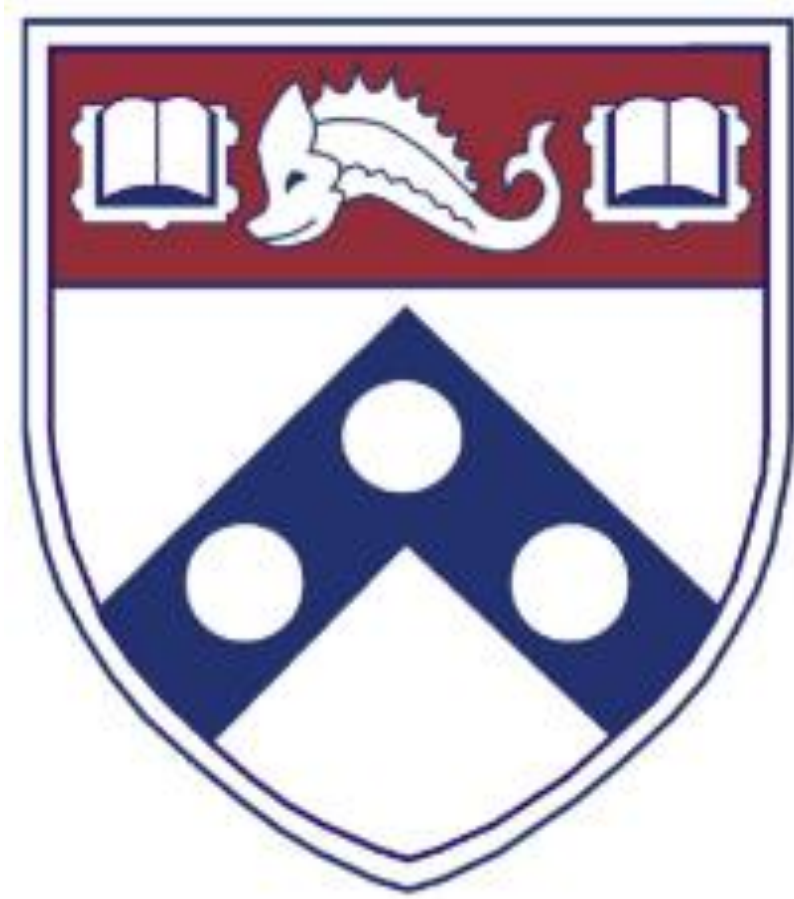
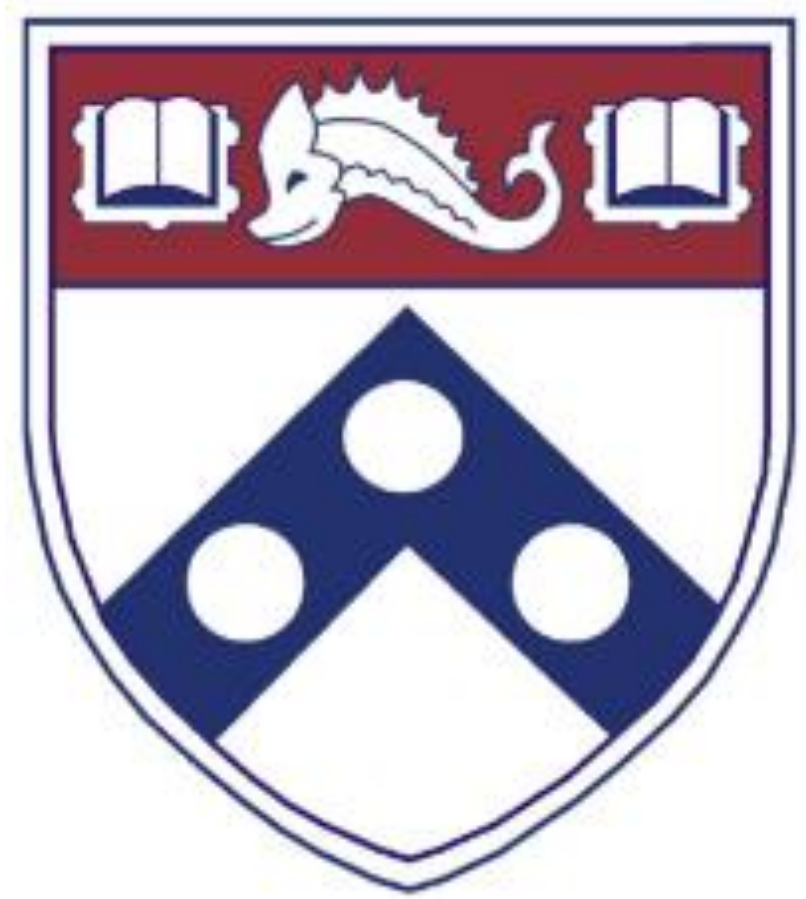




