Supplementary materials

Table S1 Disease codes included in the study

Ischemic stroke	ICD9	433.00,433.01,433.10,433.11,433.20,433.21,433.30,433.31,433.80,433.81,433.90,433.91,434.00,434.01,434.10,434.11,434.90,434.91
	ICD10	I63.41, I63.42, I63.43, I63.44, I63.5, I63.51, I63.519, I63.52, I63.53, I63.54, I65, I66, I63.40, I63.411, I63.412, I63.413, I63.419, I63.421, I63.422, I63.423, I63.429, I63.431, I63.432, I63.433, I63.439, I63.441, I63.442, I63.443, I63.449, I63.9, I63.50, I63.511, I63.512, I63.513, I63.521, I63.522, I63.523, I63.529, I63.531, I63.532, I63.533, I63.539, I63.541, I63.542, I63.543, I63.549, I63.9, I63.6, I63.8, I63.81, I63.89, I63.9
Ischemic heart disease	ICD10	I25.5, I20.0, I20.1, I20.8, I20.9, I21.0, I21.01, I21.02, I21.09, I21.11, I21.19, I21.21, I21.29, I21.3, I21.4, I21.9, I21.A1, I21.A9, I22.0, I22.1, I22.2, I22.8, I22.9, I23.0, I23.1, I23.2, I23.3, I23.4, I23.5, I23.6, I23.7, I23.8, I24.0, I24.1, I24.8, I24.9, I25.10, I25.110, I25.111, I25.118, I25.119, I25.810, I25.82, I25.83, I25.84

Table S2 Percentage and distribution of missing values

Variable Names	Validity	Missing	Proportion
weight	2359	15	1%
gcs	2370	4	0%
first_temperaturef	2369	5	0%
first_nbpm	2362	12	1%
first_nbps	2362	12	1%
first_nbpd	2362	12	1%
first_spo2	2374	0	0%
first_hr	2374	0	0%
first_rr	2372	2	0%
first_glucose	2374	0	0%
first_rdw	2363	11	0%
first_urea_nitrogen	2374	0	0%
first_cholesterol_ldl_calculated	2329	45	2%
first_mcv	2363	11	0%
first_white_blood_cells	2358	16	1%

Variable Names	Validity	Missing	Proportion
first_asparate_aminotransferase_ast	2374	0	0%
first_chloride	2374	0	0%
first_cholesterol_total	2369	5	0%
first_sodium	2374	0	0%
first_inrpt	2281	93	4%
first_mchc	2364	10	0%
first_mch	2363	11	0%
first__hemoglobin_a1c	2374	0	0%
first_red_blood_cells	2363	11	0%
first_fibrinogen_functio l	2374	0	0%
first_absolute_lymphocyte_count	2374	0	0%
first_hemoglobin	2362	12	1%
first_cholesterol_hdl	2374	0	0%
first_anion_gap	2374	0	0%
first_calcium_total	2353	21	1%
first_protein_total	2374	0	0%
first_creatine_ki se_mb_isoenzyme	2374	0	0%
first_bilirubin_indirect	2374	0	0%
first_ptt	2264	110	5%
first_magnesium	2360	14	1%
first_triglycerides	2374	0	0%
first_creatinine	2373	1	0%
first_platelet_count	2360	14	1%
first_creatine_ki se_ck	2374	0	0%
first_albumin_urine	2374	0	0%
first_potassium	2370	4	0%
first_basophils	2374	0	0%
first_bilirubin_direct	2374	0	0%
first_alanine_aminotransferase_alt	2374	0	0%
first_hematocrit	2360	14	1%
first_bicarbo te	2373	1	0%
first_pt	2282	92	4%

Table S3 Characteristics and outcomes of participants categorized by AIP index

Variable Names	Overall(n=2374)	Q1(n=594)	Q2(n=594)	Q3(n=594)	Q4(n=594)	P-value
AIP	0.04 (-0.17-0.26)	-0.31(-0.41--0.24)	-0.05 (-0.1--0.01)	0.14 (0.09-0.2)	0.43 (0.33-0.59)	**<0.01**
Demographic variables						
Age (year)	71 (61-82)	76 (64-85)	74 (62.25-83)	71 (61-80)	65 (56-75)	**<0.01**
Weight (kg)	78 (65.9-92.1)	72 (61.73-83.15)	75.6 (64.2-90)	79.4 (67.47-91.84)	85.5 (73-100.57)	**<0.01**
Male (n, %)	1305 (54.97)	273 (45.96)	332 (55.89)	349 (58.95)	351 (59.09)	**<0.01**
Clinical severity						

