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Abstract

Introduction: Urological education and exposure for medical students is imperative as we face a growing geriatric population with increased urological needs. Previous research has examined American Urological Association (AUA) program director opinions of student exposure, but no surveys have been directed at current medical students. The purpose of this study is to quantify student exposure to and opinions of urology to determine precipitating factors that lead students towards or away from urology as a specialty of choice.

Methods: A 14 question (11 multiple choice and 3 fill-in-the blank) Google Survey was developed. Questions ranged from student exposure to urology, consideration of urology as a specialty, to opinions of positive/negative aspects of urology. After receiving IRB approval, the survey was distributed to the deans and student affair offices of 156 AAMC medical schools.

Results: Twenty medical schools (13%) disseminated the survey, contributing to 147 student responses with an even gender split. The percentage of MS4s that applied to urology was 9%. Of all the respondents, 11% did not have a urology rotation, and 25% had no exposure throughout medical school. A large proportion of students (54%) felt the urology exposure to be inadequate. The majority of respondents had either a positive (43%) or neutral (48%) perception towards urology. The positive aspects of urology included perceptions of salary (87%), lifestyle (62%), focalized specialization (54%) and use of technology (49%). The negative aspects of urology included competitiveness (75%), resident workload (33%), and focalized specialization (29%).

Conclusions: Urological education opportunities during medical school appear to be limited. Many students do not have any exposure to urology, let alone opportunities to experience a clinical rotation in the field. Although the specialization and lifestyle of urology are attractive, the competitiveness of the field seems to have dissuaded many possible applicants. However, with the increased need for urologists and the decreasing supply, future work should focus on increasing medical student exposure to urology.

Keywords

graduate education, urological education, urology exposure, survey, medical students

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A Glimpse Into Urology Medical School Education: A Multi-Institutional Medical Student Survey

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Conclusions: Urological education opportunities during medical school appear to be limited. Many students do not have any exposure to urology, let alone opportunities to experience a clinical rotation in the field. Although the specialization and lifestyle of urology are attractive, the competitiveness of the field seems to have dissuaded many possible applicants. However, with the increased need for urologists and the decreasing supply, future work should focus on increasing medical student exposure to urology.

Introduction

Urological education and exposure for medical students is imperative as we face a growing geriatric population and thus, increased urological needs. Nearly 11% of the world's population is over 60 years of age and this is expected to surpass 22% by 2050.¹ In the United States, it's estimated that by 2030, 20% of Americans will be 65 years or older.² Between 2010 to 2050, the number of Americans aged 65 years or older will double from 40.2 million to 88.5 million.³

The increasing geriatric patient population will lead to an increased demand in urologic care. Yet, it is estimated that there will be a 25% decrease in full-time equivalent (FTE) urologists from 2009 to 2035.³ In addition, with the recurring changes in medical school curricula, it becomes imperative to determine current student exposure to and interest in urological surgery as a possible career choice. For example, with the implementations of shorter preclinical curricula,⁴ highly specialized subjects such as urology may not be accorded equal importance. This is in stark contrast to the past when a clinical urology rotation was mandatory. In 1956, 99% of medical schools required a clinical urology rotation,⁵ which subsequently decreased to 48% (1978), 38% (1988), and then 17% over the following two decades.^{6,7,8}

We previously assessed the perspectives of urology program directors on this topic by distributing a survey to all the 164 American Urological Association (AUA) program directors. The survey garnered a response rate of 20% (33 program directors). Although the program directors felt that 84% of students receive formal education through lectures or clinical rotations, the majority (72%) also felt that urology education was inadequate. In assessing the trends, 55% felt that the exposure to urology was stable, whereas 27% and 13% noted a decrease and increase respectively.⁹

However, our previous study and the current literature do not consider the perspectives of medical students with regards to urology as a career choice. A myriad of factors can play into a student's interest in a specific career path. With the combination of an increased need for urologists and decreased urologist workforce, it becomes increasingly important to determine perspectives of current medical

students towards urology. This will help us to identify factors that may help to stimulate more students to pursue urology as a career choice.