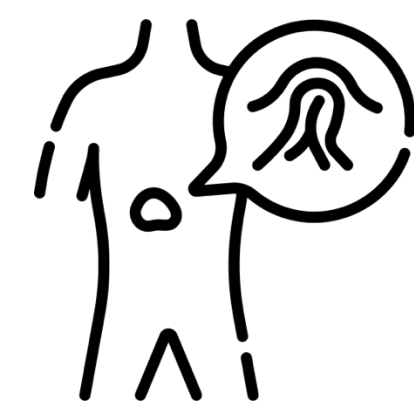
# Abdominal Wall Reconstruction In Ventral Hernia Repair: Do Current Models Predict Surgical Site Risk?

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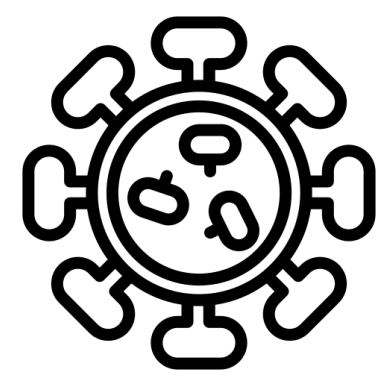
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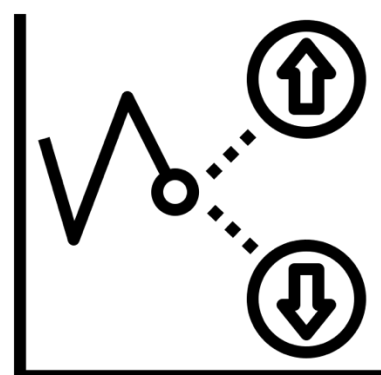
## INTRODUCTION



610,000 ventral hernia repairs (VHR) are performed yearly.



Surgical site infections (SSI) and surgical site occurrences (SSO) contribute to poor wound healing, operative reintervention, hernia recurrence, and increased costs.



There is a benefit to predicting who will have a complication: “*Prehabilitation*,” counseling, alternative options, ICU admission.

### VHWG

#### SSI/SSO Risk Model

- Grade 1**  
- Low risk, no history of infection
- Grade 2**  
- Smoker, obese, diabetic, immunocompromised, COPD
- Grade 3**  
- Prior wound infection, stoma, and violation of GI tract
- Grade 4**  
- Infected mesh, septic dehiscence

### VHRS

#### SSO Risk Model

- Mesh implantation**  
- 2 points
- Concomitant hernia repair**  
- 2 points
- Elevation of skin flaps**  
- 2 points
- Wound class 4**  
- 9 points

#### SSI Risk Model

- Concomitant hernia repair**  
- 2 points
- Elevation of skin flaps**  
- 2 points
- ASA Score 3+**  
- 2 points
- BMI>40**  
- 3 points
- Wound class 4**  
- 7 points

**Disclosures:** No disclosures relevant to this study.

## METHODS



- Retrospective review of all ventral hernias (2013-2022).
  - Demographics, comorbidities, peri-operative factors, and follow-up.



- The VHRS and VHWG models were applied to each patient and assessed for outcome congruence.



- Youden index of the respective Receiver Operating Curves (ROC) defined optimal score cutoffs for both models.
  - Area under curve (AUC) was reported to assess model quality.
  - Hosmer-Lemeshow test was performed to assess model calibration.