Variable Names	Overall(n=2374)	Q1(n=594)	Q2(n=594)	Q3(n=594)	Q4(n=594)	P-value
Sofa	3 (2-5)	3 (1-4)	3 (2-5)	3 (2-5)	4 (2-6)	**<0.01**
ASPIII	36 (27-48)	34 (26-45)	35 (28-48)	36 (27-47)	39 (29-51)	<0.01
SIRS	2 (2-3)	2 (1-3)	2 (1.25-3)	2 (2-3)	2 (2-3)	<0.01
SAPSII	32 (25-40)	31 (25.25-38)	33 (25.25-40)	32 (24-40)	33 (25-41)	<0.01
Oasis	30 (25-35.75)	29 (25-34.75)	30 (26-36)	30 (25-35)	30 (25-37)	**0.02**
GCS	14 (12-15)	14 (11-15)	14 (12-15)	14 (13-15)	15 (13-15)	**<0.01**
CCI	6 (4-8)	6 (5-8)	7 (5-8)	6 (4-8)	6 (4-8)	**<0.01**
Vital signs						
first_T (°F)	98.2 (97.7-98.7)	98.1 (97.7-98.6)	98.2 (97.7-98.6)	98.2 (97.7-98.7)	98.2 (97.8-98.8)	0.84
first_NBPm(mmHg)	92 (80-104)	94 (82-105.75)	93 (81-106)	91 (79.75-103)	88 (76-102)	0.40
first_NBPs(mmHg)	135 (117-153)	139 (121-156.75)	136 (119-155)	135 (117-151)	130 (112-148.75)	**<0.01**
first_NBPd(mmHg)	76 (64.25-89)	77 (65-89)	77 (66.25-90)	75 (63.75-88)	74 (63-88)	**0.02**
first_Spo2(%)	98 (96-100)	98 (96-99)	98 (96-100)	97 (95-99.25)	98 (96-100)	0.28
first_HR (b/min)	81 (70-94)	80 (69-91)	80 (68-93)	81 (70-94)	84 (73-98)	**<0.01**
first_RR (b/min)	18 (16-22)	18 (15-21)	18 (16-22)	19 (16-23)	19 (16-23)	**<0.01**
Laboratory Parameters						
first_Glucose(mg/dL)	127 (103-164.75)	120 (99.25-151)	125 (103-157)	126.5(104-162.25)	135 (107-185)	**<0.01**
first_RDW(%)	13.8 (13.1-14.7)	13.6 (13-14.4)	13.8 (13-14.78)	13.9 (13.1-14.7)	13.9 (13.1-15)	**<0.01**
first_BUN (mg/dL)	17 (13-26)	16 (13-22)	17 (13-25)	17 (13-25.25)	19 (13-31)	**<0.01**
first_LDL(mg/dL)	80 (57-109)	80 (58-104)	79 (58-110)	81 (57-110.25)	79 (54-113)	0.63
first_MCV	91 (88-95)	92 (88-96)	91 (88-95)	91 (87-94)	91 (87-94)	**<0.01**
first_WBC (10^9/L)	10 (7.7-13.2)	9.3 (7.23-12.38)	9.7 (7.6-12.5)	10.2 (7.77-13.2)	11 (8.1-14.97)	**<0.01**
first_AST	27 (19-50)	26 (19-43)	25 (18-43)	27 (19-49)	32 (20-77)	**<0.01**
first_Chloride total(mEq/L)	104 (100-107)	104 (101-107)	103 (101-106)	104 (101-107)	104 (100-107)	0.27
first_alkaline_phosphatase (mEq/L)	75 (60-96)	73 (59-94)	75 (61-92)	74 (59-97)	77 (59-101.75)	**0.03**
TC (mg/dL)	151 (121-185)	155.5(129.2-187)	149.5 (122-183)	148 (117.75-179)	151 (112-191.75)	**0.01**
Sodium (mEq/L)	139 (136-141)	139 (137-141)	139 (137-141)	139 (137-142)	139 (136-141)	0.26
first_INR	1.2 (1.1-1.3)	1.1 (1.1-1.2)	1.2 (1.1-1.3)	1.2 (1.1-1.4)	1.2 (1.1-1.4)	**<0.01**
first_MCHC(g/dL)	32.9 (31.9-33.8)	33 (32.1-33.8)	32.9 (31.8-33.8)	33 (31.9-33.9)	32.9 (31.8-33.8)	0.70
first_MCH (pg)	30.1 (28.7-31.4)	30.4 (29.1-31.7)	30.1 (28.6-31.4)	29.95 (28.5-31.3)	30.1 (28.4-31.2)	**<0.01**
first_HbA1c (%)	5.8 (5.4-6.5)	5.7 (5.4-6.1)	5.7 (5.4-6.3)	5.8 (5.5-6.53)	6 (5.5-7.2)	**<0.01**
first_RBC (10^9/L)	4.07 (3.56-4.51)	4.07 (3.61-4.47)	4.12 (3.64-4.59)	4.06 (3.57-4.6)	4.02 (3.36-4.47)	**<0.01**
first_Hb (g/L)	12.1 (10.5-13.6)	12.3 (10.8-13.6)	12.25(10.8-13.6)	12.1 (10.5-13.7)	11.9 (10-13.4)	**<0.01**
first_HDL(mg/dL)	43 (34-55)	61 (52-72)	47 (41-55)	39 (33-45)	30 (23-37)	**<0.01**
first_AG (mmol/L)	14 (12-16)	14 (12-16)	14 (12-16)	14 (12-16)	14 (12-17)	**<0.01**
Calcium(mEq/L)	8.7 (8.3-9.1)	8.8 (8.5-9.2)	8.8 (8.4-9.2)	8.7 (8.3-9.1)	8.6 (8-9)	**<0.01**
PTT(s)	29.3 (26.4-34.5)	29.3 (26.72-35.5)	29.3(26.52-33.9)	29.6 (26.3-34.9)	29.15 (26.3-34.1)	**0.02**
Mg (mEq/L)	1.9 (1.8-2.1)	1.9 (1.8-2.1)	1.9 (1.8-2.1)	2 (1.8-2.1)	2 (1.8-2.2)	**<0.01**
TG (mg/dL)	107 (78-150)	66 (55-77)	94 (81-109.75)	122.5(104.-145.25)	192 (153-251)	**<0.01**
Serum creatinine(mmol/L)	0.9 (0.8-1.3)	0.9 (0.7-1.1)	0.9 (0.8-1.2)	1 (0.8-1.2)	1.05 (0.8-1.5)	**<0.01**
PLT(K/μL)	209 (166-262)	211 (170-259)	204(164.-257.75)	210 (166.75-271)	210(156.-262.75)	0.13
Potassium (mmol/L)	4.1 (3.7-4.5)	4.1 (3.8-4.5)	4.05 (3.7-4.4)	4.1 (3.7-4.4)	4.1 (3.7-4.5)	**0.03**

