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EDUCATION (G BADALATO, SECTION EDITOR)

Strategies for Attracting Women and Underrepresented Minorities in Urology

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Abstract

Purpose of Review This article summarizes the current state of underrepresented minorities (URM) and women within urology. Specific strategies to promote the recruitment and retention of URM and women within urology are discussed.

Recent Findings Minorities and women remain underrepresented within urology, a disparity that has roots as early as medical school and persists throughout residency and practice. This is likely due to implicit and explicit bias, lack of role models, and persistent disparities in compensation and promotion. Strategies to improve recruitment and retention of these individuals should focus on increasing early exposure to urology, opportunities for mentorship, and support in professional development. Creation of a supportive institutional culture, consideration of alternative career advancement paths, and intentional diversity-focused recruitment efforts are also critical.

Summary Successful recruitment and retention of URM and women in urology requires specific, directed efforts to increase opportunities for exposure, mentorship, and career promotion at a programmatic, institutional, and national level.

Keywords Residency training · Urology · Recruitment · Underrepresented minorities · Women · Diversity

Abbreviations

URM	Underrepresented minority
AUA	American Urological Association
SWIU	Society of Women in Urology

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Introduction

As the population of the USA increases and continues to become more heterogeneous, the impact of diversity in healthcare has presented a growing area of interest. While diversity includes factors such as gender, race, socioeconomic status, education, sexual orientation, or personal experience, it is most commonly defined by those who are underrepresented minorities among the greater population. The Association of American Medical Colleges has historically defined an "underrepresented minority" (URM) as those who are Black, Mexican American, Native American (American Indian, Alaskan Native, Native Hawaiian), or from mainland Puerto Rico [1]. Historically, women have also been included among those underrepresented in medicine.

Diversity in medicine is important for several reasons. Indeed, greater diversity may improve health outcomes for the general population. A study by Alsan et al. demonstrated Black men who have Black providers are more likely to discuss health problems, accept preventative services, and have improved physician-patient communication compared to those who see a provider of a different race [2]. The authors further concluded that these improved outcomes as it pertains to preventative health screening and patient compliance could then be

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extrapolated to reductions in overall healthcare disparities and the life expectancy gap between black and white men [2]. Such differences in care may have the most significant effect on patients who lack experience with routine medical care and those who otherwise tend to mistrust the medical system [2]. Patients are therefore more likely to seek care from a provider who is "like them," a trend that has also been noted within the field of urology among female patients [3]. Compounding this effect is the fact that URM providers are more likely to practice in underserved communities, care for underinsured or uninsured patients, and have expanded research agendas, including research with regard to disparities [4, 5].

Greater diversity within medicine also carries implications on the education of clinical and research trainees. Training providers to practice culturally competent and sensitive care cannot happen in a homogenous racial and ethnic environment; diverse faculty and medical peers is a critical part of learning cultural competence [5]. Among graduating medical students during 2017–2018 academic year, over 66% agreed or strongly agreed that diversity within medical school classes enhanced their training and skill to work with individuals from different backgrounds [6]. Within academic medicine in particular, increasing the diversity of researchers may be of particular importance. Several studies have described the inequalities of healthcare outcomes that exist for URM; these disparities persist even when controlled for income, insurance status, age, and illness severity [7–9]. While such disparities have been well-documented, little progress has been made to identify solutions. Increasing the diversity of researchers in academic medicine may allow for greater expansion of research agendas and allow for the identification of broader solutions to eliminate health disparities [5].

Within the field of urology, the issue of diversity remains a challenge. The gender and racial make-up of urologic providers as compared to the greater population of the USA is largely discordant. Though URM constitute 30% of the American population, URM urology trainees over the past 5 years make up less than 18% of all urology trainees and 7.6% of urologists currently in practice [10, 11, 12•]. Women similarly comprise a minority of urologic providers, with female physicians accounting for only 9.2% of practicing urologists [11]. Given this disparity, understanding how to better recruit and retain URM and women in urology is of paramount significance.

