Supplementary Information

Prognostic Value of Bioelectrical Impedance Analysis Markers in Predicting 28-Day Mortality in Chinese ICU Patients

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Supplementary Table S1. Completeness of variables included in the analyses.

Data completeness

All variables included in the reported analyses were available for all 461 patients from source records. No statistical imputation was performed.

Variable group	Variables	N missing	Missing (%)
Demographics and anthropometry	Age, sex, height, weight, BMI	0	0.0
BIA variables	SMM, PBF, BMR, SMI, PhA, ECW/TBW	0	0.0
Comorbidities	Hypertension, type 2 diabetes, CKD, chronic heart failure	0	0.0
ICU treatments	Mechanical ventilation, vasopressor use, renal replacement therapy	0	0.0
APACHE II	Acute physiology, age, chronic-health components, and total	0	0.0
Fluid intake	First-24-h total fluid intake	0	0.0
Outcome	Day-28 mortality status	0	0.0

BIA = bioelectrical impedance analysis; ECW/TBW = extracellular water/total body water.

Supplementary Table S2

Optimism-Corrected Calibration and ECW/TBW Functional-Form Sensitivity

Specification	LR P	Apparent AUC	Corrected AUC	Apparent Brier	Corrected Brier	Corrected intercept	Corrected slope
Linear core model	-	0.900	0.896	0.087	0.091	0.003	0.966
ECW/TBW restricted cubic spline	0.046	0.905	0.898	0.084	0.088	0.001	0.942

AUC = area under the curve; LR = likelihood-ratio test. Corrected values were obtained from 1,000 full-model bootstrap refits. The nonlinear comparison was a sensitivity analysis and did not replace the linear core model.