Variable Names	Overall(n=2374)	Q1(n=594)	Q2(n=594)	Q3(n=594)	Q4(n=594)	P-value
ALT(U/L)	21 (14-38)	19 (14-32)	19 (13-32)	22 (15-39)	25 (15-51)	**<0.01**
HCT (%)	37 (32.4-40.7)	37.4 (32.92-40.5)	37.4 (33.4-41.1)	36.7 (32.4-41)	36.15 (30.9-40.4)	**<0.01**
Bicarbonate(mmol/L)	23 (21-25)	23 (21-25)	23 (21-25)	23 (21-25)	22 (19-24)	**<0.01**
PT(s)	12.8 (11.8-14.5)	12.5 (11.6-13.78)	12.8 (11.8-14.1)	13 (11.9-14.9)	13.1 (11.9-15.1)	**<0.01**
Comorbidities						
Sepsis (%)	856 (36.06)	152 (25.59)	204 (34.34)	212 (35.81)	288 (48.48)	**<0.01**
AF (%)	891 (37.53)	254 (42.76)	230 (38.72)	213 (35.98)	194 (32.66)	**<0.01**
Hypertension (%)	1160 (48.86)	310 (52.19)	288 (48.48)	297 (50.17)	265 (44.61)	0.06
AKI (%)	635 (26.75)	114 (19.19)	133 (22.39)	150 (25.34)	238 (40.07)	**<0.01**
CKD (%)	446 (18.79)	93 (15.66)	110 (18.52)	108 (18.24)	135 (22.73)	**0.02**
Diabetes (%)	816 (34.37)	153 (25.76)	184 (30.98)	210 (35.47)	269 (45.29)	**<0.01**
HLD (%)	1231 (51.85)	301 (50.67)	319 (53.70)	312 (52.70)	299 (50.34)	0.60
HF (%)	742 (31.26)	173 (29.12)	184 (30.98)	187 (31.59)	198 (33.33)	0.48
COPD (%)	273 (11.50)	57 (9.60)	66 (11.11)	78 (13.18)	72 (12.12)	0.25
Treatment						
CRRT (%)	50 (2.11)	6 (1.01)	9 (1.52)	7 (1.18)	28 (4.71)	**<0.01**
Copidogrel (%)	123 (5.18)	23 (3.87)	25 (4.21)	33 (5.57)	42 (7.07)	0.05
Tating (%)	456 (19.21)	117 (19.70)	108 (18.18)	112 (18.92)	119 (20.03)	0.85
Warfarin (%)	447 (18.83)	106 (17.85)	108 (18.18)	121 (20.44)	112 (18.86)	0.67
Vasopressor (%)	736 (31.00)	112 (18.86)	155 (26.09)	199 (33.61)	270 (45.45)	**<0.01**
Aspirin (%)	739 (31.13)	173 (29.12)	187 (31.48)	182 (30.74)	197 (33.16)	0.51
Ventilation (%)	596 (25.11)	96 (16.16)	121 (20.37)	160 (27.03)	219 (36.87)	**<0.01**
Outcomes						
LOS in ICU	3.05 (1.86-5.94)	2.71 (1.76-4.75)	3.06 (1.85-5.73)	2.93 (1.87-5.96)	3.8 (2-7.24)	**<0.01**
LOS in hospital	8.47 (4.71-15.81)	6.96 (3.97-12.11)	8.04 (4.65-14.22)	8.68 (4.86-16.72)	10.94(5.65-21.53)	**<0.01**

Data are expressed as median (IQR), or n (%). Analysis of variance (or the Kruskal-Wallis test) and Chi-square (or Fisher's exact) tests were used for comparisons among groups. Statistical significance ($P<0.05$).

