

PD05-11: Is Low Volume Major Surgery Set for Extinction? Evidence from the Radical Prostatectomy Market in a State-wide Registry

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- Higher surgical volume is associated with improved outcomes leading some to suggest regionalization of care and minimum surgical volume standards
- In 2005 Data from New York State revealed:
 - 80% of urologists performing radical prostatectomy (RP) were low-volume
 - Low-volume surgeons performed 25% of the total RP surgical volume
- Objective: To assess the extent to which low-volume major surgery persists in New York state through a case study of the radical prostatectomy (RP) market and to characterize persistent low-volume surgeons

- NY Statewide Planning and Research Cooperative System (SPARCS) database
- Outcomes: surgeons' annual RP volume
- Dates: January 1, 2010 to December 31, 2015
- Multivariate logistic regression to determine predictors of low volume surgeons (≤ 10 RP/year) accounting for robotic surgery, other major urologic oncology cases, career stage measured in years from medical school graduation, patient and hospital characteristics.

- 349 urologists who performed 23,568 RP from 2010-2015
- 78% performed a median of ≤ 10 RP/year
- Low-volume surgeons (≤ 10 RP/year) accounted for only 11.4% of RP surgical volume
- Relative shift in share of surgeries from high to moderate volume surgeons

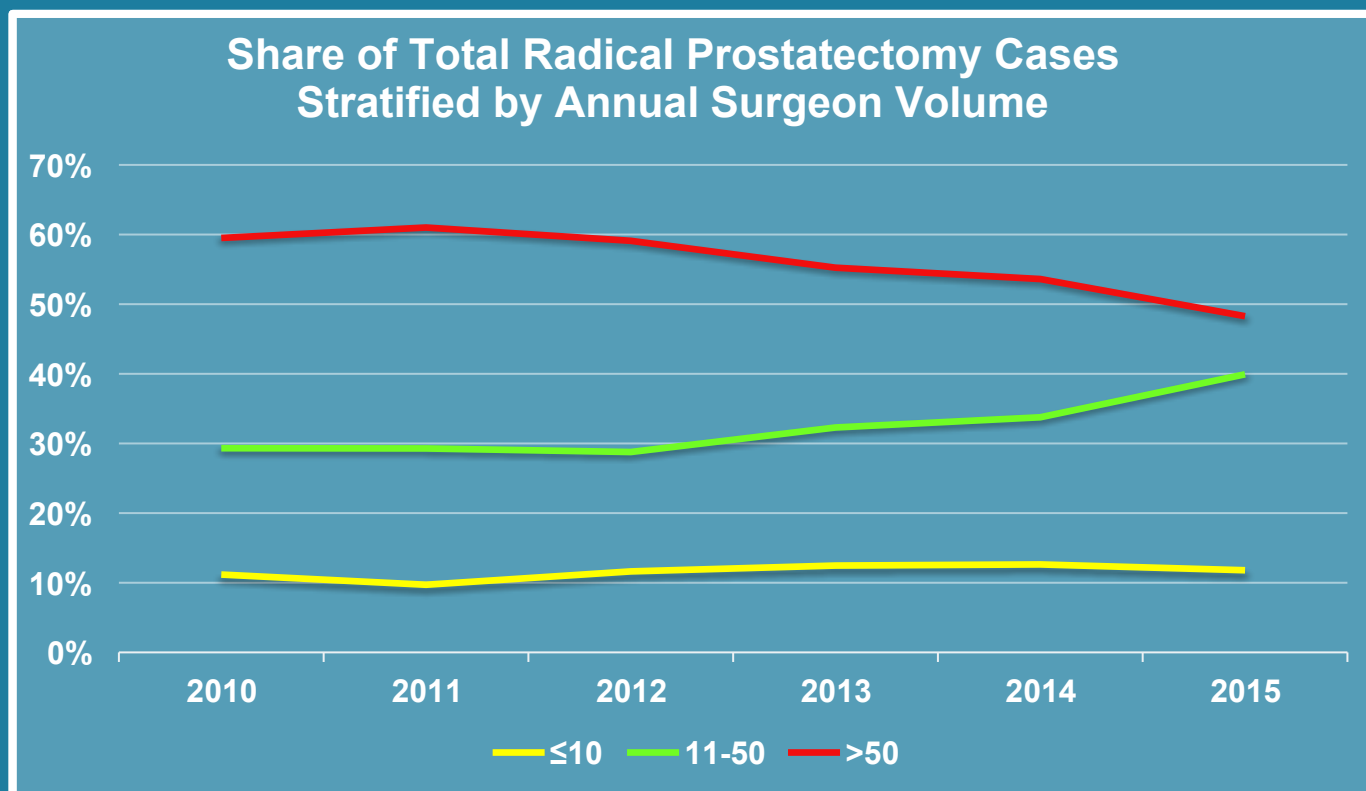


Table 2: Surgeon and population characteristics by annual caseload

Characteristics	All Surgeons	Median Annual Caseload Range				p-value
		≤10	11-25	26-50	>50	
Number of Surgeons, n (%)	349	272 (77.9)	40 (11.4)	22 (6.3)	15 (4.3)	-
Prostatectomy Annual Volume, median (IQR)	2 (0, 9)	1 (0, 3)	16 (11, 23)	35 (27, 44)	81 (61, 172)	<0.001
Ratio Major Oncology Cases (with RP) to Total, median % (IQR)	4.0 (1.2,13.0)	2.4 (0.6, 5.9)	17.2 (8.6, 29.4)	26.4 (19.9, 39.7)	60.3 (41.2, 82.1)	<0.001
Number of Robotic Surgeons, n (% of category)	221 (63)	145 (53)	40 (100)	21(95)	15 (100)	<0.001
