Jameyfield Emily Louise (Orcid ID: 0000-0003-4955-3362)
Kropf Charles (Will) (Orcid ID: 0000-0001-8380-6664)
Lewis Jason J (Orcid ID: 0000-0001-5421-407X)

Academic Emergency Medicine Education and Training
Original Research Contribution:

Virtual versus In-Person Didactic Modalities: A National Survey of Emergency Medicine Residencies

Emily Jameyfield[1,2], MD, MHPE, Charles W Kropf[3], MD, MHPE, Jason J Lewis[4], MD, Christopher Reisig[5], MD, MA, Jenna Thomas[6], MB BCh BAO, MHPE

[1] University of Chicago, Chicago, IL
[2] Current: Yale University School of Medicine, New Haven, CT; Emily.Jameyfield@yale.edu

[3] University of Michigan, Ann Arbor, MI; cwkropf@med.umich.edu

[4] Harvard Medical School, Beth Israel Deaconess Medical Center, Boston, MA; jlewis@bidmc.harvard.edu

[5] New York-Presbyterian Weill Cornell Medicine, New York, NY; chr2019@med.cornell.edu

[6] Washington University in St. Louis, St. Louis, MO; tjenna@wustl.edu

Corresponding Author: Emily Jameyfield, MD, MHPE, Department of Emergency Medicine, Yale University School of Medicine, New Haven, CT.
Email: Emily.Jameyfield@yale.edu Phone: 203-430-4000

Abstract Word Count: 300
Manuscript Word Count: 3,873

Running Title: EM Residency Didactic Modalities National Survey

Presentations: This research was shared during a didactic workshop titled "A Bad Case of the Zoomies: Deciding on Virtual vs. In-Person Didactics After COVID-19" at the Society for Academic Emergency Medicine (SAEM) Annual Meeting in May, 2024. This manuscript has not been previously published and is not currently submitted to any other journals for review or publication.

Financial Support: No funding was received by any author for the design, implementation, or analysis of this study.

Author Contributions: All authors meet all four criteria for authorship per ICJME. EJ, CWK, JJL, CR, JT all conceived and designed the study. All five authors conducted the study and acquired the data. All five authors analyzed and interpreted the data. All five authors worked together in writing the manuscript. EJ and JT finalized the manuscript draft. All authors contributed substantially to revising the manuscript critically for important intellectual content, provided their final approval of the version to be published, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1002/aet2.11056

This article is protected by copyright. All rights reserved.

Author Manuscript

Conflicts of Interest: EJ, CWK, JJL, CR, and JT report no conflict of interest in this study.

Ethical approval: Ethical approval was granted by the Institutional Review Board of the University of Chicago, where corresponding author EJ was employed throughout the duration of survey creation and data collection.

Author Manuscript

Virtual versus In-Person Didactic Modalities: A National Survey of Emergency Medicine Residencies

ABSTRACT

Background

Following the widespread shift from in-person to virtual delivery of didactics during the COVID-19 pandemic, some Emergency Medicine (EM) residency programs have retained virtual didactic time while others have returned exclusively to in-person didactics. In this national survey of EM residency programs, we explored the current national distribution of virtual vs. in-person didactic time, and the circumstances and motivators for use of each.

Methods

A cross-sectional survey with branched logic was designed via Qualtrics™. Distribution was via a Council of Residency Directors in Emergency Medicine (CORD) listserv; non-responding programs were emailed directly with subsequent reminders. Analysis and descriptive statistics were via Microsoft Excel. All authors performed thematic analysis of narrative comments.

Results

We received responses from 174 of 281 programs (61.9%). “Hybrid” programs utilizing both in-person and virtual time represented 51.7% of respondents, and the remaining 49.3% used in-person didactics only. Among hybrid programs, 77.3% utilized in-person conferences greater than 75% of the time. Simulation (100%) and procedural teaching (99%) were most strongly

preferred in-person, and oral boards practice (30.2%) was supported virtually. The most common motivations for in-person delivery were perceived impact on resident and/or faculty learning (86.8%), perception of resident engagement (79.3%), community building (74.7%), type of learning sessions (70.1%), and perceived impact on resident and/or faculty wellness (59.8%). Top reasons for choosing virtual didactics were perceived convenience for residents (75.6%) or faculty (60.0%), and perceived impact on resident and/or faculty wellness (43.3%).

Conclusion

Nationwide, EM residency programs spend most didactic time in-person. Modality choice is influenced by didactic content as well as sociocultural considerations. Future investigation into the validity of perceptions that participants are more engaged and learn better with in-person didactics is warranted.

Author Manuscript

INTRODUCTION

In March of 2020, the COVID-19 pandemic incited a sudden shift in residency education across the United States, as didactic delivery transitioned from in-person to virtual platforms. Per the Accreditation Council for Graduate Medical Education (ACGME), greater than 84% of programs in all regions of the United States reported decreased in-person didactic conferences and greater than 82% reported increases in virtual didactic conferences.[1]

Prior to the pandemic, it was common practice among emergency medicine (EM) residency programs to hold a 5-hour half-day didactic "conference" one day of the week, with up to 20% (or one hour per week) of potential "asynchronous" education.[2] As social-distancing requirements relaxed and eventually lifted after the pandemic, there were no regulations or guidelines as to how (or whether) to continue to utilize virtual didactic time during planned, synchronous resident education time. This flexibility led to wide variability in how EM residency

programs (re)formatted their residency education, and the current state of how many programs continue to use virtual didactics is unknown.

Given these uncertainties, we surveyed EM residency programs directly to clarify how residency didactics are currently structured nationally in the post-COVID landscape. The goal of this study was to determine to what extent programs currently deliver their didactics in person, virtually, or using a combination of both modalities. We additionally explored the rationale underlying the choice of virtual vs. in-person modality, how familiar programs are with what other programs are doing, and how satisfied they are with their own practice. Understanding programs' priorities and goals for didactic delivery will inform future choices into use of virtual or in-person didactics according to each program's individual needs. This insight will direct future inquiry into contemporary didactic delivery in an increasingly connected medical education landscape.