Methods

After receiving IRB approval (350-19-EX), a 14-question Google Survey was formulated. Emails were sent in February 2021 to the deans of student affairs from each of the 156 MD medical schools in the United States requesting them to distribute the survey link to current fourth year medical students at their respective institutions. After two weeks, follow-up emails were sent to schools that did not initially respond. The survey consisted of 11 multiple choice questions and 3 open-ended questions. Questions ranged from gathering information about, demographics (gender, ethnicity), preclinical exposure to urology, availability of urology rotations, consideration of urology as a specialty, and opinions (positive/negative) about the field of urology (Appendix A). After closure of the survey window, the responses were collated and analyzed. Multiple choice response percentages were calculated. Open ended responses were collected and analyzed for trends.

Results

A total of 20 medical schools accepted the invitation to distribute the survey resulting in a response rate of 13%. The most common reasons for not distributing the survey included survey fatigue and institutional policy of restricting external survey requests. From these 20 medical schools, 147 fourth year medical students responded (65% white) and were evenly split based on gender. The most common specialties that the students applied to were internal medicine (18%), general surgery (12%) and pediatrics (12%). While 9% of students applied to urology, around 61% never considered urology as a career choice.

We found that 47% of respondents had exposure to urology during medical school and 29% of respondents had urology clinical rotations. A quarter of students (24%) had no exposure to urology throughout their medical school. Having said that, 89% of the medical schools surveyed offered a rotation in clinical urology (Figure 1).

A large proportion of students (54%) felt the urology exposure to be inadequate. The majority of respondents had either a positive (43%) or neutral (48%) perceptions towards the specialty of urology with 10% harboring a negative opinion. The positive aspects of urology included perceptions of salary (87%), lifestyle (62%), focused specialization (54%), and use of technology (49%). (Figure 2). The negative aspects of urology include competitiveness (75%), resident workload (33%), physician burnout (30%) and focalized specialization (29%) (Figure 3).

Discussion

The population of Americans 65 and older is on the rise^{1,3}. With this increase in patient population, more urologists will be needed. However, the current trend points toward a decrease in practicing urologists³. As a result, it is vital to assess the level of interest in urology amongst current medical students to help develop strategies that might stimulate them to pursue urology as a career choice.

A reasonable time frame for adequate urological exposure and training during medical school has been reported to be at least two to three weeks in duration.^{6,10} However, in our study, we found that 25% of survey respondents had no exposure to urology in their medical curriculum and 11% did not have the option for a urology clinical rotation. In addition, over half of survey respondents (54%) believed urological exposure to be inadequate in their respective medical schools.

A 2008 study found that 65% of urological residency program directors at medical schools in the United States believed it was possible to graduate without any clinical exposure to urology. Additionally, 34% of program directors believed that urology exposure was decreasing compared to a decade ago and 32% of medical schools provided students no exposure to urology in preclinical years.¹¹ A follow-up study in 2014 found that the number of medical schools in the United States that did not have required urology lectures or coursework before third year had increased to 48%.¹² With more schools looking to accelerate medical education and shorten curricula,¹³ urological exposure may yet decrease further. This would negatively impact the number of future urologists, as well as decrease the already low basic urological knowledge of medical students and primary care physicians.¹⁴

When asked about negative aspects of urology, students most frequently cited the competitiveness of the field, burdensome

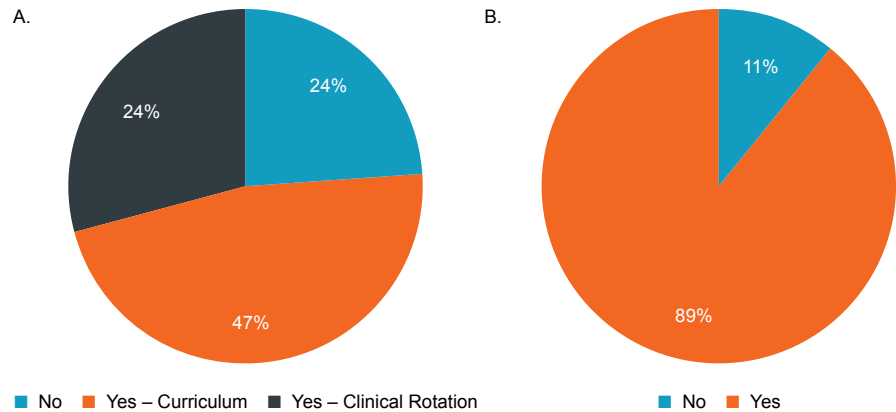


Figure 1. Urology exposure and rotation availability: A. Student responses to the question, "Did you have exposure to urology during medical school?"; B. Student responses to the question, "Is there a clinical rotation available in urology?"

