

# MODIFIED FRAILTY INDEX ASSOCIATED WITH CLAVIEN-DINDO IV COMPLICATIONS IN ROBOT-ASSISTED RADICAL PROSTATECTOMIES: A RETROSPECTIVE STUDY

Isaiah Levy, BS<sup>1</sup>, Mark Finkelstein, BS<sup>1</sup>, Khawaja Hassan Bilal, BS<sup>1</sup>, Michael Palese, MD<sup>2</sup>

<sup>1</sup>Icahn School of Medicine at Mount Sinai, New York, NY

<sup>2</sup>Departments of Urology, Icahn School of Medicine at Mount Sinai, New York, NY

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## BACKGROUND

- Elderly patients over the age of 65 comprise over 40% of all surgical patients in the United States
- Prevalence of frailty in surgical patients is higher (25.5 to 56.1%) compared to non-operative counterparts (6.9%)
- Previous research shows that a modified frailty index (mFI) can be predictive of adverse outcomes for patients undergoing open and laparoscopic prostatectomies
- 65-85% of all radical prostatectomies in the US are reported to be robot assisted

## STUDY OBJECTIVE

- To determine whether robot-assisted radical prostatectomies (RARP) patients with increased mFI scores are at a greater risk of complications and mortality

## HYPOTHESIS

- RARP patients with higher scores on a mFI are more likely to experience complications and 30-day mortality

## METHODS

- American College of Surgeons National Surgical Quality Improvement Program database assessed from 2008 to 2014
- The mFI based on Canadian Study of Health and Aging Frailty Index
- Clavien-Dindo IV (CDIV) (intensive care unit-level) complications and 30-day mortality rates assessed as adverse operative outcomes
- Multivariate logistic regression and receiver operator characteristic (ROC) curve were used to compare the association and predictive ability of the mFI in comparison with other indices including the Charlson Comorbidity Index (CCI) and American Society of Anesthesiologists' Class Risk Group (ASA).

- All statistical analyses were performed in SAS

## LIMITATIONS

- Retrospective Study
- RARP grouped with laparoscopic prostatectomies in CPT
- Selection Bias of which patient receive RARP

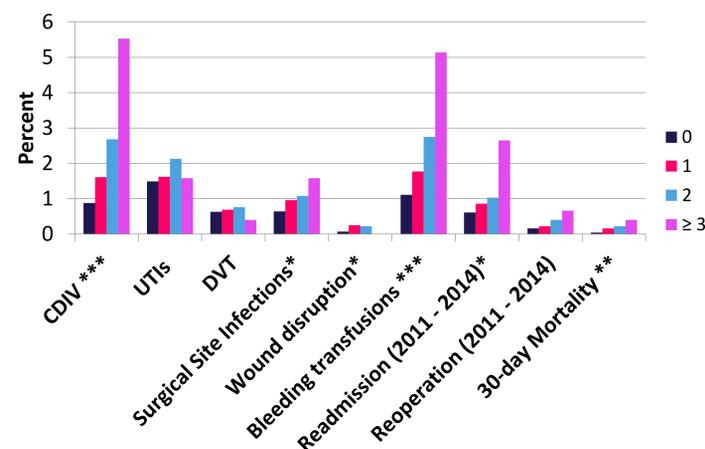
## RESULTS

TABLE 1: DEMOGRAPHIC AND CLINICAL CHARACTERISTICS FOR RARP PATIENTS BY mFI

	mFI = 0 (n=10723)	mFI = 1 (n=10141)	mFI = 2 (n=2766)	mFI ≥ 3 (n=253)	P-Value
Mean age, y (SD)	60.66 (7.26)	62.91 (7.02)	63.97 (6.65)	66.45 (6.24)	<0.0001
Age ≥ 65	3367 (31.40%)	4400 (43.39%)	1406 (50.83%)	166 (65.61%)	<0.0001
Current Smoker	1212 (11.30%)	1265 (12.47%)	419 (15.15%)	54 (21.34%)	<0.0001
Hypertension	0 (0%)	9278 (91.49%)	2721 (98.37%)	251 (99.21%)	<0.0001
<b>ASA Class</b>					
1 (Healthy)	771 (7.19%)	52 (0.51%)	6 (0.22%)	0 (0%)	
2 (Mild Systemic Disease)	7820 (72.93%)	6050 (59.66%)	916 (33.12%)	33 (13.04%)	
3 (Severe Systemic Disease)	2109 (19.67%)	3972 (39.17%)	1770 (63.99%)	191 (75.49%)	<0.0001
4 (Constant Threat to Life)	23 (0.21%)	67 (0.66%)	74 (2.68%)	29 (11.46%)	
<b>Charlson Comorbidity Index</b>					
0	10721 (99.98%)	9413 (92.82%)	352 (12.73%)	11 (4.35%)	
1	0 (0%)	669 (6.60%)	2325 (84.06%)	127 (50.20%)	<0.0001
2	2 (0.02%)	17 (0.17%)	46 (1.66%)	78 (30.86%)	
≥3	0 (0%)	42 (0.41%)	43 (1.55%)	37 (14.62%)	