## RESULTS

| Demographics                                       | Overall (N=1413)  |
|----------------------------------------------------|-------------------|
| Median Age (Q1, Q3), years                         | 57.0 (47.1, 64.7) |
| Gender                                             |                   |
| Male                                               | 595 (42.1%)       |
| Female                                             | 818 (57.9%)       |
| Median BMI (Q1,Q3), kg/m <sup>2</sup>              | 31.6 (26.6, 36.8) |
| Diabetes                                           | 232 (16.5%)       |
| Hypertension                                       | 667 (47.3%)       |
| COPD                                               | 67 (4.7%)         |
| Never Smoker                                       | 725 (51.7%)       |
| Median Number of Prior Abdominal Surgeries (Q1,Q3) | 2.0 (1.0, 3.0)    |
| Ostomy Present at Time of VHR                      | 143 (10.1%)       |
| Prior Mesh Infection                               | 146 (22.7%)       |
| Prior Wound Infection                              | 302 (21.5%)       |
| Mean Follow-up                                     | 1.72 years        |

| Operative Factors                  | Overall (N=1413)     |
|------------------------------------|----------------------|
| VHR with concurrent Panniculectomy | 429 (30.9%)          |
| Procedure Length                   | 208.0 (155.0, 273.5) |
| Lysis of Adhesion                  | 1008 (72.1%)         |
| Enterotomy/SBR                     | 197 (14.0%)          |
| Wound Class                        |                      |
| Clean                              | 963 (68.9%)          |
| Clean-contaminated                 | 271 (19.4%)          |
| Contaminated                       | 63 (4.5%)            |
| Dirty/Infected                     | 61 (4.4%)            |
| Mesh Placement                     |                      |
| No Mesh                            | 131 (9.5%)           |
| Onlay                              | 482 (34.9%)          |
| Sublay/Retrorectus                 | 490 (35.4%)          |
| Inlay/Other                        | 280 (20.2%)          |
| Mesh Type                          |                      |
| Synthetic                          | 356 (25.6%)          |
| Biosynthetic                       | 693 (49.8%)          |
| Biologic                           | 203 (14.6%)          |
| Bridging Repair                    | 109 (7.7%)           |

