

Supplementary Information

Respiratory physiology after resupination following prone ventilation to predict 28-day mortality in mechanically ventilated patients: a machine learning analysis

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Supplementary Table S1. Logistic regression analysis of factors associated with 28-day mortality.

Supplementary Table S2. Performance metrics for machine learning models for 28-day mortality prediction using 4-h post-resupination values after LASSO feature selection.

Supplementary Figure S1. LASSO regularization paths.

Supplementary Table S1. Logistic regression analysis of factors associated with 28-day mortality.

Variable	β coefficient
(Intercept)	-1.182
FiO ₂	0.374
Physiological dead space	0.304
INR	0.187
Static lung compliance	0.155
Ionized calcium	-0.136
Arterial oxygen saturation	-0.149
Base excess	-0.180
Mean arterial blood pressure	-0.221
Lactate dehydrogenase	-0.328
Alanine aminotransferase	-0.397
Dynamic lung compliance	-0.441

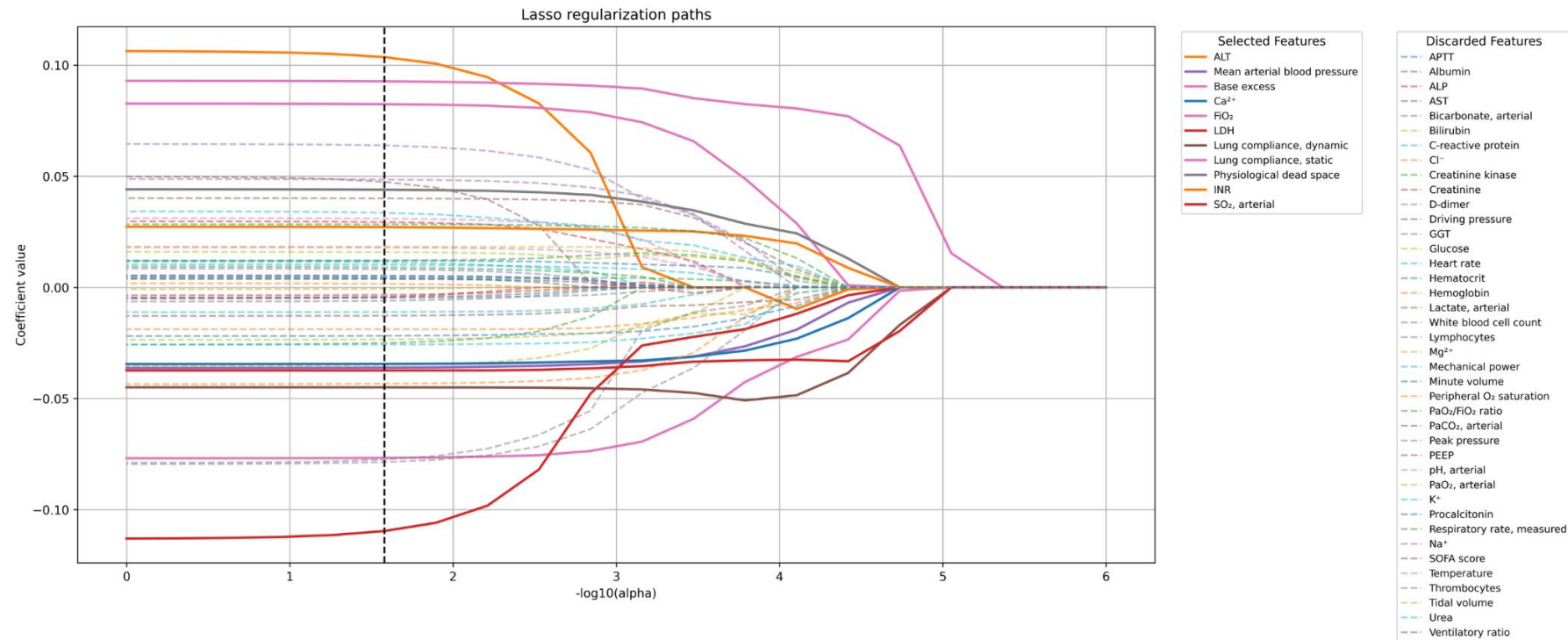
FiO₂: fraction of inspired oxygen; INR: international normalized ratio.

Supplementary Table S2. Performance metrics for machine learning models for 28-day mortality prediction using 4-h post-resupination values after LASSO feature selection.

Model	AUC-ROC	Accuracy	Precision	Recall	F1-score
Logistic regression	0.711	0.771	0.619	0.317	0.419
XGBoost	0.719	0.618	0.380	0.732	0.500
Decision tree	0.677	0.732	0.486	0.415	0.447

AUC-ROC: area under the receiver operating.

Supplementary Figure S1. LASSO regularization paths. Each colored line represents the coefficient values of a particular feature (all 4-h resupination values) as the regularization strength (alpha) increases (or as $-\log_{10}(\alpha)$ decreases from right to left). The LASSO model was trained to predict 28-day mortality over logarithmically generated alpha values from 10^{-6} to 10, with five-fold cross-validation ($cv = 5$) and 10,000 iterations to determine the optimal alpha ($\alpha = 0.026$). The vertical dashed line indicates this optimal alpha value. At this point, features with non-zero coefficients (listed as “Selected Features”) are retained, and features with coefficients reduced to zero (listed as “Discarded Features”) are eliminated.



ALP: alkaline phosphatase; ALT: alanine aminotransferase; APTT: activated partial thromboplastin time; AST: aspartate aminotransferase; FiO_2 : fraction of inspired oxygen; GGT: gamma-glutamyl transferase; INR: international normalized ratio; LDH: lactate dehydrogenase; $PaCO_2$: partial pressure of arterial carbon dioxide; PaO_2 : partial pressure of arterial oxygen; PEEP: positive end-expiratory pressure; SO_2 : oxygen saturation; SOFA: Sequential Organ Failure Assessment.