AIP index: Q1: -0.813-1.168; Q2: 1.168-1.521; Q3: 1.521-1.875; Q4:1.875-2.228

TC: total cholesterol; LDL-C: low-density lipoprotein cholesterol; TG: triglyceride; AKI: acute kidney injury; CKD: chronic kidney disease; COPD: chronic obstructive pulmonary disease; HLD: hyperlipidemia; RF: respiratory failure; HF: heart failure; AF: atrial fibrillation; RBD: red blood cell; WBC: white blood cell; RDW: red blood cell width of distribution; MCHC: mean corpuscular hemoglobin concentration; MCH: mean corpuscular hemoglobin; PLT: platelet; Hb: hemoglobin; HCT: hematocrit; TB; total bilirubin; ALT: alanine transferase; AST: alanine transferase; PT: prothrombin time; Cr: serum creatinine; BUN: blood urea nitrogen; AG: anion gap; INR: international normalized ratio; SOFA: sequential Organ Failure Estimate; APS III: Acute Physiology Score III; SIRS: Systemic Inflammatory Response Syndrome Score; SAPS II: Simplified Acute Physiology Score II; OASIS: Oxford Acute Severity of Illness Score; GCS: Glasgow Coma Score; CCI: Charlson Comorbidity Index; CRRT: continuous renal replacement therapy

Table S4 Results of feature selection LASSO regression with ending as ICU LOS

Coef Name	coeff_lamda
Spo2	-0.000171510794981609
Heart_rate	-0.00106623933256741
Respiratory_rate	-0.0015152344509176
Urea_nitrogen	-0.00214225770657118
PTT	-0.00263736148754905
Hdl	-0.00586246864078854
WBC	-0.00675193212286068
PT	-0.0110330880127181
Rdw	-0.0135813549518696
Age	-0.0202941317201702
Diabetes	-0.03053282164602
Hb_A1c	-0.0317600709983058
Creatinine	-0.0324327620549095
Mg	-0.0416939703641912
Tating	-0.062674029843168
Aspirin	-0.0930123306414155
AG	-0.122294235109681
Potassium	-0.131275579913475
CKD	-0.132278794303746
Bicarbonate	-0.135151093327111
Calcium_total	-0.14141971726285
Chloride	-0.141478021048633
AIP	-0.378995752404281
(Intercept)	-1.43268989157565
Nbpm	-2.11333850536345e-05
Ast	-2.12150106859679e-05
Glucose	-5.84495918602512e-05
Weight	0
Sex	0
Sofa	0
SIRS	0
GCS	0
MCV	0
Phosphatase	0
Cholesterol_total	0
INR	0
MCH	0
Hb	0
Plt	0
Alt	0
HLD	0
Heart_failure	0

Coef Name	coeff_lamda
TG	0
Oasis	0.000504973054157079
LDL	0.000512337952430684
SAPSII	0.000600503805363401
Nbpd	0.0024360546905646
Nbps	0.00295262410341963
MCHC	0.00395739629266872
ASPIII	0.0103973057253745
Temperature	0.0119125323532475
RBC	0.0156673911778592
CPOD	0.0228524145117044
HCT	0.0305393023519843
Warfarin	0.0659907297834698
Copidogrel	0.0674039905987059
Hypertension	0.0848466345548752
Charlson	0.118478614336936
AKI	0.119519519630608
Sodium	0.145481006133354
AF	0.222486538308234
Vasopressor	0.32339277513113
Sepsis	1.21798504263635
Ventilation	1.24928169064069
Crrt	1.82827872899862

Table S5 Results of feature selection LASSO regression with ending as hospital LOS

Coef Name	coeff_lamda
(Intercept)	-2.64247035069911
Age	-0.0284794369581402
Weight	-0.000594425486227603
Sex	0
CRRT	1.8734704371168
Sepsis	1.16820280749644
Copidogrel	0
Tating	0.151408801406616
Vasopressor	0.636130851719441
Warfarin	0.455857529095325
Aspirin	0.0845926972591935
Sofa	-0.041369770673382
ASPIII	0.00717842263176916
SIRS	0.0182344706821932
SAPSII	0.0141437378083036
Oasis	0

