

Contemporary Analysis of Cystectomy Complications

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INTRODUCTION

- Radical cystectomy (RC) is a curative treatment for invasive bladder cancer but carries significant morbidity.
- Modern improvements such as use of neoadjuvant chemotherapy and recovery after surgery protocols may improve RC complication rates.
- Herein, we examine contemporary changes in complication rates of RC.

METHODS

- The National Surgical Quality Improvement Program (NSQIP) database was queried for RC performed from 2006-2018 for nondisseminated bladder cancer identified by CPT, ICD-9 and 10 codes.
- Demographics and outcomes were studied across 3 time periods.
- 30-day complications were classified
 - Minor: urinary tract infection, superficial incisional surgical site infection (SSI), pneumonia, blood transfusion
 - Major: readmission, return to the operating room, sepsis/septic shock, deep vein thrombosis (DVT), stroke, reintubation, renal failure, myocardial infarction, pulmonary embolus (PE), dehiscence, cardiac arrest, deep incision SSI, organ/space SSI, death

Main Findings:

- Decrease in any/minor complication rates over time
- Decreased length of stay over time
- Stable readmission, UTI, and sepsis rates over time
- 48% of readmissions were infection related

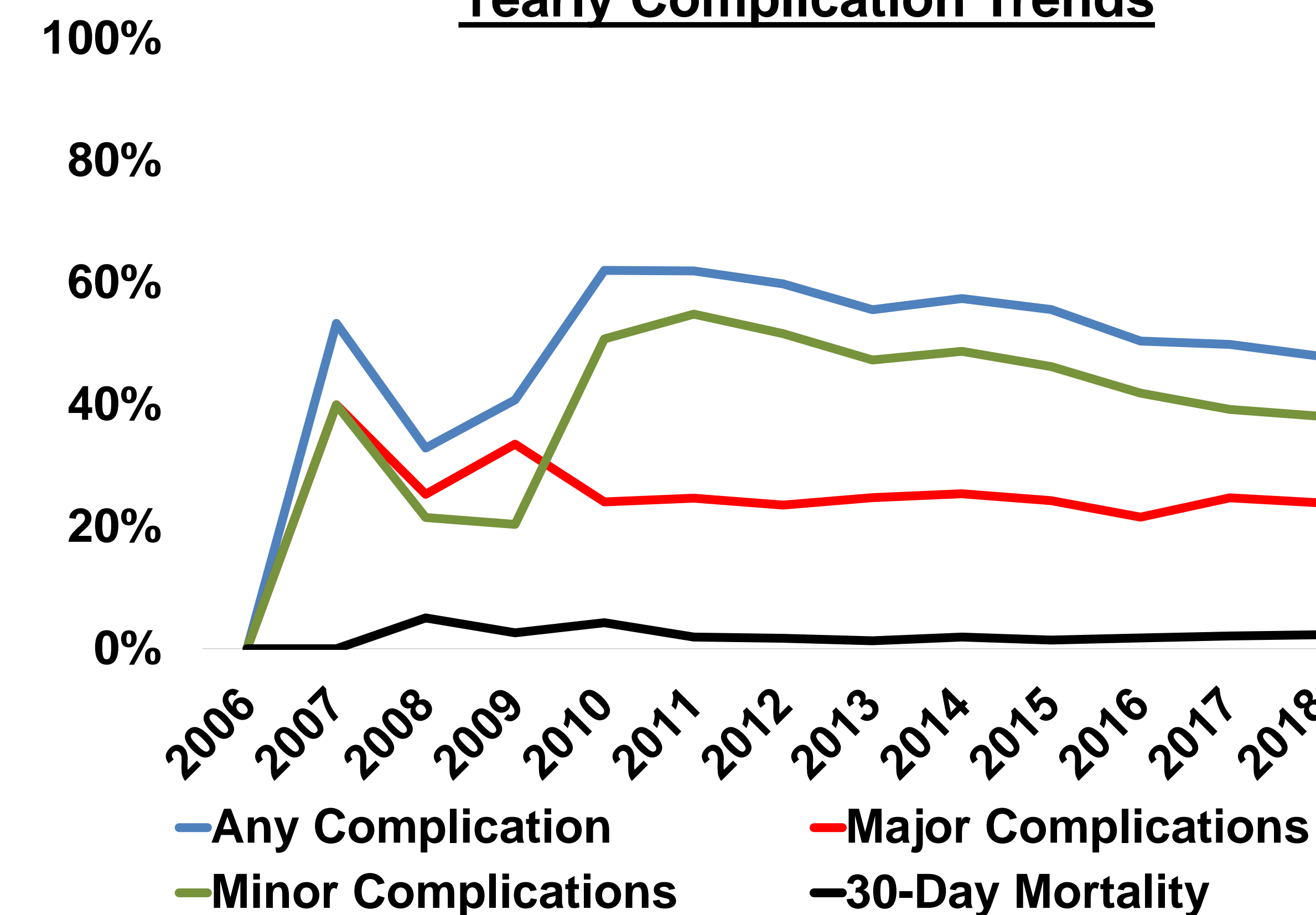
Postoperative Characteristics/Complications