## RESULTS

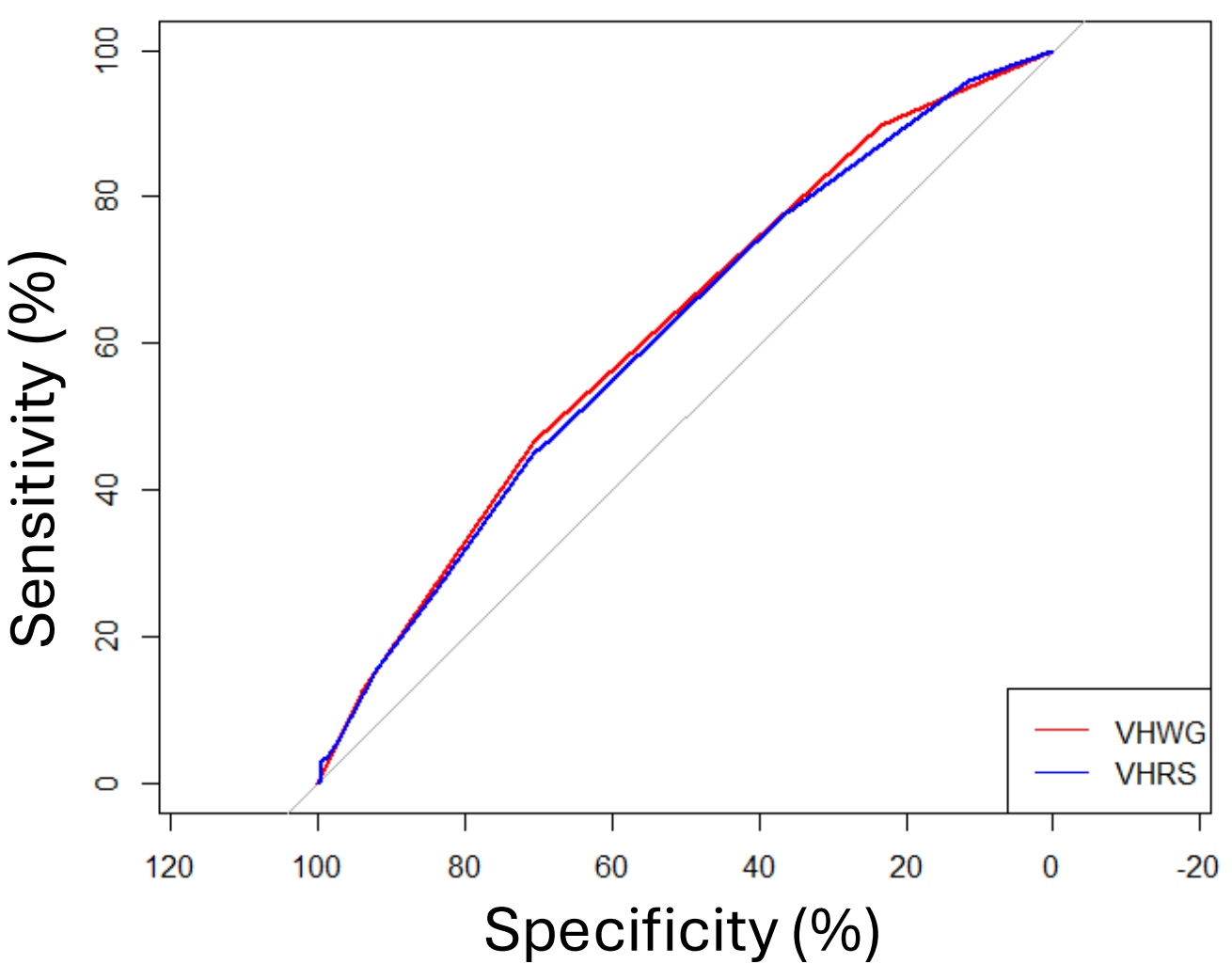
|                          | No SSI (N=1239) | Yes SSI (N=175) | Total (N=1414) | P Value |
|--------------------------|-----------------|-----------------|----------------|---------|
| VHRS SSI Score Mean (SD) | 4.070 (2.739)   | 5.187 (2.994)   | 4.209 (2.795)  | 0.001   |

|                          | No SSO (N=1047) | Yes SSO (N=367) | Total (N=1414) | P Value |
|--------------------------|-----------------|-----------------|----------------|---------|
| VHRS SSO Score Mean (SD) | 4.245 (2.340)   | 5.045 (2.607)   | 4.451 (2.437)  | 0.001   |

