

## Level of Comfort in Evaluating Older Patients Amongst Medical Students and Emergency Medicine Residents

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### INTRODUCTION

As the population ages, healthcare professionals must become better equipped to manage the complex needs of older patients. Emergency Departments (ED) represent a unique environment where better understanding and training in the complexities of geriatric emergency care is crucial to improving outcomes for older patients.<sup>1</sup> Older patients require more ED resources while having an increased risk of hospital admission, morbidity, mortality, functional decline, and repeat ED visits.<sup>2,3</sup> Older patients are more likely to experience adverse events and poor outcomes in the ED,<sup>4</sup> from iatrogenic injury<sup>5</sup> and missed diagnoses,<sup>6</sup> repeat ED visits,<sup>7,8</sup> functional decline,<sup>9-11</sup> and death.<sup>12</sup> Overall, patients  $\geq 65$  years old have accounted for 12-25% of ED visits in many countries, including the US, Taiwan, France, and Italy, and that number is increasing.<sup>13-16</sup> The increasing number of older patients in the ED necessitates a workforce that is competent in caring for the special needs of this population.

Over 10 years ago, Leipzig et al. published a consensus on minimum geriatric competencies for graduating medical students, which were recently updated in 2021.<sup>17,18</sup> Several specialty fields, like EM, psychiatry, family medicine, and internal medicine have published competencies for postgraduate trainees.<sup>19,20</sup> Recently, the Academy of Geriatric Emergency Medicine (AGEM) proposed recommendations to improve education, training, and practice in geriatric emergency care.<sup>21</sup>

A crucial factor in improved geriatric emergency medicine (GEM) care is training future physicians who are competent in caring for older patients. Geriatric education and exposure for medical students may increase interest and competency.<sup>22-25</sup> Biese et al. previously reported that geriatric curricula for EM residents may increase the knowledge base and improve patient outcomes.<sup>26</sup> However, there remain deficiencies in geriatric medical education and interest amongst trainees.<sup>27</sup> In addition, there are few geriatric-specific training programs, with only a 1.1% increase in US geriatric-specific postgraduate programs between 2001 and 2018.<sup>28</sup> Only five GEM-specific fellowships exist in the US and Canada, although this number is increasing.<sup>29</sup> It has been shown that increased exposure during pre-clinical and clinical years of medical school, as well as positive experiences and role models, positively influence trainee interest in geriatric medicine.<sup>22,30-32</sup> In addition, Snider et al. previously reported that comfort with geriatric core competencies increases with post-graduate training years, but that only one-third of graduating Canadian EM residents report comfort in all geriatric competency domains.<sup>33</sup>

While there has been a previous study on how Canadian EM residency programs have met the geriatric core competency guidelines,<sup>33</sup> there has been little to no follow-up on how well residency programs and medical schools in the United States and Canada meet these guidelines. This study is an initial step toward exploring among EM residents and medical students interested in EM (1) level of comfort in evaluating and managing older patients and (2) GEM education and interest. Understanding trainee

perspectives can improve GEM curricula and grow the GEM field to ensure that the future workforce is well-equipped to care for the growing aging population.

## METHODS

### *Study Design*

This is a cross-sectional study of EM residents and medical students in their clinical years of training with an interest in EM. We evaluated medical students' and residents' self-reported comfort with the previously reported geriatric competency domains for medical students.<sup>8,10</sup> We also asked questions regarding interest and barriers to GEM, exposure to geriatric medical education and GEM, and demographic information. (**Appendix 1** and **Appendix 2**). Questionnaires were adapted from previously published surveys of residents and medical students.<sup>33-35</sup> Survey questions regarding the geriatric core competencies were adapted for both question length and content.