METHODS

Study Design

During our review of the relevant literature, we did not identify an existing or validated survey instrument that answers the above questions. As such, we designed a cross-sectional survey aimed at capturing the practices of EM residency programs during the 2023-2024 academic year. The survey (Appendix A) contained 5 sections and employed branched logic, amounting to between 15 and 22 questions per respondent. Development and administration were via the secure web-based survey platform Qualtrics™. We used an iterative review approach to design the survey consistent with established best practices.[3] Initially, survey items were jointly designed and screened for clarity through collaboration with a subset of medical

Author Manuscript

Author Manuscript

professionals with specific training in medical education including an expert in survey methodology. Subsequently the items were reviewed by four other members of the Society for Academic Emergency Medicine (SAEM) Education Committee to assure that they targeted the desired survey objectives. Question types included checklist selection, nominal categories (with narrative box to clarify "other" responses), a numeric entry question for programs which split their time between virtual and in-person, a matrix, and narrative entry. The initial survey was piloted with two assistant program directors (APDs) from the same pilot institution to assess response process and interrater reliability. These responses were reviewed and compared for similarities and differences. Cognitive interviewing was utilized to modify items for clarity, particularly focusing on items where there were answer discrepancies. This process was then repeated with APDs at a second pilot institution and the survey items were again revised. When multiple APDs at a third pilot program interpreted items consistently, the questions were deemed to have acceptable interrater reliability and the survey was distributed.

To identify duplicate responses, the first survey question required that each respondent identify their program name from a dropdown menu. Branch logic was incorporated into the next thirteen questions of the survey so that respondents only saw questions relevant to their program as determined by prior responses. If a respondent reported that their program utilized 100% in-person conference and did not have any virtual conference education, they were not asked any questions related to virtual didactics. If a respondent reported that their program followed a hybrid structure with both in-person and virtual didactic components, they were asked questions pertaining to both in-person and virtual modalities. Each survey concluded with three questions assessing respondent knowledge and satisfaction regarding the nationwide conference landscape and five demographic questions about the program and respondent identity. Apart from the initial

question “Does your program have both in-person and virtual residency conference days?” all other questions were optional and could be skipped.

Study Setting and Population

Our target population was ACGME-accredited categorical EM residency programs. As of October 2023 there were 282 programs listed on the Electronic Residency Application Service™ (ERAS) website. One of the programs was subsequently determined to not yet be operational, resulting in a pool of 281 programs.

Study Protocol

Data was collected between October 2023 and February 2024, with responses reflecting the 2023/24 academic year. In order to get a single expert response from each institution, we requested that one program director (PD) or surrogate member of program leadership with a strong understanding of the program’s conference structure respond on behalf of their residency program. Participation in the survey was solicited through the Council of Residency Directors (CORD) Program Directors and Faculty listserv via two posts, three weeks apart. To maximize responses, any ACGME program that had not yet responded one month after the second listserv post was then sent the survey via email link. Unresponsive programs were sent one final reminder via email three weeks later. Participation was entirely voluntary and there was no incentive offered for completing the survey. The study was IRB approved.

Data Analysis

We analyzed the data using Microsoft Excel to calculate descriptive statistics. Responses were sorted by program name, and single responses were selected for each program. Handling of duplicate responses was discussed amongst the authors and the following order of operations was determined: complete responses were selected over incomplete responses. If one submission had

Author Manuscript

Author Manuscript

significantly more detail than the other and there were no discrepancies, the more detailed submission was selected. If two conflicting submissions were submitted by individuals with different roles, the one submitted by the PD was selected. If there were no substantial differences between submissions, the first submission was selected. If two submissions had obvious discrepancies requiring clarification, we emailed the PD requesting clarification. If the PD responded, the discrepancy was edited and the duplicate submission was deleted. In the single instance where the PD did not respond to our inquiry after one week, the first submission was selected.

We were unable to find any information online for two of the 281 programs identified from the ERAS website. In order to provide the most conservative estimates in our results, and with the possibility that these programs were extant and reached by our distribution efforts, we did not exclude them from the denominator during calculation of response rate.

When responses to individual questions were missing, we calculated response statistics based on the available responses for each question and reported the number of responses used in our results.

RESULTS

We received 209 survey responses. After deduplication, 174 represented unique programs for a 62% (174/281) response rate. Of responding programs, 20% were 4-year programs, 76% were 3-year programs, and 4% did not provide a response to program length (Table 1). Primary training sites were Academic (47%), Community (35%), County (10%), and Other (3%). This sample reflects the national data as reported on the Emergency Medicine Residents' Association (EMRA) Match site, with a slight over-representation of academic training sites compared to

Author Manuscript

community training sites (Table 1).[4] Program size ranged from 6-100 residents with a median of 38.7 residents. Survey respondents included program directors (72%), associate program directors (12%), assistant program directors (9%) or other (3%), which included vice-chairs of education, residency administrators, or department chairs.

Didactics were structured as a "conference" block of 4-5 hours or one half-day per week in 98% of programs. Only three programs reported "other" structures, with one not reporting details, one scheduling 5.5-6.5 hours of didactics once a week, and one scheduling 2.5 hours of didactics twice a week. With regard to asynchronous learning, 75/174 (43%) of programs reported 1 hour/week of tracked asynchronous learning, 61/174 (35%) reported less than 1 hour/week of tracked asynchronous learning, and 38/174 (22%) reported that they do not include tracked asynchronous learning.

The primary outcome of the study was the breakdown of conference modality between in-person only, virtual only, or some hybrid of virtual and in-person conference. Of all programs responding to this question, 90/174 (51.7%) reported using a hybrid model and 84/174 (48.3%) programs reported having in-person conferences only (Figure 1). There were no programs that reported holding only virtual conferences. Although 90 programs reported a hybrid approach, only 84 provided the breakdown of their hybrid approach. Of these programs, 65/84 (77.3%) utilized in-person conferences greater than 75% of the time. The average percentage of time that hybrid programs dedicated to virtual didactics was 23.3% of total annual conference time, indicating that the majority of conference time even among hybrid programs is in-person.

Of the 84 programs that hold 100% of their conferences in person, 35 (41.7%) allowed residents to obtain conference credit if they logged into a virtual platform to experience the conference in real time, either always (2/35) or in "situation-dependent" circumstances (33/35).

Author Manuscript

Similarly, 40/90 (44.4%) of the hybrid programs allowed residents to obtain credit for virtual attendance of in-person conference days. Situations warranting this attendance credit included illness (37/174, 21.3%), recent shift at a non-local hospital site (19/174, 10.9%), parental leave (12/174, 6.9%), and being post-night shift or between evening shifts (12/174, 6.9%). Four programs also noted that their PD takes additional situations into consideration for virtual attendance credit on a case-by-case basis. Of the 124 programs that offered any attendance for virtual conference, either via hybrid structure or for case-by-case concurrent attendance for in-person conference, 56 (45.2%) required that residents have their cameras turned on in order to receive conference credit, 61 (49.2%) did not require video cameras turned on for credit, and 7 (5.6%) did not respond.