Current Status of Underrepresented Minorities and Women in Urology

As the decision to pursue a career in urology occurs in medical school, the diversity of practicing urologists is largely dependent on the gender and racial composition of the "pipeline" of medical students. Of matriculating medical students in the year 2018, only 8.3% were Black, 11% were Hispanic, Latino, or Spanish origin, 0.9% were American Indian or Alaskan Native, and 0.3% were Native Hawaiian or Pacific Islander. Of those graduating medical school in 2018, 5.8% were Black, 8.8% were Hispanic, Latino, or Spanish Origin, 0.7% were American Indian or Alaskan Native, and 0.2% were Native Hawaiian or Other Pacific Islander [6, 13]. In this first critical step, there is a lack of retention in medical school, which directly correlates to the issue of diversity in the urologic workforce. The gender gap in medical school, however, has greatly improved over the past several decades, and over half of current medical students during the years 2016–2018 are women [13, 14].

Among those who decide to pursue residency training in urology, the representation of URM and women plummets significantly. Among urology applicants in 2017–2018, 4% were Black, 5.8% were Hispanic, 0 were Native American/Alaskan, and 9% were multi-ethnic [15]. Of all urology trainees in the 2017–2018, only 2.9% were Black, 3.1% were Hispanic, and 0.15% were Native American/Alaskan [16]. When compared to other specialties, the proportion of URM trainees in urology is significantly lower (17.7%), as compared to surgery and surgical subspecialties (20.4%) and all medical specialty fields (25.6%) [12•]. Women comprise less than a quarter of all urology trainees and urology lags behind most other surgical sub-specialties including plastic surgery, ophthalmology, colorectal surgery, otolaryngology, and vascular surgery in terms of its proportion of female residents [16].

Among practicing urologists, the number of URM and women continue to remain sparse. Based on most recent 2018 census estimates from the American Urological Association (AUA), 2.2% of current practicing urologists are Black and 3.9% are Hispanic [11]. Notably, the distribution of URM urologists varies by region, with Black urologists most underrepresented in the South-Central Section of the AUA, whereas the numbers of Hispanic urologists were lowest the Pacific region. URM urologists tend to be most concentrated in the South Atlantic (37.9%) and West South Central regions (15.9%) regions [17]. URM urologists are also significantly less likely to work in academia, and more likely to work in multi-specialty or solo practices [17].

The representation of women in urology has also slowly improved over time, from a single board-certified female urologist in 1973 to 9.2% of the current urology workforce [11, 18]. Women now comprise over 21% of young urologists under 45 years old and are more likely than their male counterparts to subspecialize (46.4% vs. 23.4%) [19]. URM urologists also tend to be younger and are more likely to be female [17]. Such trends reflect a greater change in the overall demographic of medical students and residents entering the pipeline of practicing urologists (Table 1). However, this shift towards a more diverse workforce has remained incremental over time and may require even more time to be reflected in the current urology workforce.

Table 1 Representation of URM and women within the field of Urology, 2017 [13, 16, 20]

	Medical school* (%)	Residents (%)	Practicing urologists (%)
Black/African American	7.4	2.9	2.2
Hispanic	10.1	3.1	4.2
American Indian/Alaskan Native	0.9	0.15	N/A
Native Hawaiian/Pacific Islander	0.3	N/A	N/A
Other	3.3	3.8	1.2
Female	52.8	24.4	8.8

*Matriculating students

Challenges to Recruitment and Retention of Underrepresented Minorities and Women in Urology

As discussed, urology lags far behind other specialties and surgical fields in its representation of URM and women. In order to address this issue and consider solutions, it is imperative to understand the factors in training and practice that may explain this discrepancy [12•, 16]. Additionally, as the diversity of medical students and residents who can join the urologic workforce grows, identifying strategies to attract, support, and retain both URM and women within the field becomes increasingly important. Growing research has emphasized that URM and female urologists have unique experiences in both training and practice that may not be well-appreciated by their non-URM and male counterparts.

