

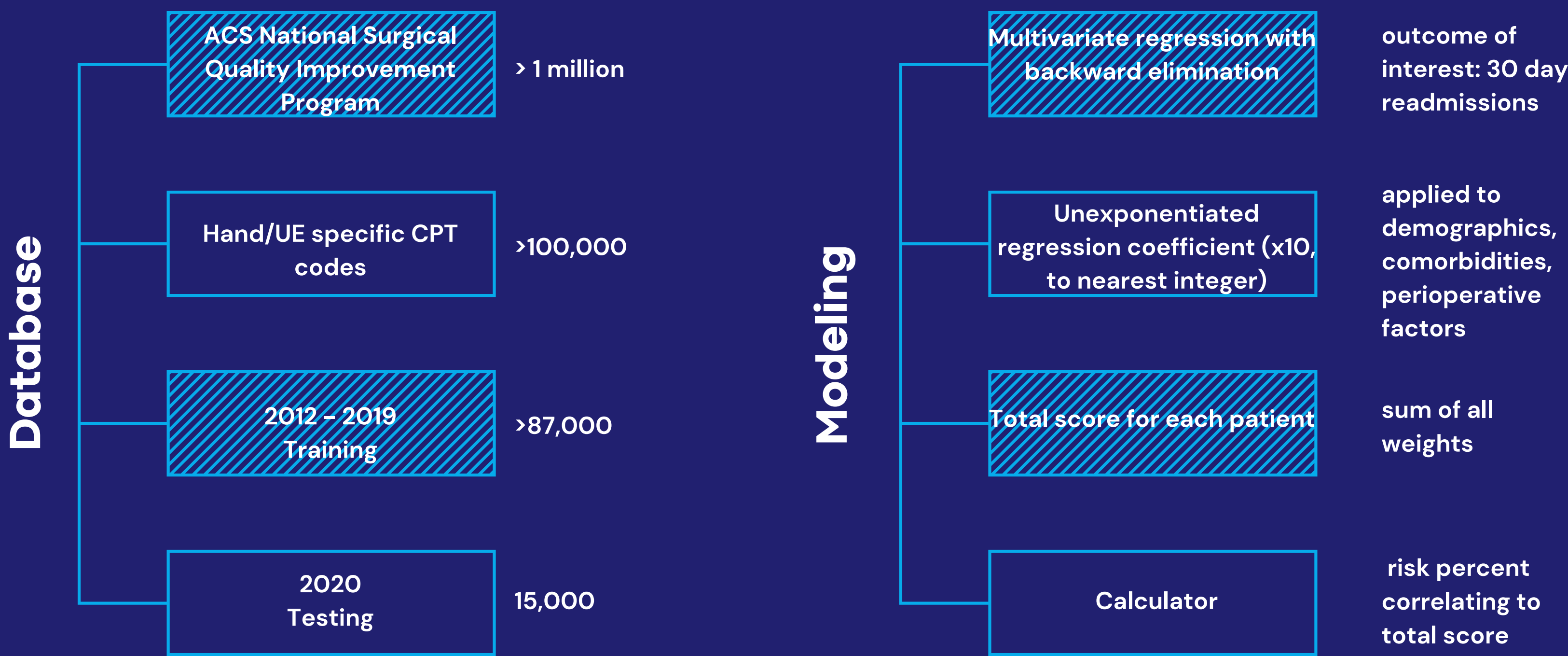
A Nationally Validated Risk Assessment Score For Predicting Unplanned Readmissions In Hand Surgery

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Methodology



Conclusions

We present a nationally validated risk stratification tool for unplanned readmissions following hand surgery. This risk score outperforms the commonly used modified frailty and Charlson comorbidity indices.

Future studies should clinically validate this model and determine if implementation of this risk score optimizes safety and reduces readmission rates in hand surgery patients.

Related literature

1. Lipira AB, Sood RF, Tatman PD, Davis JI, Morrison SD, Ko JH. Complications Within 30 Days of Hand Surgery: An Analysis of 10,646 Patients. J Hand Surg. 2015;40(9):1852-1859.e3. doi:10.1016/j.jhnsa.2015.06.103

2. Usami S, Inami K, Kawahara S, Hirase Y, Shimizu H, Mori H. Investigation of Predictors of Successful Replantation of Distal Digits at the Nail Bed Level: The Contribution of Digital Nerve Repair to Survival Rate. Plast Reconstr Surg. 2022;149(4):889-896

3. Hall DE, Arya S, Schmid KK, et al. Association of a Frailty Screening Initiative With Postoperative Survival at 30, 180, and 365 Days. JAMA Surg. 2017;152(3):233-240. doi:10.1001/jamasurg.2016.4219

Introduction

Traditional risk scores, like the Charlson Comorbidity Index and the Frailty Index, have had limited accuracy and applicability in predicting outcomes in hand surgery [1-3]

These risk assessment tools are necessary to address modifiable risk factors or to have more informed discussion of realistic outcomes.

