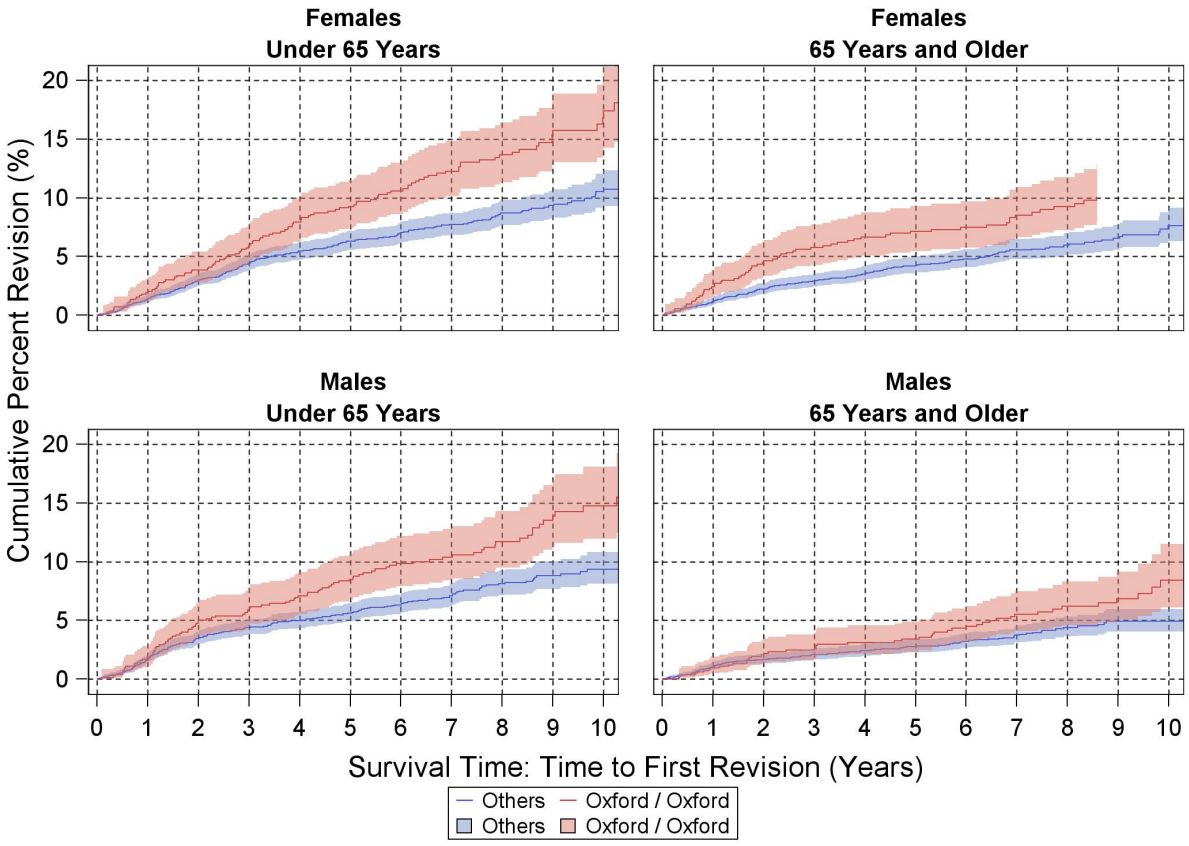


Figure 512. Cumulative Percent Revision Curve for the Oxford/Oxford Combination, Compared to All Other Implant Combinations in Primary UKA Cases by Age and Sex

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Table 1436. Cumulative Percent Revision and Number at Risk for the Oxford/Oxford Combination in Primary UKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	3,283	0.00 (0.00,0.00)	845	0.00 (0.00,0.00)	749	0.00 (0.00,0.00)	839	0.00 (0.00,0.00)	849	0.00 (0.00,0.00)
1	3,174	1.78 (1.38,2.30)	816	1.91 (1.17,3.10)	721	2.42 (1.53,3.82)	814	1.80 (1.09,2.97)	823	0.96 (0.48,1.90)
2	2,994	3.82 (3.21,4.55)	779	3.85 (2.74,5.40)	681	4.62 (3.32,6.41)	756	4.74 (3.48,6.43)	778	2.06 (1.29,3.30)
3	2,868	5.03 (4.32,5.85)	744	5.85 (4.44,7.68)	649	5.76 (4.29,7.71)	725	5.89 (4.47,7.74)	750	2.57 (1.68,3.92)
4	2,709	6.21 (5.42,7.11)	694	7.90 (6.24,9.99)	613	6.65 (5.05,8.74)	690	7.08 (5.51,9.09)	712	3.10 (2.10,4.55)
5	2,522	7.10 (6.25,8.07)	644	9.26 (7.44,11.49)	575	7.13 (5.46,9.28)	643	8.47 (6.73,10.65)	660	3.38 (2.33,4.89)
6	2,216	8.15 (7.23,9.19)	570	10.59 (8.62,12.97)	503	7.48 (5.76,9.69)	559	9.83 (7.92,12.17)	584	4.47 (3.21,6.21)
7	1,876	9.23 (8.23,10.35)	482	12.26 (10.10,14.84)	427	8.51 (6.62,10.90)	457	10.37 (8.39,12.78)	510	5.52 (4.06,7.47)
8	1,487	10.26 (9.17,11.46)	391	13.64 (11.31,16.40)	349	9.22 (7.21,11.75)	357	11.69 (9.51,14.32)	390	6.17 (4.58,8.28)
9	988	11.72 (10.49,13.10)	253	15.71 (13.03,18.87)	229	10.10 (7.92,12.83)	238	13.86 (11.28,16.97)	268	6.82 (5.06,9.16)
10	524	12.82 (11.40,14.40)	143	17.40 (14.27,21.14)	110	10.10 (7.92,12.83)	136	14.73 (11.95,18.09)	135	8.39 (6.10,11.51)

Table 1437. Reasons for First Revision Following Primary UKA for Oxford/Oxford Combination Cases

Rank	Reason for Revision	N	Percent
1	Conversion of Unicondylar Knee Arthroplasty	118	37.1
2	Aseptic Loosening	78	24.5
3	Dislocation/Instability	30	9.4
4	Implant Failure	22	6.9
5	Joint Infection	18	5.7
6	Pain	18	5.7
7	Poly liner wear	7	2.2
8	Arthrofibrosis	5	1.6
9	Patellofemoral Joint	5	1.6
10	Malalignment	4	1.3
	Unknown/missing/other	4	4.1

Table 1438. Reasons for First Revision in the First 90 Days Following Primary UKA for Oxford/Oxford Combination Cases

Rank	Reason for Revision	N	Percent
1	Conversion of Unicondylar Knee Arthroplasty	2	40.0
2	Dislocation/Instability	1	20.0
3	Implant Failure	1	20.0
4	Extensor mechanism failure	1	20.0

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Table 1439. Reasons for First Revision Between 91 and 365 days Following Primary UKA for Oxford/Oxford Combination Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	12	24.0
2	Dislocation/Instability	7	14.0
3	Joint Infection	7	14.0
4	Conversion of Unicondylar Knee Arthroplasty	7	14.0
5	Implant Failure	5	10.0
6	Pain	3	6.0
7	Peri-prosthetic fracture - Tibia	2	4.0
8	Arthrofibrosis	2	4.0
9	Extensor mechanism failure	2	4.0
10	Patellofemoral Joint	2	4.0
	Unknown/missing/other	1	2.0

Table 1440. Descriptive Statistics of Cases Receiving the Oxford/Oxford Combination in Primary UKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,601	48.4	
Age (years)	3,305	64.2 (10.3)	64 (14)
Height (cm)	3,305	170.4 (10.4)	170.2 (15.4)
Weight (kg)	3,305	91.9 (19.7)	90.4 (26.2)
BMI(kg/m^2)	3,305	31.6 (5.9)	30.7 (7.5)
Smoker - Never (%)	1,627	49.2	
Smoker - Previous (%)	1,316	39.8	
Smoker - Current (%)	336	10.2	
Smoker - Unknown (%)	26	0.8	

Table 1441. Distribution of Approach Used for Oxford/Oxford Combination in Primary UKA Cases

Approach	N	Percent
Medial parapatellar	2,999	90.7
Mid-vastus	197	6.0
Sub-vastus	28	0.8
Lateral parapatellar	8	0.2
Missing/unknown/other	73	2.2

Table 1442. Distribution of Polyethylene Used for Oxford/Oxford Combination Cases in Which Polyethylene Was Used in Primary UKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	3,264	98.8
Antioxidant XLPE	0	0.0
Missing/unknown/other	41	1.2

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Table 1443. Volume of Cases by Surgeon and Site for the Oxford/Oxford Combination in Primary UKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	41 (113)	14 (40)
Cases per site	70 (133)	19 (72)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

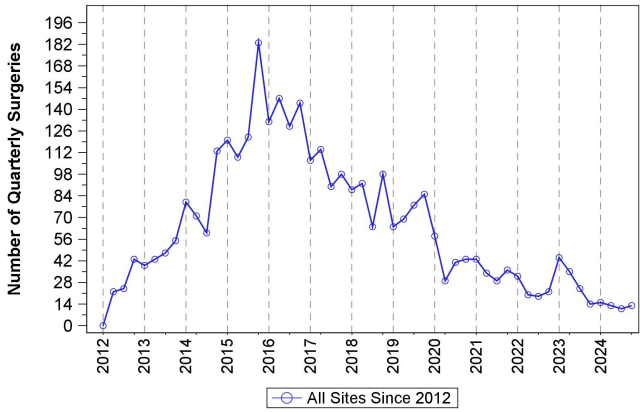


Figure 513. Utilization of the Oxford/Oxford Combination in Primary UKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

161469	161471	166942
161468	166943	166944
161470	166940	
161467	166941	

Catalog Numbers of Tibial Components Used in the Analysis

154722	154718	154776
154723	154719	154775
154721	154726	154355
154724	154727	154331
154720	159531	154370
154725	159532	

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3.6.2 Persona/Persona

N = 3,871 primary cases were used for this analysis. 97 surgeons across 57 sites used this implant combination in primary UKA cases.

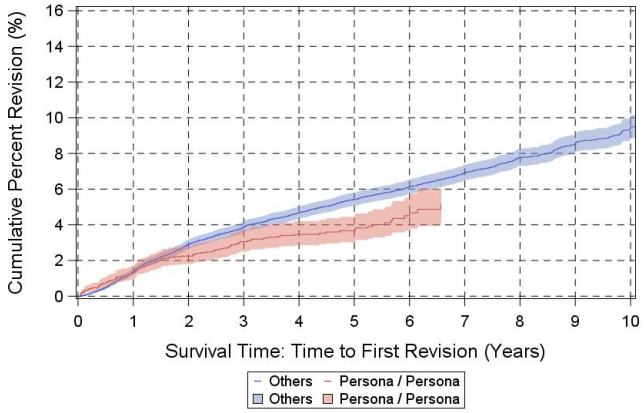


Figure 514. Cumulative Percent Revision Curve for the Persona/Persona Combination, Compared to All Other Implant Combinations in Primary UKA Cases

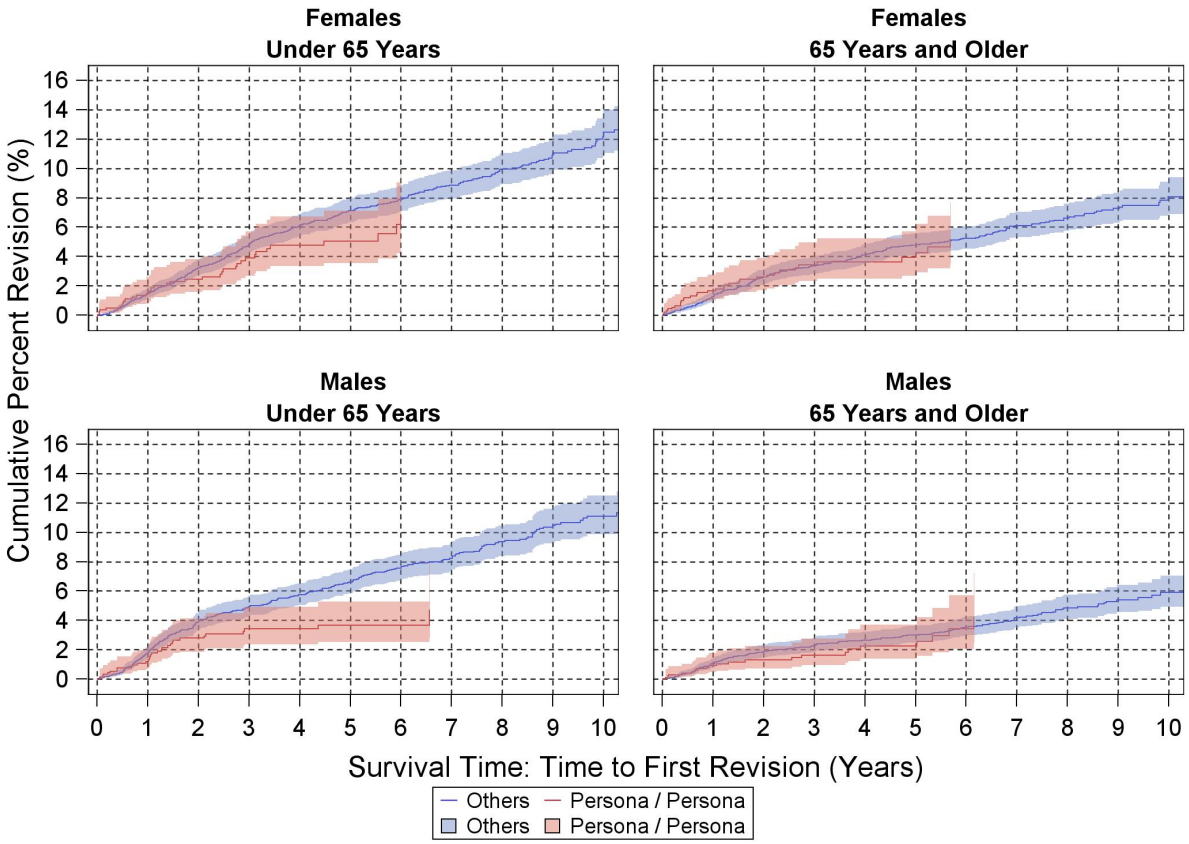


Figure 515. Cumulative Percent Revision Curve for the Persona/Persona Combination, Compared to All Other Implant Combinations in Primary UKA Cases by Age and Sex

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Table 1444. Cumulative Percent Revision and Number at Risk for the Persona/Persona Combination in Primary UKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	3,867	0.00 (0.00,0.00)	867	0.00 (0.00,0.00)	949	0.00 (0.00,0.00)	976	0.00 (0.00,0.00)	1,075	0.00 (0.00,0.00)
1	3,295	1.29 (0.97,1.72)	752	1.47 (0.84,2.58)	813	1.66 (1.00,2.74)	850	1.19 (0.66,2.13)	880	0.92 (0.48,1.76)
2	2,683	2.25 (1.80,2.81)	615	2.44 (1.56,3.80)	654	2.58 (1.70,3.90)	700	2.77 (1.87,4.11)	714	1.28 (0.73,2.25)
3	2,051	3.05 (2.50,3.73)	481	3.91 (2.68,5.69)	488	3.41 (2.34,4.97)	544	3.41 (2.36,4.93)	538	1.62 (0.95,2.75)
4	1,655	3.47 (2.85,4.21)	384	4.75 (3.33,6.74)	384	3.61 (2.49,5.23)	453	3.41 (2.36,4.93)	434	2.26 (1.38,3.70)
5	1,249	3.67 (3.02,4.45)	289	5.03 (3.54,7.13)	282	3.92 (2.69,5.69)	350	3.65 (2.53,5.26)	328	2.26 (1.38,3.70)
6	589	4.67 (3.79,5.75)	132	6.88 (4.63,10.18)	122	5.18 (3.48,7.68)	184	3.65 (2.53,5.26)	151	3.44 (2.07,5.69)
7	107	5.20 (4.10,6.58)	19	6.88 (4.63,10.18)	26	5.18 (3.48,7.68)	33	4.72 (2.79,7.93)	29	4.20 (2.43,7.22)
8	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
9	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A
10	0	N/A	0	N/A	0	N/A	0	N/A	0	N/A