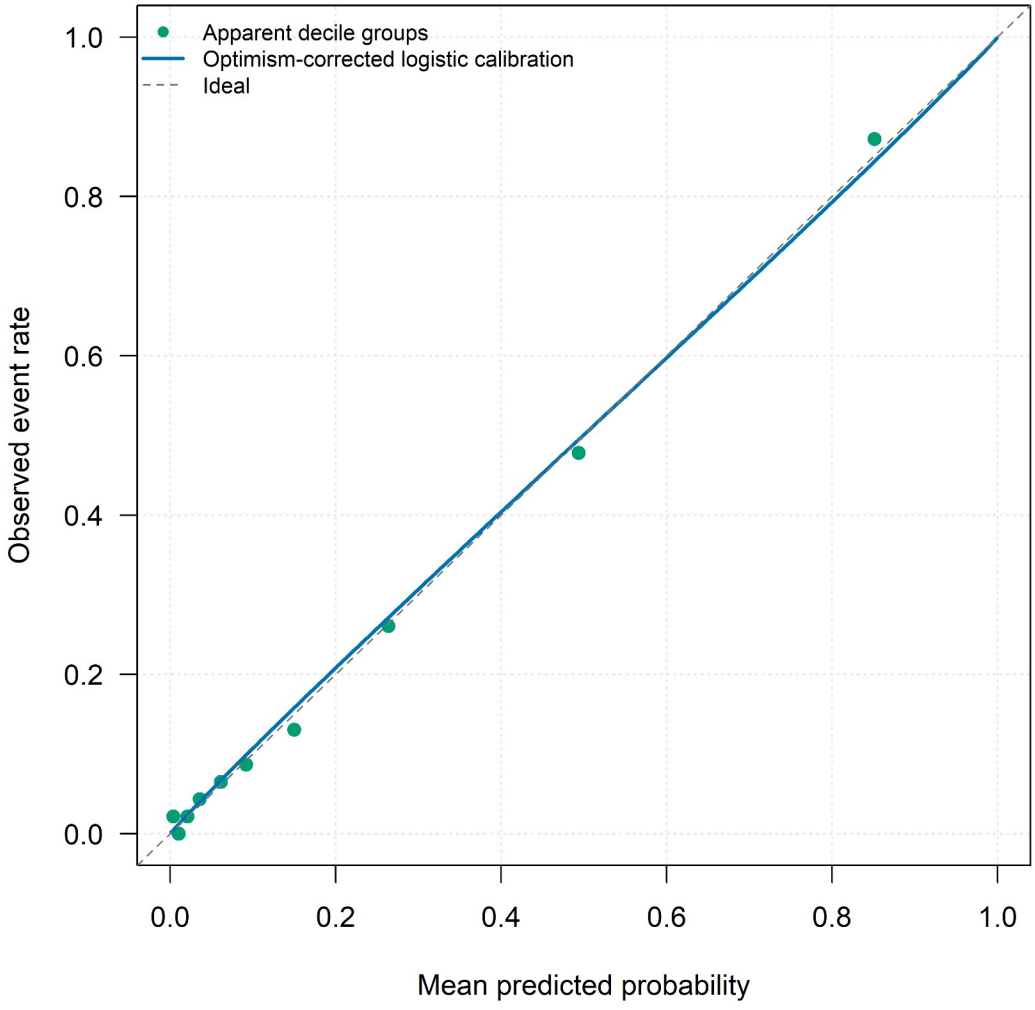
Supplementary Table S3

Full Clinically Adjusted Sensitivity Model for 28-Day All-Cause Mortality

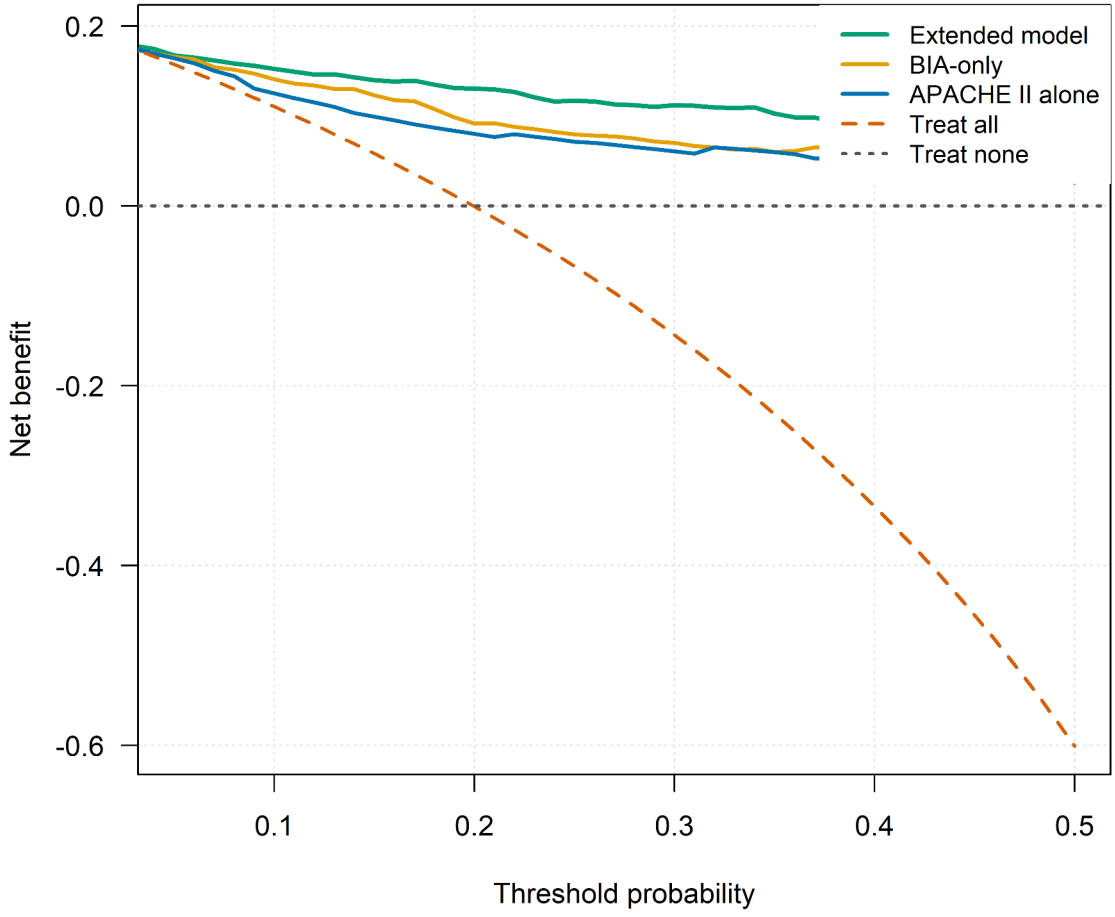
Predictor	Effect scale	Adjusted OR (95% CI)	P-value
APACHE II	per 5 points	2.996 (2.000-4.490)	<0.001
Skeletal muscle index	per 1 kg/m2	0.629 (0.514-0.770)	<0.001
Phase angle	per 1 degree	0.551 (0.416-0.729)	<0.001
ECW/TBW	per 0.05	2.958 (1.893-4.623)	<0.001
Age	per 10 years	1.289 (0.851-1.954)	0.231
Male sex	vs. female	3.126 (1.443-6.772)	0.004
Body mass index	per 1 kg/m2	0.897 (0.827-0.971)	0.008
Chronic kidney disease	yes vs. no	2.292 (0.971-5.410)	0.058
Chronic heart failure	yes vs. no	2.800 (1.252-6.265)	0.012
Daily fluid intake	per 1,000 mL	1.414 (0.847-2.360)	0.185

OR = odds ratio; CI = confidence interval; ECW/TBW = extracellular water/total body water. The model included all variables listed in the table and used all 461 patients with 92 deaths.

Supplementary Figure S1. Calibration of the extended APACHE II + BIA logistic model. The x-axis is mean predicted probability and the y-axis is observed event rate. Green points show apparent event rates in probability deciles, the blue line shows the optimism-corrected logistic calibration curve from 1,000 bootstrap refits, and the dashed 45-degree line shows ideal calibration. Apparent intercept and slope were 0.000 and 1.000; optimism-corrected intercept and slope were 0.003 and 0.966.



Supplementary Figure S2. Exploratory apparent decision-curve analysis in the development cohort. The x-axis is threshold probability and the y-axis is net benefit. The extended, BIA-only, and APACHE II-only models are compared with treat-all and treat-none strategies over thresholds of 0.01-0.50. The curves were not optimism-corrected and do not establish clinical utility outside the development cohort.



Additional files: Supplementary_Data.xlsx (deidentified source-record-derived patient-level analysis dataset with README and codebook) and Supplementary_Analysis_Code.R (analysis code).