Secondary outcomes addressed preferred modalities for different types of didactic content (Figure 2). Of the 86 hybrid programs that reported their preference for scheduling some didactic types as in-person and some as virtual, 100% preferred in-person modality for simulation training, and 99% preferred in-person procedural training. Other didactic types were regarded with mixed preference. More than half of the hybrid programs preferred a virtual modality as much or more than in-person modality when scheduling faculty or resident lectures (50/86, 58%) guest speakers (47/86, 54.7%), grand rounds (42/81, 51.9%), ITE review (47/85, 55.3%) and oral boards practice (44/86, 51.2%). Oral boards practice elicited the strongest support for virtual-specific modality with 30.2% (26/86) of hybrid programs preferring to conduct this virtually.

Residency programs noted a range of motivations behind their choice to deliver didactics in-person or virtually (Figure 3). Motivations for scheduling didactics in-person were elicited both from hybrid programs and in-person only programs (n=174). As there were no programs which reported using a virtual-only format, motivations for scheduling didactics virtually were

Author Manuscript

elicited from hybrid programs (n=90), and response rates and statistics pertaining to virtual delivery are calculated in relation to these respondents. The top reasons for choosing in-person didactics were perceived impact on resident and/or faculty learning (n=151, 86.8%), perception of resident engagement (n=138, 79.3%), community building (n=130, 74.7%), type of learning sessions (n=123, 70.1%), and perceived impact on resident and/or faculty wellness (n=104, 59.8%). Top reasons for choosing virtual didactics were perceived convenience for residents at respondents' institution (n=68, 75.6%), perceived convenience for faculty at respondents' institution (n=54, 60.0%), and perceived impact on resident and/or faculty wellness (n=39, 43.3%).

All authors engaged in thematic review of narrative comments (Table 2). Themes favoring the choice for virtual didactics included expanded invitations to guest speakers and attendees, increased attendance, reflection of resident requests, and use of virtual didactics to supplement in-person learning as a means to support wellness or in the case of special circumstances. Themes in opposition to virtual didactics included dissatisfaction with having a concurrent virtual attendance option for in-person didactics, better engagement during in-person didactics, reflection of resident preferences, and the belief that community building and engagement stem from in-person didactics.

Regarding respondents' awareness of peer practices, 73% of programs reported they were either "not at all" or "somewhat" knowledgeable of other programs' conference formatting, while only 12% reported that they were either "very" or "extremely" knowledgeable about peer programs' practices. At the same time, 85.6% noted being "very" or "somewhat" satisfied with their current residency program conference structure, and only 8.6% of respondents reported being "somewhat" or "very" dissatisfied.

Author Manuscript

DISCUSSION

Despite the nearly-exclusive virtual delivery of didactics by EM programs during the early days of the COVID-19 pandemic,[5] programs have now largely defaulted back to in-person didactics and use virtual platforms only as needed or in specific circumstances. Our results indicate that both the type of didactic and the impact on residency culture and sense of community matter when programs choose how to deliver didactic material. While the question of whether learning outcomes are better when material is delivered virtually vs. in-person is still largely unresolved, programs appear to be balancing this uncertainty with their own lived experiences of residency and faculty engagement, need for hands-on experiences with procedures and simulation, and prioritization of resident wellness and community building.

Matching Didactic Content to Delivery:

The 90 "hybrid" programs that reported using combinations of in-person and virtual modalities showed strong preferences for scheduling certain didactic types in person. Most striking was the overwhelming preference to teach simulation and procedural training in-person. This preference aligns with pandemic-era studies exploring learner reactions to virtual education which demonstrated that, while early reactions to the addition of virtual didactic content were largely positive, the impact of virtual teaching on simulation and procedural skill training was not well received and the loss of interpersonal engagement was keenly felt.[6-12] The importance of tactile feedback and hands-on practice to build psychomotor memory for procedural and simulation education appears to be universally assumed in our responses, summed up by the comment that "This is an in-person specialty" when describing motivations for choosing in-person conference.

Author Manuscript

Hybrid programs also preferred to deliver discussion-centric content such as small-group discussions, flipped-classroom sessions, interprofessional education, and morbidity and mortality sessions in-person, though the consensus was not as strong as for procedural or simulation education. A previous multicenter study of both residents and faculty of categorical EM programs found that open discussion was somewhat hindered by the virtual modality,[6] while another survey of EM and internal medicine residents indicated overwhelming preference for in-person interpersonal interactions,[7] and our responses align with these sentiments. Both virtual platforms themselves and the increased task burden of maintaining smooth operation of a virtual platform in real time were reportedly dissatisfiers of utilizing virtual formats during discussion-heavy components of didactics. Multiple narrative comments noted that the coordination of both in-person and virtual audiences during synchronous didactics required too much work and decreased participant satisfaction. However, the significant proportion of respondents with equal preference for in-person or virtual discussion-based didactics suggests that many programs have found ways to mitigate technical challenges, such as designating a member of the education team to facilitate smooth operation of the virtual platform and moderate interactive functions.[13,14]

Didactic types traditionally considered less interactive were less frequently preferred for in-person delivery. More than half of responding hybrid programs preferred virtual, or equally preferred virtual or in-person delivery, for these types of didactics, which included resident lectures, guest speakers, and grand rounds. Passive learning of this type is generally easy to transition to a virtual format using standard video-conferencing technology. Additionally, widespread dissemination of lecture content may be easier via virtual format if lecturers are not local to the residency program, or if the residency program frequently has learners living or working at sites remote to the primary hospital location.

Author Manuscript

The didactic types least frequently preferred for in-person delivery - in-training exam (ITE) review and oral board review - do not follow the above pattern, as both frequently require audience engagement to be successful. Both ITE review and oral board review sessions frequently take a "quiz" or "test" format, which can easily be facilitated via web-based applications or in-person, and both include a computer-based exam. Notably, at the time of this survey the American Board of Emergency Medicine (ABEM) had been conducting the oral portion of its certification exam virtually since 2020, and had not yet announced plans to return to in-person testing. Practicing in a virtual format more closely replicates the conditions of the anticipated exam, which likely accounts for the oral board review being most frequently preferred for virtual delivery. During the 2024-2025 academic year ABEM announced that they will be replacing their virtual oral board certifying exam with a new in-person exam in 2026.[15] We anticipate that this will affect future preferences for board review modality.