We pilot tested the questionnaire on five medical students and two EM residents to ensure clarity and validity. Feedback from pilot testing was incorporated into the survey design, and students and residents who participated in pilot testing were excluded from the study. We incentivized participation with a raffle of five \$40 gift certificates provided to those who completed the survey through an anonymous link, names and email addresses were deidentified and not connected to survey responses. The study was approved by the Massachusetts General Brigham Institutional Review Board in Boston, Massachusetts.

### *Study Settings and Participants*

An anonymous online survey was distributed in May 2021 via the Society of Academic Emergency Medicine (SAEM) Residents and Medical Students (RAMS) listserv, which has about 3,000 members. This timing was intentionally chosen so that students would be at the end of the academic year and in order to use the national SAEM meeting to advertise the survey. The survey was also disseminated via Twitter in conjunction with an announcement at the AGEM annual meeting. The initial tweets were sent by the co-authors and subsequently tweeted and re-tweeted by the AGEM community on Twitter. Twitter was used to widely disseminate the survey and reach trainees not involved with SAEM or RAMS. All medical students interested in EM in their clinical years of training and all residents in an emergency medicine training program in the US and Canada were eligible to participate. Survey data were collected and managed using a web-based software platform, REDCap, an electronic data capture tool hosted at Massachusetts General Hospital.<sup>36</sup>

### *Survey Questions*

The core competency survey questions contained a basic question regarding comfort with each specific competency domain followed by examples. The questions were closed-ended with naturally ordered responses. The survey asked respondents to rank their comfort level in providing care with respect to each domain on a five-point Likert scale of "Very Uncomfortable," "Somewhat Uncomfortable," "Neither Comfortable nor Uncomfortable," "Somewhat Comfortable," or "Very Comfortable." We also assessed other areas of GEM education and interest. Our primary outcome was the proportion of "comfort" for each competency domain, and we established, a priori, that "comfort" in any domain would be attributed to "Somewhat Comfortable" or "Very Comfortable" responses. Other survey questions regarding interest in GEM, barriers to GEM, and education experiences with GEM were either ranked on a five-point Likert scale of agreement or as yes/no questions. The scale options for agreements were "Disagree," "Somewhat Disagree," "Neither Agree nor Disagree," "Somewhat Agree," or "Agree." We established, a priori, that agreement would be attributed to "Somewhat Agree" or "Agree" responses.

## Data Analysis

Kruskal-Wallis tests were used to compare competency comfort by a medical student (MS) and post-graduate year (PGY.). For analysis, medical students who had marked “Other” as their medical school year and indicated that they were between their third and fourth years were included in the MS3 group. Mann-Whitney tests were used to compare competency comfort between PGY1 and PGY2 residents and PGY3, PGY4, and PGY5 residents, and to compare overall medical student competency comfort based on whether their medical school offered a dedicated geriatrics curriculum. A p-value less than or equal to 0.05 was considered statistically significant for all analyses. All analyses were performed using PRISM version 9.1.2 (225) for macOS (GraphPad Software, LLC).

## RESULTS

For the medical student survey, 138 respondents consented to take the questionnaire. Valid responses were screened using the question “What medical school do you attend?” Responses to this question that were not an accredited medical school were excluded. Eighteen respondents listed non-accredited medical schools and were excluded, resulting in 120 respondents that were included in the study. For the resident survey, 3,464 respondents consented to take the questionnaire. Valid responses were screened using the question “What residency program are you enrolled in?” Responses to this question that were not an accredited residency program were excluded and considered aberrant responses. 3,415 respondents listed non-accredited residency programs and were excluded, resulting in 49 respondents that were included in the study. To exclude data from non-trainees, responses were reviewed by the authors twice to ensure that respondents listed an accredited medical school or residency program before responses were included for final analysis.

For the medical student survey, 10% (12) of included respondents were in their second year of medical school (MS2), 62% (74) were in their third year of medical school (MS3), and 27% (32) were in their fourth year of medical school (MS4), and 2% (2) were in research years between their MS3 and MS4 years. For the resident survey, 31(15%) of included respondents were postgraduate year one (PGY1) 39% (19) were postgraduate year two (PGY2), 22% (11) were postgraduate year three (PGY3), 4% (2) were postgraduate year four (PGY4), and 4% (2) were postgraduate year five (PGY5).

