

Table S1 Bootstrap internal validation of the nomogram (B =1,000 iterations)

Metric	Apparent (Original)	Training Mean	Test Mean	Optimism	Bias-Corrected
Dxy (Somers' D)	0.355	0.369	0.344	0.025	0.331
C-statistic	0.678	0.685	0.672	0.012	0.665
R ²	0.083	0.091	0.077	0.014	0.069
Intercept	0.000	0.000	-0.139	0.139	-0.139
Slope	1.000	1.000	0.929	0.071	0.929
E _{max}	0.000	0.000	0.044	0.044	0.044
Brier score	0.090	0.089	0.091	-0.001	0.091

Bootstrap resampling was performed with 1,000 iterations using the validate function in the rms package (R version 4.2.0). The C-statistic is derived as $0.5 + Dxy/2$. Optimism-corrected C-statistic = apparent C-statistic – optimism = $0.678 - 0.012 = 0.665$. E_{max}, maximum absolute difference between calibrated and ideal predictions; R², Nagelkerke R²; Dxy, Somers' rank correlation between predicted probabilities and observed outcomes.