Residency Culture:

In 2021, a CORD task force surveyed attendees of the CORD Virtual Academic Assembly to better understand the perceived impact of the then-novel virtual didactics on EM learners and programs.[16] One of the biggest reported concerns about virtual learning was that it led to a decreased sense of connection with peers and colleagues. In the same year, a multicenter survey of residents and faculty comparing perceptions of virtual vs. in-person didactics found that more than 75% of both residents and faculty reported missing the social interactions of in-person conference, and most preferred that future didactics would be 20% virtual or less.[6] Three years later, this same theme is reflected in our survey responses. Community building and participant engagement were among the top reasons for selection of in-person didactic delivery, which was also highlighted in narrative comments. Programs contrasted their lived experiences

Author Manuscript

during mandatory remote didactic delivery and gathering in-person in narrative comments. One respondent "started noticing differences in class cohesion between classes who had been separated during COVID and those who went through orientation and early training in person" while another pointed out that weekly didactic conference "is the one time each week that nearly all of the residents are physically together in one place." Another respondent noted that in-person didactics led to "less isolation - rather [than] sitting alone in their homes, they get to gather for learning and socialization, breakfast and banter."

The strongest motivating factors for scheduling conferences virtually were perceived convenience and perceived impact on wellness for residents and faculty - themes which have arisen in prior studies.[6,8] A number of programs noted that they scheduled virtual conference days as a "treat" or "reward" several times a year, with at least one program explicitly acknowledging that "this contributes to [resident] wellbeing, provides time to complete tasks such as laundry/exercise, spend time with family, etc." These comments reflect the fact that virtual conferences provide a degree of flexibility that in-person conferences cannot offer. The option to attend didactics virtually also expands access to learning content by allowing residency applicants to tune in from afar, facilitating attendance for residents on off-service or remote-site rotations, and allowing fatigued residents to travel home promptly after finishing a night shift.

There was not a direct correlation between convenience and wellness as motivators for modality selection. Impact on resident and/or faculty wellness was cited as a reason for choosing in-person conference in the majority of responses (59.8%), but convenience was infrequently a motivator (<10% for both residents and faculty). Conversely, while impact on wellness was cited less frequently as a motivator for virtual didactics (43.3%), convenience for residents and faculty was cited 75.6% and 60% of the time, respectively. In short, programs perceive in-person

Author Manuscript

didactics to be in the interest of wellness more frequently than virtual didactics, even though virtual conferences are unequivocally more convenient. There is clearly an interplay between how convenience, flexibility, and interpersonal interactions all impact wellness, as themes from the narrative comments emphasized use of virtual conference days as a "balance" or a "break" from in-person didactics. Further exploration of this complex relationship should be a focus of future investigation.

Finally, it bears noting that only 5.6% of hybrid programs included "perceived impact on resident/faculty learning" as a motivator for selecting virtual delivery, in stark contrast to the 86.8% of respondents who included this as a motivator for selecting in-person delivery. With nearly a quarter of hybrid program time spent in virtual didactics, this finding should prompt investigation and, whenever possible, head-to-head comparison of higher-level learning outcomes.

LIMITATIONS

Our study has several limitations. We received responses from 61.9% of all ACGME-accredited EM programs, but it is possible our survey did not capture important trends among non-responders. Although we captured a representative cross-section of EM programs nationally, our respondents slightly over-represented academic, university-affiliated training sites and under-represented community sites (Table 1). It is possible that our initial distribution strategy via the CORD listserv disproportionately reached primarily university-affiliated programs, though we communicated directly with all programs via email to mitigate this potential responder bias.

Our survey is also limited by potential inaccuracies in reported conference data. While we requested that survey responses come from a member of program leadership with a strong understanding of the program's conference structure, it is possible that the person who responded

Author Manuscript

was not actually the most knowledgeable. In order to minimize the submission of inaccurate data we made responses to most questions optional, allowing respondents to skip any items that they did not feel confident answering. However, this decision resulted in differing numbers of respondents for each item, which adds a layer of complexity to the data review.

As this study was entirely survey-based, it does not provide direct head-to-head comparisons between in-person and virtual didactic delivery. Rather, it expands on the motivations and factors that residency programs have drawn on while developing their individual conference schedules. Future studies about the objective effectiveness of each modality are needed to make concrete recommendations about modality superiority.

CONCLUSION

The majority of mandatory didactic time in categorical EM residency programs is currently delivered in-person. Residency programs cited type of didactic content as well as resident engagement, learning, wellness, and community building as the most common motivations for scheduling didactics in-person. Some programs prefer virtual modality for the delivery of specific content, most commonly oral boards practice. Programs also report utilizing virtual modality as an intermittent tool to provide flexibility and support resident wellness. Investigation into the validity of perceptions that participants are more engaged and learn better with in-person didactics is warranted, as findings may inform future choices in didactic delivery.

REFERENCES

1. Hogan SO, Holmboe ES. Effects of COVID-19 on residency and fellowship training: results of a national survey. J Grad Med Educ 2022;14(3):359-364.

Author Manuscript

2. ACGME. Frequently asked questions: emergency medicine. ACGME.org. (https://www.acgme.org/globalassets/pdfs/faq/110_emergencymedicine_faqs.pdf).
3. Artino AR, Jr., La Rochelle JS, Dezee KJ, Gehlbach H. Developing questionnaires for educational research: AMEE Guide No. 87. Med Teach 2014;36(6):463-74.
4. EMRA Match. Emra.org. Published 2024. Accessed August 26, 2024. https://www.match.emra.org/
5. Waseem M, Garg N, Chang BP, et al. Impact of COVID-19 on emergency medicine residency programs: A cross-sectional study in New York State. West J Emerg Med 2022;23(2):246-250.
6. Tsyrulnik A, Gottlieb M, Coughlin RF, et al. Socially distanced, virtually connected: Faculty and resident perceptions of virtual didactics. AEM Educ Train 2021;5(3):e10617.
7. Weber W, Ahn J. COVID-19 Conferences: resident perceptions of online synchronous learning environments. West J Emerg Med 2020;22(1):115-118.
8. Ford TR, Fix ML, Shappell E, et al. Beyond the emergency department: Effects of COVID-19 on emergency medicine resident education. AEM Educ Train 2021;5(3):e10568.
9. Rotoli J, Bodkin R, Pereira J, et al. Emergency medicine residency curricular innovations: Creating a virtual emergency medicine didactic conference. AEM Educ Train 2020;4(3):270-274.
10. Bashir K, Anjum S, Dewji M, Khuda Bakhsh Z, Said Wali H, Azad A. Impact of online knowledge and skills learning on millennial learners within emergency medicine: A retrospective data review. Cureus 2021;13(12):e20626.

