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Optimal Cystectomy Outcome: A Composite Measurement Evaluating Quality of Care and Mortality Benefit

Parth M. Patel, Chirag P. Doshi, Alex Belshoff, Marc Nelson, Patrick J. Sweigert,
Corinne Bunn, Sujay Kulshrestha, Marshall Baker, Michael Woods, Gopal N. Gupta



Quality Assessment

- Important for all stakeholders in the health-care system
 - Patients, referring providers, hospitals, payers
- Peri-op outcomes influence patient satisfaction and long-term clinical outcomes¹
 - Resection margins, complications, LOS, readmission rates, etc.
- Individual measures inadequately represent overall performance²
- Evolving interest in developing composite measures for outcomes^{3,4}
- Has been studied in gastroesophageal, colorectal and hepatopancreaticobiliary cancer surgery⁵⁻¹¹

Radical Cystectomy

- Gold-standard in muscle-invasive bladder cancer
- Subject to wide variation in oncologic and clinical outcomes
 - Surgical margins, LN, complications, recurrence, overall survival
- Previous QI studies have measured metrics individually^{12,13}
- Opportunity to implement a composite outcome measure

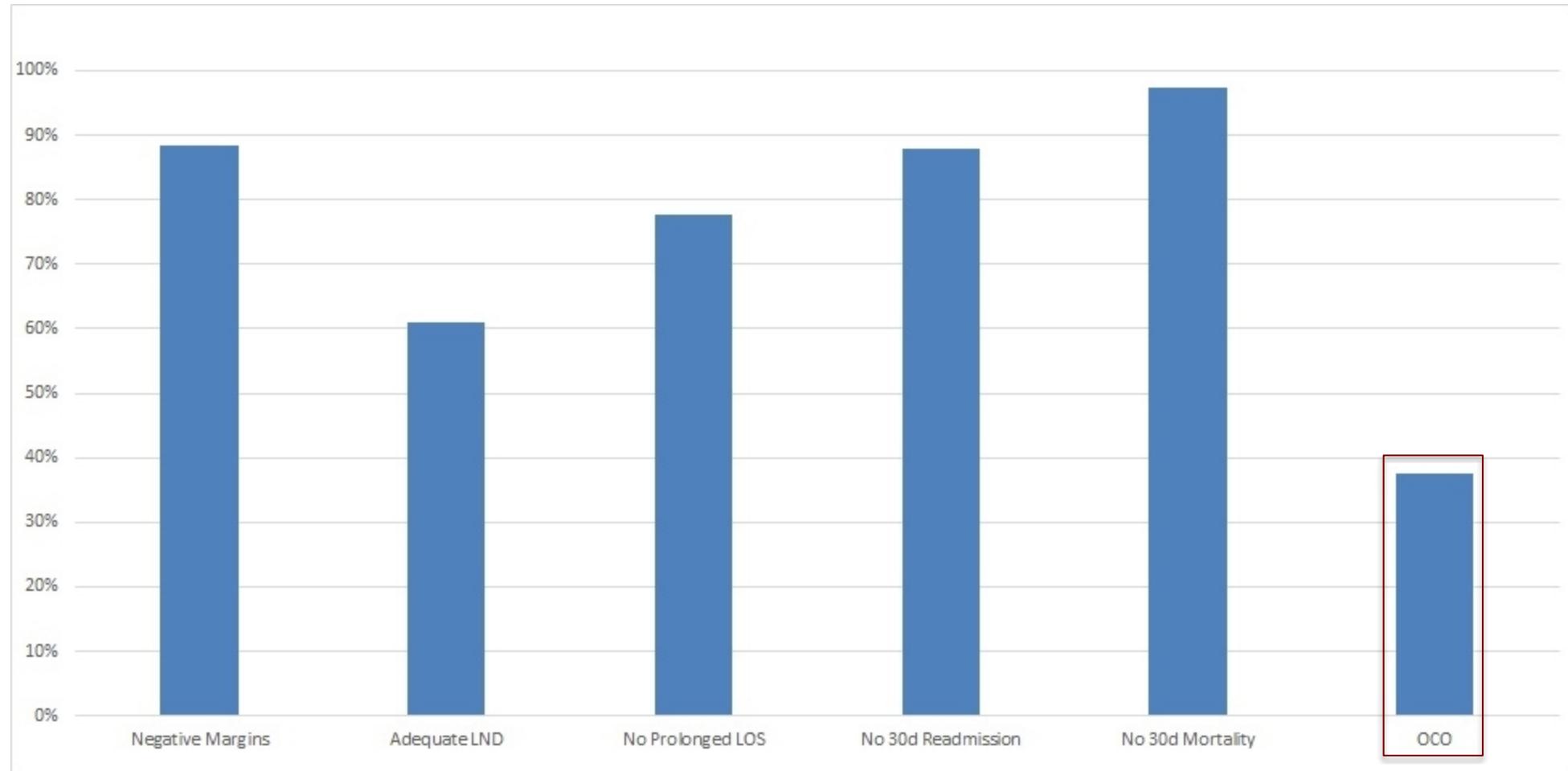
Purpose

- Define Optimal Cystectomy Outcome (OCO)
 - Negative surgical margins
 - Adequate lymph node assessment (LNA)¹⁴
 - No prolonged length-of-stay (LOS)
 - No 30-day readmissions
 - No 30-day postoperative mortality
- Evaluate temporal trends across practice settings
- Assess impact of OCO on overall survival

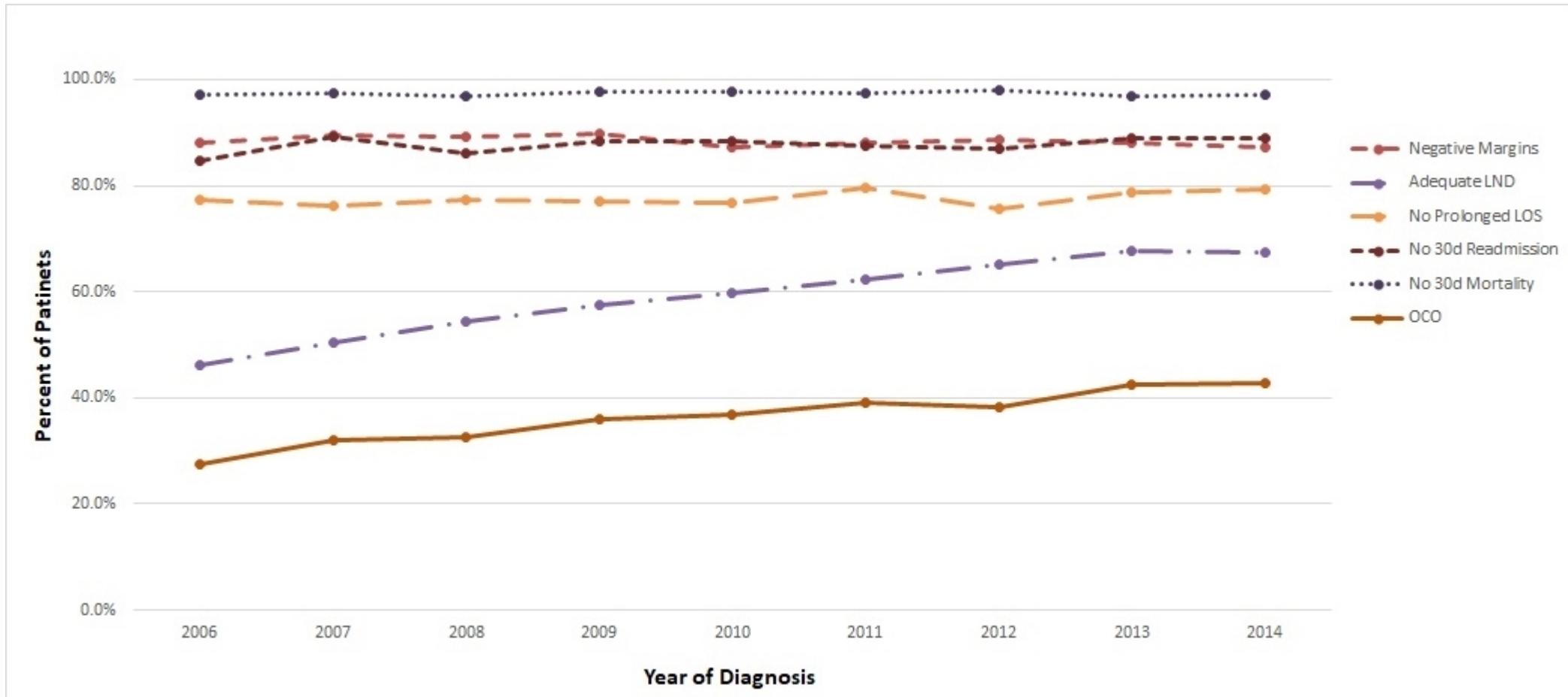
Retrospective Database Review

- National Cancer Database (2006-2014)
- Inclusion
 - >18yo
 - Histologically-confirmed MIBC
 - Clinical stage II or III
 - Definitive RC
- Exclusion
 - Other primary tumors
 - Non-urothelial histology
 - Chemotherapy
- Statistical Analysis
 - Student's t-tests
 - Pearson's χ^2 tests
 - Logistic regression
 - Cox proportional hazards
 - KM survival analysis