In medical school, exposure to urology, as well as opportunities to participate in urologic research may be more delayed and limited for URM and female students than their white, male counterparts. In a survey of urology residency applicants at a single institution, female urologists were significantly less likely than their male colleagues to have discovered urology, shadowed or operated with a urologist, and/or conducted research within the field before the third year of medical school. URM applicants were also significantly less likely to have shadowed a urologist prior to their third year of medical school [21•]. Though the decision to pursue residency in a surgical sub-specialty is multi-factorial, medical teachers and mentors were identified to be one of the top five factors influencing a medical student's decision to pursue training in urology [22]. Moreover, those who consider urology as a subspecialty are more likely to have exposure to positive role models within the field [23]. Thus, greater exposure at the medical school level may be one potential strategy to increase diversity in future cohorts of urology trainees.

Throughout training, URM and women also face distinct challenges. Implicit bias and microaggressions from peers, attendings, ancillary staff, and patients themselves may add to the already stressful nature of residency training for both URM and women, thereby contributing to uncomfortable clinical and training environments [20, 21•]. This echoes the narratives of minority medical students, whose experiences are adversely affected by racial discrimination, prejudice, and feelings of isolation [24]. Moreover, the burden of being a "token" representative for one's race or gender may exacerbate the challenge of balancing personal and professional responsibilities by demanding additional time and energy, as URM and women residents are often called to act as ambassadors, carrying out work related to diversity and inclusion for their respective institutions [25].

Indeed, subconscious biases may even spill over into the operating room, where male trainees have been noted to receive greater autonomy than their female counterparts at the same training level [26]. Subtle differences in treatment may also have downstream effects on a trainee's perceptions of self-confidence and clinical competency; this is evidenced by women within surgical subspecialties who have worse psychological health scores than their male peers or female peers in non-surgical specialties [27]. Such factors may put women and minorities at even greater risk of burnout during this vulnerable time of training.

Such difficulties persist even in practice. URM faculty remains underrepresented within the ranks of academic surgery [28, 29]. As such, URM report not only lower career satisfaction scores, but they also contemplate leaving academic medicine at a higher rate as compared to their non-URM counterparts [30]. This trend is likely related to lower rates of grant funding, promotion, and tenure among URM faculty [31]. A similar phenomenon has also been noted for women in academic urology, where few women hold senior leadership positions [32, 33]. Coupled with the lack of similar mentors within the field, such factors may deter these individuals from pursuing careers within academic medicine.

Even in non-academic practices, one's identity may impact day-to-day practice. Female urologists' salaries are, on average, over $81,000 less than their male counterparts and gender remains an independent predictor of lower compensation even after adjusting for age, practice setting, fellowship training, call frequency, hours worked, and sources of ancillary income [34]. "Pigeonholing" has also been described as a source of frustration, whereby female urologists are often referred a greater proportion of female patients and female urology issues, regardless of their clinical expertise, fellowship training, or personal preference. For example, general urologists who are women tend to perform more "traditional" urogynecological cases than their male counterparts [35].

Unique challenges also exist for female trainees and urologists who wish to pursue motherhood. Female medical students expressed a significantly greater interest in surgery if there was greater acceptance of maternity or paternity leave, hospital-based childcare was available, or if part-time training

or practice was available; these findings suggest family planning priorities inform even early decisions to pursue careers in surgery [36]. Among surveyed female surgeons who delivered during residency (n=347), only 34.9% reported a maternity leave policy, 78.4% reported ≤ 6 weeks of maternity leave, and 82.2% cited the American Board of Surgery leave policy as a major barrier to desired length of maternity leave [37]. Moreover, 39% strongly considered leaving residency and nearly 30% would discourage female medical students from a surgical career due to difficulties in balancing pregnancy and motherhood with training [37]. Notably, even among top ranked medical schools, only 53% offered paid parental leave, suggesting that this remains a challenge even for academic surgeons once in practice [38].

Strategies to Improve Recruitment and Retention of URM and Women Within Urology

Ultimately, the question of methodologies to better recruit and retain URM and women within the field is best answered by directly addressing the previously discussed challenges. Successful interventions in other fields and specialties provide informative approaches that may be applied within our own specialty. Primarily, these demonstrate that increasing diversity requires a focus on increasing exposure and opportunities for those in training, fostering networks and creating opportunities for career mentorship, as well as supporting the professional development of these individuals (Fig. 1).

