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Title: Gender Equity in Oncology: Progress, Challenges, and the Path Forward in Urologic Oncology and Oncologic Specialties

Running title (40 characters): Gender Equity in Oncology

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Precis: Despite the increasing number of women in medicine, gender disparities in leadership and career advancement, particularly in oncology, remain prominent. Addressing issues such as pay disparity, maternity leave policy, and limited access to mentorship is key to fostering gender equity and improving patient outcomes amid impending physician shortages.

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Abstract:

Women now comprise over 50% of medical school graduates and over one-third of practicing physicians in the US. Despite this progress, significant barriers to career advancement and leadership persist, particularly in male-dominated fields like urology and oncology. Women physicians are linked to improved patient outcomes and are critical to addressing the projected physician shortage, which is expected to be exaggerated in oncology specialties.

This review highlights progress, challenges, and future directions for gender equity in urology, urologic oncology, and oncology subspecialties. Urology and urologic oncology have seen growth in female representation, while radiation oncology remains stagnant, and medical oncology has reached near gender parity among trainees. However, leadership roles across all these fields continue to reflect gender inequities.

Key barriers include the gender pay gap, insufficient maternal leave policies, workplace harassment, and lack of mentorship and sponsorship for women physicians. Moving forward, efforts to advance gender equity must include transparent pay structures, supportive maternal leave, and robust anti-harassment policies. Promoting women in leadership and fostering mentorship are also essential to retaining and advancing women in these fields.

By addressing these issues, the healthcare community can progress toward gender equity, strengthen the physician workforce, and improve patient outcomes. Institutional and national advocacy is crucial for creating an equitable and effective medical community.

Key words: gender equity, women, leadership, workforce, pipeline

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Introduction

While medicine was previously a field dominated by men, women now make up over 50% of medical school applicants and graduates.[1] There has been a 97% increase in the number of women in the physician workforce from 2004 to 2022, and women now make up over one-third of practicing physicians in the United States. This growth has occurred across specialties, with 17 of the 20 largest medical specialties having an increased percentage of women over the last several years.[2] While the rise of women in medicine represents a significant shift in the healthcare profession towards gender equity, there remains significant gender inequity in promotion and academic leadership. Women fall behind men in attaining positions of leadership and ascending the academic ladder.[3] Across medical specialties, women take longer to be promoted and represent a minority of department chairs (25%) compared to men.[1] This is particularly true in fields such as urology, and specifically oncology subspecialties, that have traditionally been dominated by men.

The shift in gender composition of the physician population is not only important to achieving gender equity, but is also critical to the health of the physician workforce. According to recent workforce projections, the US will face a shortage of up to 86,000 physicians by 2036.[4] This shortage is expected to be further exaggerated among oncologic providers given the aging US population and projected increase in cancer survivors.[5] The exaggerated workforce shortage will have direct negative impact on timely access to diagnosis and care for patients with cancer. Women are expected to play a critical role in the impending shortage, currently comprising more than half of the current physician workforce under the age of 45.[4] Urology is a notable example of this, with an expected shortage of urologists per capita of 30% by 2030.[6, 7] According to Gaither et al, nearly one-third of practicing urologists are nearing retirement, and of those an estimated 2% are women.[8] By contrast, women make up a quarter of practicing urologists under the age of 45.[9] As such, it is not surprising that recent analyses have found that women urologists will play a crucial role in bolstering the urology workforce in the next four decades in multiple growth models.[10, 11]

Women are critical to addressing the physician workforce shortage, particularly in oncology, and there is a time-sensitive need to recruit, retain, and support women in medicine. This is particularly true given the higher rate of attrition of women physicians compared to men at every stage of career in medicine.[12] Aside from the impact of the attrition of women physicians on workforce shortages, there is also an expected impact on the delivery of patient care. Multiple studies have demonstrated women physicians are more likely to practice evidence-based medicine, have fewer readmissions, and lower rates of post-operative complications[10] than men. In addition to improved patient outcomes, women in urology are more likely to care for diverse patient populations, seeing twice as many dual-eligible Medicare and Medicaid beneficiaries and more people of color than men urologists.[13] Increasing representation of women in medicine is critical for gender equity, bolstering the physician workforce, and improving outcomes while providing care to more diverse patient populations.

Within this context, the objective of this review is to describe the progress, challenges, and path forward to achieving gender equity for women in urology, urologic oncology, and oncology subspecialties.

