



Understanding the prevalence and distribution of fellowship trained female and male genitourinary reconstruction and men's health/andrology academic faculty in the United States

Mei N. Tuong^{1^}, Hamilton P. Lombard², Bradley A. Erickson¹

¹Department of Urology, University of Iowa Hospitals and Clinics, Iowa City, IA, USA; ²Weldon Cooper Center for Public Service, University of Virginia, Charlottesville, VA, USA

Contributions: (I) Conception and design: MN Tuong, BA Erickson; (II) Administrative support: MN Tuong; (III) Provision of study materials or patients: MN Tuong, BA Erickson; (IV) Collection and assembly of data: MN Tuong; (V) Data analysis and interpretation: MN Tuong, HP Lombard; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors.

Correspondence to: Bradley A. Erickson, MD, MS. Department of Urology, University of Iowa Hospitals and Clinics, 3251 Carver Pavilion, Iowa City, IA 52242, USA. Email: brad-erickson@uiowa.edu.

Background: We evaluated the prevalence, distribution, and specialist to population ratio of male and female reconstruction and andrology/prosthetics faculty within United States urologic training programs. Our objective was to help determine the current need/demand for reconstructive fellowship trained faculty for necessary clinical exposure during residency in the midst of a nationwide residency expansion.

Methods: All non-military urology residency programs were evaluated. Programs were sorted into their American Urologic Association Sections and websites were analyzed for evidence of fellowship training and/or clinical expertise/interest: (I) male genitourinary reconstruction (MGR); (II) female genitourinary reconstruction (FGR) and (III) infertility/andrology/men's health (AMH). The 2020 US Census data was used to determine specialist to population ratios by sections.

Results: Of 137 evaluated programs, FGR had the highest percentage of fellowship-trained faculty (76%) followed by AMH (66%) and MGR (61%). Clinical/surgical interest was noted in pelvic organ prolapse (88%), inflatable penile prosthesis (79%) and urethral stricture disease (75%). Over 10% of training programs had two or more faculty with MGR, FGR and AMH fellowship training. Significant geographic variation amongst academic programs exists with the South and Southeastern parts of the US being relatively underserved, both in percentage of programs with fellowship-trained faculty, and by faculty per 1,000,000 inhabitants.

Conclusions: The majority of US urology residencies have faculty with fellowship training and/or stated clinical interest in MGR, FGR and AMH. Still, many programs remain without these faculty while others have two or more in their respective fields. The geographic trends noted here have both educational and recruitment significance.

Keywords: Urology; resident education; healthcare access; reconstruction

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[^] ORCID: 0000-0002-4103-6128.

Introduction

There are an estimated 4.16 practicing urologists per 100,000 people currently in the United States, which is expected to decrease to 3.1 by 2035 (1,2). One way to meet the projected shortage of urologists has been to increase the number of urology residency positions. From 2015 to 2022, the number of spots has increased from 296 to 365—a 23% increase (3). However, how this increase has affected the training, and specifically training in non-oncologic reconstructive specialties, is unknown.

One study looking at how the clinical experience of residents has been changing over time reported that from 2009 to 2016, the mean overall number surgical case volumes for urology residents has remained constant. However, the types of cases residents are doing have changed significantly, with residents now leaving their residencies with more endoscopic, retroperitoneal oncology, and laparoscopic/robotic case volumes than ever before, with a resultant decrease in the number of abdominal open oncologic and reconstructive cases (4). Interestingly, while the overall case volume has not decreased, more residents than ever are choosing to do fellowships. In a survey taken by urology chief residents in 2019, 72% of respondents stated they were electing to enter a fellowship, the biggest reason being to gain additional skills in a specific urological field (5).

