**TITLE**

**Prediction of Intraoperative Acquired Pressure Injury in Elderly Cardiac Surgery Patients Using Machine Learning: Model Development with MIMIC-IV and External Validation**

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**Table S1. Subset of features selected by univariate logistic regression.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Intercept and Variable** | **Internal data**a | | **External data**b | |
| **OR (95% CI)** | **P Value** | **OR (95% CI)** | **P Value** |
| Age | 0.907(0.686-1.199) | 0.492 | 1.038(0.938-1.148) | 0.472 |
| Sex | 0.72 (0.389-1.331) | 0.294 | 1.086(0.885-1.333) | 0.427 |
| Height | 0.927(0.706-1.217) | 0.586 | 0.994(0.87-1.136) | 0.927 |
| Weight | 0.965(0.737-1.264) | 0.795 | 1.014(0.913-1.125) | 0.801 |
| ICU Time | 0.547(0.429-0.696) | 0.001\* | 1.011(0.911-1.121) | 0.838 |
| Hypertension | 2.037(0.852-4.872) | 0.110 | 0.293(0.035-2.443) | 0.257 |
| Atrial Fibrillation | 0.799(0.345-1.851) | 0.601 | 0.588(0.479-0.722) | 0.001\* |
| Diabetes | 4.846(0.655-35.881) | 0.122 | 0.688(0.561-0.843) | 0.001\* |
| Coronary Heart Disease | 0.548(0.254-1.182) | 0.125 | 0.542(0.421-0.698) | 0.001\* |
| Heart Failure | 0.42(0.115-1.533) | 0.189 | 0.493(0.399-0.609) | 0.001\* |
| AST/ALT | 0.745(0.575-0.966) | 0.026 | 0.937(0.856-1.025) | 0.157 |
| PT Activity | 1.471(1.131-1.913) | 0.004 | 0.919(0.846-0.999) | 0.047 |
| PT- INR | 0.713(0.554-0.917) | 0.009 | 0.918(0.845-0.997) | 0.043 |
| Neutrophils | 0.672(0.515-0.877) | 0.003 | 0.939(0.809-1.089) | 0.405 |
| Absolute Neutrophil Count | 0.65(0.507-0.833) | 0.001 | 0.987(0.86-1.132) | 0.848 |
| Lymphocytes | 1.591(1.216-2.081) | 0.001 | 1.094(0.935-1.28) | 0.263 |
| Absolute Lymphocyte Count | 1.343(1.008-1.790) | 0.044 | 0.977(0.878-1.086) | 0.661 |
| Albumin | 1.397(1.067-1.829) | 0.015 | 1.028(0.898-1.177) | 0.689 |
| Red Blood Cell Count | 1.21(0.927-1.579) | 0.161 | 1.214(1.093-1.349) | 0.001\* |
| Platelet Count | 1.041(0.793-1.366) | 0.774 | 1.048(0.943-1.164) | 0.387 |
| Hemoglobin | 1.179(0.904-1.538) | 0.224 | 1.264(1.136-1.406) | 0.001\* |
| Hematocrit | 1.19(0.912-1.553) | 0.201 | 1.215(1.094-1.349) | 0.001\* |

1. The retrospective Medical Information Mart for Intensive Care IV (MIMIC-IV) cohort, which consisted of data from diverse critical care units at Beth Israel Deaconess Medical Center between 2008 and 2022.
2. The medical data is from a tertiary hospital in Jiangsu Province, covering various characteristics of patients undergoing cardiovascular surgery utilized for external validation.

Abbreviations: AST/ALT, Aspartate Aminotransferase/Alanine Transaminase; PT, Prothrombin Time; INR, International Normalized Ratio

**Table S2. Performance of the Super Learner ensemble model.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Model** | **DataSet** | **Accuracy** | **Precision** | **Recall** | **F1\_Score** | **AUC** |
| sl | innervalidationa | 0.723 | 0.753 | 0.679 | 0.714 | 0.753 |
| sl | outervalidationb | 0.681 | 0.508 | 0.586 | 0.466 | 0.728 |
| sl | innervalidationa | 0.648 | 0.673 | 0.600 | 0.634 | 0.691 |
| sl | outervalidationb | 0.655 | 0.409 | 0.599 | 0.546 | 0.730 |

1. The internal verification data originate from the retrospective Medical Information Mart for Intensive Care IV (MIMIC-IV) cohort, encompassing data from various critical care units at Beth Israel Deaconess Medical Centre from 2008 to 2022.
2. The external verification data originates from a tertiary hospital in Jiangsu Province, encompassing diverse characteristics of patients undergoing cardiovascular surgery.