Optimal Cystectomy Outcome



Optimal Cystectomy Outcome



Patient Characteristics and Hospital Features

	No Optimal		Optimal Outcome		p
Total Number (%)	8104	62.4%	4893	37.6%	
Age (SD)	68.24	10.02	65.94	10.11	0.000
Sex					0.007
Male	6103	75.3%	3786	77.4%	
Female	2001	24.7%	1107	22.6%	
Race					0.012
Caucasian	7195	88.8%	4400	89.9%	
African-American	475	5.9%	223	4.6%	
Hispanic	206	2.5%	120	2.4%	
Other/Unknown	228	2.8%	150	3.1%	
Insurance					0.000
Private	2451	30.2%	1805	36.9%	
Uninsured	225	2.8%	154	3.2%	
Medicaid	396	4.9%	236	4.8%	
Medicare	4871	60.1%	2594	53.0%	
Other/Unknown	161	2.0%	104	2.1%	
Charlson-Deyo Score					0.000
0	5343	65.9%	3556	72.7%	
1	2074	25.6%	1074	21.9%	
2	549	6.8%	215	4.4%	
3+	138	1.7%	48	1.0%	
Facility Type					0.000
Non-Academic	4183	51.6%	1552	31.7%	
Academic/Research	3921	48.4%	3341	68.3%	
Hospital Volume					0.000
<25 Cystectomies/yr	6610	81.6%	2964	60.6%	
≥25 Cystectomies/yr	1494	18.4%	1929	39.4%	
Surgical Approach					0.000
Open	3846	72.7%	2326	66.1%	
Robotic/Lap	1446	27.3%	1195	33.9%	

Multivariable Logistic Regression

	OCO		
	OR	95% CI	p
Age (per year)	0.98	0.97 - 0.99	0.000
Sex			
Male	(ref)	- -	-
Female	0.97	0.86 - 1.08	0.554
Race			
Caucasian	(ref)	- -	-
African-American	0.71	0.57 - 0.88	0.002
Hispanic	0.94	0.69 - 1.29	0.713
Other/Unknown	0.99	0.74 - 1.33	0.945
Insurance			
Private	(ref)	- -	-
Uninsured	0.86	0.64 - 1.16	0.315
Medicaid	0.66	0.53 - 0.83	0.000
Medicare	0.92	0.81 - 1.05	0.220
Other/Unknown	1.01	0.72 - 1.40	0.963
Charlson-Deyo Score			
0	(ref)	- -	-
1	0.84	0.75 - 0.94	0.002
2	0.64	0.51 - 0.79	0.000
3+	0.48	0.32 - 0.73	0.001
Facility Type			
Non-Academic	(ref)	- -	-
Academic/Research	1.60	1.34 - 1.91	0.000
Hospital Volume			
<25 Cystectomies/yr	(ref)	- -	-
≥25 Cystectomies/yr	2.45	1.77 - 3.40	0.000
Surgical Approach			
Open	(ref)	- -	-
Robotic/Lap	1.32	1.18 - 1.48	0.000