Author Manuscript

11. Weygandt PL, Jordan J, Caretta-Weyer H, Osborne A, Grabow Moore K. Impact of the COVID-19 pandemic on emergency medicine education: Insights from faculty and residents. AEM Educ Train 2021;5(3):e10603.
12. Jameyfield EL, Tesfai S, Palma AA, Olson AS. An asynchronous curriculum: Learner perspectives on incorporating asynchronous learning into in-person and virtual emergency residency didactics. Cureus 2023;15(4):e38188..
13. Hickam G, Santen SA, Cico SJ, et al. Rapid adaptation to remote didactics and learning in GME. AEM Educ Train 2021;5(3).
14. Rivera R, Smart J, Sakaria S, et al. Planning engaging, remote, synchronous didactics in the COVID-19 pandemic era. JMIR Med Educ 2021;7(2):e25213.
15. ABEM. Certifying exam: Emergency medicine certification. American Board of Emergency Medicine. (https://www.abem.org/public/become-certified/certifying-exam).
16. Dunn S, Milman BD, Bavolek RA, et al. Impacts of the COVID-19 pandemic on United States emergency medicine education: A Council of Residency Directors in Emergency Medicine (CORD) Task Force survey-based analysis. Cureus 2023;15(3):e35994.

Table 1: Program Demographics

	Survey Responses (n = 174)		**National (n = 281)**	
	n	%	n	%
Program Region				
East North Central	38	21.8	58	20.6
East South Central	6	3.4	12	4.3
Middle Atlantic	35	20.1	66	23.5
Mountain	6	3.4	12	4.3

New England	7	4.0	12	4.3
Pacific	11	6.3	27	9.6
South Atlantic	31	17.8	55	19.6
West North Central	9	5.2	12	4.3
West South Central	12	6.9	27	9.6
No Response	19	10.9	n/a	n/a
Primary Training Site				
Academic	82	47.1	100	35.6
Community	61	35.1	137	48.8
County	17	9.8	36	12.8
Other	6	3.4	8	2.8
No Response	8	4.6	n/a	n/a
Residency Length				
3 Years	132	75.9	227	80.8
4 Years	35	20.1	54	19.2
No Response	7	4.0	n/a	n/a
Survey Respondent				
Program Director (PD)	125	71.8		
Associate PD	21	12.1		
Assistant PD	15	8.6		
Other	6	3.4		
No Response	7	4.0		

This table reflects the reported demographic characteristics of 174 unique emergency medicine residency programs that responded to a national survey exploring virtual vs. in-person didactic modality use for residency conference education. Demographics are compared with national data as available on the Emergency Medicine Residents' Association (EMRA) Match website.[4]

Table 2: **Survey free text narrative comments as grouped by theme.**

Author Manuscript

Author Manuscript

Theme:	Example:
In favor of virtual didactics	
Virtual expands ability to invite guest speakers and attendees	"We preferentially use virtual conference days to schedule combined lectures with other departments and visiting grand rounds speakers" "[I]nterviews are virtual so it allows GME faculty who are interviewing to participate for the hour before interviews start" "Virtual Interviews for students were preceded by virtual didactics to allow applicants to attend"
Virtual increases attendance	"We go to virtual conference in the winter months when the days are short and residents are more likely to want to skip out" "We have found faculty attendance is improved with virtual sessions given competing demands on time, they can more easily attend some portion of the day" "We get MUCH more faculty attendance at virtual conference, but the learning is not as robust"
Virtual used "as needed" in special circumstances	"Virtual attendance is not the default, but used on a 'as needed' basis. We really only use Virtual options now for residents who are not feeling well (to prevent any spread of viral illnesses) or who have a challenging clinical schedule and want to attend conference but prefer to be home" "[allow virtual attendance due to] weather ... residents are allowed to log in for conference virtually if they are on nights, off service or ill and still want to attend" "We will be virtual when we have affiliate site conference days, when conference space is not available (1-2 times per year), and if there is a late resident event the day before" "We allow residents to participate virtually if they self report fatigue, if they work the night shift, or otherwise need it for wellness" "[Residents] on away rotations otherwise would miss conference entirely"
Virtual sessions requested by residents	"Residents requested that we continue some portion of virtual sessions as they perceive this contributes to their wellbeing, provides time to complete tasks such as laundry/exercise, spend time with family, etc. We feel this is a balance as in-person sessions and the informal time spent together on conference days also support wellbeing."
Supplementation of in person with virtual to support wellness	"We try to use virtual conference days as a special 'treat' around holidays to maximize time at home and with family." "We offer virtual conference once per quarter as a 'reward' to the residents." "Occasional Virtual conference allows a little extra sleep and rest for everyone."

Table 2 continued:

Not in favor of virtual didactics	
Dissatisfaction with concurrent virtual attendance option for in-person didactics	"We are either all in person or all virtual on each conference day. We trialed hybrid sessions with some people in person while others were on [the virtual platform] and found that both groups were dissatisfied with the overall experience and the demands on our APD to coordinate the technology were too much to manage" "Virtual attendance at an in-person conference is significantly less engaging" "Hybrid [concurrent in-person and virtual] presentations made it impossible to do anything but lecture and required too much time to oversee"
Virtual results in poorer engagement	"When we had done virtual conference previously, it was very clear that some residents were logging onto Zoom and then leaving their computers on in order to get attendance while they went into another room and slept or did other things" "I have used both virtual and in-person didactics. I had residents turn on their video (because they were clearly not engaged) and it didn't really help with learning or engagement" "Virtual didactics create apathy - disrupt engagement and likely any knowledge retention" "The virtual platform ... is clunky and does not do breakout rooms well … conference just becomes a string of lecture after lecture. In-person, we focus on small group learning and flipped classrooms to engage our learners."
In-Person preferred by residents	"The residents expressed dislike for and dissatisfaction with virtual conference. They enjoy the community and the hands on [of in-person didactics]" "[In person] preferred option by vast majority of faculty and residents" "Conference is more fun when in person for both residents and instructors. We just do virtual once a month."
In-Person builds community and program culture	"Probably most important: [in-person didactics are] when we come together as a team and build team and reinforce our program values and culture." "[Residents] reported lower socialization and well-being when virtual." "We started noticing differences in class cohesion between classes who had been separated during COVID and those who went through orientation and early training in person." “The community building in residency and shared experiences in a once-weekly [in person] session are very valuable.”

Author Manuscript

Figure 1: Virtual vs. In-Person Modality Breakdown by Program.
174 programs responded to a national survey exploring virtual vs. in-person didactic modality use for residency conference education. 168 reported the percent of time their program spent in virtual vs. in-person formats. Each vertical line represents a single program. Six programs reported using a hybrid format but did not report their breakdown of in-person vs. virtual time, and are therefore not displayed.

Figure 2: Preferred modality for different didactic content amongst hybrid emergency medicine residency programs.
Responses generated in response to the survey prompt "For the following types of learning, does your program preferentially schedule them to occur during in-person or virtual conference?" Responses for each learning activity are displayed as counts rather than as percentages. A total of 90 EM residency programs reported using hybrid modalities and received this prompt.