Coef Name	coeff_lamda
GCS	-0.0540618985548179
Charlson	0.180971422221431
Temperature	0.0214614855328976
Nbpm	-2.87983468689022e-05
Nbps	0.00276788282919682
Nbpd	0.00264229616998659
Spo2	0.0160351692397786
Heart_rate	0.00456850435846107
Respiratory_rate	0.00522775159395217
Ventilation	0.690596844352027
AF	0.196852762424766
Glucose	0.000525379107521777
Rdw	0.0944710394575992
Urea_nitrogen	-0.00584958960443159
LDL	0
MCV	0
WBC	0.00139616857549354
Ast	-1.19772748396656e-05
Chloride	-0.0683411894296369
Phosphatase	0.000344019600320046
Cholesterol_total	-0.00041883343962148
Sodium	0.047304058595169
INR	0
MCHC	0
MCH	0.00350436815310008
HbA1c	0.0347647159279809
RBC	-0.12473633686914
Hb	0
Hdl	-0.00245704608606185
AG	-0.0589045702250114
Calcium_total	0.00724572420285198
PTT	-0.00253025807701005
Mg	0.228964935360625
TG	-0.000907305292653191
AIP	0.350288061844504
Creatinine	-0.0762184621297457
Plt	-0.000995610904605238
Potassium	-0.111529796363329
Alt	0
HCT	0
Bicarbonate	-0.0629527926077533
PT	0.00857852751573665
Hypertension	0.128210172547502

Coef Name	coeff_lamda
AKI	0.609050301042501
CKD	-0.26504372211034
Diabetes	-0.15481963185399
HLD	-0.122461262474557
Heart_failure	0.0863384353080606
CPOD	-0.203115977179894

Table S6 Optimal Hyperparameters

Model	Best Parameters
Logistic Regression	{'C': 0.1, 'penalty': 'l2', 'solver': 'liblinear', 'class_weight': 'balanced'}
Decision Tree	{'max_depth': 10, 'min_samples_split': 10, 'min_samples_leaf': 3, 'max_features': 'sqrt'}
Random Forest	{'n_estimators': 100, 'max_depth': 10, 'min_samples_split': 10, 'min_samples_leaf': 5, 'max_features': 'sqrt'}
XGBoost	{'max_depth': 10, 'min_child_weight': 5, 'gamma': 0.1, 'subsample': 0.8, 'colsample_bytree': 0.8, 'n_estimators': 50, 'learning_rate': 0.1}
LightGBM	{'num_leaves': 31, 'max_depth': 10, 'learning_rate': 0.05, 'n_estimators': 100, 'subsample': 0.8, 'colsample_bytree': 0.8}

Table S7 Overfitting Prevention Measures

Model	Overfitting Prevention Methods
Logistic Regression	L1/L2 Regularization, Standardization, Class Weight Adjustment
Decision Tree	Max Depth Limitation, Minimum Samples per Split/Leaf, Feature Subset Selection
Random Forest	Max Depth Limitation, Minimum Samples per Split/Leaf, Feature Subset Selection, Bagging
XGBoost	Max Depth Limitation, Minimum Child Weight, Gamma Regularization, Subsampling, Feature Subset Selection
LightGBM	Max Depth Limitation, Minimum Child Samples, Leaf-wise Growth, Feature Subset Selection, Bagging

Table S8 Eigenvalues for each model in machine learning

Data set	AUC	Sensitivity	Specificity	Accuracy	F1
Hospital LOS (Logistic Regression)					
Train	0.799	0.752	0.694	0.716	0.716
Valid	0.794	0.804	0.660	0.718	0.718
Test	0.832	0.835	0.676	0.747	0.747
Hospital LOS (Decision Tree)					
Train	0.807	0.682	0.773	0.728	0.727
Valid	0.817	0.693	0.806	0.742	0.742
Test	0.791	0.831	0.626	0.718	0.716
Hospital LOS (Random Forest)					
Train	0.842	0.758	0.761	0.751	0.751
Valid	0.860	0.709	0.853	0.763	0.763
Test	0.813	0.747	0.765	0.735	0.734
Hospital LOS (XGBoost)					
Train	0.799	0.660	0.783	0.719	0.719
Valid	0.810	0.762	0.738	0.739	0.739
Test	0.808	0.743	0.765	0.745	0.744
Hospital LOS (LightGBM)					
Train	0.952	0.879	0.894	0.879	0.879
Valid	0.665	0.354	0.890	0.497	0.332
Test	0.812	0.734	0.744	0.735	0.735
ICU LOS (Logistic Regression)					
Train	0.761	0.588	0.806	0.691	0.689
Valid	0.737	0.577	0.827	0.682	0.679
Test	0.733	0.606	0.795	0.682	0.681
ICU LOS (Decision Tree)					
Train	0.740	0.628	0.715	0.671	0.671
Valid	0.732	0.640	0.723	0.679	0.677
Test	0.632	0.564	0.657	0.611	0.608
ICU LOS (Random Forest)					
Train	0.820	0.635	0.856	0.745	0.742
Valid	0.805	0.619	0.874	0.742	0.738
Test	0.737	0.517	0.874	0.680	0.677
ICU LOS (XGBoost)					
Train	0.810	0.772	0.686	0.712	0.710
Valid	0.778	0.746	0.670	0.687	0.683
Test	0.739	0.547	0.854	0.691	0.688
ICU LOS (LightGBM)					
Train	0.781	0.749	0.660	0.694	0.692
Valid	0.751	0.481	0.901	0.687	0.684
Test	0.740	0.508	0.879	0.678	0.676