Reconstructive urology is a subspecialty that has increased in popularity over the past decade with now almost thirty programs offering Society of Genitourinary Reconstructive Surgeons sponsored fellowship positions that fill regularly. It is unclear to what effect this growth has had on urologic training, especially as compared to more established reconstructive specialties involving female urology and infertility. Given the attendant rise in residency training positions, we sought to determine the current distribution of not only male genitourinary reconstructive (MGR) trained faculty, but also female pelvic medicine and reconstructive (FPR) and infertility/andrology/men's health (AMH) surgeons amongst academic training program faculty. The purpose of determining these distributions was two-fold: First, we hoped to identify underserved areas of the country where current reconstructive fellows might best direct future job-search efforts; and second, we hope to identify disparities in residency training as pertains to exposure to these sub-specialties and their respective surgical procedures.

Methods

A list of accredited urology residency programs was obtained from the American Urological Association (AUA) website. Residency programs in all 50 states, in addition to the District of Columbia and Puerto Rico, were included. In total, there were 147 non-military urology residency training programs (Doctor of Medicine and Doctor of Osteopathic Medicine).

Residency website faculty profiles were accessed and fellowship training was assessed. Only urology trained faculty were included in this study. Our primary outcome was the presence of any faculty at the respective urology residency program with fellowship training in male genitourinary reconstruction (MGR), female pelvic medicine and reconstruction (FPR) and/or andrology/men's health (AMH). For any faculty without fellowship training, we determined if they listed a clinical interest in a condition often managed by faculty with fellowship training, including urethral stricture disease/urethroplasty (MGR reference case), pelvic organ prolapse/sacrocolpopexy (FPR reference case) and erectile dysfunction/inflatable penile prosthesis or infertility/vasectomy reversal (AMH reference cases). If faculty profiles listed both urethroplasty and inflatable penile prosthesis, these urologists were categorized as MGR.

Statistical analysis

Residency programs were then placed into cohorts as determined by their AUA Section. Cohorts were compared for percentage of section programs with MGR, FPR and AMH fellowship trained faculty and/or with clinical interest in the respective reference case. Finally, the ratio of academic, fellowship trained urologists per 1,000,000 people, for people eighteen years and older, was calculated based on the available 2020 United States Census data and separated by AUA section. Chi-squared analyses were used to compare cohorts, performed using R Studio version 1.3.1093 (Boston, MA) with a P value <0.05 was considered statistically significant. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

Results

There were 10 (7%) residency programs (five North Central, one Southeastern, one South Central, one New England, and two New York) excluded due to academic and

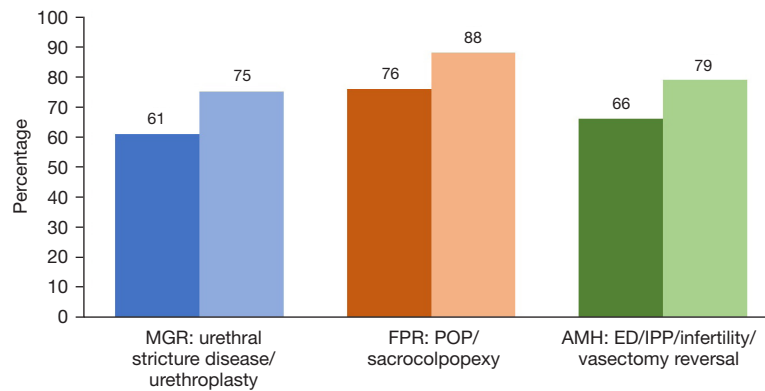


Figure 1 Percentage of academic residency programs with fellowship trained faculty (left) vs. percentage of academic residency programs with any urologist treating reference conditions (right). MGR, male genitourinary reconstruction; FPR, female pelvic medicine and reconstruction; POP, pelvic organ prolapse; AMH, andrology/men’s health; IPP, inflatable penile prosthesis.

Table 1 Comparison in percentage of academic residency programs with fellowship trained faculty by subspecialty

Subspecialty	At least 1 fellowship trained faculty	2 fellowship trained faculty	3 or more fellowship trained faculty
MGR	61	13	5
FPR	76	21	14
AMH	66	14	9

MGR, male genitourinary reconstruction; FPR, female pelvic medicine and reconstruction; AMH, andrology/men’s health.