	2006-2011 (n=1055)	2012-2014 (n=3170)	2015-2018 (n=7126)	P
Laparoscopic/Robotic	28 (2.7%)	359 (11.3%)	1038 (14.6%)	<0.01
Ileal Conduit	820 (77.7%)	2515 (79.3%)	5918 (83%)	<0.01
Readmission*	124 (21.8%)	675 (21.3%)	1494 (21.0%)	0.84
Reoperation	58 (5.5%)	187 (5.9%)	393 (5.5%)	0.73
Any Complication	596 (56.5%)	1820 (57.4%)	3607 (50.6%)	<0.01
Major Complication	275 (26.1%)	784 (24.7%)	1684 (23.6%)	0.15
Deep Venous Thrombosis	45 (4.3%)	89 (2.8%)	176 (2.5%)	<0.01
Sepsis	110 (10.4%)	280 (8.8%)	623 (8.7%)	0.2
Septic Shock	36 (3.4%)	90 (2.8%)	187 (2.6%)	0.33
Stroke	4 (0.4%)	19 (0.6%)	32 (0.4%)	0.52
Myocardial Infarction	17 (1.6%)	50 (1.6%)	121 (1.7%)	0.9
Unplanned Intubation	33 (3.1%)	97 (3.1%)	163 (2.3%)	0.04
Progressive Renal Insufficiency	27 (2.6%)	62 (2.0%)	144 (2.0%)	0.47
Acute Renal Failure	17 (1.6%)	42 (1.3%)	88 (1.2%)	0.59
Pulmonary Embolism	32 (3.0%)	71 (2.2%)	104 (1.5%)	<0.01
Dehiscence	32 (3.0%)	88 (2.8%)	192 (2.7%)	0.82
Deep Incisional SSI	20 (1.9%)	67 (2.1%)	55 (0.8%)	<0.01
Organ/Space SSI	50 (4.7%)	171 (5.4%)	519 (7.3%)	<0.01
Cardiac Arrest	11 (0.1%)	34 (1.1%)	82 (1.2%)	0.91
30-day Mortality	28 (2.7%)	53 (1.7%)	139 (2.0%)	0.13
Minor Complication	489 (46.4%)	1554 (49.0%)	2920 (41.0%)	<0.01
Superficial Incisional SSI	69 (6.5%)	196 (6.2%)	328 (4.6%)	<0.01
Pneumonia	40 (3.8%)	97 (3.1%)	193 (2.7%)	0.12
Urinary Tract Infection	107 (10.1%)	278 (8.8%)	588 (8.3%)	0.11
Intraop/Postop Transfusion	361 (34.2%)	1268 (40.0%)	2258 (31.7%)	<0.01

