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Publication Date

2016-08-01

DOI

10.1016/j.urology.2016.04.053

Peer reviewed

The Near-future Impact of Retirement on the Urologic Workforce: Results From the American Urological Association Census

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OBJECTIVE To assess self-perceived planned retirement patterns among urologists by using the American Urological Association Census Data. With an expanding elderly population and an aging urologic workforce, concerns regarding increased demand and decreased supply of urologists have been raised.

MATERIALS AND METHODS We analyzed data from the 2014 American Urological Association Census, which is a specialty representative survey distributed to the urologists who practice in the United States. A total of 2204 census samples were weighted to represent 11,703 urologists who practiced in the United States in 2014. We compared urologists who are nearing retirement (within 5 years of their planned retirement) with the rest of urologists on their demographic, geographic, and practice characteristics.

RESULTS Of the 11,703 practicing urologists in the United States, 3181 (95% confidence interval: 2884-3479) or 27% (95% confidence interval: 25%-30%) are nearing planned retirement. The mean age (standard deviation [SD]) of urologists nearing retirement (69, SD = 8.2) was older than nonretiring urologists (48, SD = 10.3), $P < .01$. Nearly double the proportion of nearing retirement urologists is found in nonmetropolitan compared to nonretiring urologists, 534 (17%) vs 782 (9%), $P < .01$, respectively. Urologists nearing retirement are more likely to practice general urology compared to nonretiring urologists, 2341 (74%) vs 5072 (60%), $P < .01$. Among urologists nearing retirement, 2155 (68%) of them still perform inpatient operations.

CONCLUSION More than one-fourth of existing practicing urologists plan to retire in the next 5 years. General urology and urology practices outside of metropolitan areas will be impacted the most by the planned retiring workforce. UROLOGY 94: 85–89, 2016. © 2016 Elsevier Inc.

With an expanding elderly population and an aging urologic workforce, concerns have been raised regarding increased demand for urologists and an expected decreased urologist-to-population ratio.[1,2] This increasing demand is well documented, as the incidence and prevalence of urologic diseases such as nephrolithiasis, benign prostatic hyperplasia, erectile dysfunction, and urologic cancers are growing.[3,4] Additionally, elderly patients required 3 times the rate of surgical service the general population uses.[5] Despite this increased demand, the American urologic workforce is aging, as 50% of urologists are 55 years of age or older.[1,6] Although urology residency programs have increased in size over the years, the increase is not enough to meet current demands.[7,8] Overall, it is expected that urologic procedural volume will increase by about 35% by 2020.[9]

The impact that retirement will have on the urologic workforce is largely unknown. The majority of studies have used older age as a surrogate for retirement age when they are not synonymous.[1,10] In 1998, Gee et al found that the average urologist plans to retire at the age of 64 years old, and that 90% of urologists report having an official retirement plan at their practice.[11] The specific subspecialty areas of urology that will be impacted the most by retirement are also understudied. One study suggested a need for more academic urologists, as there is an aging academic urologist population as well as a decrease in the number of new

Financial Disclosure: *The authors declare that they have no relevant financial interests.*

Author Disclaimer: *Opinions expressed by an author represent only the opinions of the author and do not necessarily reflect the official policy or position of the American Urological Association.*

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Submitted: March 25, 2016, accepted (with revisions): April 15, 2016

http://dx.doi.org/10.1016/j.urology.2016.04.053
0090-4295

trainees entering academics.[10] Another showed that younger urologists are joining group practices in urban areas, leaving a need for urologists in more rural areas.[1] Taken together, the studies suggest an impending urologist workforce shortage; however, many important details related to this issue remain poorly defined. These studies collectively fail to define retirement age, from where retirement will occur, and what gaps in clinic care will be made by retirement.

The current study aims to explore the impact of retirement on the urologic workforce by using the current age and the planned age of retirement in a nationally representative sample of urologists. We seek to understand which geographic regions and which urologic subspecialties will be most affected. The results of this study may aid future workforce planning decisions.

MATERIALS AND METHODS

Study Population

We analyzed data from the 2014 American Urological Association (AUA) census, which is a specialty-wide survey distributed to the entire urology community in the United States.[6] The 2014 AUA census data contain demographic, education, geographic, and practice characteristics of a sample of U.S. practicing urologists. The census data used in the current study were collected from May 2014 to September 2014. A total of 2204 urologists completed the census, which were weighted to represent 11,703 practicing urologists in the United States as defined by the National Provider Identifier.[6] Census samples were weighted based on poststratification factors (ie, gender, location, certification, status and years since initial certification) to adjust for the representation of each respondent in a census survey by assigned proper sample weight.[6] In this study, we compared urologists who are nearing retirement (within 5 years of their planned retirement) with the rest of urologists on their demographic, geographic, and practicing characteristics. The corresponding author's institutional review board gave the study exempt status.