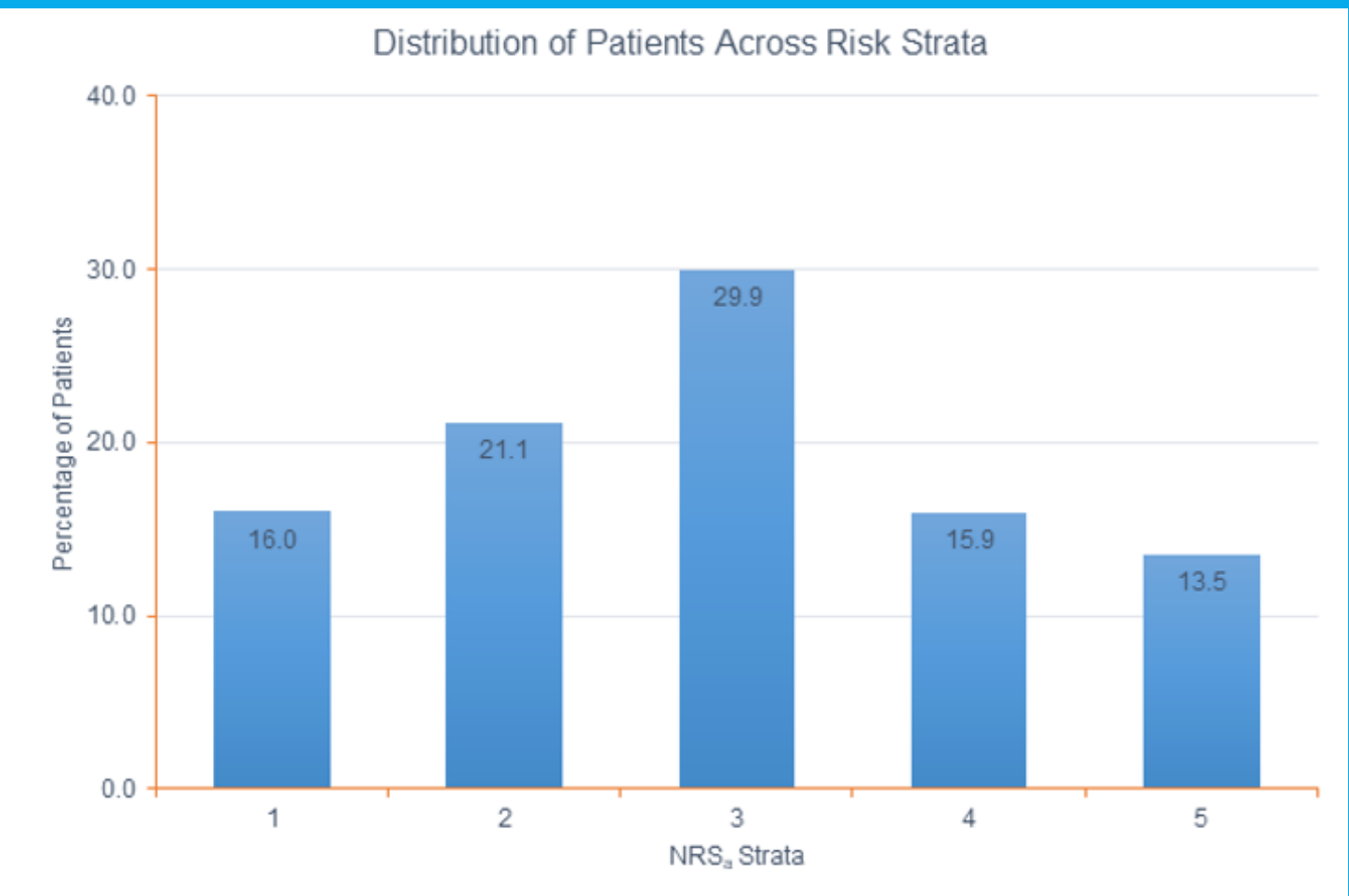
Objectives

To develop an objective and granular risk score for readmissions in hand surgery

To validate this score nationally, and demonstrate accuracy and usability

Results

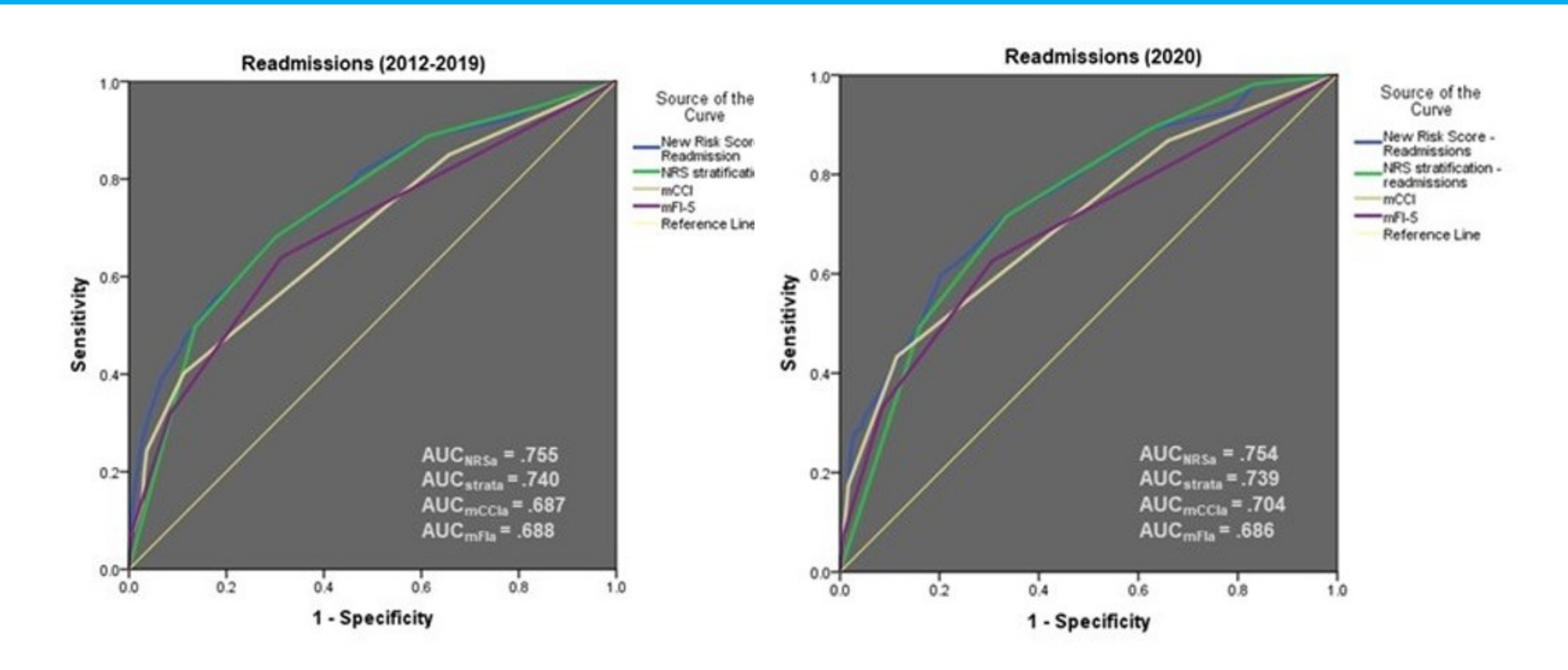
Data	Training	Testing
Years	2012-2019	2020
N	83,409	15,247
Readmissions	1.1%	1.1%



Patients were stratified by **total score** to fit a normal distribution. The strata correlate to risk categories: 1 - lowest, 2 - low, 3 - intermediate, 4 - high, 5 - highest risk

Variable	Adjusted Odds Ratio	Integer Score
Male gender	1.288	3
Race		
White	-	0
American	1.067	0
Asian	0.765	0
Black/African American	1.261	2
Native Hawaiian/Pacific Islander	1.339	0
Unknown/Not recorded	0.792	0
Emergent case	2.113	7
Diabetes	1.656	5
Dysphagia	1.509	4
BMI Class		
Normal	-	0
Underweight	1.491	4
Overweight	0.787	0
Obese class I	0.724	0
Obese class II	0.744	0
Obese class III	0.846	0
Age > 64	1.467	4
ASA Class		
1-No Disturbance	-	0
2-Mild Disturbance	0.391	0
3-Severe Disturbance	0.825	0
4-Life Threatening	1.745	0
5-Moribund	2.575	9
None assigned	1.224	0
Current Smoker	1.459	4
History of Severe COPD	1.433	5
Hypertension	1.259	2
Currently on dialysis	3.062	11
Open wound/wound infection	1.417	3
Steroid use	1.38	3
Weight loss (>10%)	2.671	10
Preoperative transfusion	2.814	10
SIRS or sepsis	1.521	4
Septic Shock	1.101	4

The integer score ranged from 0-90 when tabulated.