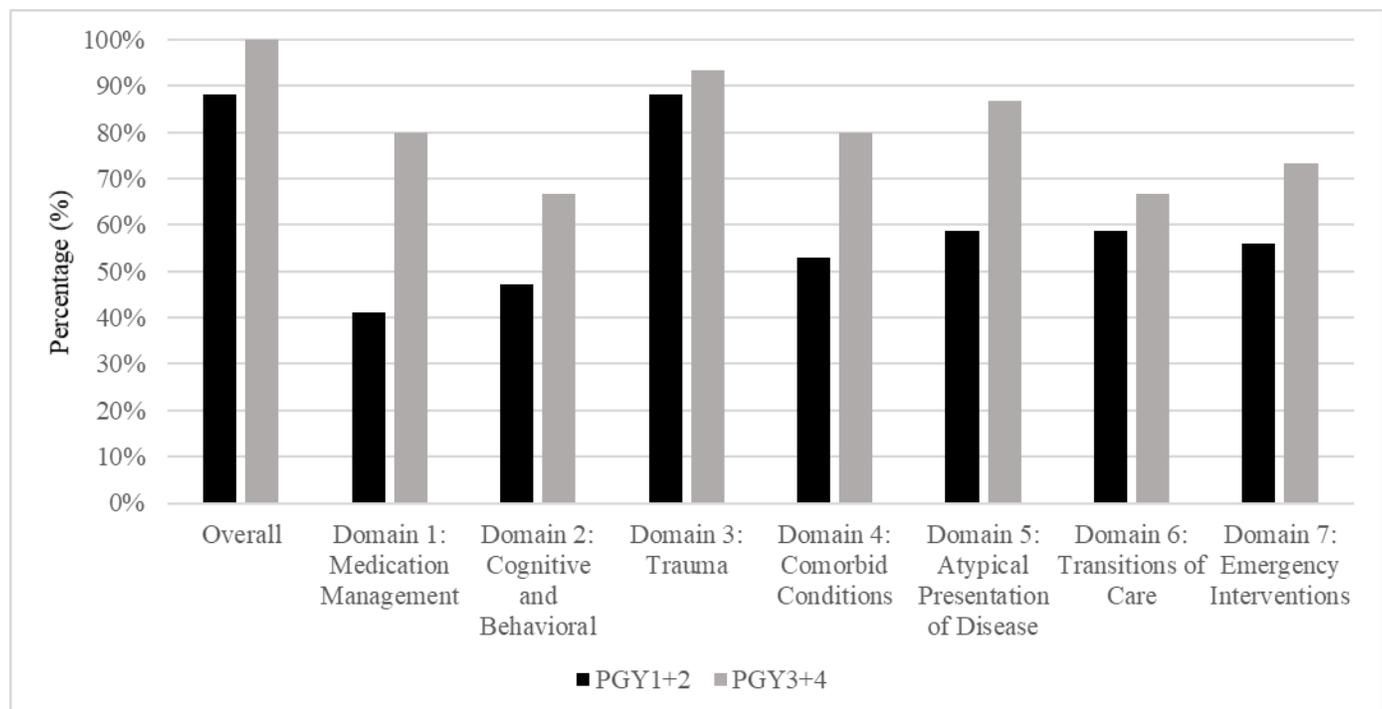
The percentage of medical students and residents who reported comfort in each competency domain are presented in **Table 1**. When stratified by year, there were no significant differences in responses for medical students except for goals of care (p-value 0.0469), but overall comfort was lowest in the MS2 group. Combining MS2 and MS3 students, the percentage of students who felt overall competent was equal to competency for MS4 students, at 66%.