Table 1445. Reasons for First Revision Following Primary UKA for Persona/Persona Combination Cases

Rank	Reason for Revision	N	Percent
1	Conversion of Unicondylar Knee Arthroplasty	48	40.7
2	Aseptic Loosening	24	20.3
3	Joint Infection	14	11.9
4	Peri-prosthetic fracture - Tibia	8	6.8
5	Dislocation/Instability	6	5.1
6	Implant Failure	5	4.2
7	Pain	5	4.2
8	Patellofemoral Joint	3	2.5
9	Malalignment	2	1.7
10	Peri-prosthetic fracture - Femur	2	1.7
	Unknown/missing/other	1	0.8

Table 1446. Reasons for First Revision in the First 90 Days Following Primary UKA for Persona/Persona Combination Cases

Rank	Reason for Revision	N	Percent
1	Joint Infection	8	50.0
2	Peri-prosthetic fracture - Tibia	6	37.5
3	Aseptic Loosening	1	6.2
4	Conversion of Unicondylar Knee Arthroplasty	1	6.2

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Table 1447. Reasons for First Revision Between 91 and 365 days Following Primary UKA for Persona/Persona Combination Cases

Rank	Reason for Revision	N	Percent
1	Conversion of Unicondylar Knee Arthroplasty	11	35.5
2	Aseptic Loosening	6	19.4
3	Implant Failure	4	12.9
4	Joint Infection	3	9.7
5	Peri-prosthetic fracture - Femur	2	6.4
6	Peri-prosthetic fracture - Tibia	2	6.4
7	Dislocation/Instability	1	3.2
8	Pain	1	3.2
9	Extensor mechanism failure	1	3.2

Table 1448. Descriptive Statistics of Cases Receiving the Persona/Persona Combination in Primary UKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,819	47	
Age (years)	3,871	65.1 (10.1)	65 (14)
Height (cm)	3,864	170.3 (10.6)	170.2 (15.2)
Weight (kg)	3,864	90.9 (19.6)	89.5 (25.3)
BMI(kg/m^2)	3,864	31.2 (5.8)	30.6 (7.3)
Smoker - Never (%)	2,054	53.1	
Smoker - Previous (%)	1,461	37.7	
Smoker - Current (%)	345	8.9	
Smoker - Unknown (%)	11	0.3	

Table 1449. Distribution of Approach Used for Persona/Persona Combination in Primary UKA Cases

Approach	N	Percent
Medial parapatellar	2,580	66.6
Mid-vastus	1,191	30.8
Sub-vastus	64	1.7
Lateral parapatellar	19	0.5
Missing/unknown/other	17	0.4

Table 1450. Distribution of Polyethylene Used for Persona/Persona Combination Cases in Which Polyethylene Was Used in Primary UKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	0	0.0
Antioxidant XLPE	3,844	99.3
Missing/unknown/other	27	0.7

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Table 1451. Volume of Cases by Surgeon and Site for the Persona/Persona Combination in Primary UKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	39 (94)	11 (24)
Cases per site	67 (116)	22 (75)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

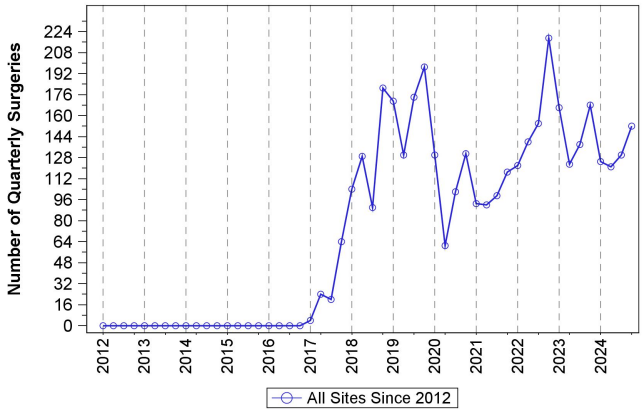


Figure 516. Utilization of the Persona/Persona Combination in Primary UKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

42558000401	42558000502	42558000701
42558000402	42558000601	42558000702
42558000301	42558000201	42558000102
42558000302	42558000202	42558000101
42558000501	42558000602	

Catalog Numbers of Tibial Components Used in the Analysis

42538000601	42538000702	42538000902
42538000501	42538000801	42538000901
42538000602	42538000401	42538000302
42538000502	42538000802	42538000301
42538000701	42538000402	

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3.6.3 Restoris MCK/Restoris MCK

N = 7,871 primary cases were used for this analysis. 118 surgeons across 31 sites used this implant combination in primary UKA cases.

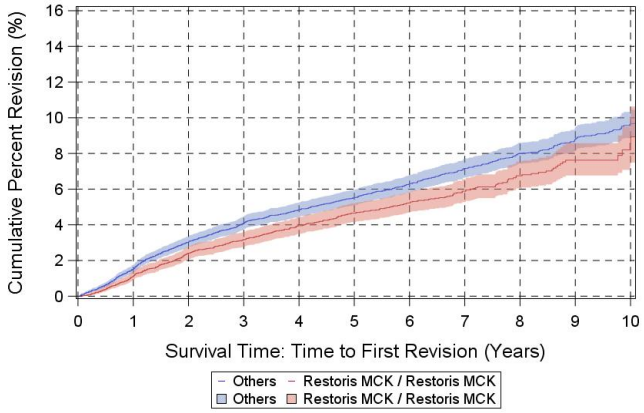


Figure 517. Cumulative Percent Revision Curve for the Restoris MCK/Restoris MCK Combination, Compared to All Other Implant Combinations in Primary UKA Cases

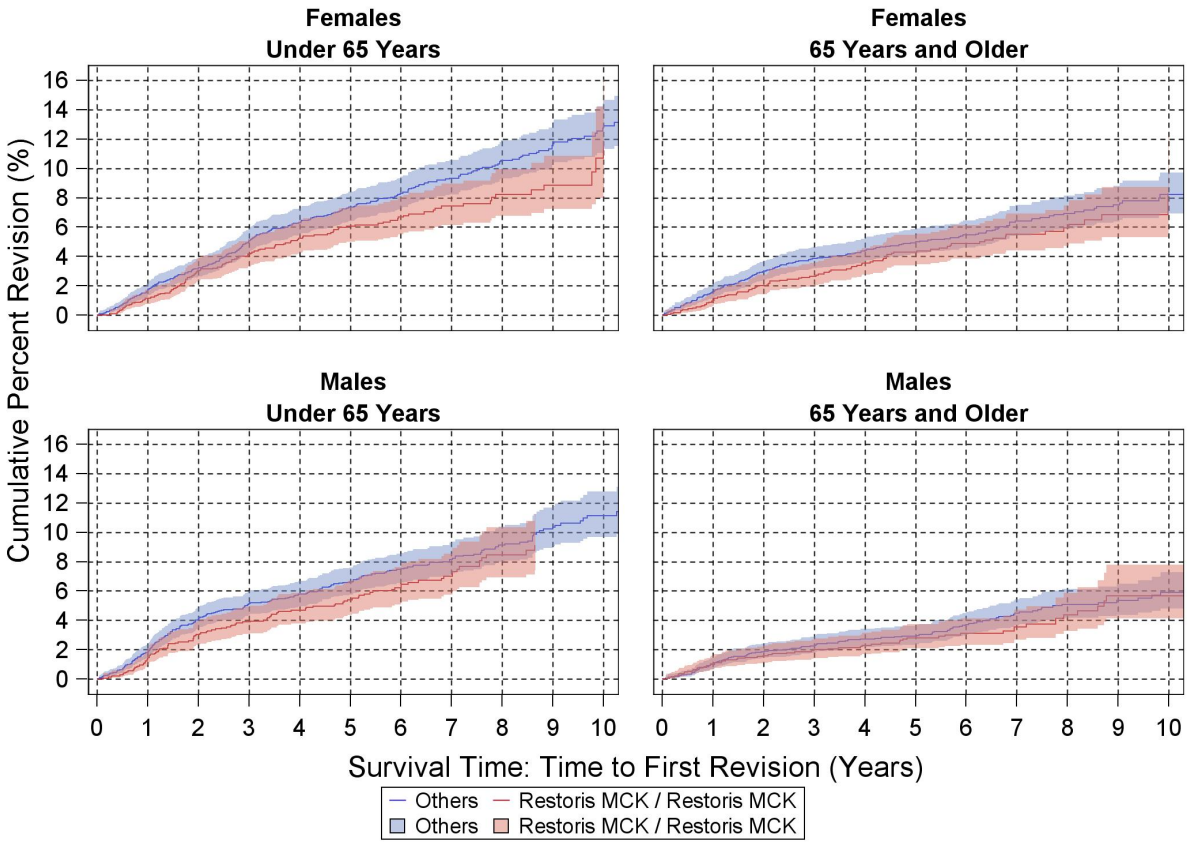


Figure 518. Cumulative Percent Revision Curve for the Restoris MCK/Restoris MCK Combination, Compared to All Other Implant Combinations in Primary UKA Cases by Age and Sex

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Table 1452. Cumulative Percent Revision and Number at Risk for the Restoris MCK/Restoris MCK Combination in Primary UKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	7,854	0.00 (0.00,0.00)	2,046	0.00 (0.00,0.00)	1,930	0.00 (0.00,0.00)	1,882	0.00 (0.00,0.00)	1,992	0.00 (0.00,0.00)
1	7,093	1.11 (0.90,1.38)	1,846	1.13 (0.75,1.71)	1,748	0.93 (0.58,1.49)	1,720	1.40 (0.95,2.06)	1,775	1.01 (0.64,1.57)
2	6,315	2.41 (2.07,2.79)	1,634	3.01 (2.32,3.90)	1,563	1.99 (1.43,2.77)	1,541	3.02 (2.31,3.94)	1,573	1.59 (1.11,2.28)
3	5,605	3.17 (2.78,3.62)	1,438	4.15 (3.31,5.20)	1,394	2.65 (1.98,3.53)	1,369	3.87 (3.05,4.92)	1,401	1.99 (1.43,2.77)
4	4,856	3.95 (3.50,4.45)	1,236	5.22 (4.25,6.41)	1,212	3.54 (2.74,4.58)	1,175	4.69 (3.76,5.85)	1,233	2.29 (1.68,3.13)
5	4,241	4.65 (4.15,5.21)	1,067	6.06 (4.98,7.36)	1,086	4.29 (3.38,5.45)	1,009	5.40 (4.37,6.67)	1,079	2.80 (2.09,3.75)
6	3,409	5.23 (4.68,5.83)	855	6.67 (5.51,8.06)	870	4.87 (3.87,6.13)	808	6.22 (5.08,7.62)	876	3.11 (2.33,4.14)
7	2,420	5.88 (5.27,6.55)	604	7.43 (6.15,8.96)	616	5.52 (4.40,6.91)	588	7.00 (5.73,8.55)	612	3.55 (2.67,4.72)
8	1,594	6.75 (6.04,7.54)	415	8.22 (6.77,9.96)	392	5.94 (4.71,7.48)	384	8.45 (6.90,10.33)	403	4.37 (3.25,5.87)
9	814	7.62 (6.76,8.58)	224	8.86 (7.22,10.86)	207	6.82 (5.32,8.73)	186	9.12 (7.37,11.26)	197	5.68 (4.12,7.79)
10	249	8.56 (7.27,10.07)	81	10.68 (8.00,14.19)	62	8.30 (5.54,12.33)	56	9.12 (7.37,11.26)	50	5.68 (4.12,7.79)

Table 1453. Reasons for First Revision Following Primary UKA for Restoris MCK/Restoris MCK Combination Cases

Rank	Reason for Revision	N	Percent
1	Conversion of Unicondylar Knee Arthroplasty	153	41.2
2	Aseptic Loosening	92	24.8
3	Pain	29	7.8
4	Dislocation/Instability	28	7.5
5	Implant Failure	21	5.7
6	Joint Infection	20	5.4
7	Peri-prosthetic fracture - Tibia	7	1.9
8	Arthrofibrosis	6	1.6
9	Poly liner wear	6	1.6
10	Patellofemoral Joint	4	1.1
	Unknown/missing/other	2	1.3

Table 1454. Reasons for First Revision in the First 90 Days Following Primary UKA for Restoris MCK/Restoris MCK Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Tibia	3	37.5
2	Joint Infection	2	25.0
3	Implant Failure	1	12.5
4	Arthrofibrosis	1	12.5
5	Conversion of Unicondylar Knee Arthroplasty	1	12.5

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Table 1455. Reasons for First Revision Between 91 and 365 days Following Primary UKA for Restoris MCK/Restoris MCK Combination Cases

Rank	Reason for Revision	N	Percent
1	Conversion of Unicondylar Knee Arthroplasty	24	32.0
2	Aseptic Loosening	15	20.0
3	Joint Infection	11	14.7
4	Dislocation/Instability	9	12.0
5	Pain	5	6.7
6	Peri-prosthetic fracture - Tibia	4	5.3
7	Implant Failure	3	4.0
8	Arthrofibrosis	2	2.7
9	Poly liner wear	1	1.3
10	Metal Reaction/Metallosis	1	1.3

Table 1456. Descriptive Statistics of Cases Receiving the Restoris MCK/Restoris MCK Combination in Primary UKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	3,985	50.6	
Age (years)	7,871	64.3 (9.8)	65 (13)
Height (cm)	7,871	170.1 (10.5)	170.2 (15.2)
Weight (kg)	7,871	90.4 (19.2)	88.8 (25.2)
BMI(kg/m^2)	7,871	31.2 (5.7)	30.5 (7.4)
Smoker - Never (%)	4,268	54.2	
Smoker - Previous (%)	2,902	36.9	
Smoker - Current (%)	684	8.7	
Smoker - Unknown (%)	17	0.2	

Table 1457. Distribution of Approach Used for Restoris MCK/Restoris MCK Combination in Primary UKA Cases

Approach	N	Percent
Medial parapatellar	5,662	71.9
Mid-vastus	1,602	20.4
Sub-vastus	31	0.4
Lateral parapatellar	309	3.9
Missing/unknown/other	267	3.4

Table 1458. Distribution of Polyethylene Used for Restoris MCK/Restoris MCK Combination Cases in Which Polyethylene Was Used in Primary UKA Cases

Polyethylene type	N	Percent
UHMWPE	1,202	15.3
XLPE	6,513	82.7
Antioxidant XLPE	1	0.0
Missing/unknown/other	155	2.0

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Table 1459. Volume of Cases by Surgeon and Site for the Restoris MCK/Restoris MCK Combination in Primary UKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	66 (116)	24 (56)
Cases per site	253 (379)	71 (306)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

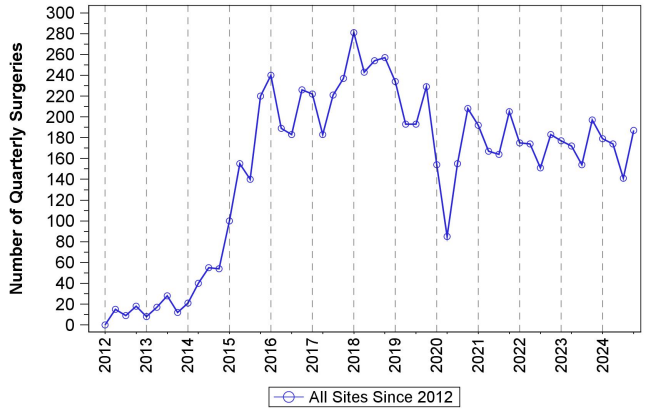


Figure 519. Utilization of the Restoris MCK/Restoris MCK Combination in Primary UKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

180503	180506	180501
180504	180516	180511
180513	180502	180518
180514	180512	
180505	180507	
180515	180517	

Catalog Numbers of Tibial Components Used in the Analysis

180604	180606	180618
180614	180616	180608
180605	180602	180611
180613	180607	180601
180603	180612	1807272
180615	180617	

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3.6.4 ZUK/ZUK

This implant (Zimmer Unicondylar Knee) was formerly known as the Zimmer High Flex Knee. N = 3,080 primary cases were used for this analysis. 117 surgeons across 47 sites used this implant combination in primary UKA cases.