- As mFI scores increase, there are significant increases in ASA and CCI classifications
- Patients with increased mFI scores were also significant older

FIGURE 1: PREVALENCE OF ADVERSE OUTCOMES IN RARP PATIENTS BASED ON mFI



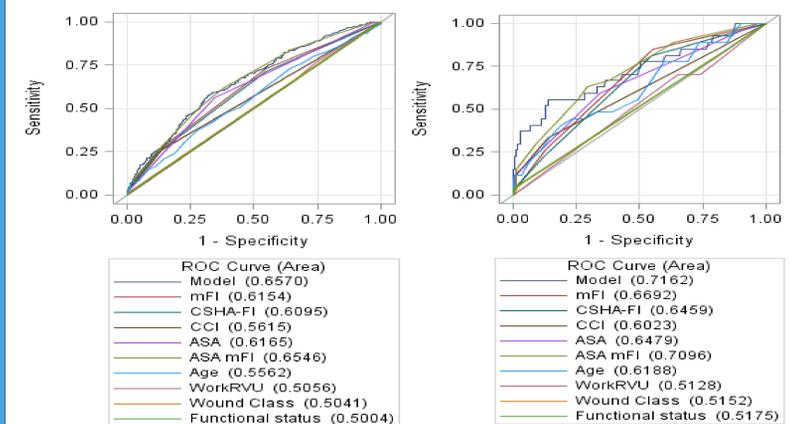
- The prevalence of CDIV complications, surgical site infections, wound disruption, bleeding transfusions, readmissions, reoperations, and 30-day mortality significantly increase with increasing mFI scores
- \*\*\* equals P < 0.0005, \*\* equals P < 0.005, \* equals P < 0.05

## RESULTS

TABLE 2: MULTIVARIATE ANALYSIS OF CDIV COMPLICATIONS

	OR	95% CI	P-Value
<b>Frailty</b>			
mFI = 0	Ref	-	-
mFI = 1	2.407	1.283 - 4.518	0.0062
mFI = 2	4.492	1.665 - 12.121	0.0030
mFI ≥ 3	8.608	2.504 - 29.587	0.0006
<b>Age</b>			
Age	1.015	0.999 - 1.031	0.0592
<b>Smoking Status</b>			
Nonsmoker	Ref	-	-
Smoker	1.225	0.91 - 1.648	0.1803
<b>Hypertension</b>			
No	Ref	-	-
Yes	0.602	0.328 - 1.103	0.1002
<b>ASA Classification</b>			
1 (Healthy)	Ref	-	-
2 (Mild Systemic Disease)	3.258	0.801 - 13.25	0.0990
3 (Severe Systemic Disease)	5.8	1.416 - 23.752	0.0145
4 (Constant threat to Life)	7.843	1.603 - 38.378	0.0110
<b>Charlson Comorbidity Index</b>			
CCI = 0	Ref	-	-
CCI = 1	0.718	0.425 - 1.215	0.2175
CCI = 2	0.43	0.127 - 1.453	0.1744
CCI ≥ 3	1.486	0.581 - 3.801	0.4081

FIGURE 2: PREDICTIVE INDICES ROC CURVES



- CDIV Complications**
- 30-Day Mortality**
- The mFI has better sensitivity and specificity than age, 11-point CSHA-FI, ASA, and CCI for RARP when predicting 30-day mortality

- Combined mFI-ASA variable had best sensitivity and specificity for predicting CDIV complications and 30-day mortality

## CONCLUSIONS

- Frailty associated with CDIV complications in RARP patients
- A combined mFI and ASA variable can help to predict whether patients are at increased risk of CDIV complications and 30-day mortality
- More prospective studies needed to fully assess the effect that frailty can have on the outcomes of RARP