

**Supplementary Table S1.** The missing data and outliers of the training data set

Variables	Missing number	Proportion
CVP [mm Hg]	620	27.78
FiO <sub>2</sub> %	332	14.87
scO <sub>2</sub>	202	9.05
pO <sub>2</sub> [mm Hg]	200	8.96
pO <sub>2</sub> /FiO <sub>2</sub>	200	8.96
Hb [g/l]	199	8.92
Lactate [mmol/l]	195	8.74
SABP [mm Hg]	167	7.48
DABP [mm Hg]	167	7.48
MAP [mm Hg]	166	7.44
PLT	31	1.39
OUTCOME	30	1.34
WBC	30	1.34
TBIL	27	1.21
APACHE II	10	0.45
Temperature	5	0.22
GCS score	5	0.22
Total fluid balance 0–1 h [ml]	1	0.04
Total fluid balance 1–2 h [ml]	1	0.04
Total fluid balance 2–3 h [ml]	1	0.04
Total fluid balance 3–4 h [ml]	1	0.04
Total fluid balance 4–5 h [ml]	1	0.04
Total fluid balance 5–6 h [ml]	1	0.04
Death	0	0
LOS	0	0
Survival time	0	0
Norepinephrine [μg]	0	0
Epinephrine [μg]	0	0
Dopamine [μg]	0	0
Gender	0	0
Age	0	0
HR	0	0
RR	0	0
SPO2	0	0
SOFA score	0	0

**Supplementary Table SII.** Comparison between training set and verification set

Items	Total (n = 2665)	Training set (n = 2232)	Verification set (n = 433)	P-value
Age, median (IQR)	60.00 (48.00, 71.00)	61.00 (48.00, 71.00)	59.00 (48.00, 70.00)	0.33
Gender, n (%)				0.419
Female	1569 (58.9)	1306 (58.5)	263 (60.7)	
Male	1096 (41.1)	926 (41.5)	170 (39.3)	
HR, median (IQR)	100.00 (87.00, 115.00)	101.00 (88.00, 116.00)	94.00 (83.00, 110.00)	< 0.001
RR, median (IQR)	18.00 (15.00, 23.00)	19.00 (16.00, 24.00)	17.00 (15.00, 20.00)	< 0.001
FiO <sub>2</sub> , median (IQR)	40.00 (40.00, 50.00)	40.00 (40.00, 50.00)	40.00 (35.11, 45.00)	< 0.001
SPO <sub>2</sub> , median (IQR)	99.00 (96.00, 100.00)	99.00 (96.00, 100.00)	99.00 (97.00, 100.00)	0.006
pO <sub>2</sub> , median (IQR)	99.23 (78.70, 133.00)	98.35 (77.50, 132.00)	106.00 (83.30, 141.00)	< 0.001
PO <sub>2</sub> /FiO <sub>2</sub> , median (IQR)	288.64 (197.78, 393.60)	286.21 (193.51, 391.52)	295.30 (210.00, 406.70)	0.053
Temperature, median (IQR)	36.60 (36.00, 37.50)	36.80 (36.00, 37.50)	36.10 (36.00, 37.00)	< 0.001
CVP, median (IQR)	9.00 (7.00, 11.00)	9.00 (7.05, 11.00)	9.00 (7.00, 11.00)	0.164
MAP, median (IQR)	91.00 (79.00, 104.00)	91.00 (78.00, 102.88)	95.00 (83.00, 107.00)	< 0.001
Invasive systolic pressure, median (IQR)	137.00 (119.00, 155.64)	136.05 (118.00, 155.00)	141.00 (124.00, 160.00)	< 0.001
Invasive diastolic blood pressure, median (IQR)	69.00 (59.00, 79.00)	68.00 (59.00, 78.00)	72.00 (62.00, 83.00)	< 0.001
Norepinephrine [μg] median (IQR)	119.00 (50.00, 262.00)	127.00 (55.00, 277.00)	93.00 (43.00, 210.00)	< 0.001
Epinephrine [μg] median (IQR)	118.00 (49.00, 262.00)	126.00 (55.00, 276.25)	93.00 (43.00, 208.00)	< 0.001
Dopamine [μg] median (IQR)	118.00 (49.00, 262.00)	125.50 (55.00, 276.25)	93.00 (43.00, 208.00)	< 0.001
Platelet [ $\times 10^9/l$ ] median (IQR)	155.00 (101.00, 216.00)	154.00 (100.00, 219.00)	157.00 (108.00, 203.00)	0.664
Hemoglobin [g/l]				
Lactate [mmol/l] median (IQR)	2.00 (1.20, 3.50)	1.90 (1.20, 3.40)	2.40 (1.40, 4.10)	< 0.001
scvO <sub>2</sub> (%), median (IQR)	73.90 (66.40, 80.60)	73.90 (66.30, 80.50)	73.75 (66.55, 81.32)	0.75
Total bilirubin (TBIL) [mmol/l]	15.70 (10.40, 26.90)	15.60 (10.30, 27.25)	16.40 (11.10, 25.90)	0.417
Serum creatinine (sCr) [mmol/l] median (IQR)	80.00 (58.77, 136.00)	81.00 (58.00, 139.00)	77.00 (60.00, 117.00)	0.226
Total fluid balance 0–1 h [ml] median (IQR)	–4.00 (–95.80, 60.00)	–4.00 (–94.15, 61.85)	–5.50 (–109.00, 50.90)	0.145
Total fluid balance 1–2 h [ml] median (IQR)	6.00 (–70.00, 80.00)	7.15 (–64.00, 83.43)	–2.40 (–99.50, 60.00)	0.011
Total fluid balance 2–3 h [ml] median (IQR)	7.80 (–79.00, 84.00)	9.10 (–76.00, 88.00)	2.00 (–89.00, 69.05)	0.104
Total fluid balance 3–4 h [ml] median (IQR)	5.00 (–81.00, 75.00)	4.00 (–80.00, 79.00)	7.50 (–88.00, 62.50)	0.437
Total fluid balance 4–5 h [ml] median (IQR)	5.00 (–73.00, 75.25)	7.00 (–70.25, 80.00)	–4.40 (–88.80, 60.00)	0.052
Total fluid balance 5–6 h [ml] median (IQR)	3.80 (–85.10, 65.00)	4.00 (–85.03, 65.12)	1.90 (–87.00, 64.00)	0.613
Total fluid volume, median (IQR)	39.00 (–422.65, 484.20)	52.00 (–399.40, 502.42)	–16.10 (–530.00, 354.95)	0.004
SOFA score, median (IQR)	10.00 (6.00, 12.00)	9.00 (6.00, 12.00)	10.00 (8.00, 13.00)	< 0.001
APACHE II, median (IQR)	18.00 (14.00, 24.00)	18.00 (14.00, 25.00)	15.00 (12.00, 19.00)	< 0.001
GCS score, median (IQR)	8.00 (5.00, 14.00)	8.00 (5.00, 15.00)	6.00 (4.00, 8.00)	< 0.001
Outcome, n (%):				< 0.001
Survivors	2185 (82.0)	1803 (80.8)	382 (88.2)	
Non-survivors	480 (18.0)	429 (19.2)	51 (11.8)	
LOS, median (IQR)	6.00 (3.00, 12.00)	7.00 (3.00, 13.00)	5.00 (3.00, 10.00)	< 0.001