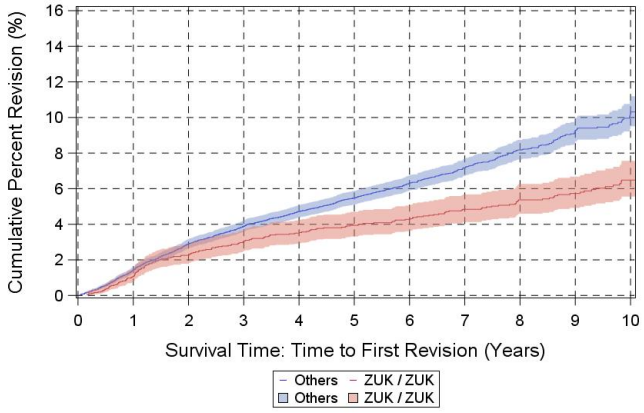


Figure 520. Cumulative Percent Revision Curve for the ZUK/ZUK Combination, Compared to All Other Implant Combinations in Primary UKA Cases

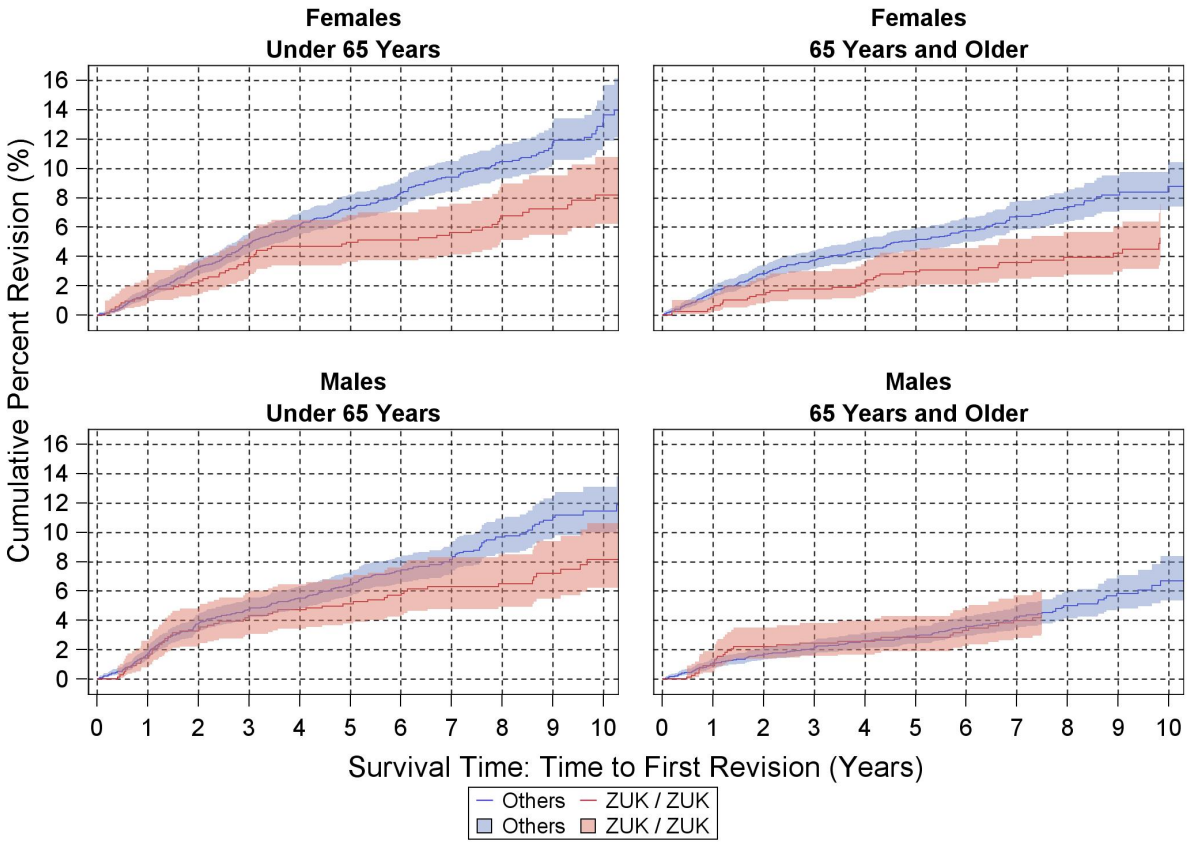


Figure 521. Cumulative Percent Revision Curve for the ZUK/ZUK Combination, Compared to All Other Implant Combinations in Primary UKA Cases by Age and Sex

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Table 1460. Cumulative Percent Revision and Number at Risk for the ZUK/ZUK Combination in Primary UKA Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	3,061	0.00 (0.00,0.00)	727	0.00 (0.00,0.00)	790	0.00 (0.00,0.00)	766	0.00 (0.00,0.00)	778	0.00 (0.00,0.00)
1	3,028	1.08 (0.77,1.51)	716	1.51 (0.84,2.72)	786	0.51 (0.19,1.34)	755	1.44 (0.80,2.58)	771	0.90 (0.43,1.88)
2	2,992	2.25 (1.78,2.85)	711	2.20 (1.35,3.57)	779	1.39 (0.77,2.50)	741	3.26 (2.22,4.79)	761	2.19 (1.36,3.49)
3	2,964	3.04 (2.49,3.71)	700	3.71 (2.56,5.37)	775	1.77 (1.05,2.97)	731	4.31 (3.08,6.01)	758	2.44 (1.56,3.80)
4	2,889	3.50 (2.90,4.21)	685	4.68 (3.36,6.48)	753	2.16 (1.35,3.45)	713	4.70 (3.42,6.46)	738	2.57 (1.67,3.96)
5	2,735	3.94 (3.30,4.69)	658	4.96 (3.61,6.82)	708	2.95 (1.97,4.40)	682	5.11 (3.76,6.93)	687	2.84 (1.88,4.28)
6	2,485	4.27 (3.61,5.06)	601	5.11 (3.73,6.99)	634	3.08 (2.08,4.57)	641	5.68 (4.24,7.59)	609	3.30 (2.24,4.86)
7	2,205	4.84 (4.12,5.68)	548	5.61 (4.15,7.58)	563	3.57 (2.46,5.17)	572	6.28 (4.75,8.28)	522	3.99 (2.78,5.70)
8	1,863	5.37 (4.59,6.27)	468	6.78 (5.10,8.97)	484	3.95 (2.75,5.65)	472	6.47 (4.91,8.51)	439	4.38 (3.08,6.19)
9	1,400	5.73 (4.91,6.68)	356	7.22 (5.47,9.51)	364	4.20 (2.93,6.00)	356	7.18 (5.48,9.39)	324	4.38 (3.08,6.19)
10	920	6.48 (5.55,7.56)	239	8.18 (6.20,10.75)	225	5.25 (3.64,7.54)	235	8.13 (6.20,10.63)	221	4.38 (3.08,6.19)

Table 1461. Reasons for First Revision Following Primary UKA for ZUK/ZUK Combination Cases

Rank	Reason for Revision	N	Percent
1	Conversion of Unicondylar Knee Arthroplasty	85	52.5
2	Aseptic Loosening	22	13.6
3	Implant Failure	15	9.3
4	Pain	9	5.6
5	Joint Infection	7	4.3
6	Dislocation/Instability	6	3.7
7	Malalignment	3	1.9
8	Patellofemoral Joint	3	1.9
9	Poly liner wear	3	1.9
10	Extensor mechanism failure	2	1.2
	Unknown/missing/other	2	4.3

Table 1462. Reasons for First Revision in the First 90 Days Following Primary UKA for ZUK/ZUK Combination Cases

Rank	Reason for Revision	N	Percent
1	Peri-prosthetic fracture - Femur	1	33.3
2	Peri-prosthetic fracture - Tibia	1	33.3
3	Conversion of Unicondylar Knee Arthroplasty	1	33.3

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Table 1463. Reasons for First Revision Between 91 and 365 days Following Primary UKA for ZUK/ZUK Combination Cases

Rank	Reason for Revision	N	Percent
1	Conversion of Unicondylar Knee Arthroplasty	7	35.0
2	Joint Infection	5	25.0
3	Aseptic Loosening	2	10.0
4	Implant Failure	2	10.0
5	Pain	2	10.0
6	Osteolysis	1	5.0
7	Extensor mechanism failure	1	5.0

Table 1464. Descriptive Statistics of Cases Receiving the ZUK/ZUK Combination in Primary UKA Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	1,522	49.4	
Age (years)	3,080	64.8 (10.6)	65 (15)
Height (cm)	3,063	170 (10.5)	170 (15.2)
Weight (kg)	3,064	89.2 (19.3)	88 (26.6)
BMI(kg/m^2)	3,063	30.8 (5.8)	30 (7.6)
Smoker - Never (%)	1,506	48.9	
Smoker - Previous (%)	1,234	40.1	
Smoker - Current (%)	312	10.1	
Smoker - Unknown (%)	28	0.9	

Table 1465. Distribution of Approach Used for ZUK/ZUK Combination in Primary UKA Cases

Approach	N	Percent
Medial parapatellar	1,916	62.2
Mid-vastus	906	29.4
Sub-vastus	52	1.7
Lateral parapatellar	158	5.1
Missing/unknown/other	48	1.6

Table 1466. Distribution of Polyethylene Used for ZUK/ZUK Combination Cases in Which Polyethylene Was Used in Primary UKA Cases

Polyethylene type	N	Percent
UHMWPE	0	0.0
XLPE	1,303	42.3
Antioxidant XLPE	1,742	56.6
Missing/unknown/other	35	1.1

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Table 1467. Volume of Cases by Surgeon and Site for the ZUK/ZUK Combination in Primary UKA Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	26 (54)	7 (19)
Cases per site	65 (90)	31 (91)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

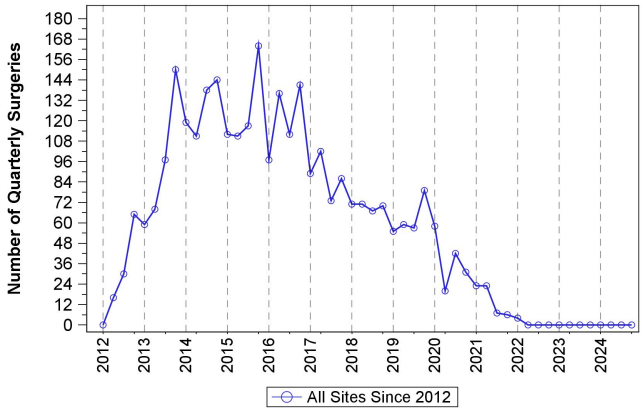


Figure 522. Utilization of the ZUK/ZUK Combination in Primary UKA Cases

Catalog Numbers of Femoral Components Used in the Analysis

584201402	584201301	584201701
584201401	584201602	584201702
584201501	584201601	584201102
584201502	584201201	584201101
584201302	584201202	

Catalog Numbers of Tibial Components Used in the Analysis

584200301	584206108	584206210
584200402	584205108	584205110
584200302	584207108	584205210
584200401	584200102	584206110
584200502	584206208	584206112
584200501	584207208	584207212
584200202	584200101	584205210
584200201	584204208	584206210
584200601	584208108	
584200602	584204108	
584205208	584208208	

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3.7 PFJ

The discrepancy between the number of cases listed at the beginning of an implant and N at year 0 in the table following the CPR figures is due to deaths. The former number is the total number of cases; the latter is the number of cases used to estimate the CPR considering deaths as censored events.

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3.7.1 Gender Solutions PFJ

N = 531 primary cases were used for this analysis. Distribution of utilization: 70 surgeons across 45 sites used this implant combination in primary PFJ cases.

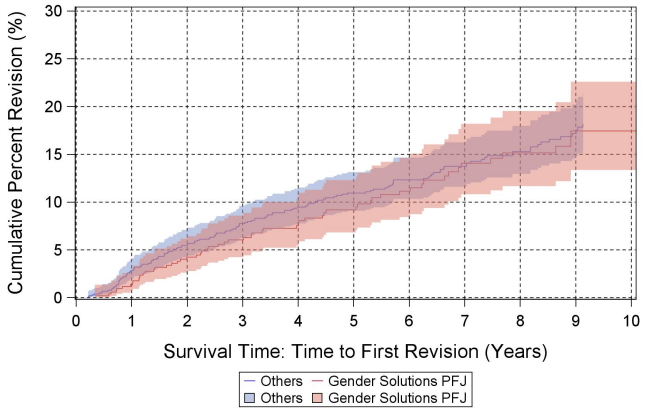


Figure 523. Cumulative Percent Revision Curve for the Gender Solutions PFJ Femoral Component, Compared to All Other Femoral Components in Primary PFJ Cases

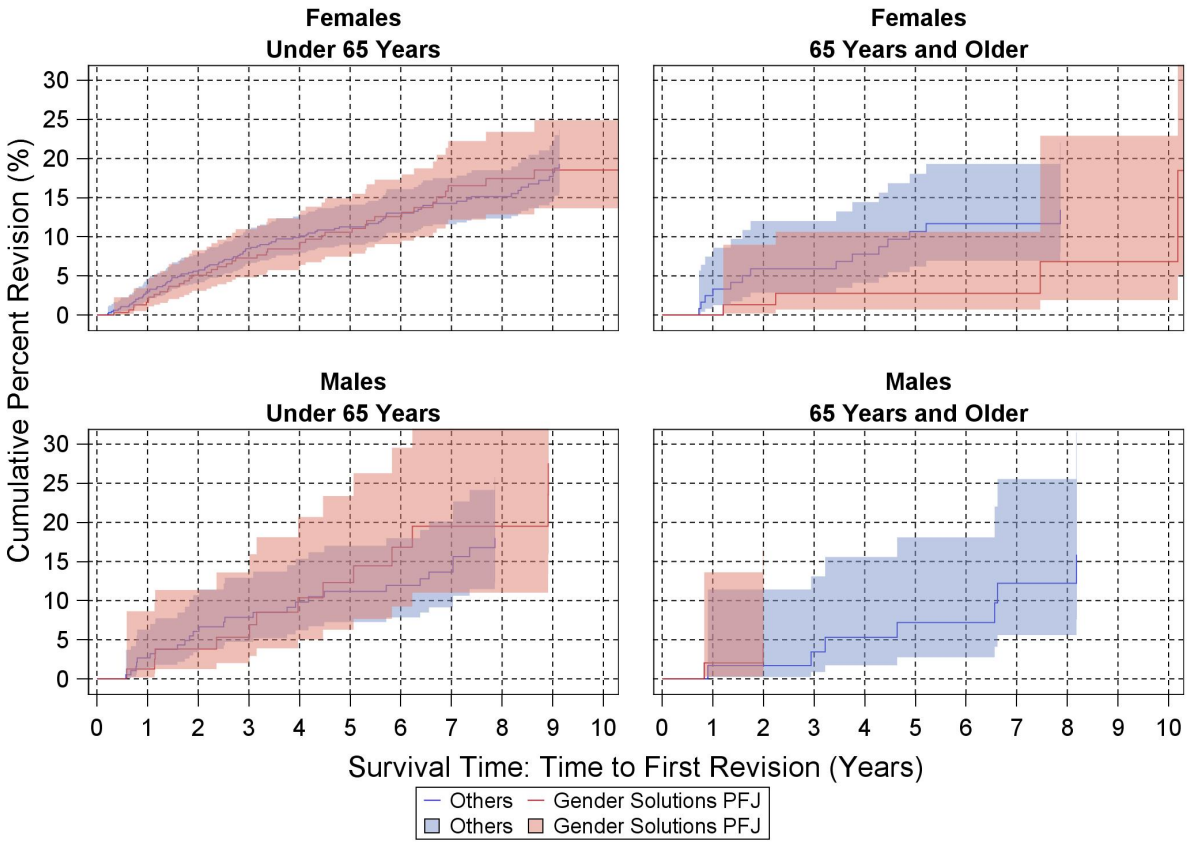


Figure 524. Cumulative Percent Revision Curve for the Gender Solutions PFJ Femoral Component, Compared to All Other Femoral Components in Primary PFJ Cases by Age and Sex