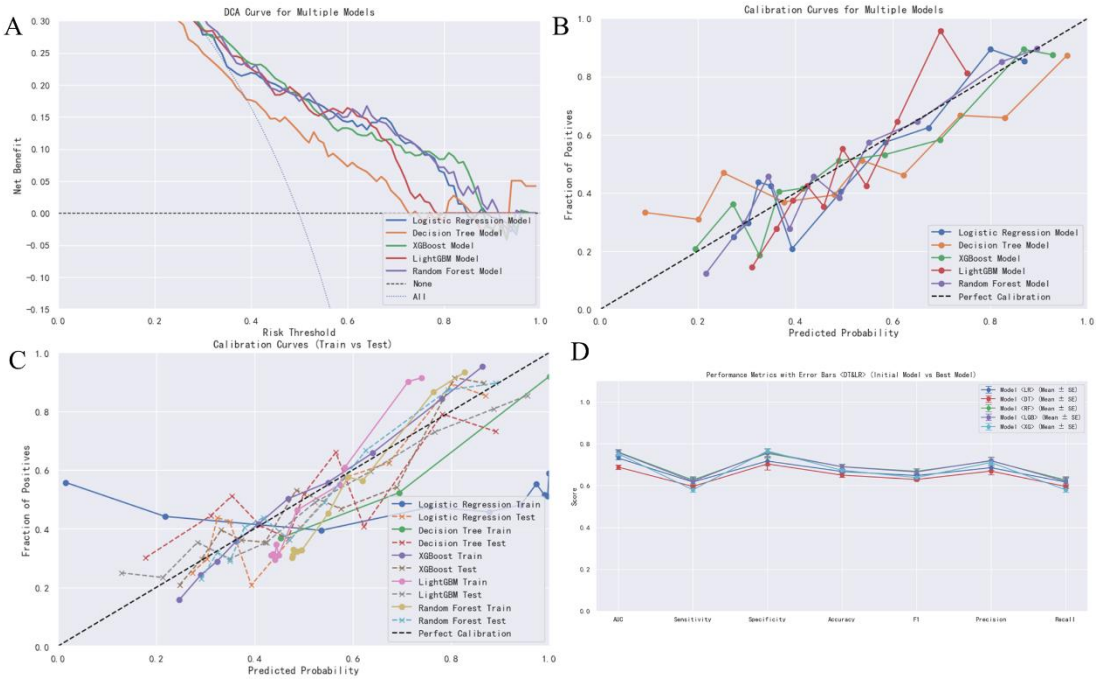

Fig.S1 Performance of machine learning (ML) models predicting ICU length of stay in patients with ASCVD. (A)Decision curve analysis curves for each model. (B, C) Calibration curves for multiple models on training and test sets. (D) Error bar charts for multiple models.