Table 2 Percentage of urologic residency programs by American Urologic Association Section with fellowship trained urologists

American Urologic Association Section	FPR	MGR	AMH	Percentage of total residency programs
Northeastern	67	100*	50	4
New England	67	75	83	9
New York	80	13	73	11
Mid-Atlantic	83	83*	61	13
Southeastern	69	58	62	19
South Central	67	50	50	13
North Central	73	58	69	19
Western	100	75*	81	12
P value	0.19	<0.001	0.49	–

*, P<0.05 Northeastern, Mid-Atlantic, Western vs. New York. MGR, male genitourinary reconstruction; FPR, female pelvic medicine and reconstruction; AMH, andrology/men’s health.

clinical websites lacking training and/or clinical interest information for faculty members, leaving 137 residency programs for analysis.

Figure 1 presents the overall percentage of programs with fellowship training and/or clinical interest in the reference surgical case. FPR (76%) fellowship training was the most common, followed by AMH (66%) and MGR (61%). Evidence of reference condition interest followed a similar trend with 88% of programs reporting a faculty with clinical interest in pelvic organ prolapse/sacrocolpopexy, followed by erectile dysfunction/inflatable penile prosthesis/infertility/vasectomy reversal (79%) and urethral stricture disease/urethroplasty interest (75%). FPR trained faculty make up a median 6% (IQR: 2%, 11%) of all academic urologists, followed by MGR (4%, IQR: 0%, 7%) and AMH (4%, IQR: 0%, 8%).

Table 1 shows that while many programs still do not have faculty with formal fellowship training in reconstructive urologic surgery, some programs have two or more such faculty. For example, 14% of US urologic training programs have three or more FPR fellowship trained faculty.

Table 2 breaks down the percentage of training programs with fellowship training by AUA section. Significant geographic variation is noted, but only variation in MGR fellowship trained faculty was statistically significant, with the lowest percentage being found in the New York (13%) and South Central Sections (50%).

Figure 2A-2C depict Choropleth maps of fellowship training and any urologist treating these subspecialty pathologies by both AUA Section and Section population



Figure 2 Choropleth maps of fellowship trained academic subspecialists and academic urologists to 1,000,000 people ratio. (A) Female pelvic medicine and reconstruction; (B) male genitourinary reconstruction; (C) andrology/men's health. *, United States Average 1,000,000 People Ratio. AUA, American Urological Association.

density. Geographical areas of relative fellowship training disparity are colored red and orange. Areas of relative excess are shown in green. Notable disparities in fellowship trained FPR and AMH urologists exist throughout the South, Western, and Southeast AUA Sections. However, these disparities increased compared to the national average for any urologists treating any subspecialty pathologies in the South, Western, and Southeast AUA Sections. Interestingly, areas which had lack of access to care for fellowship trained urologists, New York and Northeastern Sections, had an excess of care of any urologists treating all three subspecialty pathologies.

Discussion

This study's purpose was to determine the distribution of fellowship-trained reconstructive urologic faculty in the US. There is a growing trend amongst graduating US urology chief residents to pursue fellowship training, and some of the most popular fellowships are those involving non-oncologic, specialized, adult surgical care. Understanding the geographic distribution of fellowship trained faculty and of any urologist performing subspecialty procedures in academic institutions was, thus, important for both educational and recruitment purposes.

All urologic training programs are designed, and certified, to provide a minimum exposure to all aspects of urologic care such that chief residents are able to safely practice as non-fellowship trained general urologists. Given that most urologic training occurs in academic programs, much of the training will be with fellowship trained faculty and, therefore, many of the cases will likely be of the sort that a general urologist may not be expected to perform in practice. However, this exposure to subspecialty training has been shown to positively impact the education of urology residents, regardless of eventual career choice. For example, the presence of a fellowship trained male infertility urologist on faculty significantly improves resident understanding of infertility workup and competency of performing microscopic infertility procedures (6). Similarly, the presence of a genitourinary reconstructive trained faculty is associated with residents publishing research on urotrauma and experience with multidisciplinary trauma conferences in practice (7).