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Table 1468. Cumulative Percent Revision and Number at Risk for the Gender Solutions PFJ Femoral Component in Primary PFJ Cases, Overall and by Age and Sex (Numerical Values)

Year	All cases		Females Under 65		Females 65+		Males Under 65		Males 65+	
	N	CPR	N	CPR	N	CPR	N	CPR	N	CPR
0	531	0.00 (0.00,0.00)	318	0.00 (0.00,0.00)	80	0.00 (0.00,0.00)	83	0.00 (0.00,0.00)	50	0.00 (0.00,0.00)
1	499	1.36 (0.65,2.84)	296	1.63 (0.68,3.87)	77	0.00 (0.00,0.00)	78	1.27 (0.18,8.65)	48	2.04 (0.29,13.62)
2	442	4.24 (2.79,6.44)	265	5.08 (3.09,8.29)	71	1.32 (0.19,8.97)	66	3.81 (1.25,11.36)	40	4.43 (1.12,16.66)
3	393	6.05 (4.24,8.59)	243	7.28 (4.81,10.96)	58	2.77 (0.70,10.64)	59	5.32 (2.02,13.60)	33	4.43 (1.12,16.66)
4	346	7.53 (5.45,10.35)	221	8.44 (5.73,12.35)	52	2.77 (0.70,10.64)	48	10.36 (5.03,20.68)	25	4.43 (1.12,16.66)
5	295	9.19 (6.83,12.31)	188	10.58 (7.46,14.91)	45	2.77 (0.70,10.64)	42	12.30 (6.27,23.36)	20	4.43 (1.12,16.66)
6	246	11.14 (8.44,14.64)	159	12.56 (9.06,17.30)	36	2.77 (0.70,10.64)	34	16.82 (9.23,29.53)	17	4.43 (1.12,16.66)
7	187	14.07 (10.82,18.20)	114	16.53 (12.18,22.23)	29	2.77 (0.70,10.64)	28	19.50 (11.01,33.20)	16	4.43 (1.12,16.66)
8	139	15.15 (11.67,19.54)	85	17.43 (12.85,23.40)	19	6.82 (1.90,22.90)	24	19.50 (11.01,33.20)	11	4.43 (1.12,16.66)
9	99	17.45 (13.37,22.61)	60	18.53 (13.64,24.90)	13	6.82 (1.90,22.90)	18	27.55 (15.97,44.95)	*	4.43 (1.12,16.66)
10	65	17.45 (13.37,22.61)	39	18.53 (13.64,24.90)	*	6.82 (1.90,22.90)	14	27.55 (15.97,44.95)	*	4.43 (1.12,16.66)

* Denotes that the number of cases is between 1 and 10.

Table 1469. Reasons for First Revision Following Primary PFJ for Gender Solutions PFJ Femoral Component Cases

Rank	Reason for Revision	N	Percent
1	Patellofemoral Joint	16	25.8
2	Conversion of Unicondylar Knee Arthroplasty	15	24.2
3	Pain	13	21.0
4	Implant Failure	6	9.7
5	Aseptic Loosening	4	6.5
6	Dislocation/Instability	3	4.8
7	Joint Infection	2	3.2
8	Arthrofibrosis	1	1.6
9	Metal Reaction/Metallosis	1	1.6
10	Poly liner wear	1	1.6

There were no revisions within 90 days, so no table of reasons for revisions during this time period is included.

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Table 1470. Reasons for First Revision Between 91 and 365 days Following Primary PFJ for Gender Solutions PFJ Femoral Component Cases

Rank	Reason for Revision	N	Percent
1	Aseptic Loosening	2	28.6
2	Patellofemoral Joint	2	28.6
3	Pain	1	14.3
4	Arthrofibrosis	1	14.3
5	Conversion of Unicondylar Knee Arthroplasty	1	14.3

Table 1471. Descriptive Statistics of Cases Receiving the Gender Solutions PFJ Femoral Component in Primary PFJ Cases

Quantity	N	Mean (SD)	Median (IQR)
Female (%)	398	75	
Age (years)	531	55.5 (12)	55 (18)
Height (cm)	529	169.1 (10)	167.6 (12.7)
Weight (kg)	529	85.7 (20.5)	84.4 (28.5)
BMI(kg/m^2)	529	29.8 (6.1)	29.3 (8.3)
Smoker - Never (%)	299	56.3	
Smoker - Previous (%)	166	31.3	
Smoker - Current (%)	64	12.1	
Smoker - Unknown (%)	2	0.4	

Table 1472. Distribution of Approach Used for Gender Solutions PFJ Femoral Component in Primary PFJ Cases

Approach	N	Percent
Medial parapatellar	476	89.6
Mid-vastus	15	2.8
Sub-vastus	3	0.6
Lateral parapatellar	21	4.0
Missing/unknown/other	16	3.0

Table 1473. Volume of Cases by Surgeon and Site for the Gender Solutions PFJ Femoral Component in Primary PFJ Cases

Quantity	Mean (SD)	Median (IQR)
Cases per surgeon	7 (10)	4 (7)
Cases per site	11 (15)	6 (13)

The mean is substantially greater than the median, which suggests some high-volume surgeons this distribution.

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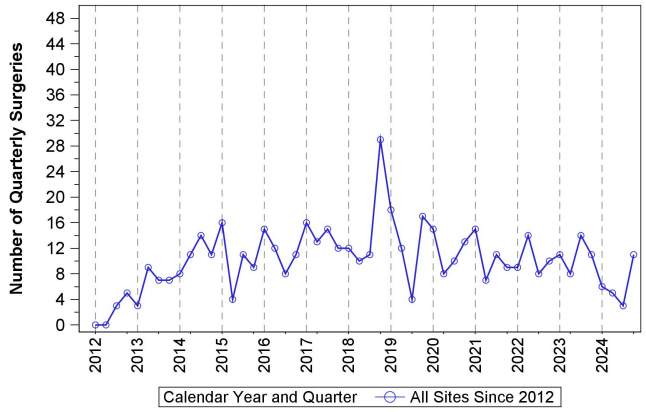


Figure 525. Utilization of the Gender Solutions PFJ Femoral Component in Primary PFJ Cases

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Catalog Numbers of Femoral Components Used in the Analysis

592601302	592601402	592601502
592601301	592601101	592601501
592601202	592601401	
592601201	592601102	

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Appendices

Appendix A

Statistical Methods

This appendix is intended to provide a clear and precise description of the analytical methods used to generate figures, tables, and text in this report. It is written primarily for registry methodologists. It can be used as a reference for readers most interested in clinical aspects of arthroplasty.

A.1 MARCQI Cohort: Qualifying Patients

MARCQI was designed to improve quality of care for elective primary total hip and knee arthroplasty and associated revisions, excluding treatment for trauma cases. Therefore, MARCQI includes:

1. *Elective primary*. All primary hip and knee joint replacements for which the procedure has been planned and the patient undergoes the surgery for a non-emergent condition.
2. *Urgent/emergent*. Rare situations may occur when the patient has a scheduled elective primary procedure but enters the hospital through the emergency room or clinic. These cases are occasionally classified or scheduled by the hospital as urgent or emergent. If the case proceeds under this designation and the original diagnosis and plan are otherwise unchanged then they may be included. This situation is very uncommon.
3. *Revision*. All revision hip and knee replacements regardless of diagnosis are included.
4. *Trauma*. Primary trauma cases do not qualify. The clinical data abstractor (CDA) reviews the case to determine if an urgent/emergent qualifying revision of a knee or hip was performed.

A.2 Time Window, Inclusion, and Exclusion Criteria for the Implant-specific Data Chapter

This report covers MARCQI activities from 02/15/2012 to 12/31/2024, and includes both primary and revision(s) cases.

A.3 Events for Descriptive Statistics and Implant Survival Analysis

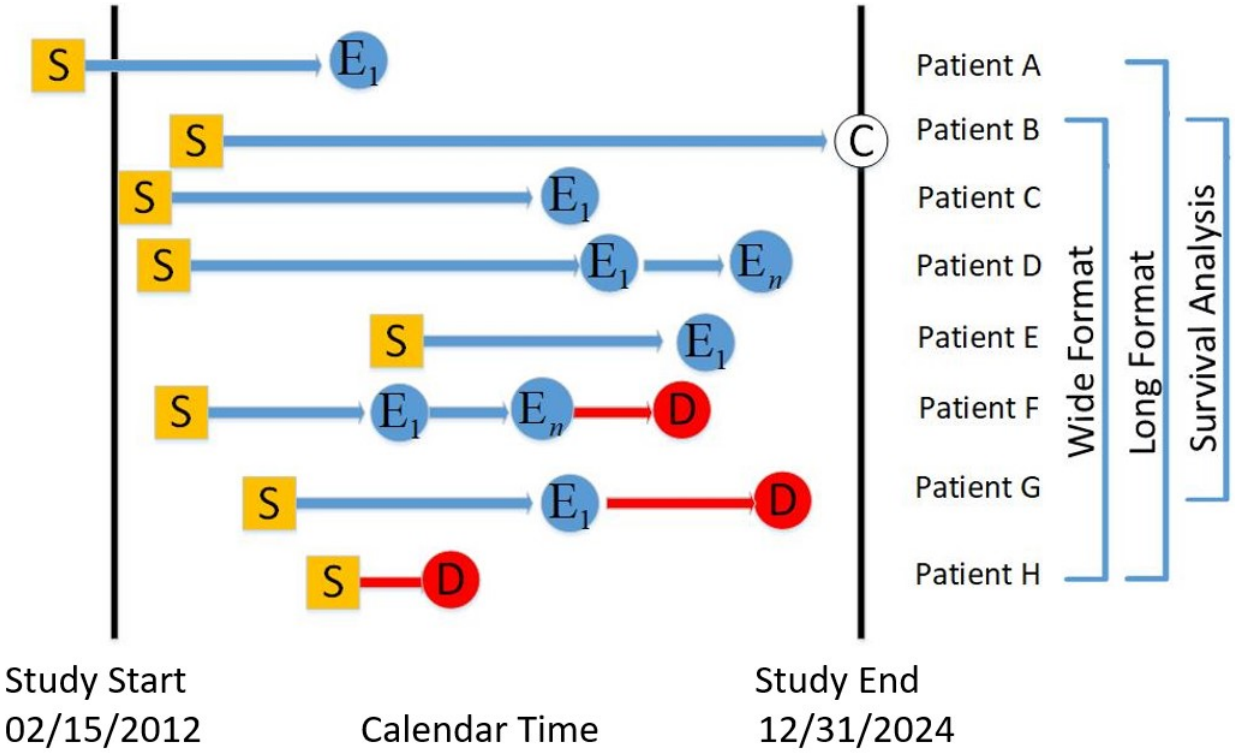


Figure 526. Illustration of Event Flow and Eight Types of Patients in MARCQI Database

There are many different combinations of events that can occur for each patient within and outside the 2/15/2012 - 12/31/2024 time window. For example, a patient could have a primary and revision, have a primary and then die, or have a primary and have no revision before 12/31/2024 but remain alive. It is important to understand each when interpreting data in this report, especially time-to-revision and the resulting cumulative percent revision curves and numbers. Figure 526 illustrates the possible events (*e.g.*, revision) for the report window using eight types of patients. Symbols in the figure represent start of a primary surgery (S), single event (E_1) and/or multiple events (E_n), death (D), and censoring (C). The figure helps define important concepts used in MARCQI analyses:

1. *Study time window*. All primary and revision surgeries performed between 02/15/2012 to 12/31/2024 are included. The revision event might be registered after 12/31/2024 in the database, but those post-study end event(s) do NOT qualify for implant survival analysis and were censored at the end of the study. In addition, primary surgeries performed prior to 02/15/2012 are not included in the revision analysis.

2. *Qualified patients*. All eight types of patients qualify for volume reporting, including patient A and patient H. Patient B through patient G qualified for implant survival analysis (thus patients A and H are disqualified). Patient C and patient E are of the same type, even though starting time varies. Deaths are addressed in (7) below. Patient type A, included in long format dataset, is only qualified to calculate total volumes over time. Patient types B through H are included in the wide format dataset as primary surgery cases.

3. *Censoring*. The patients who did not have the event as of the study-end are considered right-censored. These patients provide some information, but not complete information, *e.g.*, Patient B. Patient A is excluded in implant survival analysis because the surgery occurred prior to the onset of the MARCQI registry; thus, no left-censoring is considered in this report.

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4. *Time-to-event*. Number of days elapsed from primary surgery to the event of interest (*e.g.*, first revision following surgery).

5. *Qualified revision events for implant survival analysis*. First event E_1 after primary surgery (thus events E_2, E_3, ..., E_n disqualified). However, E_2, E_3, ..., E_n are counted in the total volume calculations.

6. *Lost-to-follow-up (LTFU)*. This report does not consider LTFU (*e.g.*, due to geographical relocation of patient) as an event of interest. Instead, if MARCQI has no follow-up or death information until study-end, that patient is treated as a right-censoring at the study-end.

7. *Handling of deaths*. The MARCQI data abstractor records deaths within 90 days of surgery. A national death index is used to identify deaths after 90 days. In the time window used for this report, the overall and the 90-day death rates after primary THA surgeries are about 0.67% and 0.18% respectively, including patient types F, G, and H. The overall and 90-day death rates without any event(s) after primary surgery are approximately 0.64% and 0.18% respectively, like patient type H. Following primary TKA cases, the overall death rate is 0.64% and 0.62% with and without any revision event(s), respectively. The 90-day death rate is 0.14% and 0.14% with and without any revision event(s), respectively. Patients A and H are treated as qualified patients (in the denominator) in calculating descriptive statistics, implant combinations, surgeon volumes, and site volumes. However, they are excluded in implant survival analysis. Patients that die after a revision event (like patient F and G) are included in the implant survival analysis since those patients contributed information of time-to-first revision. This strategy ensures minimal information loss. Kandala *et al.* (2015) showed that low death rate does not substantially affect the implant survival analysis. Thus, in the report, the patient type A and H are excluded in the implant survival analysis without conducting competing risk analysis and left censoring.

Finally, for purposes of this report, “unit” is a general term and context specific and may refer to the surgeon, hospital, or implant that a patient is embedded.

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A.4 MARCQI Definition of Revision

For the purposes of MARCQI revision analyses, a revision is defined to be a procedure that involves either (a) removing and replacing some, or all, of the joint replacement components or (b) adding a component. This applies to all MARCQI qualifying cases. There are two situations likely to cause confusion that need to be clarified: (1) adding a cup after a hemi-arthroplasty is a conversion, which is a primary case according to MARCQI criteria; and (2) adding a unicompartmental knee to another compartment of a knee having pre-existing unicompartmental components is considered another primary case rather than a revision.