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Progress of Women in Urology

While urology has traditionally been a field dominated by men, the gender composition of the urology workforce has changed dramatically over recent decades. There has been an 11-fold increase in the representation of women in urology from 1978 to 2013, marking it the largest growth in representation of women in any medical specialty in that timeframe.[14] This is reflected in the 2023 American Urological Association census data which reports 11.8% of current practicing urologists are women and 30.9% of urology residents are women, compared to 22 women practicing urology in 1978 and 0.9% of urology residents in 1985.[14, 15]

Despite the overall number of women in the field of urology increasing, there remains significant gender inequity in leadership within urology. A 2017 study of urology programs found that 3.3% of department chairs, 4.5% of vice chairs, and 7.9% of division directors in urology were women.[16] Overall, women in urology are nearly half as likely as men to become full professors, regardless of age, years since completion of training, or number of publications.[17] An example of organized effort to address gender inequity is the Society of Women in Urology (SWIU), which was organized in 1980, with one of the key tenants of their mission to "support the professional advancement of women urologists".[18] The growth of women in urology has been exponential, however, the expansion of that growth into leadership remains a critical area of inequity within the field.

Progress of Women in Urologic Oncology

Within urology, women are under-represented in urologic oncology and only 4% of urologists with an oncology focus are women.[19] Similar to the overall increase in women within urology in recent decades, there has also been an increase in women practicing urologic oncology, albeit on a smaller scale. Since the first woman urologic oncologist, Elisabeth Pickett, in 1954, the field has appreciated slow, incremental growth in the number of women that provide urologic oncology care. From 2004 to 2015, there were only 34 women urologic oncologists.[20] This number has since grown with 78 women registered in the Society of Urologic Oncology (SUO) in 2021 and 91 in 2022. This is likely a byproduct of an increase in the number of women applicants to urologic oncology fellowship in recent years, with 10 women applicants in 2019 up to a peak of 17 in 2021, and most recently 13 in the 2025 fellowship match.[21-23]

Despite this increase, women remain a significant minority in urologic oncology, prompting the establishment of the Women in Urologic Oncology (WUO) organization in 2019 within the Society of Urologic Oncology. The organization's primary objective is "advanc[ing] recruitment, retention, and promotion of women in urologic oncology".[20] While the overall number of women pursuing urologic oncology in recent years has increased, there continues to be a huge gap in gender equity among leadership in urologic oncology. As of 2017, there were no women oncology division chiefs, and the Board of Directors of the SUO had its first woman named to the executive board in 2023, and the current Board of Directors features 5 women to 23 men.[16, 24]

Progress of Women in Oncology Subspecialties

As the number of women increases across medicine, the proportion of women entering different specialties and attaining leadership roles has been variable, particularly in oncology subspecialties.

Similar to urology, radiation oncology has historically been a field dominated by men; however, unlike urology, radiation oncology has had a slower increase in the number of women in the field over recent decades despite having similar proportions of women applicants to residency positions.[25] In 1980, 27.1% of radiation oncology residents identified as women compared to

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33.3% in 2010,[26] and more recently 30.8% in 2019,[27] suggesting an overall slow and intermittently receding growth pattern of women entering the field. Over a similar time period, the number of women faculty in radiation oncology has grown from 11% in 1980 to 26.7% in 2012.[26] In light of stagnant growth of women in the field, in 2022 the American Society for Radiation Oncology formed the Women in Radiation Oncology Affinity Group taskforce to evaluate current state of women in the field and identify areas for improvement.[28] One such area identified for improvement is women in leadership. Despite women making up approximately one-third of all faculty positions in radiation oncology, only 12% of departments have a chairwoman,[27] and 1 of 4 current radiation oncology trustees for the American Board of Radiology are women, suggesting persistent gender inequity at higher levels of academic leadership.[29] Compared to urology, our colleagues in radiation oncology have had less growth of women in their workforce, but have similar to slightly improved proportion of women in positions of leadership although this still lags in gender equity on the whole.

Compared to radiation oncology, medical oncology has seen a significant and ongoing increase in women within the field over recent decades that has closely matched overall percentage of women in medicine. Further, women made up 48.4% of medical oncology trainees in 2013, nearing gender parity.[30] Despite the impressive percentage of women trainees, the number of women faculty in medical oncology has yet to follow suit with 35.8% of practicing oncologists identifying as women according to the 2022 American Society of Clinical Oncology Snapshot.[31] Representation of women in leadership positions in medical oncology is slightly more favorable than in urology or radiation oncology, with 31.4% in any leadership position and 21.7% of chairs identifying as women.[32, 33] Medical oncology, though reaching near gender parity in trainees, continues to fall short of gender equity in leadership similar to their colleagues in urologic oncology and radiation oncology.

Challenges

These findings across urologic oncology, radiation oncology, and medical oncology outline how gender equity has remained elusive across oncologic specialties. While each specialty has made variable progress in recruitment, retention, or promotion of women into leadership, there are shared gender-specific challenges across specialties. The first step towards achieving gender equity is to identify these shared challenges across oncology subspecialties.