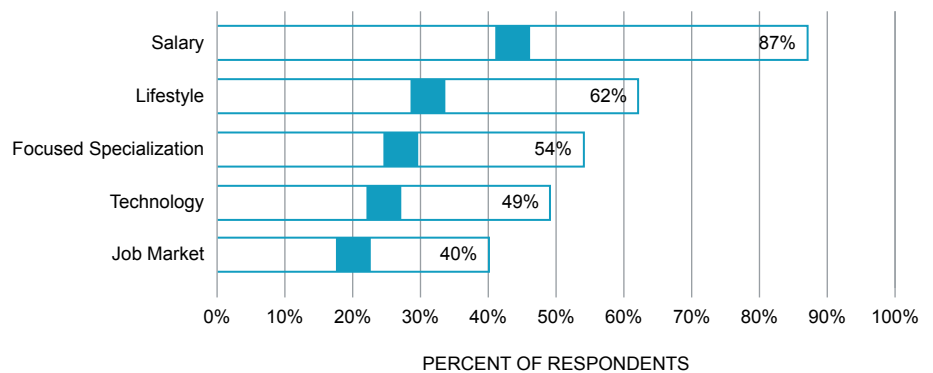


Figure 2. Student perceived positive aspects of urology: The top 5 responses based on the question, "What do you believe to be positive aspects of urology (check all that apply)?"

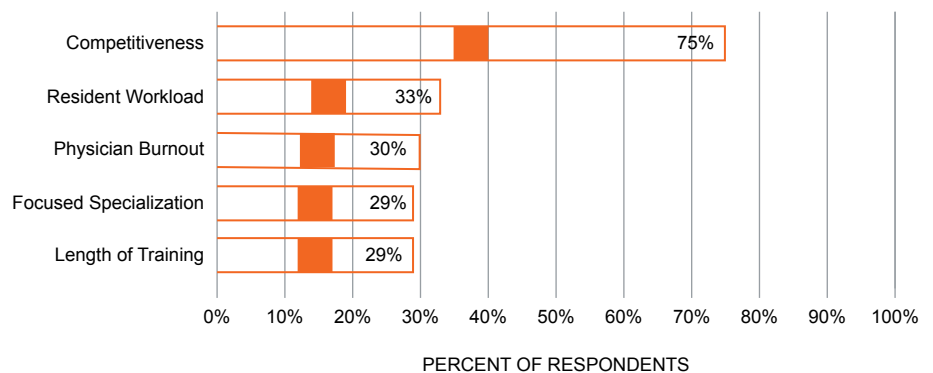


Figure 3. Student perceived negative aspects of urology: The top 5 responses based on the question, "What do you believe to be negative aspects of urology (check all that apply)?"

resident workload, physician burnout, and the specialization of urology. Other barriers include curriculum limitations as some medical schools only allow a certain number of rotations within a given field and the shortened deadline of the early urology match of the American Urological Association.¹⁵

There are a variety of methods that could be utilized to increase medical student interest and exposure to urology. Early exposure to urology is paramount to fostering interest in the specialty. A study in the United Kingdom found that early exposure to urology correlated with students considering a career in urology.¹⁶ This could be undertaken with

dedicated urological curriculum or clinical rotations in urology, which could increase student comfort in managing urological issues regardless of ultimate career choice. However, it could be difficult for medical schools to implement this as there may not be ample time in the curriculum.

More importantly, a study that looked at why specific medical schools had more students pursuing urology than others found that strong mentorship was the most important factor.⁷ Strong mentors led to more positive perceptions of urology as well as an increased interest in the field. In addition, this trend occurs in general surgery where early exposure to surgery improves perception of and likelihood of a surgical career.¹⁷ Urology faculty can act as mentors to medical students through various avenues such as, offering research projects, leading small group sessions during medical school, as well as serving as teachers in preclinical courses such as anatomy and reproductive physiology and pathology. Along the same lines, another study found that having a urology interest group was one of the strongest predictors of students choosing to pursue urology as a specialty.¹⁸ Supporting student urology interest groups enables outreach to medical students to garner interest in urology and introduces students to urological faculty as well as opportunities in research and shadowing.