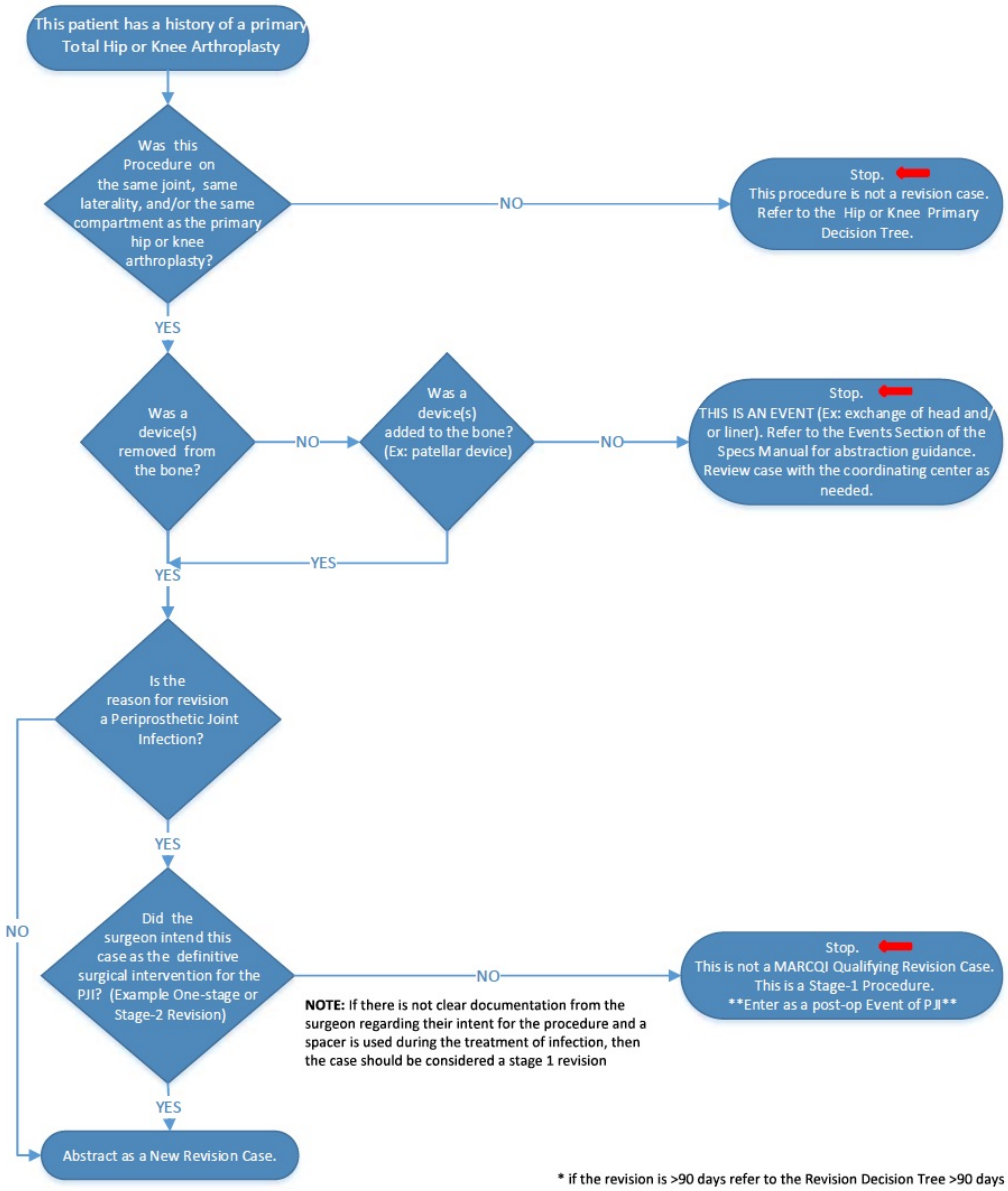


Figure 527. Flowchart of Method Used to Identify Revisions Within 90 Days of Surgery

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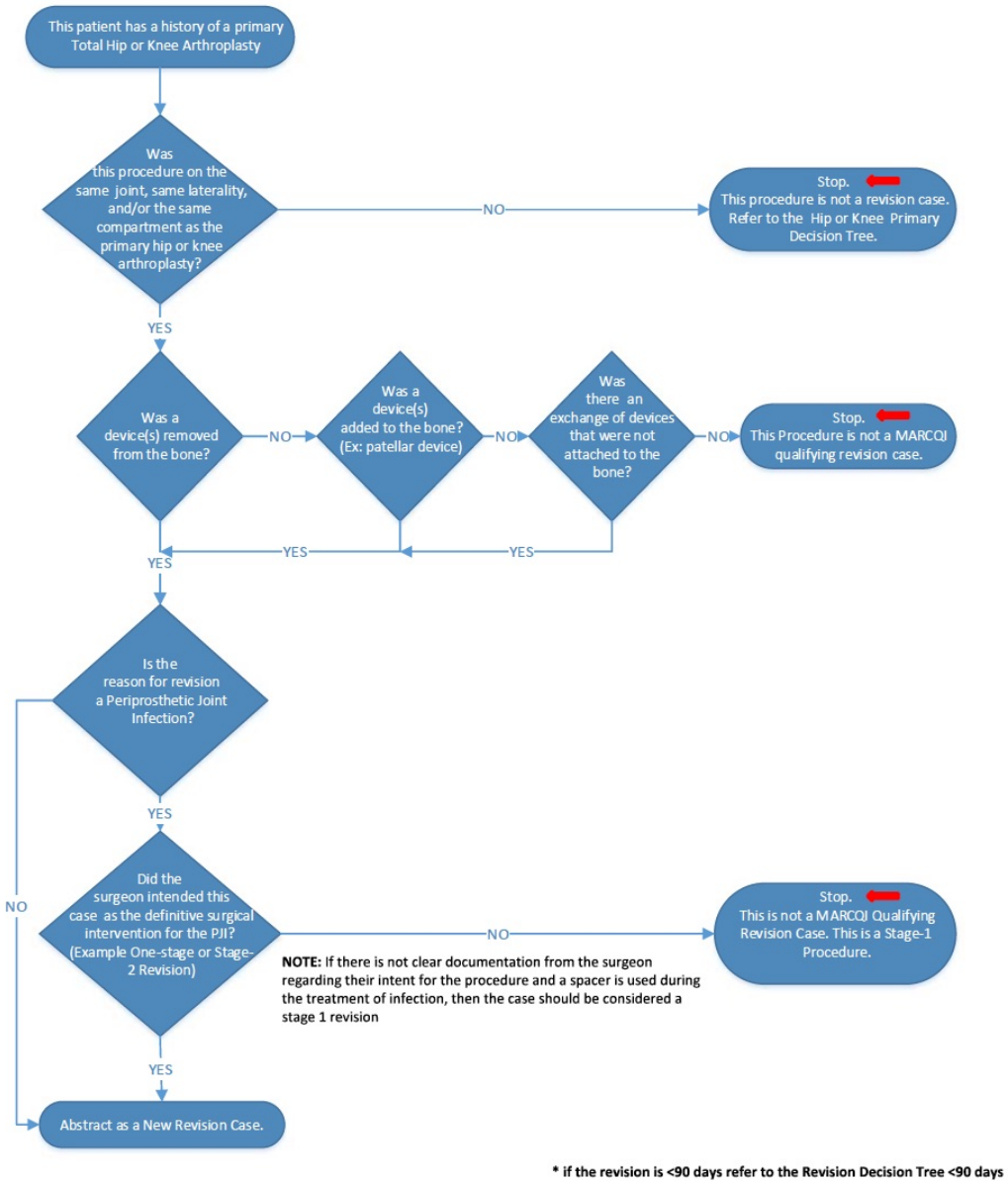


Figure 528. Flowchart of Method Used to Identify Revisions More Than 90 Days of Surgery

MARCQI uses a multi-faceted methodology for identifying revisions for two reasons: (1) revision data comes from both abstracted and administrative data sources, and (2) hospitals switched from ICD-9 to ICD-10 coding in 2015. Figures 527 and 528 illustrates the process used to identify revisions for this report. The process is different within 90 days and beyond 90 days because MARCQI was designed to focus primarily on reduction in 90-day events. For surgeries occurring on or after October 1, 2015, a registry-based MARCQI revision is a case identified by ICD-10 code and confirmed by a CDA. For surgeries occurring prior to October 1, 2015, a revision surgery was identified by the ICD-9 procedure recorded for the case and confirmed by a CDA. MARCQI qualifying revisions are identified by the following criteria:

1. Did the patient have a primary procedure?
2. Determine, if possible, if the revision was performed less than or greater than 90 days from the primary.
3. Determine what devices were removed or implanted by using the surgeon's narrative (operative note) and the device record.
4. ICD-10 codes may be used as validation.

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A common question is how MARCQI handles staged revisions for the treatment of infection. MARCQI data abstractors are taught the following logic, which is included in the MARCQI data manual:

1. A *stage-one revision* is performed to treat the infection and may involve removal of all or some devices. It often involves debridement of tissues (I&D) and treatment with antibiotics via a functional spacer (static or articulating), cement antibiotic beads, IVs, or an intra-articular catheter. The intent is to perform a second procedure to replace the devices. If performed $\leq$ 90 days of the associated case, the stage one would be an event of prosthetic joint infection. If performed $>$ 90 days, it is not a qualifying case. Note: if the case is within 90 days of surgery performed at another site, this is a new revision case.

2. A *stage-two revision* is performed to insert new devices after an infection is treated. Typically, this includes removal of the spacer, beads, or intra-articular catheter and insertion of the new permanent devices. This procedure is intended as the final stage in treating the infection or the definitive surgical intervention. This qualifies as a new revision case (new devices were implanted into bone).

3. A *one-stage revision* treats infection and replaces the devices during the same operative encounter. There is no intent for another procedure; therefore, these are considered a definitive surgical intervention and a new revision case (new devices were implanted into bone).

Procedures performed within 90 days of surgery that involve an exchange of a device(s) not attached to bone, are events. These procedures may also be called an incision and drainage (I&D) or washout. For a hip case, it may involve the femoral head and acetabular liner. For a knee case, it may involve the tibial insert. Note: If the case is within 90 days of a surgery performed at another site, this is a new revision case.

A.5 Data Structure for Analytics

Two formats of data sets are used for this report, called “long” format and “wide” format.

1. The “long” format has a record (or row) for each case, *i.e.*, an individual record for each primary and revision case. Some patients may have multiple records indicating they have had multiple hip or knee replacement procedures over time. There may be a few patients with primary cases before 02/15/2012, and revision after 02/15/2012 (but before the end of the study 12/31/2024). This dataset is used to calculate statistics for total number of performed cases, overall and per calendar year.

2. In contrast, the “wide” format has one record (or row) for each primary case because a patient can only have one primary surgery per joint; subsequent procedures on the same joint would indicate revisions. There are no stand-alone records dedicated to revision(s). Rather, in the wide format the existence of a first revision is indicated as a dummy variable (1 means having a revision, 0 means not having a revision). Time to first revision in days was calculated for implant survival analysis. No revisions beyond first revision are coded in the wide data format. Some patients may have multiple records (or rows) if this patient had more than one primary surgery on different joints and/or lateralities. In this report, each primary surgery was treated as a new case. The date of primary cases must fall within the study window. This dataset is used to calculate descriptive statistics for primary cases, overall and breakdown by sex, diagnosis, and type of implant. It is also used for implant survival analysis.

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A.6 Multi-level Closed-loop Data Quality QC/QA

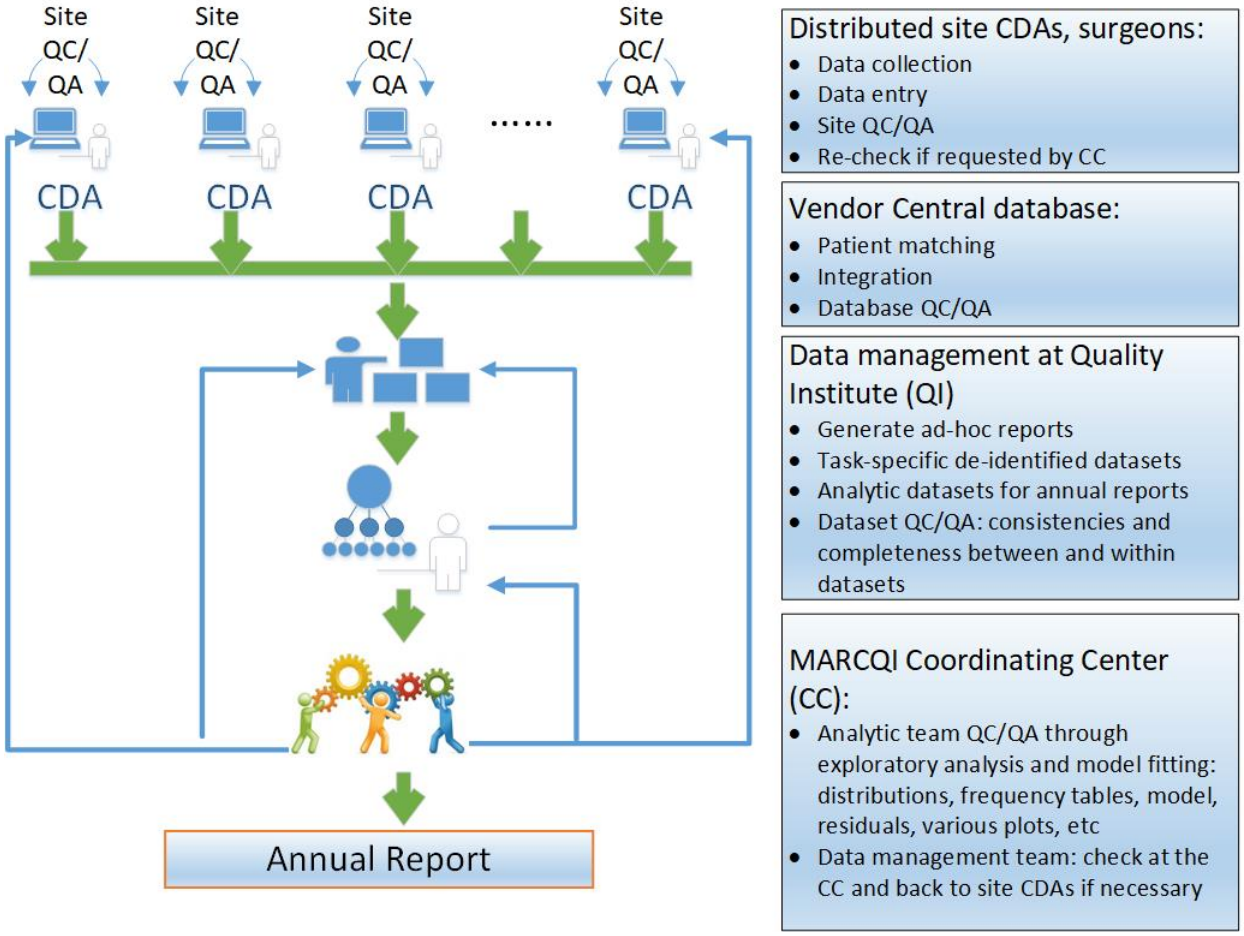


Figure 529. Flowchart of MARCQI Four-level QC/QA Process

Data quality is critical in MARCQI. In order to meet quality dimensions, including accuracy/validity, reliability/consistency, completeness, precision, timeliness, confidentiality, and integrity (Sheppard and Terveen, 2011), MARCQI data has been checked and validated on four levels: (1) hospital, (2) vendor database, (3) data management, and (4) analytical. At the analytical level, the measures were further checked through distributions, frequency tables, model fittings, residuals, and other visualization tools. The questionable measures were directed to the coordinating center data management team and then returned to site clinical data abstractors (CDAs) if necessary. The CDAs validated data and made necessary corrections in the database if a measure was found to be in error. Figure 529 is the flowchart of MARCQI's four-level quality control/quality assurance (QC/QA) process.

The following goals are the focus of data quality in MARCQI:

1. *Accuracy/validity*. MARCQI data accuracy is validated based on the definitions and medical domain knowledge to ensure that data is entered correctly and appropriately into the domain. At the data entry stage, validation messages are created and a warning message window will pop-up if a value is out of normal range as pre-defined by the domain experts. This helps filter out potential data collection errors and allows confirmation of out-of-range but accurate values.
2. *Reliability/consistency*. The coordinating center staff ensures that the definition of measures is consistent over time and across sites.
3. *Completeness*. Data are fully inclusive, *e.g.*, a complete list of eligible implant names, device materials, patient demographics, etc. Missing data, invalid data, and/or incomplete data are checked.

