

Appendix 1. Clinical and Demographic Characteristics of Women Who Underwent Minimally Invasive Ovarian Cystectomy

	Unadjusted				<i>P</i>	Propensity Score Matched				<i>Standardized Difference</i>
	Laparoscopic		Robotic			Laparoscopic		Robotic		
	n	(%)	n	(%)		n	(%)	n	(%)	
	32,459	(93.0)	2456	(7.0)		1867	(50.0)	1867	(50.0)	
<i>Age</i>					0.22					
<40	25,867	(93.0)	1934	(7.0)		1449	(49.6)	1473	(50.4)	-
40-49	5539	(92.5)	452	(7.5)		365	(51.9)	338	(48.1)	0.076
50-59	789	(94.4)	47	(5.6)		39	(48.8)	41	(51.3)	0.050
60-69	156	(92.3)	13	(7.7)		7	(41.2)	10	(58.8)	0.358
≥70	108	(91.5)	10	(8.5)		7	(58.3)	5	(41.7)	0.337
<i>Race</i>					<0.001					
White	21,883	(93.4)	1546	(6.6)		1225	(50.3)	1211	(49.7)	-
Black	3279	(90.8)	334	(9.2)		226	(50.6)	221	(49.4)	0.024
Other	7297	(92.7)	576	(7.3)		416	(48.9)	435	(51.1)	0.044
<i>Year of surgery</i>					<0.001					
2009	7262	(97.6)	176	(2.4)		183	(51.0)	176	(49.0)	-
2010	8151	(96.0)	344	(4.1)		342	(51.0)	328	(49.0)	0.040
2011	9022	(92.3)	752	(7.7)		589	(49.5)	600	(50.5)	0.020
2012	8024	(87.1)	1184	(12.9)		753	(49.7)	763	(50.3)	0.012
<i>Insurance</i>					<0.001					
Commercial	23,698	(92.1)	2040	(7.9)		1552	(50.4)	1526	(49.6)	-
Medicare	764	(94.0)	49	(6.0)		37	(49.3)	38	(50.7)	0.028
Medicaid	5002	(95.8)	217	(4.2)		177	(48.1)	191	(51.9)	0.076
Uninsured	1658	(96.4)	62	(3.6)		53	(49.5)	54	(50.5)	0.020
Unknown	1337	(93.8)	88	(6.2)		48	(45.3)	58	(54.7)	0.189
<i>Marital status</i>					<0.001					
Married	15,191	(93.1)	1129	(6.9)		880	(50.3)	870	(49.7)	-
Single	13,777	(93.5)	961	(6.5)		703	(50.0)	704	(50.0)	0
Unknown	3491	(90.5)	366	(9.5)		284	(49.2)	293	(50.8)	0.032
<i>Area of residence</i>					<0.001					
Metropolitan	29,065	(92.5)	2352	(7.5)		1756	(49.8)	1769	(50.2)	-
Non-metropolitan	3394	(97.0)	104	(3.0)		111	(53.1)	98	(46.9)	0.030
<i>Region</i>					<0.001					
Eastern	4438	(96.8)	146	(3.2)		110	(46.6)	126	(53.4)	-
Midwest	6415	(93.5)	444	(6.5)		360	(50.6)	352	(49.4)	0.024
South	14,431	(90.7)	1475	(9.3)		1064	(49.6)	1080	(50.4)	0.016
West	7175	(94.8)	391	(5.2)		333	(51.9)	309	(48.1)	0.076
<i>Comorbidity</i>					<0.001					
0	19,845	(92.6)	1584	(7.4)		1197	(50.0)	1197	(50.0)	-
1	6879	(92.9)	527	(7.1)		399	(50.5)	391	(49.5)	0.020
≥2	5735	(94.3)	345	(5.7)		271	(49.3)	279	(50.7)	0.028
<i>Hospital type</i>					0.67					
Non-teaching	21,088	(92.9)	1606	(7.1)		1170	(49.4)	1201	(50.7)	-
Teaching	11,371	(93.0)	850	(7.0)		697	(51.1)	666	(48.9)	0.034
<i>Hospital size</i>					<0.0001					
<400 beds	19,054	(93.7)	1280	(6.3)		1016	(49.8)	1024	(50.2)	-

Wright JD, Kostolias A, Ananth CV, Burke WM, Tergas AI, Prendergast E, et al. Comparative effectiveness of robotically assisted compared with laparoscopic adnexal surgery for benign gynecologic disease. *Obstet Gynecol* 2014;124.

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400-600 beds	8081	(90.6)	837	(9.4)		605	(51.4)	572	(48.6)	0.056
>600 beds	5324	(94.0)	339	(6.0)		246	(47.6)	271	(52.4)	0.096
<i>Hospital volume</i> (median, IQR)	16 (7-28)		6 (2-14)		<0.001	9 (4-15)		8 (3-17)		0.008
<i>Surgeon volume</i> (median, IQR)	2 (0-6)		1 (0-3)		<0.001	1 (0-3)		1 (0-3)		0.01
<i>Procedure</i>										
Benign neoplasm	5420	(16.7)	602	(24.5)	<0.001	432	(23.1)	422	(22.6)	0.013
Infection	1223	(3.8)	124	(5.1)	0.002	94	(5.0)	91	(4.9)	0.007
Endometriosis	13,096	(40.4)	1202	(48.9)	<0.001	878	(47.0)	882	(47.2)	0.004
Functional cyst	22,621	(69.7)	1539	(62.7)	<0.001	1182	(63.3)	1193	(63.9)	0.012
Torsion	621	(1.9)	19	(0.8)	<0.001	20	(1.1)	17	(0.9)	0.016
Other	3870	(11.9)	319	(13.0)	0.12	255	(13.7)	234	(12.5)	0.033

P-values and standardized difference represent overall values for each covariate.