Despite differences in the representation of women at the trainee and faculty level across urologic oncology and our colleagues in medical and radiation oncology, there is a persistent pattern of decreased representation of women in higher levels of academic leadership compared to men across all three specialties. This has been referred to by many as the “leaky pipeline”, or diminishing proportion of women at each level of higher academic leadership.[32] While some have explained this phenomenon as a function of time, men and women have been in near parity proportions of medical school graduates for decades, beyond the length of time required over a career to ascend to leadership. This suggests that the pipeline, while long, is also leaky, such that women drop out of the pipeline before climbing the leadership ladder. Recently, gender-specific barriers to attaining higher-level leadership and “leaking” from the pipeline have come into focus.

Multiple studies have shown that women physicians across specialties are paid less than men, with an estimated difference of nearly 2 million dollars over a 40-year career.[34] In urology, providers who are women earn significantly less than men, with median salary difference of $81,578 when controlled for hours, practice setting, fellowship training, and use of advanced practice providers.[35] This is also true specifically within urologic oncology, wherein providers who are women have median salaries $54,000 lower than men in the field.[19] While gender pay

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discrepancy has long been reported across specialties, it is not surprising that women urologists who are well-compensated report higher levels of job satisfaction which may combat attrition.[36]

Another major contributor for the leaky pipeline is work-life conflict for women trainees and young faculty members, particularly as it relates to family building. While there has been increased attention paid to fertility, pregnancy accommodations, and maternal leave as the proportion of women in medicine and urology grows, it remains poorly understood. For example, women urologists are more likely to bear children later in life, have fewer children, utilize assisted reproductive technology more often, and have higher rates of pregnancy complications compared to the general US population.[37, 38] A survey of over 240 women urologists with at least one biological child reported that 69% of respondents were dissatisfied with their maternal leave due to work or residency related issues.[39] While federal legislation to prevent pregnancy discrimination (Pregnancy Discrimination Act of 1978, Family and Medical Leave Act) and well-defined policies for pregnant residents exist via the Accreditation Council for Graduate Medical Education (ACGME), there are no national organizational policies regarding family building for attending physicians within the AUA, ASTRO, or American Society of Clinical Oncologists (ASCO), with the vast majority of policy arising at the institutional level if at all.

Beyond family building, gender inequity in domestic tasks, including childcare, has been identified as an ongoing challenge for women physicians in the workforce. Persistent societal expectations that women serve as primary caregivers in the home have been identified as a barrier to the professional advancement of women physicians.[40] Women physicians have been found to spend on average 8.5 more hours weekly on domestic tasks, including parenting, compared to men physicians.[41] While differences in caretaker duties have not been shown to result in gender differences in work-life balance satisfaction,[42] they may cause women physicians to modify their clinical or surgical practices.[43] Importantly, studies during the COVID-19 pandemic revealed that women physicians with children were more likely to lose child care coverage and have high rates of burnout.[44, 45] While the COVID-19 pandemic was an exacerbated example of childcare challenges, it highlighted that policies and programs to support childcare for physicians, and particularly women physicians, are often lacking at the institutional level.[46]

Women physicians also may face significant harassment in the workplace. A recent AAMC report found that 34% of women physicians have experienced sexual harassment compared to 22% of men.[47] This is particularly true in fields dominated by men, such as urology. Per 2023 AUA census data, 61% of women urologists reported experiencing discrimination and/or harassment by patients or their families, notably higher than 21% among men who are urologists.[9] This trend was similarly identified among women residency applicants to urology, who reported significantly higher rates of discrimination, abuse, or harassment compared to men applying to residency (63% versus 35%, $p < 0.001$).[48] Addressing harassment at an institutional level is key to creating a safe space for women to excel within.[32] While the AUA has issued a position statement on fostering a productive work environment to eliminate discrimination and harassment, they encourage development of policy at the institutional level to achieve these goals.[49] Thus, it is imperative that individual institutions develop and enforce effective anti-harassment and discrimination policies that can further create safe workspaces for women within urology and medicine as a whole.

When it comes to promoting gender equity in higher levels of leadership, mentorship and sponsorship are crucial. Departments with women in leadership positions have 7 to 10% more women retained in faculty positions.[33] Similar trends have been noted amongst residency applicants and trainees, in the AUA match from 2018-2020, there was a positive correlation between proportion of women applicants matched and proportion of women residents and faculty in each program.[50] To recruit, retain, and promote women in urology, we must acknowledge the

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importance of representation of women in leadership positions. While this is likely true for most medical specialties, it is particularly true in surgical specialties wherein 35% of women medical students were discouraged from pursing surgical careers due to lack of women role models.[51] Institutions must seek to promote and retain women in leadership positions to beget future women leaders and progress towards achieving gender equity.