One main area of focus lies in developing recruitment processes that focus on increasing diversity in the applicant pool in addition to a commitment to diversity by residency programs. Early exposure of medical students to urology is associated with their decision to pursue residency training within the field, and exposure to strong mentors is critical [21•, 22, 23]. Medical schools with department chairs, faculty, and residents who are charismatic, nationally prominent, supportive, and available to students have increased numbers of medical students who match within urology. This trend further underscores the importance of early mentorship and a diverse faculty and residency class with whom applicants can identify with and garner support [39]. More formalized diversity training for program directors may help further focus attention to increasing diversity and help attract a broader range of candidates. Though 75% of urology residency program directors deem multicultural training to be important, none report any formal multicultural training program [28].

Strategic "pipeline" initiatives focused on active recruitment of medical students to urology may also be another strategy by which to increase the diversity of applicants to urology programs. Programs such as structured summer internship programs for medical students have worked to increase the numbers of URM and female applicants in orthopedic surgery, a surgical subspecialty that has historically faced similar challenges in the diversity of its providers [40]. Early outreach is also a critical component, as college students are already beginning to form aspirations for their academic careers as early as the undergraduate years and gather inspiration from such summer enrichment programs.

More specific diversity-focused residency recruitment efforts have demonstrated success in other specialties and may

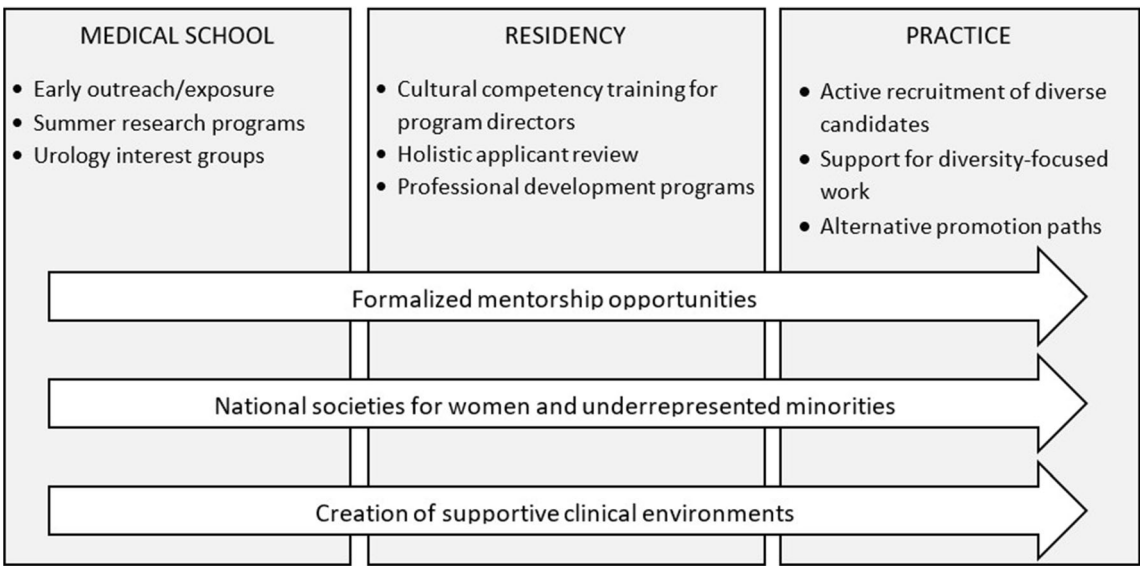

Fig. 1 Schematic of strategies to attract and retain underrepresented minorities and women to urology at all stages of training. Efforts should focus on early exposure of medical students, creating formalized opportunities for networking and mentorship, supporting professional development and diversity work, and creating a diversity-focused institutional culture