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4. *Precision*. MARCQI data are detailed and include demographics, lab, OR log, implant, etc.
5. *Timeliness*. MARCQI data are up-to-date and available quickly and frequently. Data reports are updated monthly, and the analytical datasets are updated quarterly.
6. *Integrity*. MARCQI maintains the accuracy, validity, and consistency of data over the whole data lifecycle, within and between data tables so that data is recoverable, searchable, traceable, and stable.
7. *Confidentiality*. MARCQI data are maintained according to national/international standards for data. All MARCQI data are protected and used appropriately.

This entire process guarantees the quality of MARCQI data.

A.7 Descriptive Statistics and Visualization

For this report continuous measures were checked for normality and skewness. Categorical variables were checked for cell sizes and questionable category values. If any potential issues were found and confirmed by the MARCQI data management team, then the data quality checking/correction was directed to a different level accordingly.

Univariate analyses are performed to compute descriptive statistics for this report, including frequency tables for smoker, both mean and standard deviation (SD), median and interquartile range (IQR) for age, weight, height, body mass index (BMI), and surgeon volumes (overall and device-specific). Frequency tables and various visualization tools, including pie charts, bar charts, Pareto charts (Montgomery, 2009; Tague, 2004), and line plots are employed to present data for sex, approach, diagnosis, distribution of primary vs. revision cases, venous thrombosis prophylaxis, polyethylene type, procedure type, bearing surface couple, head size, reason for revision, and American Society of Anesthesiologists (ASA) class.

A.8 Kaplan-Meier: Unadjusted Survival Probabilities and Cumulative Percent Revision (CPR)

MARCQI presents revision risk for implants using a curve called the “cumulative percent revision,” which is abbreviated CPR and inspired by the Australian Orthopaedic Association National Joint Replacement Registry. Obviously, lower revision risk is preferred to higher risk.

The CPR is constructed starting with the time a primary joint replacement is performed, with the endpoint of interest being revision surgery on that joint. MARCQI computes the time to first revision since the primary procedure for those patients having revision surgery, which is the X-axis in the CPR curve. The Y-axis is the percent of patients who have had a revision among patients with the joint replacement by the corresponding X-axis, time.

Computationally, the CPR curve is derived from unadjusted survival probabilities, $\hat{S}(t)$, which is calculated using the Kaplan-Meier product-limit estimator (Kaplan and Meier, 1958; Rich *et al.*, 2010), and corresponding standard errors are calculated with Greenwood's formula (Kalbfleisch and Prentice, 2002). Then the overall, stratified, and implant-specific CPRs are expressed as percentages and calculated by $C\hat{P}R = (1 - \hat{S}(t)) \times 100$. The log-rank test is used to compare survival curves between groups at the $\alpha = 0.05$. There is a significant difference in the survival time between groups if the *p*-value is less than 0.05.

A.9 Cox Proportional-hazards Model

The Cox proportional-hazards model (Cox, 1972) is commonly used for investigating the association between the survival time of patients and one or more predictor variables. Specifically, the Cox proportional-hazard model formulates the hazard function for individual as $h_i(t, \mathbf{x}_i) = h_0(t, 0)e^{\mathbf{x}_i^T \boldsymbol{\beta}}$, where $h_i(t, \mathbf{x}_i)$ is the hazard at time t for the i$^{\text{th}}$ case, $h_i(t, 0)$ is the baseline hazard function with all covariates being 0, $\boldsymbol{\beta}$ is a column vector of regression coefficients, and $\mathbf{x}_i$ is a column vector of covariates for the i$^{\text{th}}$ case. The measures of association given by the Cox model as *hazard ratio (HR)* is used to explain the risk of event for certain categories of covariates or exposure of interest. The hazard ratio is obtained by taking the ratio of the hazards of two cases who have different values of the covariates, $\mathbf{x}$:

$$HR = \frac{h_i(t,\mathbf{x}_i)}{h_j(t,\mathbf{x}_j)} = \frac{h_0(t,0)e^{\mathbf{x}_i^T\boldsymbol{\beta}}}{h_0(t,0)e^{\mathbf{x}_j^T\boldsymbol{\beta}}} = e^{(\mathbf{x}_i-\mathbf{x}_j)^T\boldsymbol{\beta}}$$

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The model includes surgeon as a random effect to account for within-subject correlation of the observed outcomes (Zhao *et al.*, 2005).

Parameters in a Cox model and HR are estimated using partial likelihood (Cox, 1975; Verweij and van Houwelingen, 1994). The proportional hazards assumption is assessed following Lin *et al.* (1993), *i.e.*, graphical and numerical methods for model assessment based on the cumulative sums of martingale residuals. Basically, the distributions of the stochastic processes under the assumed model are approximated by the distributions of zero-mean Gaussian processes. The 1000 realizations are generated by simulation. Each observed residual pattern was compared, both graphically and numerically, with simulated realizations from the null distribution. In this report, the risk-adjusted (age and sex) hazard ratio and 95% confidence interval are reported for each specific implant if the proportional-hazards assumption is met according to the supremum test.

A.10 Database and Software Platform

The raw data sources are securely transported to MARCQI by the data vendor (Ortech) in MS SQL format. All the data management, exploratory data analysis, descriptive statistics, graphs, and statistical modeling are performed using SAS 9.4 (SAS® Institute Inc., Cary, North Carolina)[1], SAS / Interactive Matrix Language (IML)[2], and SAS Macro Language [3].

[1] SAS® 9.4 Product Documentation.
[2] SAS/IML® 15.1: User's Guide, Copyright © 2018, SAS Institute Inc., Cary, NC, USA.
[3] SAS® 9.4 Macro Language: Reference, Fifth Edition.

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Appendix B

Awards and Publications

B.1 Awards

2016 Current Concepts in Joint Replacement/Orthopaedic Research and Education Foundation - Clinical Practice Award Paper, *No Difference in Dislocation Seen in Anterior vs Posterior Approach Total Hip Arthroplasty*, Maratt, J.D., Gagnier, J.J., Butler, P.D., Hallstrom, B.R., Urquhart, A.G., and Roberts, K.C..

2022 John N. Insall Knee Society Award, *MARCQI's Pain-control Optimization Pathway (POP): Impact of Registry Data and Education on Opioid Utilization*, Layson, J.T., Markel, D.C., Hughes, R.E., Chubb, J., and Frisch, N.B..

2025 Most Innovative Intervention Poster Award, CQIO All Faculty and Staff Meeting, *Intraoperative Irrigation and Topical Antibiotic Use Fail to Reduce Early Periprosthetic Joint Infection Rates: A Michigan Arthroplasty Registry Collaborative Quality Initiative Study* by Seta, J.F., Weaver, M.J., Hallstrom, B.R., Zheng, H.T., Larese, D.M., Dailey, E.A., Markel, D.C..

B.2 Journal Publications

2014

Franklin, P.D., Lewallen, D., Bozic, K., Hallstrom, B., Jiranek, W., and Ayers, D.C. (2014) Implementation of patient-reported outcome measures in U.S. total joint replacement registries: rationale, status, and plans. *Journal of Bone and Joint Surgery - American Volume*, 96 Suppl 1:104-109.

2015

Hughes, R.E., Hallstrom, B.R., Cowen, M.E., Igrisan, R.M., Singal, B.M., and Share, D.A. (2015) Michigan Arthroplasty Collaborative Quality Initiative (MARCQI) as a model for regional registries in the United States. *Orthopaedic Research and Reviews*, 7:47-56.

2016

Ellimoottil, C., Ryan, A.M., Hou, H., Dupree, J., Hallstrom, B., and Miller, D.C. (2016) Medicare's new bundled payment for joint replacement may penalize hospitals that treat medically complex patients. *Health Affairs*, 35(9):1651-1657.

Hallstrom, B.R., Singal, B., Cowen, M.E., Roberts, K.C., and Hughes, R.E. (2016) The Michigan experience with safety and effectiveness of tranexamic acid use in hip and knee arthroplasty. *Journal of Bone and Joint Surgery - American Volume*, 98:1646-1655.

Maratt, J.D., Gagnier, J.J., Butler, P.D., Hallstrom, B.R., Urquhart, A.G., and Roberts, K.C. (2016) No difference in dislocation seen in anterior vs posterior approach total hip arthroplasty. *Journal of Arthroplasty*, 31(9 Suppl):S127-S130.

Markel, D.C., Allen, M.W., and Zappa, N.M. (2016) Can an arthroplasty registry help decrease transfusions in primary total joint replacement? A quality initiative. *Clinical Orthopaedics and Related Research*, 474:126-131.

2017

Charles, R.J., Singal, B.M., Urquhart, A.G., Masini, M.A., and Hallstrom, B.R. (2017) Data sharing between providers and quality initiatives eliminate unnecessary nursing home admissions. *Journal of Arthroplasty*, 32(5):1418-1425.

Courtney, P.M., Huddleston, J.I., Iorio, R., and Markel, D.C. (2017) Socioeconomic risk adjustment models for reimbursement are necessary in primary total joint arthroplasty. *Journal of Arthroplasty*, 32:1-5.

Courtney, P.M. and Markel, D.C. (2017) Arthroplasty registries: Improving clinical and economic outcomes. *Journal of Knee Surgery*, 30(1):7-11.

Hughes, R.E., Batra, A., and Hallstrom, B.R. (2017) Arthroplasty registries around the world: valuable sources of hip implant revision risk data. *Current Reviews in Musculoskeletal Medicine*, 10:240-252.

Markel, D.C., Allen, M., Hughes, R., Singal, B., and Hallstrom, B. (2017) Quality initiative programs can decrease total joint arthroplasty transfusion rates - A multicenter study utilizing the MARCQI total joint registry database. *Journal of Arthroplasty*, 32(11):3292-3297.

Omari, A., Hughes, R.E., Hallstrom, B.R., Singal, B.M., Igrisan, R.M., and McCardel, B.R. (2017) Using device data to improve identification of intraoperative femur fractures in total hip arthroplasty. *Michigan Journal of Medicine*, 2(1).

2018

Charpentier, P.M., Srivastava, A.K., Zheng, H., Ostrander, J.D., and Hughes, R.E. (2018) Readmission rates for single midnight versus two midnight length of stay in primary total knee arthroplasty: Analysis of the MARCQI Database. *Journal of Bone and Joint Surgery – American*, 100:1757-64.

Cheek, C., Zheng, H., Hallstrom, B.R., and Hughes, R.E. (2018) Application of a causal discovery algorithm to the analysis of arthroplasty registry data. *Biomedical Engineering and Computational Biology*, 9:1-9.

Hughes, R.E., Zheng, H., Igrisan, R.M., Cowen, M.E., Markel, D.C., and Hallstrom, B.R. (2018) The Michigan Arthroplasty Registry Collaborative Quality Initiative Experience: Improving the quality of care in Michigan. *Journal of Bone and Joint Surgery – American*, 100(22):e143.

2019

Hood, B.R., Cowen, M.E., Zheng, H., Hughes, R.E., Singal, B., and Hallstrom, B.R. (2019) Aspirin compared with other anticoagulants for prevention of venous thromboembolism in patients after total knee arthroplasty: A non-inferiority analysis. *Journal of the American Medical Association – Surgery*, 154(1):65-72.

2020

Foster, C., Posada, C., Pack, B., Hallstrom, B.R., and Hughes, R.E. (2020) Summary of knee implant one, three, five and 10-year revision risk reported by national and regional arthroplasty registries: A valuable source of evidence for clinical decision-making. *EFORT Open Reviews*, 5:268-272.

Hallstrom, B.R. and Hughes, R.E. (2020) Controversies in hip arthroplasty: Using registries to answer difficult questions (Editorial). *Journal of the American Medical Association*, 323:1046-1048.

Hughes, R.E, Zheng, H., and Hallstrom, B.R. (2020) Why registries are important: The example of the Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI) (Viewpoint). *Arthroplasty Today*, 6:747-748.

Hughes, R., Hallstrom, B., Schemanske, C., Howard, P.W., Wilton, T. (2020) Returning to operating following COVID-19 shutdown: what can human factors tell us? (Editorial) *Bone & Joint Journal*, 102-B(10):1277-1278.

Knapp, P., Weishuhn, L., Pizzimenti, N., and Markel, D.C. (2020) Risk factors for manipulation under anaesthesia after total knee arthroplasty. *Bone & Joint Journal*, 102-B(6 Supple A):66-72.

2021

Chubb, H.A., Cornish, E.R., Hallstrom, B.R., and Hughes, R.E. (2021) Early benchmarking total hip arthroplasty implants using data from the Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI). *Orthopaedic Research and Reviews*, 13:215-228.

Muscatelli, S., Zheng, H., Hughes, R.E., Cowen, M.E., and Hallstrom, B.R. (2021) Non-inferiority of aspirin for venous thromboembolism prophylaxis after hip arthroplasty in a statewide registry. *Journal of Arthroplasty*, 36(6):2068-2075.

Schuman, A.D., Syrjamaki, J.D., Norton, E.C., Hallstrom, B.R., Regenbogen, S.E. (2021) Effect of statewide reduction in extended care facility use after joint replacement on hospital readmissions. *Surgery* 169(2):341-346.

2022

Hallstrom, B., Hughes, R.E., and Huddleston, J.I. 3rd (2022) State-based and national U.S. registries: The Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI), California Joint Replacement Registry (CJRR), and American Joint Replacement Registry (AJRR). *Journal of Bone and Joint Surgery – American*, 104 (Suppl 3):18-22.

Han, P., Fu, S., Kolis, J., Hughes, R., Hallstrom, B.R., Carvour, M., Maradit-Kremers, H., Sohn, S., and Vydiswaran, V. (2022) Multicenter validation of natural language processing algorithms for the detection of common data elements in operative notes for total hip arthroplasty: Algorithm development and validation. *JMIR Medical Informatics*, 10(8):e38155.

Layson, J.T., Markel, D.C., Hughes, R.E., Chubb H., and Frisch, N.B. (2022) MARCQI's pain-control optimization pathway (POP): Impact of registry data and education on

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opioid utilization. *Journal of Arthroplasty*, 37(6):S19-S26.

Markel, J.F., Driscoll, J.A., Zheng, T.H., Hughes, R.E., Moore, D.D., Hallstrom, B.R., Markel, D.C. (2022) Causes of early hip revision vary by age and sex: Analysis of data from a statewide quality registry. *Journal of Arthroplasty*, 37:S616-S621.

Muscatelli, S., Zheng, H., Muralidharan, A., Tollemar, V., and Hallstrom, B.R. (2022) Limiting the surveillance period to 90 days misses a large portion of infections in the first year after total hip and knee arthroplasty. *Arthroplasty Today*, 16:90-95.

2023

Cowen, M.E., Zheng, H., Hughes, R.E., Franklin, P.D., Masini, M.A., and Hallstrom, B.R. (2023) How much perioperative pain and dysfunction underlie the HOOS JR and KOOS JR? *Clinical Orthopaedics and Related Research*, 481:1800-1810.

Hughes, R.E., Zheng, H., Kim, T., and Hallstrom, B.R. (2023) Total hip and knee arthroplasty implant revision risk to 5 years from a state-wide arthroplasty registry in Michigan. *Arthroplasty Today*, 21:101146.

Markel, J.F., Adams, N.A., Srivastava, A.K., Zheng, T.H., Hallstrom, B.R., Markel, D.C. (2023) Do ′Surgeon Champions′ and High-Volume Surgeons Have Lower Rates of Periprosthetic Femur Fracture? Perspective From a State-Wide Quality Improvement Registry. *Journal of Arthroplasty*, 38(7S):S247-S251.

Nelson, J., Zheng, H., Hallstrom, B.R., Hughes, R.E., Mont, M.A., and Masini, M. (2023) Are short stems associated with higher fracture rates and early revision rates in primary total hip arthroplasty? - A non-inferiority analysis. *Journal of Arthroplasty*, 38:1287-1294.