The area under the curve (AUC) represents the discriminatory ability of the model. Generally, >0.7 represents an accurate test. Our model demonstrated higher accuracy than the mFI-5 and mCCI, and rendered an AUC >0.7 in both the training and testing datasets.

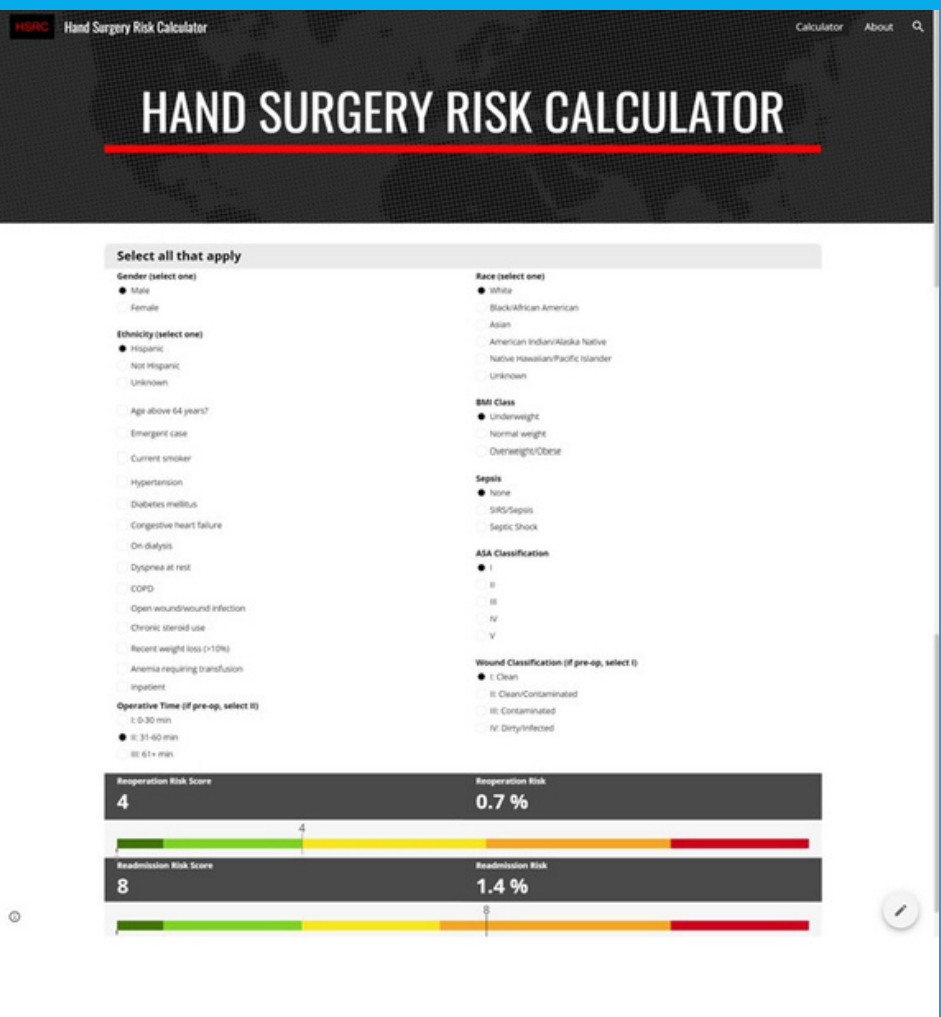
Examples

Patient 1: ED consult for trauma patient.

On exam: female, history of hypertension, diabetes., and has hgb < 7 (requiring preoperative transfusion)

Patient 2: office consult for elective case.

On exam: male, elderly, history of COPD, end stage renal disease (on dialysis), congestive heart failure,



Patient 1: Readmission score: 17
• Highest risk category

Wait until anemia is treated and stabilized
• New readmission score: 7

Patient 2: Readmission score: 23
• Highest risk category

No easily modifiable risk factors
• discussion with patient about reasonable expectations

Acknowledgements

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