By increasing the number of reconstructive fellowship-trained faculty at US academic urology residency programs, we would expect improved exposure to both new and evidence based surgical techniques for treating non-oncologic, adult urologic diseases. For example, historical

studies have described that an endoscopic (urethrostomy/urethral dilation) preference in treating urethral stricture disease remains amongst practicing urologists despite the significantly higher risk of urethral stricture recurrence as compared to formal urethroplasty (8). For example, Consolo *et al.* surveyed urologists within the Mid-Atlantic section of the AUA of whom only 49% reported formal urethroplasty training in residency (9). Importantly, urethrotomy remained the most commonly performed procedure for a recurrent bulbar urethral stricture (33%) followed by referral for urethroplasty. The main predictor for recommending or placing a referral for urethroplasty over urethrotomy in this study was exposure to urethroplasty in residency or fellowship.

Encouragingly, in 2015, Liu *et al.* reported that a higher rate of newly certifying urologists were performing urethroplasty (10.6%) compared to those recertifying (2.9%) when treating urethral stricture disease (10). In addition, newly certifying urologists had a lower DVIU to urethroplasty ratio compared to first time recertifying urologists (8.5:1 *vs.* 20:1). While there has not been a recent update, with 61% of academic urology residency training programs having at least one MGR fellowship trained faculty, one could predict there is now an even higher percentage of graduating urology residents who feel comfortable in performing a straightforward urethroplasty.

Our demographic description of fellowship trained urologists not only points to AUA regional sections with low ratios of fellowship trained urologists to improve resident education, but also to geographical areas where there is a need for improved patient care. While there is greater availability of subspecialty care to patients throughout the AUA regional sections when looking at our any urologist to population ratio, there are greater disparities in accessing urologic care when compared to the US national averages. Overall, the majority of AUA regional sections have 1 or less urologist providing subspecialty care per 1,000,000 people. Yet, more specifically, the Western, South Central, and Southeastern AUA Sections tended to have both lower fellowship trained urologists and any urologist performing these subspecialty procedures per 1,000,000 people compared to the national US ratio for almost all three subspecialties. This trend is similar to the practicing urologist to population ratio by state published by the AUA Census in 2021: states in the Western, South Central, and Southeastern AUA Sections have a smaller ratio of practicing urologist to 100,000 population ratio (1,11). Notably, the fifteen fastest growing states are all in

the South and West—Florida now the third most populous, and Texas the second—meaning these geographic disparities may continue to grow. However, regardless of US location, wait times (IQR: 13.8–43.3 days) and travel distances (average 111 miles) for reconstructive specialists are already high and likely to increase (12,13).

Limitations of this study include the lack of descriptive data on residency program websites. While 7% of residency programs were excluded due to no clinical information available, many program websites had minimal faculty information for evaluation. Similarly, program websites could present old faculty profiles as there is not a standard statement regarding when the website was last updated. In addition, it is not known how much contribution faculty have on their own academic profiles. This study also did not look at large private practice urology groups who commonly employ fellowship trained urologists. While these large practices certainly help with access to care clinically, few are training residents which may be exacerbating the push toward sub-specialization and fellowship. However, we did include urologists working in large private practice urology affiliated with academic residency programs if their profiles were listed on program websites. Finally, while presence of a fellowship-trained faculty is strongly associated with exposure to specialty-specific surgical cases, the case-logs were not reviewed. Future studies will address how early residency exposure to non-oncologic, adult reconstructive specialties affects the pursuit of fellowship training.

Conclusions

The majority of US urology training programs have faculty members with FPR, AMH and MGR fellowship training although there are still significant regional variations, amongst all subspecialties, especially in the West, South Central and Southeastern Sections of the US. With both a growing population and expansion of urologic training programs in these sections, this snapshot of the current academic reconstruction workforce provides evidence of a persistent need for any reconstructive fellowship trained urologists to fill academic positions especially in these regions of the US, ensuring graduating residents have exposure to all aspects of urologic care necessary for independent practice.

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Footnote

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Ethical Statement: The authors are 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. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

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