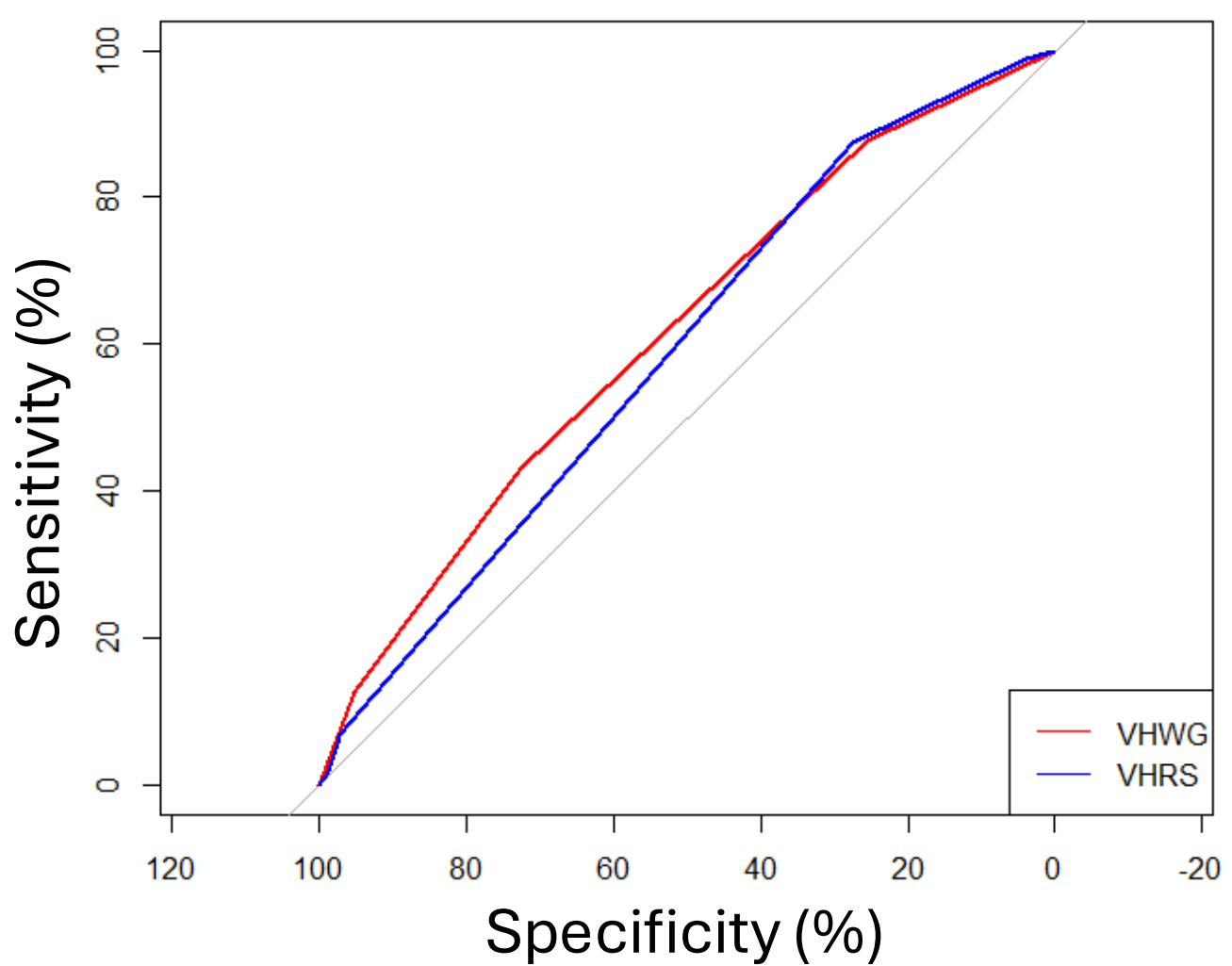
| VHWG Score | No SSI (N=1239) | Yes SSI (N=175) | Total (N=1414) |
|------------|-----------------|-----------------|----------------|
| 1          | 289 (23.5%)     | 18 (10.3%)      | 307 (21.8%)    |
| 2          | 581 (47.2%)     | 75 (43.1%)      | 656 (46.7%)    |
| 3          | 287 (23.3%)     | 59 (33.9%)      | 346 (24.6%)    |
| 4          | 75 (6.1%)       | 22 (12.6%)      | 97 (6.9%)      |

| VHWG Score | No SSO (N=1047) | Yes SSO (N=367) | Total (N=1414) |
|------------|-----------------|-----------------|----------------|
| 1          | 264 (25.4%)     | 45 (12.3%)      | 309 (22.0%)    |
| 2          | 492 (47.3%)     | 163 (44.5%)     | 655 (46.6%)    |
| 3          | 234 (22.5%)     | 112 (30.6%)     | 346 (24.6%)    |
| 4          | 50 (4.8%)       | 46 (12.6%)      | 96 (6.8%)      |

ROC – VHRS vs VHWG (SSI)



ROC – VHRS vs VHWG (SSO)



## CONCLUSIONS

- Our study presents the largest external validation cohort for assessing the VHRS model.
  - VHRS was not superior to the VHWG for SSI/SSO prediction.
- The models fail to appropriately weight pre-operative measures and more holistically evaluate clinical factors.
- The models have limited predictability and generalizability in patients undergoing ventral hernia repair.