Even if medical students decide not to pursue urology as a specialty, it is still important for an established urological curriculum in schools. This will provide the basic knowledge/skills about urology which will be essential for general practitioners that are likely to treat a growing geriatric population. A basic urological foundation can help providers accurately triage urologic problems, manage simple urologic issues, as well as start appropriate work-up of more complex urological issues before ultimate referral. In fact, the AUA has previously published an online medical student curriculum via the AUA University that is separate from the more complex core curriculum used by urology residents.^{19,20} These high-yield topics could be beneficial to create a framework for urological curricula for medical students in programs that currently do not have adequate urological exposure. In addition, literature has explored the usage of dedicated urology-specific curricula for third- and fourth-year medical students, resulting in increased student comfort and proficiency with genitourinary skills^{21,22,23} in addition to the expression of student gratitude for the opportunity to learn a sensitive patient exam.²¹

There are several limitations to this study with the primary one being the low response rate (13% of medical schools and 147 student responses). This low response rate should ensure caution to avoid generalization of this data for the entire United States. In addition, as with any survey, respondents may not feel comfortable providing completely accurate answers. Moreover, as this survey was completely voluntary, this self-selects for a population of students that is not necessarily representative of the nation.

In terms of future work, it would be beneficial to explore the medical school student curriculum for each school individually to ascertain exposure to urology. This could be accomplished by contacting the individual curriculum program directors from each medical school. In addition, with the United States Medical Licensing Examination (USMLE) Step 1 transitioning to a pass/fail format, it could help to diminish the perceptions of the competitive nature of the urological specialty. Thus, it would be beneficial to revisit this survey after applicants start to report pass/fail scores instead of the current numerical scores for USMLE Step 1.

Conclusion

Urological medical school education opportunities are limited. Many students do not have any exposure to urology, let alone the opportunity to experience a clinical rotation in the field. Although the specialization and lifestyle of urology are attractive, the competitiveness of the field seems to have dissuaded the majority of possible applicants. However, with the increased need for urologists and the decreasing supply, future work should focus on increasing medical student exposure to urology and foster their interest in the field as career choice. ■

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Appendix A. Survey Questions:

1. What medical school do you attend?
2. What degree are you pursuing (MD, MD/PhD)
3. Gender – Female, Male, Other
4. Race/Ethnicity - White, Hispanic/Latino/Spanish, Black/African American, Asian/Asian Indian, Native American, Middle Eastern, Other, prefer not to say
5. What specialty are you planning/did you apply into?
 - a. Anesthesiology, Dermatology, Emergency Medicine, Family Medicine, Internal Medicine, IM PEDS, Neurosurgery, Neurology, OB/GYN, Ophthalmology, Orthopedic Surgery, Otolaryngology, Pathology, Pediatrics, PMR, Plastic Surgery, Psychiatry, Radiation Oncology, Radiology, General Surgery, Thoracic Surgery, Urology
6. Did you have exposure to Urology during medical school?
 - a. No
 - b. Yes – from medical school curriculum or lecture
 - c. Yes – from a clinical rotation
7. Is there a clinical rotation available in urology?
 - a. No
 - b. Yes – required
 - c. Yes – elective
8. Do you believe Urology exposure to be lacking in your medical school?
 - a. No
 - b. Yes
9. Did you consider Urology as a potential career?
 - a. Never
 - b. Rarely
 - c. Occasionally
 - d. Frequently
 - e. I applied
10. What is your general perception towards Urology as a career?
 - a. Positive
 - b. Neutral
 - c. Negative
11. Please explain your answer to the above
12. What do you believe to be positive aspects of Urology? Check all that apply
 - a. Research, Lifestyle, Resident workload, Level of physician burnout, Patient population, Focalized specialization, Size of field, Salary, Job Market, Technology, Length of training, Competitiveness, Other
13. What do you believe to be negative aspects of Urology? Check all that apply
 - a. Research, Lifestyle, Resident workload, Level of physician burnout, Patient population, Focalized specialization, Size of field, Salary, Job Market, Technology, Length of training, Competitiveness, Other
14. What are your reservations about pursuing a career in Urology?