

Changes in practice patterns in male infertility cases in the United States: the trend toward subspecialization

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Objective: To assess changes in the practice patterns of urologists performing male infertility procedures (vasal reconstruction, sperm retrieval, varicocelectomy) from 2004 to 2015 in the United States.

Design: Examination of self-reported procedural volumes from urologists undergoing certification and recertification using case log data provided by the American Board of Urology. The study period was stratified into early (2004–2007) and recent (2012–2015) time periods.

Setting: Not applicable.

Patient(s): None.

Intervention(s): None.

Main Outcomes Measure(s): Temporal variations in male infertility practice patterns among different urologic subspecialties between the early and recent time periods.

Result(s): The overall proportion of total male infertility procedures performed by andrologists significantly increased between the early and recent groups (23% to 26%). This growth was driven by a significant increase in the proportion of varicocele repairs being performed by andrologists between the early and recent periods (19% to 25%). Most notably, an assessment of total number of male infertility procedures performed by newly certifying urologists showed that there was a significant increase in the overall proportion of all male infertility procedures being performed by recently trained andrologists (24% to 35%). This significant increase was seen individually among all three types of male infertility procedures.

Conclusion(s): With the increased trend in urologists obtaining fellowship training, male infertility surgical volume is beginning to shift from general urologists to subspecialized andrologists. (Fertil Steril® 2018;110:76–82. ©2018 by American Society for Reproductive Medicine.)

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Key Words: Andrology, male infertility, sperm retrieval, varicocelectomy, vasal reconstruction

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The field of urology is constantly undergoing evolution fueled by both the rapid growth in the understanding of the pathophysiology of

urologic diseases and the incorporation of new technologies. In a similar vein, urologic training has seen numerous changes over the past two decades.

Most notably, there has been a significant increase in fellowship training among urology residency graduates (1). This phenomenon has been seen across North America, with 49%–63% of recent American urology graduates and 85% of recent Canadian urology graduates pursuing additional fellowship training (2–4).

Although the majority of urologic fellowship training programs focus on oncology and endourology, there has also been substantial growth in andrology and male reproductive medicine training (5). After the establishment of

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the first andrology fellowship programs in the United States in the 1980s, interest in additional training has expanded significantly. This ultimately resulted in the creation of the American Urological Association (AUA) Andrology Fellowship Match program in 2007. Four programs participated in the inaugural match, which has grown steadily to include 13 programs in the most recent 2017 match—a number that fails to include many andrology fellowship programs that continue to exist outside of the AUA Andrology Fellowship Match program.

Although there has been a shift in urologic training over the past two decades, its impact on American urologic and andrology-specific practice patterns remains unknown. In this study, we sought to assess changes in the practice pattern of American urologists performing male infertility procedures (vasal reconstruction, sperm retrieval, varicocelectomy) between 2004 and 2015. We hypothesized that increased fellowship training in andrology would result in the concentrating of male infertility procedures among andrologists.

MATERIALS AND METHODS

As part of the certification process mandated by the American Board of Urology (ABU), American urologists are required to submit a surgical case log of all procedures performed over a consecutive 6-month period before initial certification. A similar surgical case log must be submitted to the ABU as part of the recertification process that occurs every 10 years after initial certification.

The surgical case log contains information on surgeon demographics, including gender, training, and certification cycle (initial certification or recertification), as well as practice type and location. Surgeons are also required to self-identify with one of six subspecialties—general urology, andrology, oncology, endourology, female urology, or pediatrics. Cases are logged according to Current Procedural Terminology codes.

After obtaining approval from the institutional review board at Weill Cornell Medical College, we conducted a retrospective review of all annualized ABU case logs for certifying and recertifying urologists between 2004 and 2015. Male infertility cases were identified by Current Procedural Terminology code and included vasal reconstruction (55400, 54900, 54901), sperm retrieval (55870, 54865, 54500, 54505,

54800), and varicocele repair (55530, 55535, 55550). Corresponding information on surgical case volumes, subspecialization, certifying group, and fellowship training status was also analyzed. Surgeons were stratified into an early group (2004–2007) and a recent group (2012–2015). The early and recent groups were then compared to analyze temporal changes in practice patterns. The time periods were chosen to represent the period before the institution of the AUA Andrology Fellowship Match program and the most recent period. We also performed a subgroup analysis on newly certifying urologists to determine whether practice patterns among recently trained urologists differed from the early and recent period.

Practice characteristics were compared between urologists applying for certification in the late vs. early periods using Mann-Whitney U and χ^2 tests for continuous and categorical variables, respectively. Similar comparisons were made among the subset of urologists who reported performing at least one infertility procedure, and by self-reported subspecialty. Secondary analyses included only those who were newly certifying in andrology. All tests were two-sided, with an α level of 0.05 deemed statistically significant, and performed in SPSS (IBM).

RESULTS

American Board of Urology case logs were submitted by 9,389 urologists between 2004 and 2015, of whom 2,642 urologists were in the early (2004–2007) group and 3,316 urologists were in the recent (2012–2015) group, resulting in 5,958 urologists in the analysis (Table 1). There were 874 (33%) and 1,034 (31%) newly certifying urologists in the early and recent periods, respectively. The total number of male infertility procedures increased by 16.8% (early = 3,524 vs. recent = 4,119). Over this same time period the total number of urologists performing male infertility procedures increased by 2.6% (early = 1,069 vs. recent = 1,097).

Changes in Fellowship Training

The number of urologists reporting any fellowship training rose from 15% in the early period to 19% in the recent group ($P < .001$). The increase in fellowship training was most

TABLE 1

Characteristics of urologists and procedures included in analysis.

Variable	Early period (2004–2007)	Recent period (2012–2015)	P value
No. of urologists	2,642	3,316	–
No. of certifying urologists (% of all urologists)	874 (33)	1,034 (31)	–
No. of total urologists identifying as andrologist (% of all urologists)	46 (1.7)	77 (2.3)	.14
No. of certifying urologists identifying as andrologist (% of all certifying urologists)	16 (1.8)	36 (3.5)	.02
No. of urologists with fellowship training (% of all urologists)	401 (15)	635 (19)	< .001
No. of certifying urologists with fellowship training (% of all certifying urologists)	190 (22)	344 (33)	< .001
No. of male infertility procedures reported	3,524	4,119	–
No. of urologists performing male infertility procedures (% of all urologists)	1,069 (40)	1,097 (33)	< .001
No. of certifying urologists performing male infertility procedures (% of all certifying urologists)	335 (38)	325 (31)	.002

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