*Readmission documentation started in 2011

RESULTS

Yearly Complication Trends

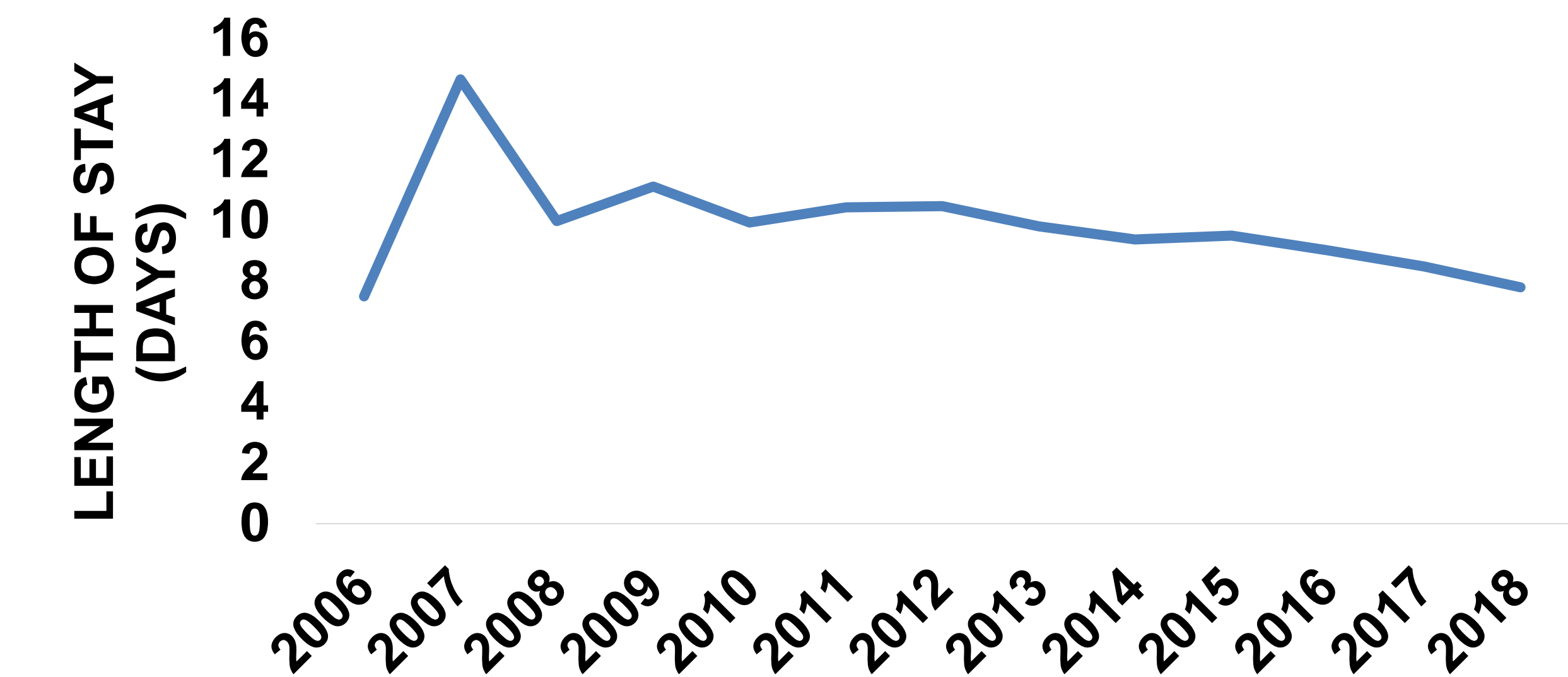


Logistic Regression Analysis of Complications and Mortality Over Time Compared to 2006 - 2011

Years	Multivariate OR	95% CI	p
Any Complication			
2012-14	1.07	0.93-1.24	0.33
2015-18	0.83	0.72-0.94	<0.01
Major Complication			
2012-14	0.93	0.79-1.09	0.38
2015-18	0.88	0.76-1.02	0.10
Minor Complication			
2012-14	1.15	1.0-1.32	0.05
2015-18	0.84	0.74-0.96	<0.01
30-day Mortality			
2012-14	0.68	0.42-1.09	0.11
2015-18	0.77	0.50-1.19	0.24

*Covariates in multivariable analysis include Age, BMI, ASA, Surgical Approach, Urinary Diversion Type

Yearly Mean Length of Stay



Linear Regression Analysis of Length of Stay Over Time Compared to 2006-2011

	Multivariate		
	β	95% CI	p
2012-14	-0.60	-1.08, -0.13	0.01
2015-18	-1.74	-2.18, -1.30	<0.01

*Covariates in multivariable analysis include Age, BMI, ASA, Surgical Approach, Urinary Diversion Type

CONCLUSIONS

- An analysis of the contemporary era shows continued decrease in LOS after RC and a decrease in overall complications.
- This may reflect beneficial effects of changes in perioperative bladder cancer management such as increased use of neoadjuvant chemotherapy and enhanced recovery after surgery protocols
- Further efforts to improve care must target infectious complications and readmissions