be potentially applied to the recruitment of future urology residents as well. For example, in one pilot study among Emergency Medicine residency applicants at Denver Health, the implementation of a scholarship-based externship program, a funded second-look event, and the increased visibility of URM faculty during recruitment events eventually doubled the proportion of URM candidates who were ultimately offered an interview; this in turn increased the proportion of matched URM residents by over fourfold in the following year [41]. Additionally in another 2019 study involving general surgery applicants at the University of Pennsylvania, a three-pronged approach to increase diversity was utilized: a 4-week visiting student program, the use of a selection committee for holistic applicant reviews, and the targeted outreach to URM candidates by an institutional minority physician group. This strategy increased proportions of URM candidates who were interviewed and matched at this particular program without any compromise in more traditional applicant excellence measures, such as overall step 1 score [42••].

Supporting URM and female urology residents throughout training is also a critical to retention of these trainees. Regional and national initiatives to promote networking, education, and professional development may connect URM and female students, residents, and practicing urologists, thereby fostering mentorship opportunities and supportive communities. Organizations such as the Society of Women in Urology (SWIU), the R. Frank Jones Urological Society, and Urology Section of the National Medical Association are examples of this. All provide opportunities for mentorship, which has a strong impact on personal and career development, career choice, and research productivity [43]. For example, the equivalent of one of these professional organizations in general surgery has developed a formalized program entitled the "Diverse Surgeons Initiative." This initiative has had measurable success in facilitating post-residency fellowship, board certification, and faculty appointment; in addition, the program translated into increased research productivity and leadership positions at the local, regional, and national levels [44, 45].

Diversity initiatives at the individual institution or practice level can also help to increase the diversity among trainees, faculty, and practitioners. Passive encouragement of diverse candidates is insufficient. Creating a clinical environment to foster and support diversity requires active, intentional efforts. Among academic medicine departments, surveys and interviews of faculty have revealed several areas for focus in the recruitment process. These include the use of social networks and interpersonal connections to identify diverse candidates, and in turn dedicating institutional resources and support for professional growth, research, and opportunities for advancement [46]. Moreover, a pro-active recruitment strategy with an explicit commitment to workforce diversity is critical. This may potentially mean hiring excellent candidates even if not engaged in an official search in order to attract the most diverse, qualified individuals.

Retaining URM and female urologists within a practice or a department also means supporting their career growth and trajectories. URM and female urologists may participate in diversity development activities or take on mentorship responsibilities disproportionately at all levels of training [25, 46]. Such efforts should be recognized, valued, and rewarded. Consideration of alternate promotion paths that may take this work into account is one example of how this could be accomplished. In doing so, not only is a stronger network of potential mentors, teachers, and advocates created, but institutional incentives become better aligned with diversity-focused values.

Diversity within a department or practice can also promote innovation from the generation of diverse ideas, improved performance, and increased morale. While racial and gender bias is often rooted in greater social or cultural norms, addressing implicit bias within the workplace is critical. Institutions and practices must be aware of their climate and treatment of URM and women faculty [47]. Studies have shown that departmental training on implicit bias significantly improves self-efficacy measures in gender-equity-promoting behaviors among faculty in university science, technology, engineering, and medicine (STEM) departments and also increases self-reported actions to promote gender equity in the months following the training [48••]. Notably, those departments who participated in training significantly increased the proportion of women hired in the subsequent years, compared to their counterparts who did not [49]. Such interventions may be similarly efficacious when applied to racial and ethnic biases as well. The efficacy of implicit bias training therefore appears to last far beyond the immediate training period and may be a readily applicable way to create a more diversity-focused institutional culture.

Lastly, creating a culture of inclusion also includes provisions for structured maternity leave and support for parenting responsibilities. Among female urologists, those with ≥ 9 weeks of maternity leave were most likely to report satisfaction with childbearing; though this was more common among those in practice than those in training, only 30% of those in practice had leave duration of this length [50]. Moreover, dissatisfaction with leave and breastfeeding duration were significantly associated with work-related factors [50]. Such studies underscore the importance of providing adequate maternity leave and support for childbearing-related needs for female urology trainees and practitioners who ultimately choose to have children. At a national level, family-friendly provisions to allow flexibility in academic meeting attendance and presentations for surgeon-parents may help to further cultivate a culture of inclusiveness within the specialty; such strategies have been utilized by the Society of Thoracic Surgeons to expand the involvement of its female members [51]. Such

policies benefit both men and women of diverse backgrounds, as the priorities of newer generations of surgical trainees and future surgeons continue to evolve [52].