Competency Domain	N(%)					P-Value
	Total (N=120)	MS2 (N=12)	MS3 (N=76)	MS4 (N=32)		
<b>Medical Students</b>						<b>p-value</b>
Overall	79 (66%)	5 (42%)	52 (70%)	21 (66%)	-	0.4439
Domain 1: Medication Management	67 (56%)	7 (58%)	42 (55%)	17 (53%)	-	0.1704
Domain 2: Cognitive and Behavioral	69 (58%)	6 (50%)	47 (62%)	15 (47%)	-	0.3081
Domain 3: Baseline Functionality	72 (60%)	8 (67%)	41 (55%)	23 (72%)	-	0.2240
Domain 4: Falls	81 (68%)	4 (33%)	52 (69%)	24 (75%)	-	0.8607
Domain 5: Health Care Planning and Promotion	73 (61%)	5 (42%)	50 (66%)	17 (53%)	-	0.7707
Domain 6: Atypical Presentation of Disease	63 (53%)	5 (42%)	41 (54%)	16 (50%)	-	0.3919

Domain 7: Goals of Care	71 (59%)	6 (50%)	50 (66%)	14 (44%)	-	-	0.0469
Domain 8: Hospital Interventions	71 (59%)	7 (58%)	44 (59%)	20 (63%)	-	-	0.2371
<b>Residents</b>	<b>Total (N=49)</b>	<b>PGY1 (N=15)</b>	<b>PGY2 (N=19)</b>	<b>PGY3 (N=15)</b>	<b>PGY4 (N=2)</b>	<b>PGY5 (N=2)</b>	<b>p-value</b>
Overall	45 (92%)	14 (93%)	16 (84%)	11 (100%)	2 (100%)	2 (100%)	0.5929
Domain 1: Medication Management	26 (53%)	6 (40%)	8 (42%)	8 (73%)	2 (100%)	2 (100%)	0.3152
Domain 2: Cognitive and Behavioral	26 (53%)	7 (47%)	9 (47%)	7 (64%)	1 (50%)	2 (100%)	0.3026
Domain 3: Trauma	44 (90%)	13 (87%)	17 (89%)	11 (100%)	2 (100%)	1 (50%)	0.3026
Domain 4: Comorbid Conditions	30 (61%)	9 (60%)	9 (47%)	10 (91%)	1 (50%)	1 (50%)	0.2812
Domain 5: Atypical Presentation of Disease	33 (67%)	9 (60%)	11 (58%)	9 (82%)	2 (100%)	2 (100%)	0.4627
Domain 6: Transitions of Care	30 (61%)	9 (60%)	11 (58%)	7 (64%)	1 (50%)	2 (100%)	0.8143
Domain 7: Emergency Interventions	30 (61%)	9 (60%)	10 (53%)	8 (73%)	2 (100%)	1 (50%)	0.5149
*P-values represent the significance of comparisons between years of training. MS2, second-year medical student; MS3, third-year medical student; MS4, fourth-year medical student; PGY1, post-graduate year 1; PGY2, post-graduate year 2; PGY3, post-graduate year 3; PGY4, post-graduate year 4; PGY5, post-graduate year 5.							

When stratified by year, there were no significant differences in resident responses, but overall reported comfort for residents was lowest in PGY2 residents. When combined, PGY1 and PGY2 residents reported lower comfort in all competencies compared to PGY3, PGY4, and PGY5 residents, as shown in **Figure 1**. The only domain that was statistically significant between these groups was medication management, with a p-value of 0.0241.

**Figure 1**



\*Resident competency comfort separated by junior residents (PGY1 and PGY2) and senior residents (PGY3, PGY4, and PGY5). PGY1, post-graduate year 1; PGY2, post-graduate year 2; PGY3, post-graduate year 3; PGY4, post-graduate year 4; PGY5, post-graduate year 5.