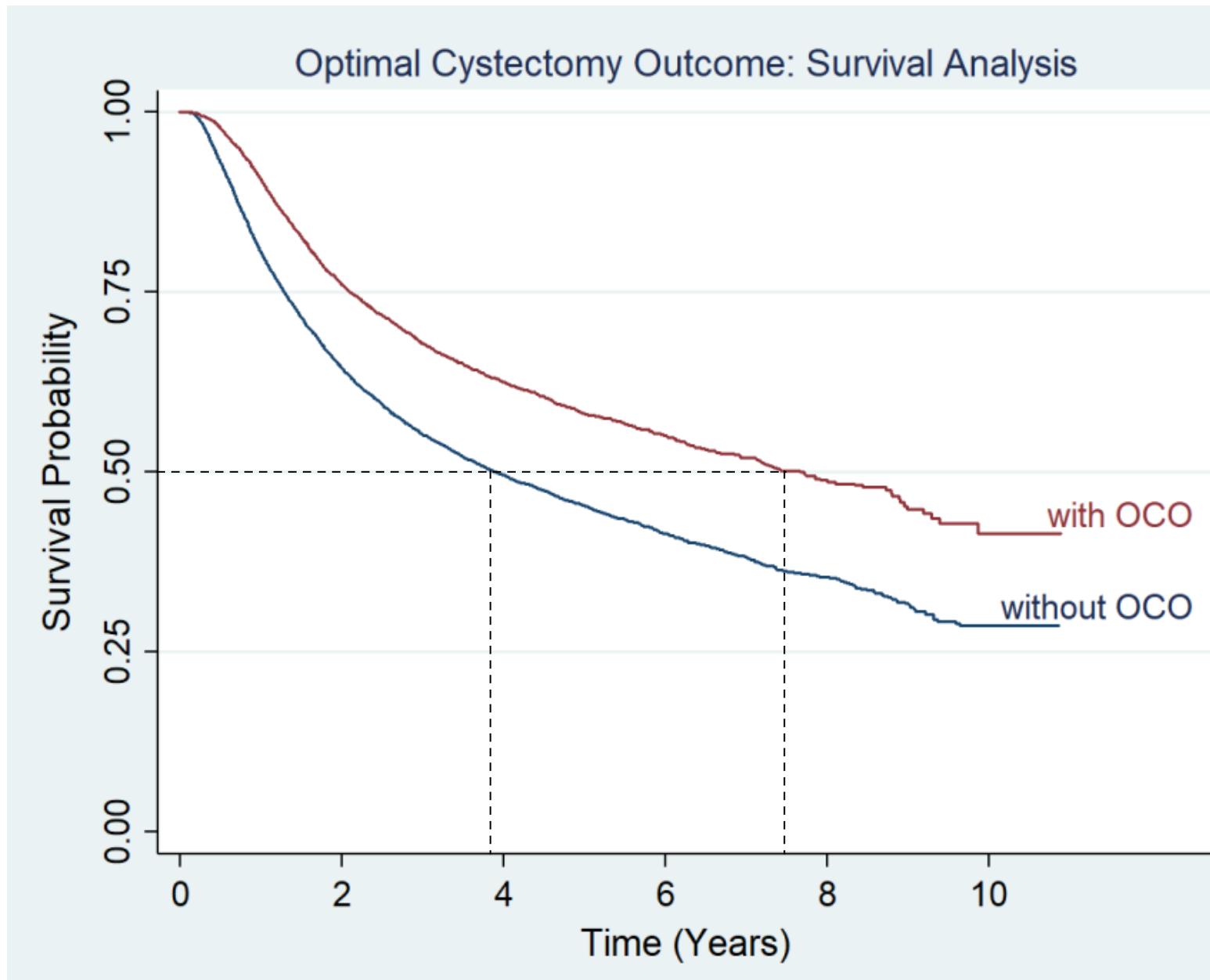
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Academic/Research	1.60	1.34	1.91	0.000
Hospital Volume				
<25 Cystectomies/yr	(ref)	-	-	-
≥25 Cystectomies/yr	2.45	1.77	3.40	0.000
Surgical Approach				
Open	(ref)	-	-	-
Robotic/Lap	1.32	1.18	1.48	0.000

Why does any of this matter?

	HR	95% CI		<i>p</i>
Optimal Outcome	0.69	0.64	0.74	0.000
Age (per year)	1.02	1.01	1.02	0.000
Sex				
Male	(ref)	-	-	-
Female	1.07	0.99	1.15	0.101
Race				
Caucasian	(ref)	-	-	-
African-American	1.21	1.05	1.39	0.008
Hispanic	0.88	0.70	1.10	0.267
Other/Unknown	0.63	0.49	0.81	0.000
Insurance				
Private	(ref)	-	-	-
Uninsured	1.15	0.92	1.43	0.218
Medicaid	1.38	1.18	1.61	0.000
Medicare	1.14	1.04	1.25	0.005
Other/Unknown	1.06	0.82	1.36	0.660
Charlson-Deyo Score				
0	(ref)	-	-	-
1	1.19	1.11	1.29	0.000
2	1.32	1.15	1.51	0.000
3+	1.74	1.38	2.20	0.000
Facility Type				
Non-Academic	(ref)	-	-	-
Academic/Research	0.99	0.92	1.07	0.825
Hospital Volume				
<25 Cystectomies/yr	(ref)	-	-	-
≥25 Cystectomies/yr	0.97	0.88	1.06	0.451
Surgical Approach				
Open	(ref)	-	-	-
Robotic/Lap	0.92	0.85	0.99	0.020

Why does any
of this matter?



Conclusions

- OCO, a composite measure correlating with survival
- Patients & referring providers
- Hospitals
 - Follow in-house quality control measures
 - Inter-hospital variation
- Payers
 - Contracts and reimbursements
- Limitations
 - Selection bias
 - Complications
 - Neoadjuvant chemo

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