# Changes in Pelvic Organ Prolapse Surgery in the Last Decade among United States Urologists

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**Abbreviations and Acronyms**

ABU = American Board of Urology

FDA = Food and Drug Administration

POP = pelvic organ prolapse

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**Purpose:** Surgical correction of pelvic organ prolapse underwent transformation in the last decade. Training in pelvic organ prolapse surgery, the ease of mesh kit use, and Food and Drug Administration warnings about mesh have influenced practice patterns. We investigated trends in pelvic organ prolapse procedures.

**Materials and Methods:** Case logs of pelvic organ prolapse procedures, mesh use and pessary placement were obtained from the American Board of Urology for 2003 to 2012. We evaluated associations between surgeon characteristics and the use of pelvic organ prolapse procedures.

**Results:** Of 6,355 nonpediatric urologists applying for certification or recertification 2,192, representing a 10% annual sample of all urologists, reported performing pelvic organ prolapse procedures during the study period. The number of procedures increased steadily from 930 in 2003 to 6,978 in 2012. The number of colporrhaphies increased from 806 to 2,670 and the number of colpopexies increased from 32 to 1,414 between 2003 and 2012. The number of vaginal colpopexies increased from 24 to 1,016 during the study period. The number of sacrocolpopexies increased from 8 to 398 with exponential increases in laparoscopic sacrocolpopexy (282 cases by 2012). Mesh insertion increased from 10 cases reported by applicants in 2005 to 1,552 reported in 2012 ($p < 0.0005$). Mesh revision, first reported in 2007 with 52 performed, consistently increased to 214 in 2012. Urologists trained in female urology performed a median of 16 pelvic organ prolapse procedures, double the number reported by surgeons trained in other urological fellowships. Urologists of the female gender also reported performing approximately 8 more procedures annually than male urologists.

**Conclusions:** The number of pelvic organ prolapse operations done by urologists increased dramatically in the last decade with a similar increase in mesh use. More colpopexies are now performed with laparoscopic sacrocolpopexy showing an exponential increase. The recent trend of mesh revision is notable with a much faster rate of increase than mesh insertion.

**Key Words:** pelvic organ prolapse; reoperation; surgical mesh; physicians, women; physician's practice patterns

Pelvic organ prolapse is a common condition that affects about half of women and correlates with increasing age.[1] Approximately 10% of women with this condition undergo surgical treatment.[1] The lifetime risk of prolapse surgery in a woman in the United States is 11% to 19% by age 80



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years.[2] There are several management options for POP, including colporrhaphy (with or without mesh) or colpopexy (vaginal or sacrocolpopexy) vs nonsurgical management, including pessaries.

Surgical correction of POP underwent a transformation in the last decade with the introduction of transvaginal mesh kits and the increase in laparoscopic/robotic surgery. Training in POP surgery, ease of mesh use and FDA warnings about mesh use have influenced practice patterns.[3,4] We analyzed annual case logs submitted to the ABU for certification and recertification between 2003 and 2012 to determine the surgical practice patterns of American urologists who performed POP procedures in the last 10 years. 1) We hypothesized that the total volume of POP procedures would increase between 2003 and 2012. 2) We hypothesized that fellowship trained urologists would perform more procedures for POP. 3) We hypothesized that we would see increasing mesh use with a corresponding decrease after 2008 and 2011 with the release of FDA warnings against mesh.

## METHODS

### Study Cohort and Data Source

We obtained annualized case logs for 2003 to 2012 from the ABU. A total of 344 urologists applied for certification or recertification in 2003, of whom 66 reported performing POP procedures. This increased to 583 applicants in 2004 with 148 reporting POP procedures. It continued to increase with 808 applicants in 2012, including 271 reporting POP procedures.

Urologists applying for board certification must submit 6 months of billing data, which can be audited at the request of the ABU, along with information on surgeon gender, age, self-reported specialty and subspecialty, practice type, fellowship training, original certification year and practice area size. These billing data are duplicated to produce 1 year of case data per applicant. Urologists must apply for recertification at 10-year intervals. Therefore, these case data represent approximately 10% of currently certified urologists in the United States.

Urologists were excluded from this analysis if they reported a subspecialty of pediatric urology. Nonpediatric urologists who performed pediatric cases were included in analysis. However, any who performed procedures in patients 18 years old or younger were excluded since the incidence of prolapse in pediatric patients is extremely rare.

### Statistical Methodology

We used negative binomial regression to assess the significance of the association between surgeon gender, fellowship training or recertification status and the number of cases reported for each procedure. Recertification status was used as a surrogate for urological experience. Case numbers by procedure and by year are shown as the total number reported to the ABU in annual case logs. The median case count is reported when procedure volume was analyzed in specific groups of urologists. The supplementary table (http://jurology.com/) lists the CPT codes used and how they were grouped by procedure type. All analysis was done using Stata® 12.

## RESULTS

A total of 6,355 urologists applied for ABU certification or recertification between 2003 and 2012, of whom 2,192 (approximately a third) reported performing any procedure to correct POP. Urologists were mostly male and 13% of applicants were female. Median age at first certification, and first, second and third recertifications was 33, 42, 52 and 60 years, respectively. Of these urologists 3% reported female urology fellowship training and 9% reported any other type of urological fellowship training. The remaining 88% of urologists reported no fellowship training (table 1).

In 2003 ABU applicants performed a total of 930 procedures for female POP. However, by 2005 the number of POP procedures had more than tripled to 3,054. The total number of procedures continued to increase until 2008. Total POP procedure volume subsequently stabilized with a mean volume of 6,100 reported cases per year between 2009 and 2012.

Of urologists who performed POP operations 83% reported performing at least 1 colporrhaphy (table 2). Of all procedures for POP colporrhaphy was reported by the most surgeons and it was the highest volume procedure type for POP between 2003 and 2012. Fewer than 40% of surgeons reported performing each of the other procedure types for POP.

While colporrhaphy was the most commonly reported procedure, the use of colpopexy for POP increased significantly. Applicants reported only 32 of these procedures in 2003. In contrast, 1,414 colpopexies were reported in 2012. Sacrocolpopexy was reported by only 393 urologists in this cohort. However, the number of sacrocolpopexies increased

**Table 1.** *Characteristics of 2,192 urologists who reported performing POP procedures between 2003 and 2012*

| | | |
|---|---|---|
| No. male (%) | 1,915 | (87) |
| Median surgeon age at data collection (IQR)* | 42 | (35, 49) |
| Median No. reported female procedures by surgeon (IQR): | | |
| Overall urology, including POP | 28 | (14, 58) |
| POP | 8 | (4, 20) |
| No. fellowship training (%): | | |
| Any urology, including female | 272 | (12) |
| Female urology | 73 | (3) |
| None | 1,920 | (88) |
| No. certification (%): | | |
| Original | 731 | (33) |
| 1st Recertification | 904 | (41) |
| 2nd Recertification | 539 | (25) |
| 3rd Recertification | 18 | (1) |

* Total of 2,191 surgeons.