Predictor Variables

Current age and planned retirement age were collected in the census and the difference is used to define a practicing urologist is nearing planned retirement if he or she is within 5 years of his or her current age or is not nearing planned retirement otherwise.

Outcome Variables

The AUA census collects demographic and practice characteristics of each participant. Demographic characteristics analyzed in our study included age, race, and ethnicity (white, nonwhite, other, Hispanic), gender (male, female), census region (Northeastern, New England, New York, Mid-Atlantic, North Central, South Eastern, South Central, and Western), and level of rurality (metropolitan, micropolitan, and small town or rural village). Levels of rurality were defined using zip codes that correspond to the rural-urban commuting areas[12] of the U.S. Census.[13] Practice characteristics analyzed in our study included subspecialty type (general, oncology, sexual health or reconstruction, female pelvic medicine, endourology or robotics, and other), institution type (academic, public or private hospital, single urology group, solo practice, multispecialty group, or other), and clinical practice characteristics (number of office locations, clinical hours, inpatient operations performed, patients seen per week, total hours per week, and total years in urology). Except for gender and location that were collected from the National Provider Identifier file, all other variables were self-reported by respondents in the AUA 2014 Census.

Statistical Analysis

All data were analyzed by the IBM SPSS Statistics Software version 23.0. The complex samples function in SPSS was utilized to deal with complex survey samples to generate representative data by specialty. These data were analyzed with the Pearson's chi-square test (two sided) and the Student *t* test (two sided). Bivariate associations of planned retirement and demographic and practice characteristics were calculated using a Pearson's chi-square test. A Student *t* test was used for all continuous variables. All tests were two sided and statistical significance for all cases was defined as $P \leq .05$.

RESULTS

The mean age of all 11,703 practicing urologists in the United States was 53. Among all practicing urologists, 3181 (95% confidence interval [CI]: 2884-3479) or 27% (25%-30%) of them are nearing planned retirement. The mean age (standard deviation [SD]) of urologists who are nearing planned retirement (69, SD = 8.2) was older than nonretiring urologists (48, SD = 10.3) ($P < .01$). The mean age of planned retirement of the 11,703 urologists is 68 (SD = 7.6). The mean age of projected retirement for those urologists nearing planned retirement (69, SD = 8.6) was older than the nonretiring urologists (67, SD = 7.1) ($P < .01$). A larger proportion of urologists nearing retirement were male (3121 [98%]) compared to nonretiring urologists (7,538 [89%]) ($P < .01$). The Mid-Atlantic, New England, North Central, and South Central regions had more urologists nearing retirement. Nearly double the proportion of nearing retirement urologists are found outside metropolitan areas (534 [17%] vs 782 [9%]) ($P < .01$) compared to nonretiring urologists (Table 1).

The percentage of urologists nearing planned retirement was more likely to practice general urology (2341 [74%]), which was significantly higher than that of nonretiring urologists (5072 [60%]) ($P < .01$). No differences were observed between urologists nearing planned retirement and nonretiring urologists by subspecialty. A greater proportion of urologists nearing planned retirement practice was in a solo practice compared to nonretiring urologists (627 [20%] vs 816 [10%]) ($P < .01$). Among urologists nearing retirement, 2155 (68%) of them still perform inpatient operations, whereas the majority of nonretiring urologists (7562 [89%]) perform inpatient operations ($P < .01$). Those urologists nearing planned retirement see an average of 88 patients per week (95% CI [86.7-89.1]), whereas those further from retirement see an average of 96.5 patients per week (95% CI [96-97]) ($P < .01$). Fewer urologists nearing retirement use AUA guidelines in their practices compared to nonretiring urologists (2883 [91%] vs 8217 [96%]) ($P < .01$) (Table 2).