New York City Metro Area, n (%)	215 (62)	166 (61)	27 (68)	11 (50)	11 (73)	0.43
Years from Medical School Grad., median (IQR)	22 (15, 31)	23 (15, 31)	20 (12, 26)	20 (14, 28)	24 (19, 31)	<0.001
Percent Early-career (5-15 years)	27.6	26.6	39.6	30.1	11.5	<0.001
Percent Mid-career (16-30 years)	43.8	42.6	43.9	48.8	56.3	
Percent Late-career (>30 years)	28.5	30.8	16.5	21.1	32.2	

- Surgeon factors associated with being a low-volume surgeon in any given year:
 - Advanced career stage increased the odds of being low-volume
 - Performing robotic surgeries decreased the odds of being low-volume
 - Performing other major urologic oncology cases decreased the odds

Table 3: Odds Ratios from Multivariable Logistic Regression for performing ≤10 RP in a given year clustered by surgeon

Variables	Full Multivariable Model		
	Odds Ratio	95% CI	p-value
Years from Medical School Graduation			
5-15 (Early-Career)	base		
16-30 (Mid-Career)	2.98	1.68, 5.28	<0.001
>30 (Late-Career)	3.64	1.86, 7.17	<0.001
Robotic Prostatectomy Surgeon vs. open only	0.17	0.07, 0.41	<0.001
% Other Major Oncology to Total Volume	0.97	0.94, 0.99	0.01

*Regression adjusted for: year of surgery, surgeons' prior year volume, patient population racial demographics, patient population insurance case-mix, hospital urbanicity

- Claims-based nature of data allows large population sample but there is risk of misclassification
- Lack of clinical outcomes data to assess oncologic outcomes differences in this cohort

- The population-level impact of low-volume surgery has diminished greatly compared to historical data.
- By 2015 only 11% of patients undergoing RP had a low-volume surgeon compared to 24% in 2005.
- Persistent low-volume RP surgeons are more likely to be approaching retirement and to only perform open radical proctectomy compared to higher-volume colleagues.
- Some degree of low-volume surgery will necessarily persist with entry and exit of surgeons to the market. No surgeon becomes high-volume overnight.