**Table 2** shows medical student and resident responses regarding statements about GEM exposure and caring for older patients in the ED. Seventy-four percent of medical students agree that GEM will be an important aspect of clinical care in the future, and 76% agree that more specialized courses and clinical experiences are necessary. Comparatively, 67% of residents felt that GEM receives

adequate emphasis in clinical care education, but only 41% feel that their residency curriculum has prepared them well for caring for older patients in the ED. 96% of residents agree that GEM will be an important aspect of clinical care in the future, and 78% agree that more specialized courses and clinical experiences are necessary.

**Table 2: Medical student and Resident agreement with statements about Geriatric Emergency Medicine exposure and caring for older patients in the Emergency Department.**

Question	N(%)	
	Medical Students N=120	Residents N=49
I receive adequate contact with older patients during my ED <sup>a</sup> clinical training.	69 (58%)	47 (96%)
I am interested in treating older patients in the ED.	81 (68%)	40 (82%)
My medical school (resident) curriculum has prepared me well for caring for older patients in the ED.	74 (62%)	20 (41%)
GEM <sup>b</sup> receives adequate emphasis in clinical care education.	59 (49%)	33 (67%)
More specialized courses and clinical experiences regarding the care of older patients in the ED are necessary for medical students (residents).	91 (76%)	38 (78%)
Geriatric Emergency Medicine will be an important aspect of clinical care in the future.	89 (74%)	47 (96%)
I am interested in GEM as a subspecialty.	65 (54%)	9 (18%)
Have you heard of GEM as a subspecialty?	56 (47%)	35 (71%)
Have you heard of AGEM <sup>c</sup> ?	89 (74%)	12 (24%)

(<sup>a</sup>ED= Emergency Department, <sup>b</sup>GEM=, Geriatric Emergency Medicine, <sup>c</sup>AGEM= Academy of Geriatric Emergency Medicine)

Notable barriers to GEM, how to increase respondents’ interest in GEM, and resources used to learn about older patients in the ED are noted in **Table 3**. The most common barriers for medical students and residents included exposure in medical education and training, 59% and 65% respectively. Medical students also noted that more exposure in preclinical and clinical training would make them more interested in GEM, at 57% and 54%, respectively. For residents, learning more about what a career in GEM looks like would increase interest in GEM (51%). Sixteen percent of medical students and 31% of residents responded that they are not interested in GEM. The most common resources used to learn about older patients in the ED were society guidelines for medical students (56%) and UpToDate for residents (82%).

**Table 3: Barriers and interest in Geriatric Emergency Medicine and resources to learn about older patients in the Emergency Department.**

Questions	N(%)	
	Medical Students N=120	Residents N=49
<b>What are barriers you face in learning about GEM<sup>a</sup>?</b>		
Exposure in your medical education and training	71 (59%)	32 (65%)
Personal interest	63 (53%)	19 (39%)
Availability of faculty mentors	59 (49%)	4 (8%)
None	8 (7%)	1 (2%)
Other, please specify below	2 (2%)	0
<b>What would make you more interested in GEM?</b>		
I am not interested in GEM	19 (16%)	15 (31%)
More exposure in preclinical training	68 (57%)	7 (14%)
More exposure in clinical training	65 (54%)	15 (31%)

Journal clubs	25 (21%)	8 (16%)
Learning more about what a career in GEM looks like	48 (40%)	25 (51%)
Other, please specify below	0	0
<b>What resources do you use to learn about older patients in the ED<sup>b</sup>?</b>	<b>Medical Students N=120</b>	<b>Residents N=49</b>
UpToDate	43 (36%)	40 (82%)
Aquifer modules	25 (21%)	4 (8%)
Websites, like <a href="https://geri-em.com">https://geri-em.com</a> or FOAMed	60 (50%)	26 (53%)
Journal articles	45 (38%)	13 (27%)
Society curriculum guidelines, like AMA, SAEM, ACEP, EMRA, or other	67(56%)	20 (41%)
Podcasts	43 (36%)	22 (45%)
Other, please specify below	1 (1%)	1 (2%)
I have never used any resources to learn about clinical care for older patients in the ED	6 (5%)	3 (6%)
( <sup>a</sup> GEM= Geriatric Emergency Medicine, <sup>b</sup> ED= Emergency Department)		