Comment

This study used a nationally representative sample of American practicing urologists to assess the impact of retirement

Table 1. Demographic characteristics among near-retirement urologists and nonretiring urologists

	Near-retirement Urologists (n = 3181)	Nonretiring Urologists (n = 8522)	*P* Value
Age, n (%)			
35-44	76 (2)	3654 (43)	<.01
45-54	116 (4)	2479 (29)	
55-64	856 (27)	1844 (22)	
≥65	2133 (67)	545 (6)	
Race, n (%)			
White	2529 (80)	6712 (79)	<.01
Non-White	450 (14)	1391 (16)	
Other	202 (6)	421 (5)	
Hispanic, n (%)			
Yes	85 (3)	381 (5)	<.01
No	2986 (94)	7945 (93)	
Prefer not to answer	110 (4)	197 (2)	
Gender, n (%)			
Male	3121 (98)	7538 (89)	<.01
Female	60 (2)	984 (12)	
AUA region, n (%)			
Northeastern	145 (5)	422 (5)	<.01
New England	176 (6)	420 (5)	
New York	214 (7)	679 (8)	
Mid-Atlantic	403 (13)	815 (10)	
North Central	595 (19)	1563 (18)	
South Eastern	607 (19)	1871 (22)	
South Central	515 (16)	1114 (13)	
Western	528 (17)	1638 (19)	
Level of rurality, n (%)			
Metropolitan	2648 (83)	7740 (91)	<.01
Micropolitan	430 (14)	609 (7)	
Small town/rural village	104 (3)	173 (2)	

AUA, American Urological Association.

Table 2. Practice characteristics of near-retirement urologists compared to nonretiring urologists

	Near-retirement Urologists (n = 3181)	Nonretiring Urologists (n = 8522)	*P* Value
Primary subspecialty, n (%)			
General	2341 (74)	5072 (60)	<.01
Oncology	295 (9)	1041 (12)	
Sexual health or reconstruction	135 (4)	521 (6)	
Female pelvic medicine	112 (4)	441 (5)	
Endourology or robotics	154 (5)	670 (8)	
Other	144 (5)	777 (9)	
Institution type, n (%)			
Academic	504 (16)	2175 (26)	<.01
Public or private hospital	457 (14)	835 (10)	
Single urology group	963 (30)	3066 (36)	
Solo practice	627 (20)	816 (10)	
Multispecialty group	528 (17)	1503 (18)	
Other	102 (3)	127 (2)	
Practice description, mean (95% CI)			
Number of office locations	2.1 (2.1-2.2)	2.5 (2.4-2.5)	<.01
Patients/week	88 (87-89)	97 (96-97)	<.01
Clinical hours/week	40.0 (39.7-40.3)	46.5 (46.4-46.7)	<.01
Nonclinical hours/week	7.2 (7.1-7.3)	8.8 (8.7-8.9)	<.01
Total hours	48.1 (47.8-48.5)	56.0 (55.8-56.1)	<.01
Total years in urology	33.6 (33.4-33.8)	14.6 (14.5-14.7)	<.01
Perform inpatient operations, n (%)			
Yes	2155 (68)	7562 (89)	<.01

CI, confidence interval.

on the United States urologic workforce. We found that more than one-fourth of urologists plan to retire in the next 5 years. General urology and practices outside of metropolitan areas will be impacted the most by the planned retiring workforce. Many AUA regions have similar proportions of retiring and nonretiring urologists; however, the Mid-Atlantic and South Central regions have a large number of retiring urologists in the next 5 years. Although nonretiring urologists see more patients and work more hours, urologists who are nearing retirement are still highly productive, seeing an average of 88 patients per week and working an average of 48 hours per week. In addition, 68% of those urologists nearing retirement still perform inpatient operations.

Even though more than one-fourth of urologists plan to retire in the next 5 years, the training of new urology residents has remained stable from 1995 to 2010.[8] It was expected that approximately 320 urology residency graduates (including medical doctor and doctor of osteopathy residency programs) will join the urology workforce between 2015 and 2018 (list maintained by AUA).[13] If this number remains constant, in the next 5 years, 1600 urologists will be trained, which is approximately one-half the amount of urologists who plan to retire within this same time frame (3181 urologists within 5-year planned retirement age). Since 1997, there has been a governmental cap on funding for residency training, and lack of funding was cited as the number 1 obstacle to adding new urology residency positions.[14] Thus, only 170 urology positions are government funded, leaving the rest to philanthropic or hospital funds.[14] In addition to lack of funding, it has been cited that academic medical centers will have difficulty recruiting new faculty due to lack of funds for salaries as well as pressure on academic faculty to produce clinical revenue over teaching.[14] Any decrease in urology faculty will make it more challenging to gain Accreditation Council on Graduate Medical Education approval for additional residency spaces.[14,15] Overall, transparency in funding needs to be established as well as support of academic faculty.