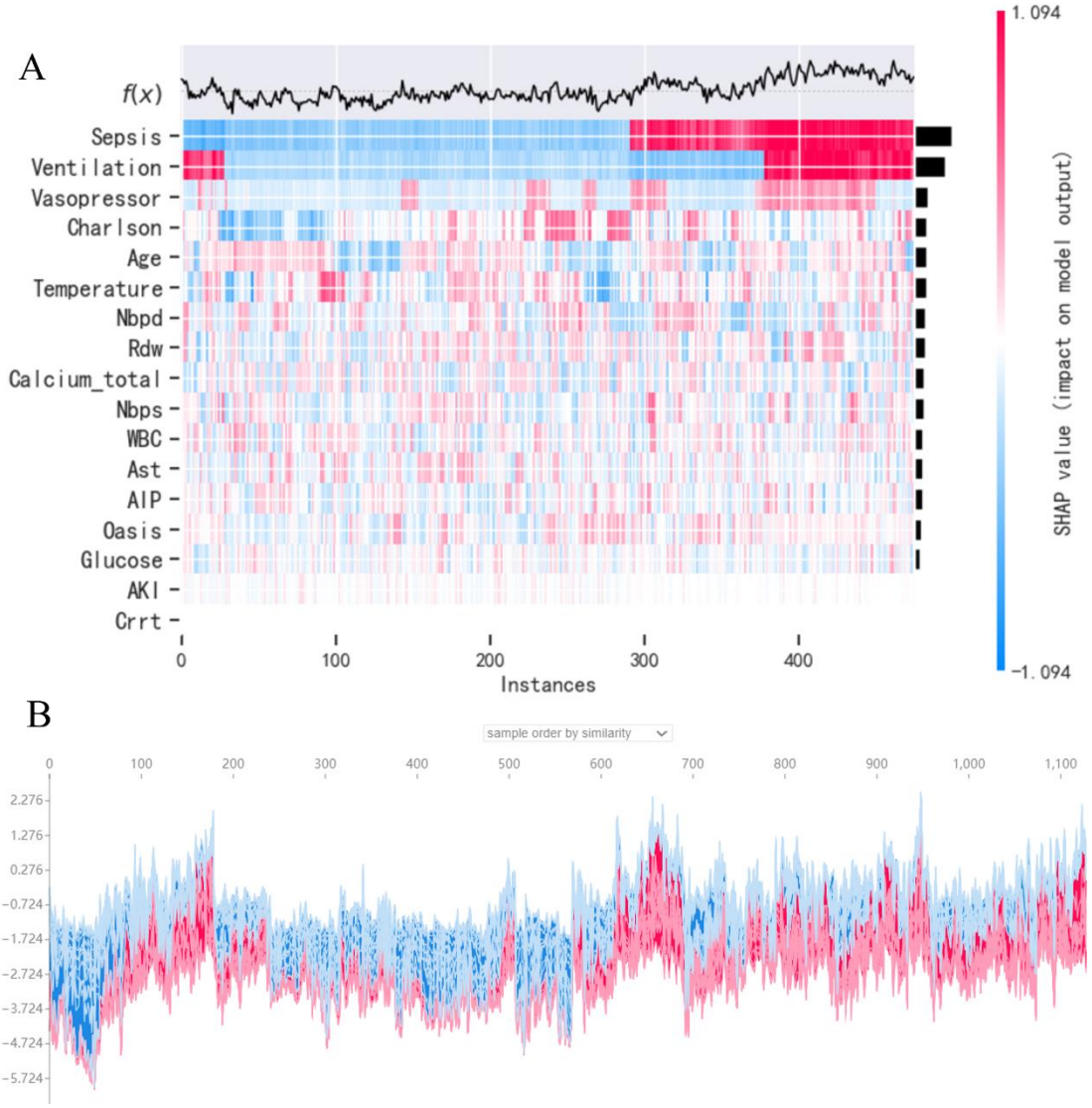

Fig.S2 (A) Heatmap of LGB model variables for predicting ICU length of stay for ASCVD patients. Each row represents a sample of data, and each column represents features, ordered by importance, the higher up the scale the more important, colors indicate feature values, red represents positive contribution, blue represents negative contribution, and darker colors indicate greater predictive impact. The black bar on the right side of each row of the right bar graph indicates the importance of the feature in the overall sample, the longer the length of the bar indicates the higher importance of the feature to the overall prediction of the model, and the top line graph shows the trend of the model output values in different samples. (B)The fluctuation of SHAP values in the graph demonstrates the sensitivity of the model to ICU LOS. The alternating red and blue areas show the variation in the value of this feature across samples.

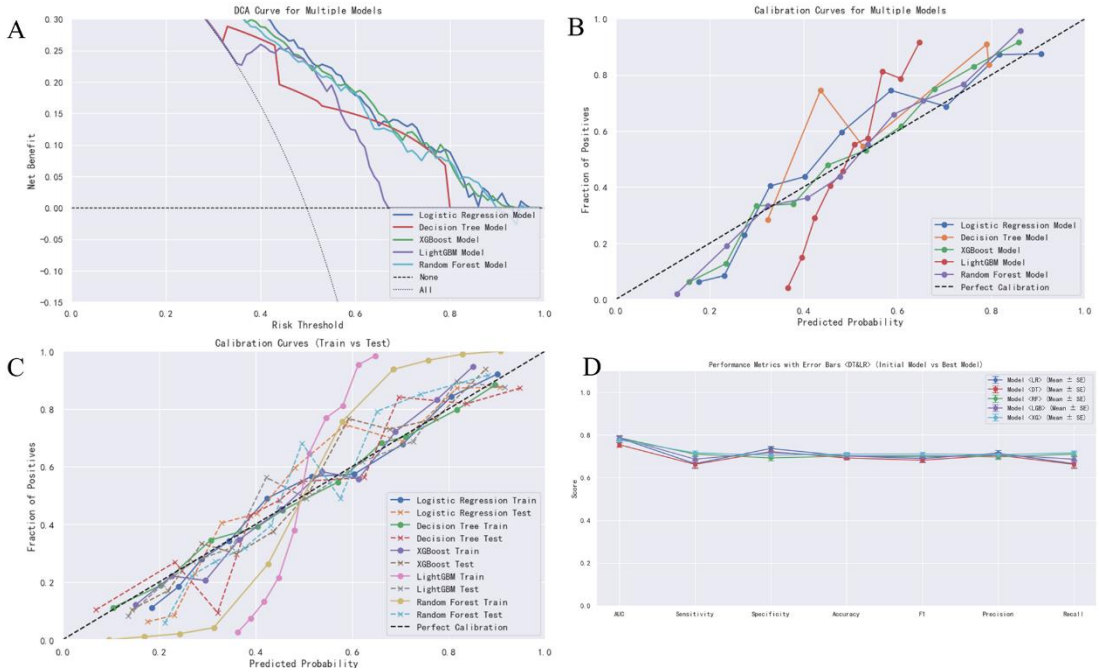

Fig.S3 Performance of machine learning (ML) models predicting length of hospitalization in patients with ASCVD. (A)Decision curve analysis curves for each model. (B, C) Calibration curves for multiple models on training and test sets. (D) Error bar charts for multiple models