**Table 4** shows how many medical schools and residency programs offer a dedicated geriatric curriculum, course, or rotation. Only 30% of medical students noted that their school offers a dedicated geriatric curriculum, 41% offered a dedicated geriatrics course, and 33% offered a dedicated geriatrics rotation. Furthermore, only 22% of residents noted that their program offers a dedicated geriatric curriculum, 8% offered a dedicated geriatrics course, and 10% offered a dedicated geriatrics rotation. Medical students whose medical school offered a geriatrics curriculum reported more comfort in evaluating and managing older patients in the ED, with a p-value of 0.0035.

Curriculum/Course/Rotation	Medical Students, N (%)			Residents, N (%)		
	Offered (N=120)	Required	Participated	Offered (N=49)	Required	Participated
Curriculum	36 (30%)	31 (26%)	-	11 (22%)	7 (14%)	-
Course	49 (41%)	38 (32%)	47 (39%)	4 (8%)	3 (6%)	4 (8%)
Rotation	39 (33%)	30 (25%)	34 (28%)	5 (10%)	3 (6%)	2 (4%)
None	22 (18%)	-	-	24 (49%)	-	-
I don't know	18 (15%)	-	-	10 (20%)	-	-

## DISCUSSION

Our study found that while trainees overall felt comfortable in evaluating and managing older patients according to the geriatric core competencies, comfort with domains varied according to years of training and specific domains, although a statistically significant difference was found only in comfort with goals of care amongst medical students and medication management amongst residents. Trainee identified limited educational exposure and lack of faculty mentors as common barriers to learning about GEM and felt increased clinical exposure would increase interest in this field.

We found that the difference in comfort in GEM for trainees based on training years was not statistically significant in this study, in contrast to Snider et al.'s previous report that Canadian residents' comfort with the geriatric core competencies increased throughout residency training.<sup>33</sup> Snider et al. also reported that only one-third of graduating Canadian EM residents reported feeling comfortable in all domains of GEM.<sup>33</sup> Similarly, our data show that only 41% of residents surveyed feel that their residency curriculum has prepared them well for caring for older patients in the ED. The lack of statistical significance in this study can partially be explained by small sample sizes overall and in

individual trainee years. In addition, while medical knowledge tends to increase from year to year, comfort and confidence may vary as trainees continually learn more complex medicine and assume more responsibility as their training advances. Notably, trainees' comfort in specific domains ranged from 53% to 68% for medical students, and 53% to 90% for residents, with less comfort reported regarding atypical presentation of disease for medical students, medication management for residents, and cognitive and behavioral for both groups. These areas represent targets for additional education and clinical training. Lack of comfort in the geriatric core competency domains reported in this study and others causes concern that future EM physicians are not receiving adequate training in GEM, a finding that would be unacceptable in other areas of EM training, like pediatrics, trauma, or resuscitation.

This study also identified a discrepancy that more residents than medical students reported that they are not interested in GEM (31% versus 16%). While we cannot definitively say why interest is higher in medical students compared to residents, previous studies have shown that increased exposure in the pre-clinical and clinical years of medical school, as well as positive experiences and role models, have a positive influence on students' interest in geriatric medicine.<sup>22,30-32</sup> It could be that medical students are more open to exploring diverse clinical interests and more susceptible to positive experiences and exposures in GEM. It is reassuring that the methods identified by respondents to increase interest in GEM complement the barriers trainees identified, like exposure in training.