Figure 3: Factors motivating in-person or virtual didactic modality choice.
EM residency programs indicated which motivating factors contributed to their decision to hold a didactic via virtual or in-person modality. Both programs that held conferences 100% in-person and those which used hybrid/mixed modality responded about the in-person modality (n=174). Hybrid/mixed modality programs responded about the virtual modality (n=90). No programs reported holding conferences 100% virtually. Prompts were offered as checkboxes and multiple responses were allowed. Responses are demonstrated as percentages of all possible respondents.

Author Manuscript

Author Manuscript

Academic Emergency Medicine Education and Training
Original Research Contribution:

Virtual versus In-Person Didactic Modalities: A National Survey of Emergency Medicine Residencies

Emily Jameyfield[1,2], MD, MHPE, Charles W Kropf[3], MD, MHPE, Jason J Lewis[4], MD, Christopher Reisig[5], MD, MA, Jenna Thomas[6], MB BCh BAO, MHPE

[1] University of Chicago, Chicago, IL
[2] Current: Yale University School of Medicine, New Haven, CT; Emily.Jameyfield@yale.edu

[3] University of Michigan, Ann Arbor, MI; cwkropf@med.umich.edu

[4] Harvard Medical School, Beth Israel Deaconess Medical Center, Boston, MA; jlewis@bidmc.harvard.edu

[5] New York-Presbyterian Weill Cornell Medicine, New York, NY; chr2019@med.cornell.edu

[6] Washington University in St. Louis, St. Louis, MO; tjenna@wustl.edu

Corresponding Author: Emily Jameyfield, MD, MHPE, Department of Emergency Medicine, Yale University School of Medicine, New Haven, CT.
Email: Emily.Jameyfield@yale.edu Phone: 203-430-4000

Abstract Word Count: 300
Manuscript Word Count: 3,873

Running Title: EM Residency Didactic Modalities National Survey

Presentations: This research was shared during a didactic workshop titled "A Bad Case of the Zoomies: Deciding on Virtual vs. In-Person Didactics After COVID-19" at the Society for Academic Emergency Medicine (SAEM) Annual Meeting in May, 2024. This manuscript has not been previously published and is not currently submitted to any other journals for review or publication.

Financial Support: No funding was received by any author for the design, implementation, or analysis of this study.

Author Contributions: All authors meet all four criteria for authorship per ICJME. EJ, CWK, JJL, CR, JT all conceived and designed the study. All five authors conducted the study and acquired the data. All five authors analyzed and interpreted the data. All five authors worked together in writing the manuscript. EJ and JT finalized the manuscript draft. All authors contributed substantially to revising the manuscript critically for important intellectual content, provided their final approval of the version to be published, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflicts of Interest: EJ, CWK, JJL, CR, and JT report no conflict of interest in this study.

Ethical approval: Ethical approval was granted by the Institutional Review Board of the University of Chicago, where corresponding author EJ was employed throughout the duration of survey creation and data collection.

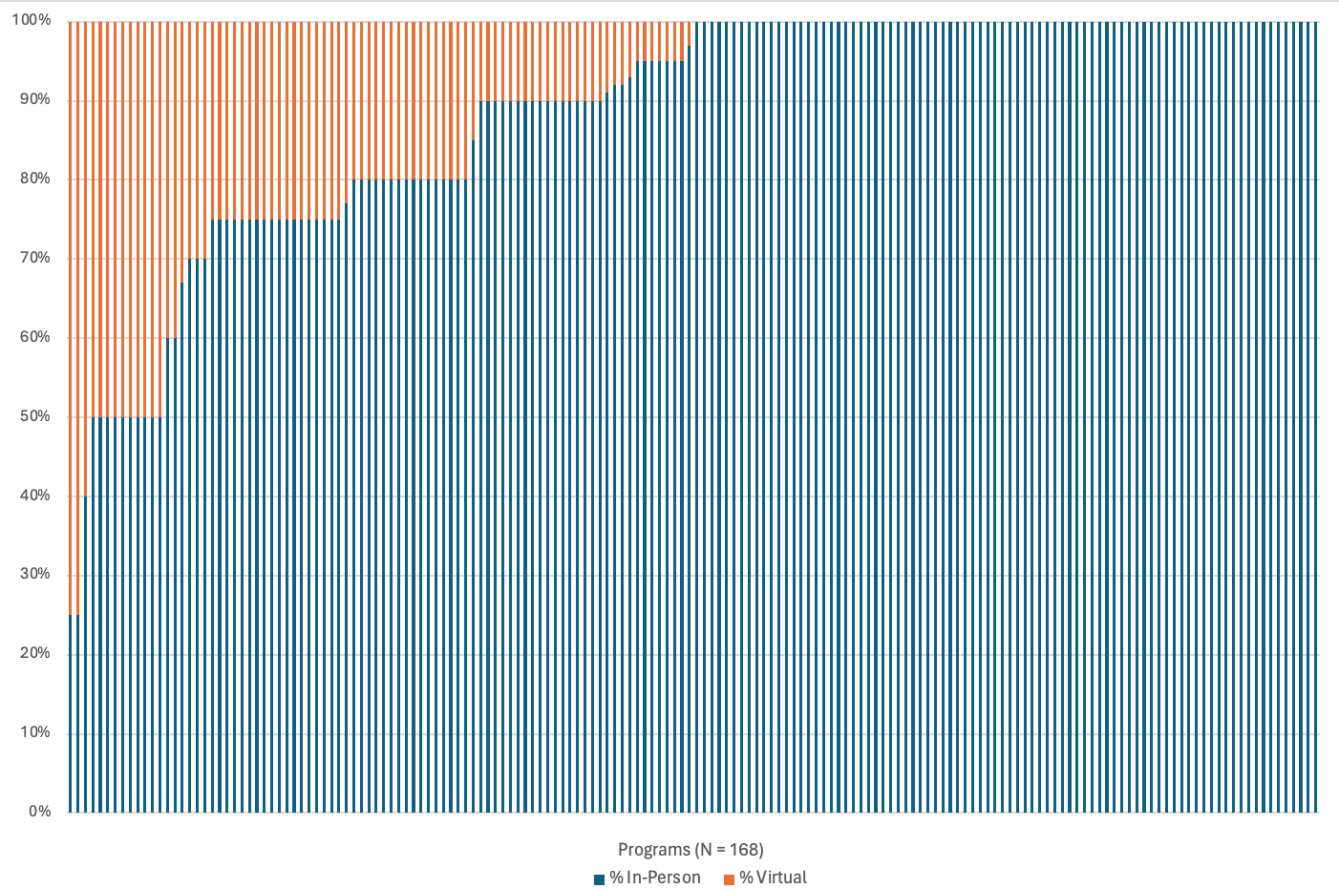


Figure 1: Virtual vs. In-Person Modality Breakdown by Program.