One potential solution to the urology workforce shortages is to hire and train advanced practice providers (APPs) into urology practices. In fact, about 70% of residency programs have hired APPs to compensate for lack of resident availability due to restrictions on work hours.[14] Also, the majority of private practices now employ an APP to provide clinical urologic care, with many now performing simple urologic procedures.[16,17] However, given that 68% of those urologists nearing retirement still perform inpatient operations, APP will not be able to fill this gap. In a survey of urologists in 2013, APP can complete about 41% of a urologist's full-time employment responsibilities, compared to their ability to complete 75% of primary care full-time employment.[18] Overall, the number of residency positions in urology as well as APP does not meet the expected number of urologists who plan to retire, and funding for the additional non-graduate medical education slots is not sustainable. Furthermore, the aging population, and thus their urological needs, might exacerbate this demand.[7,8,15]

The demand for future urologists to practice in rural areas has been previously highlighted.[1] Our study confirms this concern, as nearly double the proportion of nearing retirement urologists were found outside metropolitan areas. Near-retiring urologists were also more likely to be generalists. Approximately 16.5% of the United States population lives in rural areas, and some suggest that surgical accessibility in these areas is approaching a crisis.[19-21] Reported barriers to increasing draw to rural areas for general surgeons include a lack of broad-based training, increased subspecialization, increased workload, and increased medical malpractice costs.[19] These reasons proposed by general surgeons are most likely similar to the reasons why the urology workforce has shifted toward urban centers.[1] Younger providers are drawn to urban centers to practice in group settings, and many in the millennial generation prefer urban areas.[22] Loan forgiveness programs or higher rural reimbursement models might also attract future urologists to rural areas. Which rural locations are in most need deserve future research, although our results suggest that the Mid-Atlantic and South Central regions will be impacted by projected retirement. Urologic telemedicine has been shown to be successful in reducing patient commuting time and costs in rural areas.[23] Whether or not telemedicine can reduce the urologic shortage in rural areas remains to be studied.

The age a surgeon should retire is unknown and understudied. As cognitive and physical skills decline with age, it has been suggested that surgeon age may be a risk factor for poor surgical outcomes.[24] Fine and gross motor control decline with age.[25] The average age of urologists in our cohort (53) is consistent with that found by Pruthi et al, further supporting an aging workforce.[1] The average urologist who is near planned retirement is 69 years old.[25,26] Some have suggested that surgical competence be assessed on an individual level, focusing on functional ability over chronological age.[27,28] As the urologic workforce is aging, surgeon competency and age of retirement merit future research and inquiry. Given the growing shortage of available urologists, some surgeons may be compelled to practice after they desired to retire and as their physical skills decline.

This study is based on national representative samples of U.S. practicing urologists. However, this study is not without limitations. We used a urologist's planned age of retirement as a surrogate for actual retirement age. As we expect some urologists to retire before and after this expected age, the measurement is imperfect. However, we do not expect that the misclassification of retirement also leads to misclassification of our outcome variables (practice type, location, etc). Despite these limitations, we believe that this study significantly adds to the current literature on retirement in urology, as this is a national sample of urologists and is representative of the entire U.S. urology workforce.

CONCLUSION

More than one-fourth of existing urologists plan to retire in the next 5 years. Of the near-retirement urologists,

clinical productivity remains high. The number of retiring urologists greatly exceeds the number of new urologists that will be produced from residency programs. General urology and urology practices outside of metropolitan areas will be impacted the most by the planned retiring workforce. These findings should be considered in urology workforce discussions and decisions.

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EDITORIAL COMMENT

The American Urological Association (AUA) Annual Census offers a valuable data source regarding practice patterns among urologists in the United States. Although surveys that solicit prediction-based responses can only be validated by the test of time, the AUA Annual Census corroborates previous AUA survey data[1] to suggest that a substantial number of urologists are nearing retirement. As is the case with other medical specialties,[2] the demand for urologists is further exacerbated by U.S. population expansion and the federal funding cap on residency training spots.[3]

For medical communities with an existing or predicted urologist shortage, advanced planning is required to mitigate the effects of this looming crisis. The authors of this study point out a few solutions, such as telemedicine and advanced practice providers that can be employed to provide varying levels of urology services.[4] However, the success of these strategies will likely vary, in part due to the wide spectrum of regional regulatory and payment policies on their use.

New technologies and methods have drastically changed our domain over the past few decades and may be heavily relied upon to assist in the delivery of care if urology workforce predictions prove to be accurate.

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http://dx.doi.org/10.1016/j.urology.2016.04.054