Future directions

Given women physicians who are well-compensated report higher job satisfaction,[36] there has been increased attention placed on addressing the gender pay gap in medicine. Some proponents have suggested that the first step to achieving pay equity is transparency. This includes offering standardized pay packages for new hires, particularly given the largest gender pay gap amongst physicians occurs in the first few years of the career.[34] This transparency can be extended to more senior roles by setting public salary benchmarks within departments. Beyond departmental and institutional policies, our specialty society organizations must support equal pay legislation at the national level.

While detailed policies regarding family building exist for resident physicians, there is no comparable policy on a national level for attending physicians despite recommendations made by national organizations beyond the federal and state regulations (e.g., FMLA). Further, FMLA does not provide salary support or paid leave, and does not apply within the first year of employment.[52] This leaves management of maternal leave policy up to individual institutions, with 40% of women urologists reporting no maternal leave policy at their institution.[39] As such, a critical first step to supporting family building among women physicians is enactment of transparent and readily accessible maternal policies and benefits that include leave duration as recommended by obstetric specialists and paid leave that is separate from vacation or sick leave.[52] While this may be suggested and supported by our national organizations and societies, the responsibility for policy in the current state falls on the institution. Beyond institutional-level change, workplace cultures must be shaped to acknowledge and support maternal health to accommodate family building without penalizing career progress for women physicians.

Lack of accessible childcare options and flexible policies regarding caretaker responsibilities may contribute to women physician burnout and delay career advancement. There is a substantial need to develop programs to support women physicians and trainees with children. Potential interventions to address this barrier include institutional investment in on-site childcare, including extended or 24/7 hours to account for the unpredictable work hours of on-call physicians or sick children.[53] In addition to providing these resources, to reduce burnout and increase physician engagement, institutions should promote schedule flexibility and work-life integration, particularly for women who take on a greater degree of domestic duties outside the workplace.[41, 54] This is critical given that in a survey of over 600 women surgeons, the workplace factor with the strongest association with career satisfaction was the degree of work-life integration efforts in the workplace.[43] Institutions should seek to build flexible cultures that promote work-life integration and enact structural changes to provide childcare coverage for physicians to reduce burnout and support women physicians in the workforce.

Harassment and discrimination within the workplace, which is experienced at greater rates by women residents and attending physicians, can lead to increased burnout and may contribute to subsequent attrition from the workforce.[55, 56] This is particularly true among women physicians from underrepresented groups.[55] While national legislation exists to combat harassment in the workplace, it remains prevalent in healthcare culture, and is typically addressed at the institutional level. Institutional actions to combat the increased prevalence of harassment among women

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physicians in the workplace include efficient avenues for event reporting, required training targeted to health professionals within institutions, and deployment of bystander training. These efforts should be paired with clear, direct institutional policy and enforcement to instill a culture of accountability and create a psychologically safe healthcare workplace for everyone, and particularly women.

Perhaps the most influential barrier to addressing the leaky pipeline of women in academic medicine is lack of available women role models, mentors, and sponsors. To seek out gender equity in academic medicine leadership we must promote more women to leadership roles, provide appropriate leadership training, and support women mentoring other aspiring women to follow their footsteps. A critical first step to promoting women to leadership is increasing their representation on recruitment committees through institutional policy and quotas. For example, the University of California at San Francisco reported a 50% increase in the number of female chairs in the years following a policy requiring 50% of hiring committee members to be women or persons from underrepresented minority backgrounds.[57] Once women are hired or promoted to positions of leadership, it is critical for institutions to support their development by offering leadership courses designed for women, such as Executive Leadership in Academic Medicine (ELAM), to provide women with the skills to excel in their leadership and mentorship roles.[58] Institutions and departments can also consider development of term limits on academic leadership positions such that new leaders, including women and persons of diverse backgrounds, can enter into leadership positions earlier and promote gender equity and diversity in academic leadership.[59] While these are a few institutional interventions to promote gender equity in academic promotion, concerted efforts at the individual and departmental level are also likely required to make meaningful change in the pipeline.

Conclusion

To repair the leaking pipeline of women from academic leadership in urology, urologic oncology, and adjacent oncology specialties, we must address the ongoing gender-specific barriers to achieving equity including advocating for equal pay, promoting equitable maternal leave policies, offering accessible childcare, addressing workplace harassment, and supporting women trainees and faculty with women role models, mentorship, and sponsorship so that they may ascend to higher levels of leadership. Taking these steps will not only work towards improvement in gender equity in medicine and urology and urologic oncology, specifically, but may also support the physician workforce ahead of looming shortages and improve the quality of care delivered to patients across specialties.

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