Author Manuscript

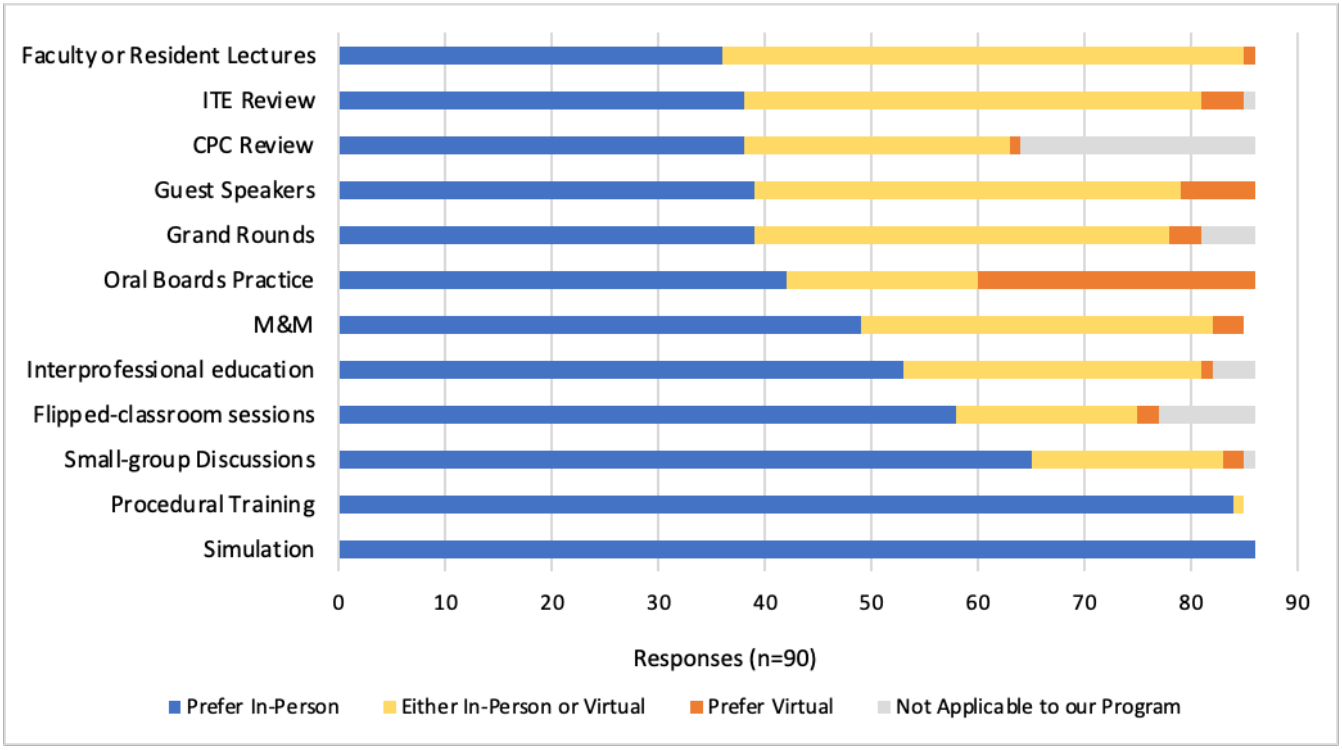


Figure 2: Preferred modality for different didactic content amongst hybrid emergency medicine residency programs.

Author Manuscript

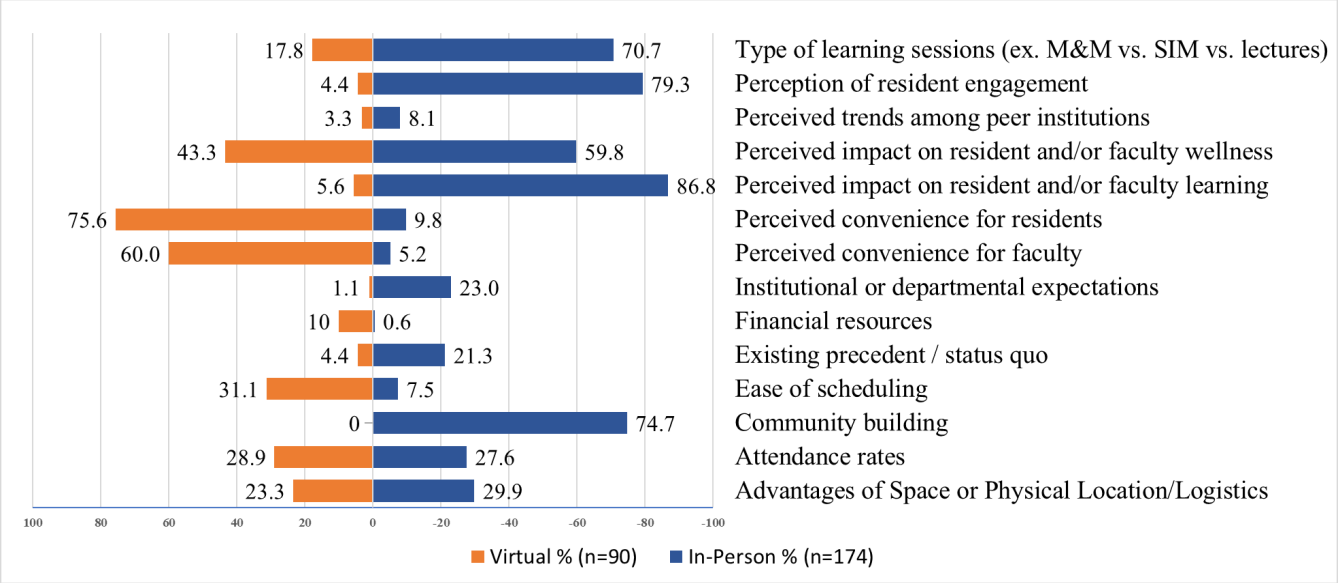


Figure 3: Factors motivating in-person or virtual didactic modality choice.