Conclusions

Despite growing recognition of the importance of diversity in medicine, both URM and females remain underrepresented among current medical students, urology residents, and practicing urologists. Strategies to attract and recruit these individuals to the field must focus on addressing many of the personal, social, and institutional challenges that they face upon entering the field. In addition, a commitment to diversity is required. Efforts to increase the pipeline of medical students interested in urology through early outreach programs, supporting the professional development of residents and faculty through structured mentorship opportunities, and actively recruiting URM and female candidates are several actionable strategies to accomplish this. Moreover, building a clinical environment and institutional culture that is welcoming of a diverse group of trainees and urologists should remain an ongoing effort. We remain hopeful that through such concerted efforts, we may further the experience of URM and women within our field in the years to come.

Compliance with Ethical Standards

Conflict of Interest Jessica C. Dai, Nnenaya Agochukwu-Mmonu, and Adam B. Hittelman each declare no potential conflicts of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

References

Papers of particular interest, published recently, have been highlighted as:
- • Of importance
- •• Of major importance

1. "Underrepresented in Medicine Definition". Association of American Medical Colleges. 2019. Available from: https://www.aamc.org/initiatives/urm/. Accessed 1 Jun 2019.
2. Alsan M, Garrick O, Graziani G. Does diversity matter for health? Experimental evidence from Oakland. 2018. Report No.: 24787. Available from: http://www.nber.org/papers/w24787. Accessed 1 Jun 2019.
3. Oberlin DT, Vo AX, Bachrach L, Flury SC. The gender divide: the impact of surgeon gender on surgical practice patterns in urology. J Urol. 2016;196:1522–6.
4. Komaromy M, Grumbach K, Drake M, Vranizan K, Lurie N, Keane D, et al. The role of black and Hispanic physicians in providing health care for underserved populations. N Engl J Med. 1996 May 16;334(20):1305–10.
5. Cohen JJ, Gabriel BA, Terrell C. The case for diversity in the health care workforce. Health Aff. 2002;21(5):90–102.
6. Association of American Medical Colleges. Medical School Graduation Questionnaire 2018 All Schools Summary Report. 2018 [cited 2019 Mar 15]. Available from: https://www.aamc.org/download/490454/data/2018gqallschoolssummaryreport.pdf
7. Fiscella K, Franks P, Gold MR, Clancy CM. Inequality in quality: addressing socioeconomic, racial, and ethnic disparities in health care. JAMA. 2000;283(19):2579–84.
8. Smedley BD, Stith Butler A, et al. Committee on institutional and policy-level strategies for increasing the diversity of the U.S. Health Care Workforce Board on Health Sciences Policy Brian D. Smedley. National Academies Press (US); 2004.
9. Haider AH, Scott VK, Rehman KAV, et al. Racial disparities in surgical care and outcomes in the United States: a comprehensive review of patient, provider, and systemic factors. J Am Coll Surg. 2013;216(3):482–92.
10. Bureau USC. Quick Facts, United States. 2019. Available from: https://www.census.gov/quickfacts/fact/table/US/PST045218. Accessed 1 Jun 2019.
11. The State of Urology Workforce and Practice in the United States 2018. Linthicum, Maryland, U.S.A.; 2019.
12.• Shantharam G, Tran TY, McGee H, et al. Examining Trends in Underrepresented Minorities in Urology Residency. Urology. 2019;127:36–41 **This reference highlights current disparities in the representation of URM in Urology, as compared to other specialties, and provides thoughtful discussion of some of the factors contributing to this.**
13. Association of American Medical Colleges. 2018 Matriculating Student Questionnaire [Internet]. 2018 [cited 2019 Mar 15]. Available from: https://www.aamc.org/download/494044/data/msq2018report.pdf.
14. Halpern JA, Lee UJ, Wolff EM, Mittal S, Shoag JE, Lightner DJ, et al. Women in urology residency, 1978-2013: a critical look at gender representation in our specialty. Urology. 2016;92:20–5.
15. Association of American Medical Colleges. 2018 [cited 2019 Jun 1]. Available from: https://www.aamc.org/download/359238/data/urology.pdf.
16. Data Resource Book, Academic Year 2017–2018. Accreditation Council for Graduate Medical Education. Chicago, IL; 2018 [cited 2019 Jun 1]. Available from: https://www.acgme.org/Portals/0/PFAssets/PublicationsBooks/2017-2018_ACGME_DATABOOK_DOCUMENT.pdf.
17. Washington SL III, Baradaran N, Gaither TW, et al. Racial distribution of urology workforce in United States in comparison to general population. Transl Androl Urol. 2018;7(4):526–34.
18. Grimsby GM, Wolter CE. The journey of women in urology: the perspective of a female urology resident. Urology. 2013;81(1):3–6.
19. Nettey OS, Fuchs JS, Kielb SJ, Schaeffer EM. Gender representation in urologic subspecialties. Urology. 2018;114:66–70.
20. American Urological Association. The State of Urology Workforce and Practice in the United States. Linthicum, Maryland, U.S.A.; 2017.
21.• Gaither TW, Awad MA, Breyer BN, et al. Gender and racial disparities in early urology exposures during medical school. Urol Pract. 2019;6(2):129–34 **This reference examines early factors during medical school that may contribute to gender and racial disparities among urology trainees.**
22. Yang Y, Li J, Wu X, Wang J, Li W, Zhu Y, et al. Factors influencing subspecialty choice among medical students: a systematic review and meta-analysis. BMJ Open. 2019;9(3):e022097.
23. Kim S, Farrokhyar F, Braga LH. Survey on the perception of urology as a specialty by medical students. Can Urol Assoc J. 2016;10(9–10):349.