Unadjusted results and data after propensity score matching are reported.

Appendix 2. Sensitivity Analysis of Morbidity, Mortality, and Resource Utilization of Women With Endometriosis

	Oophorectomy				<i>P</i>	PS Matched OR Robotic vs. Laparoscopic	Cystectomy				<i>P</i>	PS Matched OR Robotic vs. Laparoscopic
	Laparoscopic		Robotic				Laparoscopic		Robotic			
	n	(%)	n	(%)			n	(%)	n	(%)		
	700		702				878		882			
<i>Any complication</i>	35	(5.0)	45	(6.4)	0.25	1.30 (0.83-2.05)	18	(2.1)	33	(3.7)	0.03	1.86 (1.04-3.32)
<i>Intraoperative complications</i>	18	(2.6)	28	(4.0)	0.13	1.57 (0.86-2.87)	8	(0.9)	18	(2.0)	0.05	2.27 (0.98-5.24)
<i>Surgical site complications</i>	6	(0.9)	6	(0.9)	0.99	1.00 (0.32-3.11)	1	(0.1)	9	(1.0)	0.01	9.04 (1.14-71.51)
<i>Medical complications</i>	11	(1.6)	15	(2.1)	0.43	1.37 (0.62-3.00)	9	(1.0)	10	(1.1)	0.83	1.11 (0.45-2.74)
<i>Utilization</i>												
Transfusion	8	(1.1)	3	(0.4)	0.12	0.37 (0.10-1.41)	5	(0.6)	8	(0.9)	0.41	1.60 (0.52-4.90)
Reoperation	2	(0.3)	3	(0.4)	0.66	1.50 (0.25-8.99)	3	(0.3)	2	(0.2)	0.65	0.66 (0.11-3.98)
Total cost*	\$4921 (\$3725- \$6776)		\$7339 (\$5088- \$10,309)		<0.001	\$2340 (\$1943- \$2844)	\$3802 (\$2802- \$5316)		\$7354 (\$5289- \$10,688)		<0.001	\$3552 (\$3288- \$3909)
Fixed cost	\$2115 (\$1382- \$3110)		\$3135 (\$1810- \$5131)		<0.001	\$1017 (\$845- \$1280)	\$1686 (\$1036- \$2478)		\$3125 (\$1943- \$5304)		<0.001	\$1439 (\$1278- \$1653)
Variable cost	\$2610 (\$1963- \$3602)		\$3920 (\$2799- \$5262)		<0.001	\$1307 (\$1112- \$1518)	\$2061 (\$1521- \$2847)		\$4195 (\$3025- \$5637)		<0.001	\$2134 (\$1913- \$2264)
Non-routine discharge	5	(0.7)	1	(0.1)	0.09	0.20 (0.02-1.70)	1	(0.1)	1	(0.1)	0.99	1.00 (0.06-16.01)
Death	0	-	0	-	-	-	0	-	0	-	-	-

*Data from propensity score-matched cohort.

Appendix 3. Sensitivity Analysis of Morbidity, Mortality, and Resource Utilization of Women Treated by the Highest Quartile by Volume of Physicians

	Oophorectomy						Cystectomy					
	Laparoscopic		Robotic		P	PS Matched OR or Difference Robotic vs. Laparoscopic	Laparoscopic		Robotic		P	PS Matched OR or Difference Robotic vs. Laparoscopic
	n	(%)	n	(%)			n	(%)	n	(%)		
	1020		1020				578		564			
Any complication	57	(5.6)	53	(5.2)	0.70	0.93 (0.63-1.36)	12	(2.1)	20	(3.6)	0.13	1.73 (0.84-3.58)
Intraoperative complications	16	(1.6)	23	(2.3)	0.26	1.45 (0.76-2.76)	5	(0.9)	13	(2.3)	0.05	2.70 (0.96-7.63)
Surgical site complications	12	(1.2)	8	(0.8)	0.37	0.66 (0.27-1.63)	2	(0.4)	5	(0.9)	0.23	2.57 (0.50-13.32)
Medical complications	35	(3.4)	26	(2.6)	0.24	0.74 (0.44-1.23)	7	(1.2)	5	(0.9)	0.59	0.73 (0.23-2.31)
Utilization												
Transfusion	9	(0.9)	6	(0.6)	0.44	0.67 (0.24-1.87)	3	(0.5)	4	(0.7)	0.68	1.37 (0.31-6.13)
Reoperation	1	(0.1)	4	(0.4)	0.16	4.01 (0.45-35.95)	2	(0.4)	1	(0.2)	0.57	0.51 (0.05-5.66)
Total cost*	\$4692		\$7438		<0.001	\$2743	\$3807		\$7777		<0.001	\$3957
	(\$3621-6069)		(\$4804-11,067)			(\$2461-3050)	(\$2809-5313)		(\$5116-11,944)			(\$3581-4374)
Fixed cost	\$2030		\$3257		<0.001	\$1223	\$1633 (\$997-2408)		\$3233		<0.001	\$1592
	(\$1443-2880)		(\$1715-5891)			(\$1045-1427)			(\$2056-6266)			(\$1361-1868)
Variable cost	\$2487		\$3937		<0.001	\$1442	\$2050		\$4466		<0.001	\$2408
	(\$1955-3365)		(\$2719-5371)			(\$1256-1641)	(\$1552-2868)		(\$3061-5733)			(\$2115-2545)
Non-routine discharge	5	(0.5)	1	(0.1)	0.09	0.20 (0.02-1.71)	0	-	1	(0.2)	0.23	-
Death	0	-	0	-	-	-	0	-	0	-	-	-

*Data from propensity score-matched cohort.