Author Manuscript

Author Manuscript

Table 1: Program Demographics

	Survey Responses (n = 174)		National (n = 281)	
	n	%	n	%
Program Region				
East North Central	38	21.8	58	20.6
East South Central	6	3.4	12	4.3
Middle Atlantic	35	20.1	66	23.5
Mountain	6	3.4	12	4.3
New England	7	4.0	12	4.3
Pacific	11	6.3	27	9.6
South Atlantic	31	17.8	55	19.6
West North Central	9	5.2	12	4.3
West South Central	12	6.9	27	9.6
No Response	19	10.9	n/a	n/a
Primary Training Site				
Academic	82	47.1	100	35.6
Community	61	35.1	137	48.8
County	17	9.8	36	12.8
Other	6	3.4	8	2.8
No Response	8	4.6	n/a	n/a
Residency Length				
3 Years	132	75.9	227	80.8
4 Years	35	20.1	54	19.2
No Response	7	4.0	n/a	n/a
Survey Respondent				
Program Director (PD)	125	71.8		
Associate PD	21	12.1		
Assistant PD	15	8.6		
Other	6	3.4		
No Response	7	4.0		

This table reflects the reported demographic characteristics of 174 unique emergency medicine residency programs that responded to a national survey exploring virtual vs. in-person didactic modality use for residency conference education. Demographics are compared with national data as available on the Emergency Medicine Residents' Association (EMRA) Match website.[4]

Author Manuscript

Table 2: **Survey free text narrative comments as grouped by theme.**

Theme:	Example:
In favor of virtual didactics	
Virtual expands ability to invite guest speakers and attendees	"We preferentially use virtual conference days to schedule combined lectures with other departments and visiting grand rounds speakers" "[I]nterviews are virtual so it allows GME faculty who are interviewing to participate for the hour before interviews start" "Virtual Interviews for students were preceded by virtual didactics to allow applicants to attend"
Virtual increases attendance	"We go to virtual conference in the winter months when the days are short and residents are more likely to want to skip out" "We have found faculty attendance is improved with virtual sessions given competing demands on time, they can more easily attend some portion of the day" "We get MUCH more faculty attendance at virtual conference, but the learning is not as robust"
Virtual used "as needed" in special circumstances	"Virtual attendance is not the default, but used on a 'as needed' basis. We really only use Virtual options now for residents who are not feeling well (to prevent any spread of viral illnesses) or who have a challenging clinical schedule and want to attend conference but prefer to be home" "[allow virtual attendance due to] weather ... residents are allowed to log in for conference virtually if they are on nights, off service or ill and still want to attend" "We will be virtual when we have affiliate site conference days, when conference space is not available (1-2 times per year), and if there is a late resident event the day before" "We allow residents to participate virtually if they self report fatigue, if they work the night shift, or otherwise need it for wellness" "[Residents] on away rotations otherwise would miss conference entirely"
Virtual sessions requested by residents	"Residents requested that we continue some portion of virtual sessions as they perceive this contributes to their wellbeing, provides time to complete tasks such as laundry/exercise, spend time with family, etc. We feel this is a balance as in-person sessions and the informal time spent together on conference days also support wellbeing."
Supplementation of in person with virtual to support wellness	"We try to use virtual conference days as a special 'treat' around holidays to maximize time at home and with family." "We offer virtual conference once per quarter as a 'reward' to the residents." "Occasional Virtual conference allows a little extra sleep and rest for everyone."

Author Manuscript

Table 2 continued:

Not in favor of virtual didactics	
Dissatisfaction with concurrent virtual attendance option for in-person didactics	"We are either all in person or all virtual on each conference day. We trialed hybrid sessions with some people in person while others were on [the virtual platform] and found that both groups were dissatisfied with the overall experience and the demands on our APD to coordinate the technology were too much to manage" "Virtual attendance at an in-person conference is significantly less engaging" "Hybrid [concurrent in-person and virtual] presentations made it impossible to do anything but lecture and required too much time to oversee"
Virtual results in poorer engagement	"When we had done virtual conference previously, it was very clear that some residents were logging onto Zoom and then leaving their computers on in order to get attendance while they went into another room and slept or did other things" "I have used both virtual and in-person didactics. I had residents turn on their video (because they were clearly not engaged) and it didn't really help with learning or engagement" "Virtual didactics create apathy - disrupt engagement and likely any knowledge retention" "The virtual platform ... is clunky and does not do breakout rooms well … conference just becomes a string of lecture after lecture. In-person, we focus on small group learning and flipped classrooms to engage our learners."
In-Person preferred by residents	"The residents expressed dislike for and dissatisfaction with virtual conference. They enjoy the community and the hands on [of in-person didactics]" "[In person] preferred option by vast majority of faculty and residents" "Conference is more fun when in person for both residents and instructors. We just do virtual once a month."
In-Person builds community and program culture	"Probably most important: [in-person didactics are] when we come together as a team and build team and reinforce our program values and culture." "[Residents] reported lower socialization and well-being when virtual." "We started noticing differences in class cohesion between classes who had been separated during COVID and those who went through orientation and early training in person." “The community building in residency and shared experiences in a once-weekly [in person] session are very valuable.”

Author Manuscript

Author Manuscript

Table 1: Program Demographics
This table reflects the reported demographic characteristics of 174 unique emergency medicine residency programs that responded to a national survey exploring virtual vs. in-person didactic modality use for residency conference education. Demographics are compared with national data as available on the Emergency Medicine Residents' Association (EMRA) Match website.[4]

Table 2: **Survey free text narrative comments as grouped by theme.**
EM residency programs responding to a national survey exploring virtual vs. in-person didactic modality use for residency conference education had a number of opportunities to expand on survey items (Appendix A) with narrative comments. Comments are grouped here under a number of common themes both "in favor" and "not in favor" of virtual didactics.

Figure 1: Virtual vs. In-Person Modality Breakdown by Program.
174 programs responded to a national survey exploring virtual vs. in-person didactic modality use for residency conference education. 168 reported the percent of time their program spent in virtual vs. in-person formats. Each vertical line represents a single program. Six programs reported using a hybrid format but did not report their breakdown of in-person vs. virtual time, and are therefore not displayed.

Figure 2: Preferred modality for different didactic content amongst hybrid emergency medicine residency programs.
Responses generated in response to the survey prompt "For the following types of learning, does your program preferentially schedule them to occur during in-person or virtual conference?" Responses for each learning activity are displayed as counts rather than as percentages. A total of 90 EM residency programs reported using hybrid modalities and received this prompt.

Figure 3: Factors motivating in-person or virtual didactic modality choice.
EM residency programs indicated which motivating factors contributed to their decision to hold a didactic via virtual or in-person modality. Both programs that held conferences 100% in-person and those which used hybrid/mixed modality responded about the in-person modality (n=174). Hybrid/mixed modality programs responded about the virtual modality (n=90). No programs reported holding conferences 100% virtually. Prompts were offered as checkboxes and multiple responses were allowed. Responses are demonstrated as percentages of all possible respondents.