24. Dyrbye LN, Thomas MR, Eacker A, Harper W, Massie FS, Power DV, et al. Race, ethnicity, and medical student well-being in the United States. Arch Intern Med. 2007;167(19):2103.
25. Osseo-Asare A, Balasuriya L, Huot SJ, et al. Minority Resident Physicians' Views on the Role of Race/Ethnicity in Their Training Experiences in the Workplace. JAMA Netw Open. 2018;1(5):e182723 Available from: .2723.
26. Meyerson SL, Sternbach JM, Zwischenberger JB, et al. The effect of gender on resident autonomy in the operating room. J Surg Educ. 2017;4(6):e111–8.
27. Salles A, Mueller CM, Cohen GL. Exploring the relationship between stereotype perception and residents' well-being. J Am Coll Surg. 2016;222(1):52–8.
28. Vemulakonda VM, Sorensen MD, Joyner BD. The current state of diversity and multicultural training in urology residency programs. J Urol. 2008;180:668–72.
29. Abelson JS, Symer MM, Yeo HL, Butler PD, Dolan PT, Moo TA, et al. Surgical time out: our counts are still short on racial diversity in academic surgery. Am J Surg. 2018;215(4):542–8.
30. Palepu A, Carr PL, Friedman RH, Ash AS, Moskowitz MA. Specialty choices, compensation, and career satisfaction of underrepresented minority faculty in academic medicine. Acad Med. 2000;75(2):157–60.
31. Fang D, Moy E, Colburn L, et al. Racial and ethnic disparities in faculty promotion in academic medicine. JAMA. 2000;284(9):1085–92.
32. Mayer EN, Lenherr SM, Hanson HA, Jessop TC, Lowrance WT. Gender differences in publication productivity among academic urologists in the United States. Urology. 2017;103:39–46.
33. Han J, Stillings S, Hamann H, Terry R, Moy L. Gender and subspecialty of urology faculty in department-based leadership roles. Urology. 2017;110:36–9.
34. Spencer ES, Deal AM, Pruthi NR, Gonzalez CM, Kirby EW, Langston J, et al. Gender differences in compensation, job satisfaction and other practice patterns in urology. J Urol. 2016;195(2):450–5.
35. Rotker K, Iosifescu S, Baird G, et al. What's gender got to do with it: difference in the proportion of traditionally female cases performed by general urologists of each gender. Urology [Internet]. 2018 Jun [cited 2019 Mar 15];116:35–40. Available from: http://www.ncbi.nlm.nih.gov/pubmed/29550347.
36. Snyder RA, Bills JL, Phillips SE, Tarpley MJ, Tarpley JL. Specific interventions to increase women's interest in surgery. J Am Coll Surg. 2008;207:942–947.e8.
37. Rangel EL, Smink DS, Castillo-Angeles M, et al. Pregnancy and motherhood during surgical training. JAMA Surg. 2018.
38. Itum DS, Oltmann SC, Choti MA, Piper HG. Access to paid parental leave for academic surgeons. J Surg Res. 2019;233:144–8.
39. Kutikov A, Bonslaver J, Casey JT, et al. The gatekeeper disparity–why do some medical schools send more medical students into urology? J Urol. 2011;185(2):647–52 Available from: http://www.ncbi.nlm.nih.gov/pubmed/21168862. Accessed 1 Jun 2019.