Powell, D., Comer, B., Hallstrom, B., Zheng. H., Hughes, R., Markel, D. (2023) Early survivorship of uncemented total knee arthroplasty varies by age and sex based on data from the Michigan Arthroplasty Registry Collaborative Quality Initiative. *Journal of Arthroplasty*, 38(7 Suppl 2):S221-S226.

Powell, D., Markel, D., Chubb, H., Muscatelli, S., Hughes, R., Hallstrom, B., and Frisch, N. (2023) The differential effect of COVID on total joint arthroplasty between hospital and ambulatory surgery centers/hospital outpatient departments: A Michigan Arthroplasty Registry Collaborative Quality Initiative Analysis. *Arthroplasty Today*, 23:101189.

Wenzlick, T.S., Kutzner, A.R., Markel, D.C., Hughes, R.E., Chubb, H.D., Roberts, K.C. (2023) A reduction in opioid prescription size after total joint arthroplasty can be safely performed without an increase in complications. *Journal of Arthroplasty*, 38:1245-1250.

2024

Abbas, M.J., Markel, D.C., Hallstrom, B.R., Zheng, H.T., Charters, M.A. (2024) The Impact of Surgeon Volume on Unicompartmental Knee Arthroplasty Survivorship: A Michigan Arthroplasty Registry Collaborative Quality Initiative Database Analysis. *Journal of Arthroplasty*, 13:S0883-5403(24)00837-4.

Frisch, N.B., Masini, M.A., Zheng, H., Hughes, R.E., Hallstrom, B.R., and Markel, D.C (2024) Early identification of poorly performing implants in Michigan with example of the Vanguard XP. *Arthroplasty Today*, 30:101478.

Mesko, J.W., Zheng, H., Hughes, R.E., and Hallstrom, B.R. (2024) Individualized surgeon reports in a statewide registry: A pathway to improved outcomes. *Journal of Bone and Joint Surgery - American*, 106:2045-50.

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Adik, K., Adams, N.A., Srivastava, A.K., Hughes, R.E., Zheng, T.H., Hallstrom, B.R., and Markel, D.C. (2025) Increasing use of cemented stems is associated with reduced early fracture after total hip arthroplasty: A Michigan Arthroplasty Registry Collaborative Quality Initiative study. *Journal of Arthroplasty*, 40(8S1):S84-S89.

Combescure, C., Smith, J.A., Barea, C., Hoogervorst, L.A., Nelissen, R., Marang-van de Mheen, P.J., Lübbeke, A., and the arthroplasty registry group* (2025) Cumulative risk of revision after primary total hip arthroplasty in registries internationally: Systematic review and meta-analysis of selected hip stems and cups. *EFORT Open Reviews*, 10:277-285. *The arthroplasty registry group includes Richard Hughes.

Cornish, E.R., Zheng, H., Carpenter, C., and Hallstrom, B.R. (2025) Similar Revision Rates for High- and Low-Viscosity Cement in Total Knee Arthroplasty. *Journal of Arthroplasty*, 26:S0883-5403(25)01216-1.

Cornish, E.R., Zheng, H., Markel, D.C., Hallstrom, B.R., and Hughes, R.E. (2025) Variation in KOOS JR improvement across total knee implant designs: a cohort study from Michigan Arthroplasty Registry Collaborative Quality Initiative. *Acta Orthopaedica*, 96:587-594.

Hodson, N., Hamza, R., Hallstrom, B., Hughes, R.E., Zhang, H., and Charters, M. (2025) Achieving the CMS CMS-defined substantial Clinical Benefit Following Total Knee Arthroplasty (TKA) and Total Hip Arthroplasty (THA) in MARCQI. *Journal of Arthroplasty*, 40(9S1):S92-S99.

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Lübbeke, A., Hoogervorst, L.A., Marang-van de Mheen, P.J., Prentice, H.A., Rolfson, O., Nelissen, R.G.H.H., Steinbrück, A., McGauran, G., Barea, C., Erikson, K., Pedersen, A.B., Porter, M., and ISAR group (2025) Arthroplasty registries at a glance: an initiative of the International Society of Arthroplasty Registries (ISAR) to facilitate access, understanding, and reporting of registry data from an international perspective. *Acta Orthopaedica*, 96:116-126.

Paull, T.Z., Weaver, M.J., Comer, B.J., Zheng, H.T., Hallstrom, B.R., Hughes, R.E., and Markel, D.C. (2025) Uncemented Total Knee Arthroplasty in the State of Michigan has Higher Rates of Revision Through 5-Year Follow Up. *Journal of Arthroplasty*, 40(7S1):S263-S270.

Puri, S., Weaver M., Chen, L., Kim, T., Dailey, E., and Markel, D.C. (2025) Assessment of 90-Day Outcomes Following Total Joint Arthroplasty in Ambulatory Surgery Centers, Hospital Outpatient Departments, and Hospitals: A Michigan Arthroplasty Registry Collaborative Quality Initiative Analysis. *Arthroplasty Today*, 32:101659.

Seta, J.F., Weaver, M.J., Hallstrom, B.R., Zheng, H.T., Larese, D.M., Dailey, E.A., and Markel, D.C. (2025) Intraoperative Irrigation and Topical Antibiotic Use Fail to Reduce Early Periprosthetic Joint Infection Rates: A Michigan Arthroplasty Registry Collaborative Quality Initiative Study. *Journal of Arthroplasty*, 40(8S1):S297-S303.e2.

Uppal, H., Markel, D., Melone, G., Puri, S., Chen, L., Kim, T., Hallstrom, B., Hughes, R., and Dailey, E. (2025) Site of Service Changes Have Resulted in Increased Opioid Prescriptions for Primary Total Hip And Knee Patients in Michigan, A Michigan Arthroplasty Registry Collaborative Quality Initiative Quality Study. *Arthroplasty Today*, 34:101771.

B.3 Conference Abstracts

2014

Hughes, R.E., Igrisan, R., and Hallstrom, B. (2014) Designing pay-for-performance incentives for an arthroplasty quality improvement collaborative. *3rd International Congress of Arthroplasty Registries*, May 31-June 2, Cambridge, MA, 2014.

2015

Hallstrom, B.R., Hughes, R., Igrisan, R., Cowen, M., and Singal, B. (2015) Dramatic reduction in blood transfusion through a quality improvement project in the Michigan arthroplasty registry. *4th International Congress of Arthroplasty Registries*, Gothenburg, Sweden, May 23-25, 2015.

Hughes, R.E., Singal, B., Hallstrom, B., Cowen, M., and McCardel, B. (2015) Using device data to improve detection of intra-operative femur fractures in total hip arthroplasty. *4th International Congress of Arthroplasty Registries*, Gothenburg, Sweden, May 23-25, 2015.

Hughes, R. (2015) Development and operation of a regional arthroplasty quality improvement collaborative. *Healthcare Systems Process Improvement Conference 2015*, February 18-20, Orlando, FL, 2015.

Maratt, J.D., Gagnier, J., Butler, P., Hallstrom, B.R., Urquhart, A.G., and Roberts, K. (2015) Direct anterior approach does not reduce dislocation risk. *American Association of Hip and Knee Surgeons*, November 5-8, Dallas, TX, USA, 2015.

2016

Hallstrom, B., Hughes, R., Singal, B., and Cowen, M. (2016) Primary and revision case capture in the Michigan arthroplasty registry. *5th International Congress of Arthroplasty Registries*, Manchester, England, May 28-30, 2016.

Hughes, R.E., Chan, M.Y.H., and Hallstrom, B.R. (2016) A Bayesian network model for hip implant outlier detection in post-market surveillance. *2016 BMES/FDA Frontiers in Medical Devices Conference*, College Park, MD, USA, May 23-25, 2016.

Maratt, J.D., Gagnier, J.J., Butler, P.D., Hallstrom, B.R., Urquhart, A.G., and Roberts, K.C. (2016) No difference in dislocation in anterior versus posterior approach total hip arthroplasty. *American Orthopaedic Association*, June 24-27, Seattle, WA, USA, 2016.

Zarling, B.J., Sikora-Klak, J., Bergum, C., and Markel, D.C. (2016) How do pre-operative medications influence outcomes in total joint arthroplasty? *34th Annual Meeting of the Mid-America Orthopaedic Association*, Bonita Springs, FL, USA, April 13-17, 2016.

2017

Hood, B., Singal, B., Zheng, H., Hughes, R., Cowen, M., and Hallstrom, B. (2017) Aspirin for venous thromboembolism prophylaxis after primary total knee arthroplasty: An analysis of 41,537 cases in the Michigan arthroplasty registry. *6th International Congress of Arthroplasty Registries*, San Francisco, CA, USA, May 20-22, 2017.

Hood, B.R., Hallstrom, B.R., Cowen, M., Hughes, R., Zheng, T., and Singal, B. (2017) Equivalence of aspirin for prophylaxis of venous thromboembolism after knee

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replacement in a state-wide registry. *American Association of Hip and Knee Surgeons 2017 Annual Meeting*, November 2-5, Dallas, TX, 2017.

Hughes, R.E., Batra, A., Pack, B.J., and Hallstrom, B.R. (2017) Translating registry data into clinical practice: Summary of arthroplasty registry reports of revision risk for hips. *6th International Congress of Arthroplasty Registries*, San Francisco, CA, USA, May 20-22, 2017.

Hughes, R.E., Zheng, H., Kabara, J., Mendenhall, S., Pack, B.J., and Hallstrom, B.R. (2017) Variation in bearing surface couples in conventional total hip arthroplasty within Michigan. *6th International Congress of Arthroplasty Registries*, San Francisco, CA, USA, May 20-22, 2017.

Hughes, R.E., Batra, A., Pack, B.J., and Hallstrom, B.R. (2017) Translating registry data into clinical practice: Summary of arthroplasty registry reports of revision risk for hips. *2017 Michigan Orthopaedic Society Annual Scientific Meeting*, Mackinac Island, MI, USA, June 16-18, 2017.

Zheng, H., Hughes, R.E., Kabara, J., Cowen, M.E., and Hallstrom, B.R. (2017) A multi-stage modeling framework to analyze discrete events with applications to venous thromboembolism (VTE) prophylaxis following total knee arthroplasty (TKA) within MARCQI. *6th International Congress of Arthroplasty Registries*, San Francisco, CA, USA, May 20-22, 2017.

2018

Cheek, C., Zheng, H., Hallstrom, B.R., and Hughes, R.E. (2018) Application of a causal discovery algorithm to the analysis of arthroplasty registry data. *7th Congress of Arthroplasty Registries*, Reykjavik, Iceland, June 9-11, 2018.

Hallstrom, B., Hughes, R., Cowen, M., and Zheng, H. (2018) Differences in reason for early revision between THA and TKA in Michigan. *7th Congress of Arthroplasty Registries*, Reykjavik, Iceland, June 9-11, 2018.

Hallstrom, B., Hughes, R., Cowen, M., and Zheng, H. (2018) Males are more likely to be revised than females in the first year after primary TKA in Michigan. *7th Congress of Arthroplasty Registries*, Reykjavik, Iceland, June 9-11, 2018.

Hughes, R.E., Zheng, H., and Hallstrom, B. (2018) Implant-specific revision risks to three years in Michigan. *7th Congress of Arthroplasty Registries*, Reykjavik, Iceland, June 9-11, 2018.

Zheng, H., Hughes, R.E., Hallstrom, B.R., Charpentier, P.M., Srivastava, A.K., Igrisan, R. (2018) A comparative study on propensity score approaches: Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI). *Joint Statistical Meetings (JSM)*, Vancouver, British Columbia, Canada, July 28 – August 2, 2018.

2019

Hallstrom, B.R., Hughes, R.E., Zheng, H., and Igrisan, R. (2019) Signal detection for implants in the Michigan Arthroplasty Registry Collaborative Quality Initiative. *8th Congress of Arthroplasty Registries*, Leiden, Netherlands, June 1-3, 2019.

Hallstrom, B.R., Zheng, H., Igrisan, R., Cowen, M., and Hughes, R.E. (2019) Combining funnel plots and risk adjusted cumulative sum charts in surgeon reporting and decision making. *8th Congress of Arthroplasty Registries*, Leiden, Netherlands, June 1-3, 2019.

Hallstrom, B.R., Zheng, H., Coon, S., and Hughes, R.E. (2019) First report of an increased 5 year revision risk for a novel knee design in statewide registry data. *American Association of Hip and Knee Surgeons Annual Meeting*, Dallas, November 7-10, 2019.

Hughes, R.E, Zheng, H., and Hallstrom, B.R. (2019) Reducing discharge to extended care facility does not increase readmission in knee and hip arthroplasty patients. *2019 Annual Meeting of the American Academy of Orthopaedic Surgeons*, Las Vegas, NV, March 13-19, 2019.

Knapp, P., Weishuhn, L., Pizzimenti, N., and Markel, D.C. (2019) Assessment of numerous risk factors for manipulation under anesthesia after total knee arthroplasty. *33rd Annual Congress of the International Society for Technology in Arthroplasty*, Toronto, October 2-5, 2019.

Zheng, H., Hughes, R.E., Hallstrom, B.R., and Igrisan, R. (2019) Effects of hospital scale and infection control program on infection reduction following TKA and THA: A simulation study. *8th Congress of Arthroplasty Registries*, Leiden, Netherlands, June 1-3, 2019.

Zheng, H., Hughes, R.E., Hallstrom, B.R., and Igrisan, R. (2019) Risk-adjusted cumulative sum charts (CUSUM) as a quality improvement toolkit to monitor early revisions with Monte-Carlo simulation and application to Michigan arthroplasty registry data. *8th Congress of Arthroplasty Registries*, Leiden, Netherlands, June 1-3, 2019.

2020

Bolz, N.J., Zarling, B.J., and Markel, D.C. (2020) Long-term sustainability of a quality initiative program on transfusion rates in total joint arthroplasty: A follow-up study. *Journal of Arthroplasty*, 35:340-346.

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(2020) Applying International Prosthesis Working Group benchmarking guidelines for Hip Prostheses in the State of Michigan. *Virtual 9th International Congress of Arthroplasty Registries*, November 13-16, 2020.

Hallstrom, B., Roberts, K., and Hughes, R. (2020) Reducing Opioid Prescribing with a Registry Quality Improvement Project in the Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI). *Virtual 9th International Congress of Arthroplasty Registries*, November 13-16, 2020.

Hallstrom, B.R., Zheng, H., and Hughes, R.E. (2020) The Importance of Early Implant Registry Surveillance: An example with the iTotal knee in the Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI). *Virtual 9th International Congress of Arthroplasty Registries*, November 13-16, 2020.

Hughes, R.E., Zheng, H., Coon, S., and Hallstrom, B.R. (2020) The 7-year annual report (2019) of the Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI): Enhancements and Highlights. *Virtual 9th International Congress of Arthroplasty Registries*, November 13-16, 2020.

Nelson, J., Zheng, T., Hallstrom, B., Hughes, R., Mont, M., and Masini, M. (2020) Do Short Stems Lead to Higher Fracture Rates and Early Revision Rates in Primary Total Hip Arthroplasty? - A Non-Inferiority Analysis. *Virtual 9th International Congress of Arthroplasty Registries*, November 13-16, 2020.

Zheng, H., Hallstrom, B.R., Hughes, R.E., and Kim, T. (2020) Integrated Quantitative Methodology to Characterize the Improvement of Patient-report Outcome Measures (PROMs): Michigan Arthroplasty Registry. *Virtual 9th International Congress of Arthroplasty Registries*, November 13-16, 2020.

Zheng, H., Hughes, R., Cowen, M., Gumtow, M., Kim, T., Zhu, Q., and Hallstrom, B. (2020) Development of Infection Risk Calculator for Clinical Decision Making Using Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI) Database. *Virtual 9th International Congress of Arthroplasty Registries*, November 13-16, 2020.