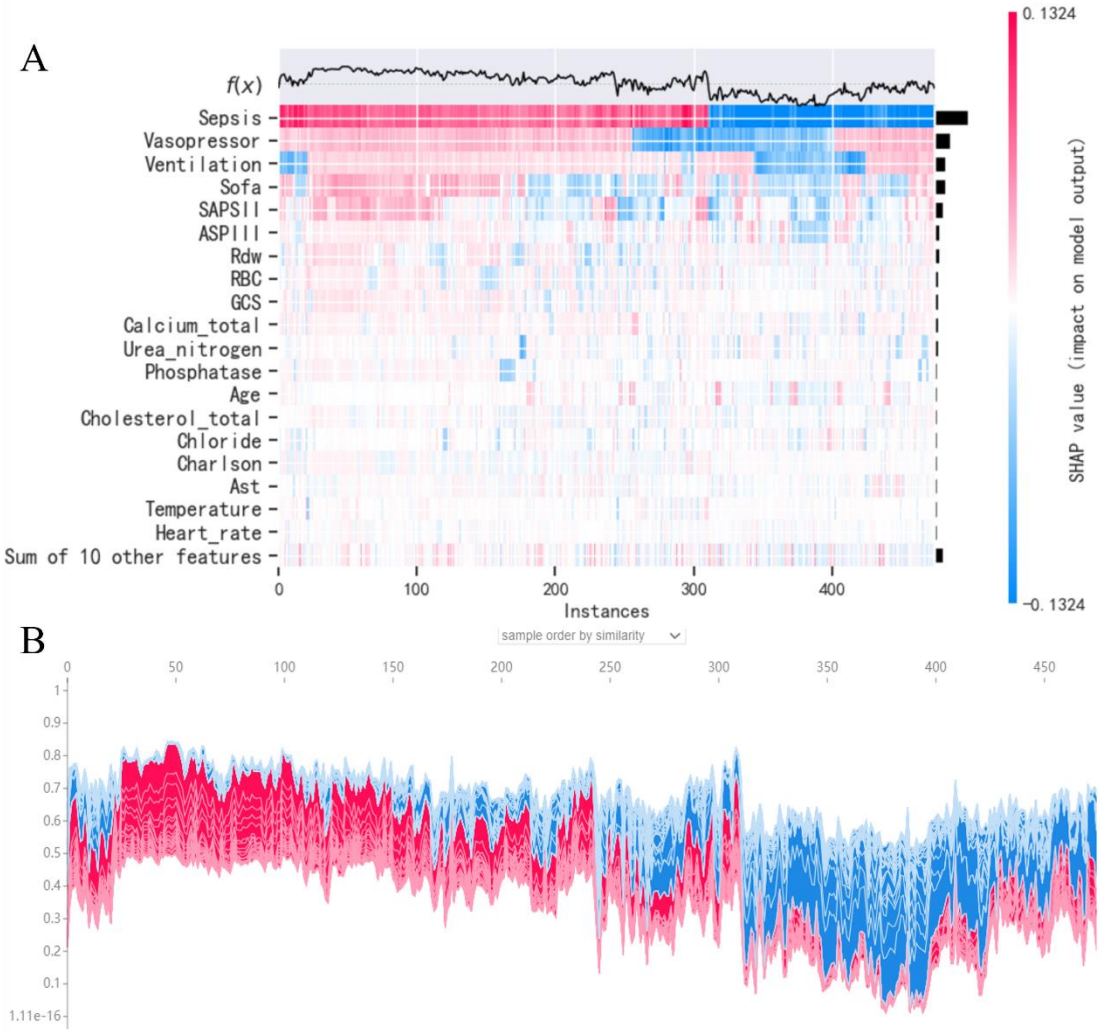

Fig.S4 (A) Heatmap of LR model variables for predicting length of hospitalization for ASCVD patients. Each row represents a sample of data, and each column represents features, ordered by importance, the higher up the scale the more important, colors indicate feature values, red represents positive contribution, blue represents negative contribution, and darker colors indicate greater predictive impact. The black bar on the right side of each row of the right bar graph indicates the importance of the feature in the overall sample, the longer the length of the bar indicates the higher importance of the feature to the overall prediction of the model, and the top line graph shows the trend of the model output values in different samples. (B)The fluctuation of SHAP values in the graph demonstrates the sensitivity of the model to the length of hospitalization. The alternating red and blue areas show the variation in the value of this feature across samples.