40. Parks ML, Chambers MC, Mason, et al. Can a strategic pipeline initiative increase the number of women and underrepresented minorities in orthopaedic surgery? Clin Orthop Relat Res. 2016;474(9):1979–85.
41. Tunson J, Boatright D, Oberfoell S, Bakes K, Angerhofer C, Lowenstein S, et al. Increasing resident diversity in an emergency medicine residency program: a pilot intervention with three principal strategies. Acad Med. 2016;91(7):958–61.
42.•• Butler PD, Aarons CB, Ahn J, et al. Leading from the front: an approach to increasing racial and ethnic diversity in surgical training programs. Ann Surg. 2019;269(6):1012–5 **This references provides evidence for the role institutional-level programmatic efforts to increase diversity during recruitment of surgical residents and offers a framework that may be adopted by other training programs.**
43. Sambunjak D, Straus SE, Marušić A. Mentoring in academic medicine: a systematic review. J Am Med Assoc. 2006;296:1103–15.
44. Butler PD, Britt LD, Green ML, et al. The diverse surgeons initiative: an effective method for increasing the number of underrepresented minorities in academic surgery. J Am Coll Surg. 2010;211(4):561–6.
45. Butler PD, Britt LD, Richard CE, Chang B, Serletti JM, Green ML Jr, et al. The diverse surgeons' initiative: longitudinal assessment of a successful national program. J Am Coll Surg. 2015;220(3):362–9.
46. Peek ME, Kim KE, Johnson JK, Vela MB. URM candidates are encouraged to apply. Acad Med. 2013;88(3):405–12.
47. Moody J. Faculty diversity: problems and solutions: Routledge; 2004.
48.•• Carnes M, Devine PG, Baier Manwell LB, et al. The Effect of an Intervention to Break the Gender Bias Habit for Faculty at One Institution. Acad Med. 2015;90(2):221–30 **This references highlights the long-term impact of a brief intervention to reduce bias within STEM departments on departmental hiring practices and provides evidence for the benefit of such programs. It also provides an example of a structured intervention that could be carried out at other institutions.**
49. Devine PG, Forscher PS, Cox WTL, et al. A gender Bias habit-breaking intervention led to increased hiring of female faculty in STEMM departments. J Exp Soc Psychol. 2017;73:211–5.
50. Lerner LB, Baltrushes RJ, Stolzmann KL, Garshick E. Satisfaction of women urologists with maternity leave and childbirth timing. J Urol. 2010;183:282–6.
51. Antonoff M. Opportunities for academic achievement during parental leave: the Society of Thoracic Surgeons sets the standard. Ann Thorac Surg. 2018;16(2):321–3.
52. Stein SL. The changing face of surgery today: it is not a women's issue, It's a Work Force Issue. Ann Surg. 2017.