Zheng, H. Hallstrom, B.R., Hughes, R.E., Kim, T., and Cowen, M. (2020) Anchor-based improvement of patient-report outcome measures (PROMs) from Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI). *Virtual 9th International Congress of Arthroplasty Registries*, November 13-16, 2020.

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Hallstrom, B.R., Zheng, T., Hughes, R.E., and Kim, T. (2021) A method to track improvement in pain and function after hip and knee replacement using Markov transition modeling: Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI). *10th International Congress of Arthroplasty Registries. 2nd Virtual Congress*, Copenhagen, Denmark, November 11-13(14), 2021.

Hughes, R.E., Chubb, H., Cornish, E., and Hallstrom, B.R. (2021) Propensity-score method for conducting safety surveillance of the shift from hospitals to ambulatory surgery centers for elective total hip and knee arthroplasty. *10th International Congress of Arthroplasty Registries. 2nd Virtual Congress*, Copenhagen, Denmark, November 11-13(14), 2021.

Hughes, R.E., Kim, T., and Hallstrom, B. (2021) Optimizing presentation of revision risk information to orthopaedic surgeons. *10th International Congress of Arthroplasty Registries. 2nd Virtual Congress*, Copenhagen, Denmark, November 11-13(14), 2021.

Hughes, R.E., Zheng, H., and Hallstrom, B.R. (2021) Biomechanical variables should be included in analyses of arthroplasty registry data. *Virtual 45th Meeting of the American Society of Biomechanics*, August 10-13, 2021.

Long, L. and Hughes, R.E. (2021) Importance of including BMI, weight, and height in arthroplasty revision data analysis. *Midwest American Society of Biomechanics Meeting*, Cleveland, OH, September 16-17, 2021.

Long, L., Hallstrom, B.R., and Hughes, R.E. (2021) Biomechanical rationale for including body mass and height in analysis of THA revision. *10th International Congress of Arthroplasty Registries. 2nd Virtual Congress*, Copenhagen, Denmark, November 11-13(14), 2021.

Masini, M.A., Nelson, J.T., Zheng, H., Hallstrom, B.R., Hughes, R.E., and Mont, M.A. (2021) Do short stems lead to higher fracture rates and early revision rates in primary hip arthroplasty? *American Association of Hip and Knee Surgeons Annual Meeting*, Dallas, TX, November 11-14, 2021.

Muscatelli, S., Zheng, H., Hughes, R.E., Cowen, M.E., and Hallstrom, B.R. (2021) Non-inferiority of aspirin versus other anticoagulants for venous thromboembolism prophylaxis after total joint arthroplasty. *American Academy of Orthopaedic Surgeons*, San Diego, CA, August 31 – September 3, 2021.

Zheng, H., Hughes, R.E., Kim, T., Zhu, Q., and Hallstrom, B.R. (2021) Semi-parametric stochastic mixed effect model with applications to pain score progression following joint replacement: Michigan Arthroplasty Registry Quality Initiative. *10th International Congress of Arthroplasty Registries. 2nd Virtual Congress*, Copenhagen, Denmark,

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November 11-13(14), 2021.

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Burns, K., Chubb, H., and Hughes, R.E. (2022) Propensity-score optimal matching method that assures statistical independence. *International Society of Arthroplasty Registry Congress*, Dublin, Ireland, September 3-5, 2022.

Hallstrom, B., Zheng, T., and Hughes, R. (2022) Patellar resurfacing and survivorship after TKA in Michigan. *International Society of Arthroplasty Registry Congress*, Dublin, Ireland, September 3-5, 2022.

Hallstrom, B., Zheng, T., and Hughes, R. (2022) Uncemented knee survivorship varies by age and sex in MARCQI. *International Society of Arthroplasty Registry Congress*, Dublin, Ireland, September 3-5, 2022.

Hallstrom, B., Zheng, T.H., Kim, T., and Hughes, R.E. (2022) Early- and long-term revisions in unicompartmental knee arthroplasty (UKA): Ten-year follow-up analysis with MARCQI database. *International Society of Arthroplasty Registry Congress*, Dublin, Ireland, September 3-5, 2022.

Hallstrom, B.R., Chubb, H., Kim, T., and Hughes, R. (2022) The effects of the COVID pandemic on arthroplasty patients and use of outpatient surgical centers. *International Society of Arthroplasty Registry Congress*, Dublin, Ireland, September 3-5, 2022.

Hughes, R.E., Zheng, T.H., and Hallstrom, B.R. (2022) Graphical causal modeling of revision outcome for THA. *International Society of Arthroplasty Registry Congress*, Dublin, Ireland, September 3-5, 2022.

Layson, J.T., Markel, D.C., Hughes, R., Chubb, H., and Frisch, N.B. (2022) MARCQI's Pain-Control Optimization Pathway (POP): Impact of Registry Data and Education on Opioid Utilization. American Academy of Orthopaedic Surgeons Annual Meeting (Knee Society Specialty Day), Chicago, IL, March 22-26, 2022.

Muscatelli, S., McHugh, M., Locke, C., and Dailey, E. (2022) Aspirin is not for everyone: Discharge to non-home facilities after total hip or knee arthroplasty increases risk of venous thromboembolism. *American Association of Hip and Knee Surgeons Annual Meeting 2022*, Grapevine, TX, November 3-6, 2022.

Salka, B., Long, L., Hughes, R.E., and Hallstrom, B.R. (2022) Dashboard for comparing THA and TKA revision rates across multiple international registries. *International Society of Arthroplasty Registry Congress*, Dublin, Ireland, September 3-5, 2022.

Zheng, T., Hughes, R.E., Kim, T., and Hallstrom, B.R. (2022) Surgeon volume and survivorship of UKA: What is high volume? A 10-year follow-up analysis with MARCQI database. *International Society of Arthroplasty Registry Congress*, Dublin, Ireland, September 3-5, 2022.

Wenzlick, T., Kutzner, A., Markel, D., Hughes, R., Chubb, H., and Roberts, K. (2022) A reduction in opioid prescription size after total joint arthroplasty can be safely performed without an increase in complications. *American Academy of Orthopaedic Surgeons Annual Meeting*, Chicago, IL, March 22-26, 2022.

2023

Abbas, M.J., Hallstrom, B.R., Hughes, R.E., Markel, D.C., Zheng, T., Urquhart, A.G., and Charters, M.A. (2023) Impact of Surgeon Volume on UKA Survivorship: A 10-year follow-up analysis with MARCQI database. *American Association of Hip and Knee Surgeons Annual Meeting 2023*, Dallas, TX, November 2, 2023.

Comer, B.J., Foote, J., Markel, D.C. (2023) Hospital-Based Total Joint Arthroplasty and Impact on Time to Discharge. *Current Concepts in Joint Replacement*, Orlando, FL, December 13-16, 2023.

Comer, B.J., Powell, D.T., Fry, M., Markel, D.C. (2023) Cementless Total Knee Arthroplasty in Patients Over 75: A Single Practice Review Using Statewide Registry Data. *Ascension Providence Hospital Annual Research Day 2023*, Southfiled, MI, April 19, 2023.

Comer, B.J., Powell, D.T. , Fry, M., Markel, D.C. (2023) Cementless Total Knee Arthroplasty in Patients Over 75: A Single Practice Review Using Statewide Registry Data. *Mid-America Orthopaedic Association*, Miramar Beach, FL, April 19-23, 2023.

Foote, J.D., Comer, B., Kesto, W., Knesek, D.A., Frush, T.J., Michaelson, J., Markel, D.C. (2023) Manual vs Robotic Unicompartmental Knee Arthroplasty Outcomes: A Single Center MARCQI-Based Review. *American Association of Hip and Knee Surgeons*, Grapevine, TX, November 2-5, 2023.

Foote, J., Weaver, M., Comer, B., Markel, D. (2023) Ninety-Day Opioid Use Among Total Knee Arthroplasty Patients: A Single Center Study. *Current Concepts in Joint Replacement*, Orlando, FL, December 13-16, 2023.

Hughes, R.E., Zheng, H., and Hallstrom, B.R. (2023) Patient reported outcomes vary by TKA implant design. *12th International Congress of Arthroplasty Registries*, Montreal, Canada, May 13-15, 2023.

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Miller, A., Powell, D., Markel, D., Chubb, H., Muscatelli, S., Hughes, R., Hallstrom, B., Frisch, N. (2023) The Differential Effect of COVID on Total Joint Arthroplasty Between Hospital and ASC/HOPD? A MARCQI Analysis. *Ascension Providence Hospital Annual Research Day 2023*, Southfield, MI, April 19, 2023.

Powell, D.T., Frisch, N., Muscatelli, S., Chubb, H., Hughes, R., Hallstrom, B., Markel, D.C. (2023) The Differential Effect of COVID-19 on Total Joint Arthroplasty Between Hospital and ASC/HOPD - A MARCQI Analysis. *Mid-America Orthopaedic Association*, Miramar Beach, FL, April 19-23, 2023.

Seta, J., Dietz, P., Aboona, F., Weaver, M., Bou-Akl, T., Ren, W., Markel, D. (2023) Efficacy of Commercially Available Irrigation Solutions on Removal of Staphylococcus Aureus Infected Porous Titanium Implants- an in-Vitro Study. *The* 35^{th} *International Congress*, New York City, September 27-30, 2023.

Zheng, H., Hallstrom, B.R., and Hughes, R.E. (2023) Propensity score matching to evaluate the improvement of KOOS-JR with applications to selected devices: MARCQI five year study. *12th International Congress of Arthroplasty Registries*, Montreal, Canada, May 13-15, 2023.

Zheng, T.H., Hughes, R.E., Kim, T., and Hallstrom, B.R. (2023) Surgeon volume and survivorship of UKA: What is high volume? A 10-year follow-up analysis with MARCQI database. *24th EFFORT Congress*, Vienna, Austria, May 24, 2023.

2024

Adik, K., Adams, N., Srivastava, A., Hughes, R., Zheng, H.T., Hallstrom, B., and Markel, D. (2024) Increasing use of cemented stems is associated with reduced early fracture after total hip arthroplasty: A single statewide arthroplasty registry perspective. *35th International Society for Technology in Arthroplasty*, Nashville, TN, August 28-31, 2024.

Dailey, E., Hughes, R.E., Zheng, T.H., Hallstrom, B.R. (2024) Age affects TKA implant risk of revision in a regional United States registry. *13th International Congress of Arthroplasty Registries*, Hamburg, Germany, June 1-3, 2024.

Foote, J.D., Comer, B., Kesto, W., Knesek, D.A., Frush, T.J., Michaelson, J., Markel, D.C. (2024) Manual vs Robotic Unicompartmental Knee Arthroplasty Outcomes: A Single Center MARCQI-Based Review. *Ascension Providence Hospital Annual Research Day 2024*, Southfield, MI, April 17, 2024.

Foote, J.D., Comer, B.J., Olson, A.W., Markel, D.C. (2024) Outpatient Total Joint Arthroplasty in the Hospital Setting and Impact of Time to Discharge. *Ascension Providence Hospital Annual Research Day 2024*, Southfield, MI, April 17, 2024.

Foote, J.D., Comer, B.J., Olson, A.W., Markel, D.C. (2024) Outpatient Total Hip Arthroplasty in the Hospital Setting and Impact of Time to Discharge. *Mid-America Orthopaedic Association*, Bonita Springs, FL, April 10-14, 2024.

Foote, J., Weaver, M., Comer, B., Markel, D. (2024) Ninety-Day Opioid Use Among Total Knee Arthroplasty Patients: A Single Center Study. *Ascension Providence Hospital Annual Research Day 2024*, Southfield, MI, April 17, 2024.

Foote, J.D., Weaver, M.J., Comer, B.J., Markel, D.C. (2024) Ninety-Day Opioid Use Among Total Knee Arthroplasty Patients: A Single Center Study. *Mid-America Orthopaedic Association*, Bonita Springs, FL, April 10-14, 2024.

Frisch, N.B., Masini, M., Zheng, H., Hughes, R.E., Hallstrom, B.R., and Markel, D. (2024) Early identification of poorly performing implants in Michigan with the example of the Vanguard XP. *2024 Annual Meeting of the American Academy of Orthopaedic Surgeons*, San Francisco, CA, February 12-16, 2024.

Hallstsrom, B.R., Zheng, H., Hughes, R.E. (2024) The effect of the adoption of uncemented knees on TKA survivorship in Michigan. *13th International Congress of Arthroplasty Registries*, Hamburg, Germany, June 1-3, 2024.

Hallstrom, B.R., Zheng, H., and Hughes, R.E. (2024) Increasing use of cemented stems is associated with reduced early fracture after total hip arthroplasty in MARCQI. *13th International Congress of Arthroplasty Registries*, Hamburg, Germany, June 1-3, 2024.

Hallstrom, B.R., Zheng, H., Kim, T., Chen, L., and Hughes, R.E. (2024) Survivorship at 5 years of uncemented total knee replacement varies by age and is not superior in younger men. *13th International Congress of Arthroplasty Registries*, Hamburg, Germany, June 1-3, 2024.

Hughes, R, Dailey, E., Zheng, T., and Hallstrom, B. (2024) Age affects implant hazard of revision in every implant in a regional United States registry. *25th EFORT Congress*, Hamburg, Germany, May 22-24, 2024.

Hughes, R.E., Zheng, T.H., Hallstrom, B.R. (2024) Benchmarking THA implants in the United States using ODEP criteria. *25th EFORT Congress*, Hamburg, Germany, May 22-24, 2024.

Lübbeke, A., Pindeo-Villanueva, R., Hannouche, D., Chen, L., Zheng, H., Zhu, Q., Hallstrom, B., and Hughes, R. (2024)

Female sex and a higher ASA score increased the 90-day risk of periprosthetic fracture in two distinct registries. *13th International Congress of Arthroplasty Registries*, Hamburg, Germany, June 1-3, 2024.

Puri, S., Uppal, H., Weaver, M., Melone, G., Hughes, R., Dailey, E., and Markel, D. (2024) Patients having primary total joint arthroplasty at ASC's have lower readmission and ER visits than those at HOPDs or hospitals. *35th International Society for Technology in Arthroplasty*, Nashville, TN, August 28-31, 2024.

Zheng, H., Mesko, W., Hughes, R.E., and Hallstrom, B.R. (2024) Wide variation in Patient Reported Outcome Measures (PROMS) improvement at the surgeon level. *13th International Congress of Arthroplasty Registries*, Hamburg, Germany, June 1-3, 2024.

Ziedas, A., Miller, A., Biddle, E., Laker, M., Michaelson, J., Frush, T., Markel, D.C. (2024) Manual vs Robotic Patellofemoral Arthroplasty Outcomes: A Single Center MARCQI-Based Study. International Society for Technology in Arthroplasty Annual Meeting 2024. *35th International Society for Technology in Arthroplasty*, Nashville, TN, August 28-31, 2024.

Ziedas, A., Puri, S., Kesto, W., Michaelson, J., Knesek, D., Frush, T., and Markel, D. (2024) Cementless vs Cemented Robotic-Assisted Total Knee Arthroplasty Outcomes: A Single Center MARCQI-Based Study. *35th International Society for Technology in Arthroplasty*, Nashville, TN, August 28-31, 2024.

Ziedas, A., Puri, S., Kesto, W., Michaelson, J., Knesek, D., Frush, T., and Markel, D. (2024) Manual vs Robotic Patellofemoral Arthroplasty Outcomes: A Single Center MARCQI-Based Study. *Michigan Orthopaedic Society Annual Scientific Meeting*, Mackinac Island, MI, June 7-9, 2024.

Ziedas, A., Puri, S., Kesto, W., Michaelson, J., Knesek, D., Laker, M., Frush, T., and Markel, D. (2024) Cemented Robotic-Assisted vs Manual Total Knee Arthroplasty Outcomes: A Single Center MARCQI-Based Study. *American Association of Hip and Knee Surgeons Annual Meeting*, Grapevine, TX, November 7-10, 2024.

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Support for MARCQI is provided by Blue Cross and Blue Shield of Michigan and Blue Care Network as part of the BCBSM Value Partnerships program.

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