A minority of medical trainees surveyed noted that their medical school or residency program offers a dedicated geriatrics curriculum, course, or rotation and that not all are required. While expected, this is contrasted with the requirement for curriculum, courses, and rotations for other subspecialty populations, like pediatrics. Although much of general medical training is on adult patients, patients  $\geq$  65 years old have complex needs different from that of the general adult population, as evidenced by the rise in geriatric-specific postgraduate training programs and certified geriatric emergency departments. Preclinical and clinical education for EM trainees must match this demand at all levels of education. Furthermore, our study found a statistically significant association between medical students reporting overall comfort in caring for older patients and whether their medical school offered a dedicated geriatrics curriculum. Given the barriers and approaches to increasing interest in GEM discussed above, increasing the availability of curriculum and courses aimed at learning about geriatrics and GEM would likely increase awareness and knowledge in this important field.

While it would be ideal to require more geriatric-specific education for medical trainees, we recognize that it is difficult to increase curricular demands on trainees. In addition, teaching this information in an engaging and meaningful format can be difficult. Various methods in which geriatric medicine has been creatively taught include a dedicated geriatrics rotation, unique experiences outside of the classroom with older patients, interactive case-based group sessions, and patient simulation.<sup>23-25,37,38</sup>

Medical trainees also recognize the need for GEM and more specialized training in this area. According to our study, most medical students and residents believe that GEM will be an important aspect of clinical care in the future and more specialized courses and clinical experiences are necessary. Trainees are aware of needing to become better trained at caring for older adults in the ED. While we do not expect that every EM physician will be certified in GEM, increasing knowledge of best practices and competent care for older patients should be prioritized and is something that trainees agree is important and necessary.

## LIMITATIONS

Survey data are inherently biased given the subjective nature and reliability of respondents' responses rather than direct observation or more objective measures. However, to obtain responses from a variety of training programs with minimal resources, we felt it was the best research tool available. The survey tool used in the study was original and was designed for our specific purpose and thus lacks criterion validity, although it was adapted from published surveys.<sup>33-35</sup>

Valid response rates for the survey were low, with the RAMS listserv including over 3,000 members of residents and medical students. Also, not all EM residents and interested medical students are a part of RAMS, so the survey was also disseminated via Twitter, which resulted in many aberrant responses, especially for the resident survey. This was likely secondary to the prize raffle offered to survey respondents, which was done to incentivize participation amongst trainees. The two

dissemination methods of the RAMS listserv and Twitter still do not include all EM residents and interested medical students, so some part of the population was likely missed.

In addition, this survey was announced at the AGEM annual meeting, as part of SAEM, so there is likely some selectivity bias in recruiting trainees who have already expressed an interest in GEM. This may explain the number of trainees who responded positively to questions regarding interest and importance of GEM and a career in GEM, the lower numbers for those who said that they are not interested in GEM. This study also focused only on emergency medicine residents and medical students who self-identified as interested in EM, so the results are less generalizable to the general population of medical trainees not interested in EM. This survey examined self-reported comfort with core geriatric competencies, rather than objective knowledge and skills, which is a direction for future research.

## CONCLUSION

This study is an initial step toward exploring the level of comfort EM residents and medical students interested in EM have in evaluating and managing older patients, as measured with the geriatric core competencies, as well as exploring trainees' exposure to GEM. More work is needed in this area to understand trainee comfort with the geriatric core competencies and working with this complex population. Greater geriatrics exposure in preclinical and clinical training can increase competency and interest, which may be best accomplished earlier in medical training. EM trainees are aware of the need for and importance of additional GEM education, and educators should find ways to teach trainees creatively and engagingly about caring for older patients. Increasing GEM exposure and training will be important in creating a future EM physician workforce that is comfortable in the required competencies for caring for this complex and important patient population.

## KEYWORDS

Geriatrics, Emergency Medicine, Geriatric Emergency Medicine, Medical Education

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## CONFLICTS OF INTEREST

The authors have no conflicts to report.

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