

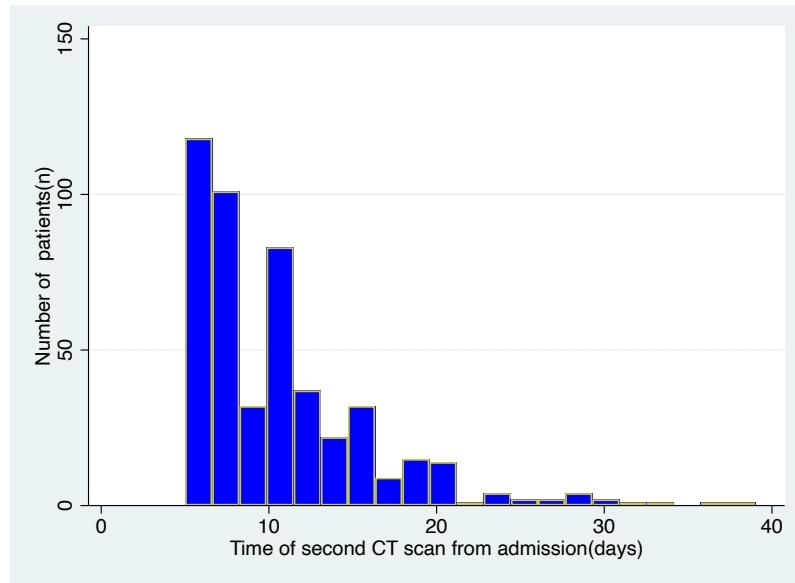


Fig.S1 Interval days between two CT scans from ICU admission

Table S1 Abdominal cross-sectional skeletal muscle area of ICUAW and no ICUAW patients

	All patients (N=482)	ICUAW group (N=271)	no ICUAW group (N=211)	<i>p</i>
Admission CT scan				
L3SMA (cm ²) mean (SD)	118.96 (32.28)	123.14 (32.42)	113.59 (31.37)	<0.001*
L3SMI (cm ² /m ²) mean (SD)	41.79 (10.29)	43.18 (10.27)	39.99 (10.05)	<0.001*
Follow up CT scan				
L3SMA (cm ²) mean (SD)	104.46 (28.27)	101.51 (26.96)	108.25 (29.50)	<0.001*
L3SMI (cm ² /m ²) mean (SD)	36.69 (9.02)	35.58 (8.53)	38.12 (9.45)	<0.001*
ΔL3SMI (%) (median [IQR])	10.56 (5.45, 17.33)	15.95 (11.89, 21.34)	4.70 (2.10, 7.01)	<0.001*

*: $p < 0.001$, ICUAW intensive care unit-acquired weakness, L3SMA skeletal muscle area at L3 slices, L3SMI skeletal muscle index at L3 slices, ΔL3SMI (admission CT L3SMI-Follow up CT L3SMI)/ admission CT L3SMI.

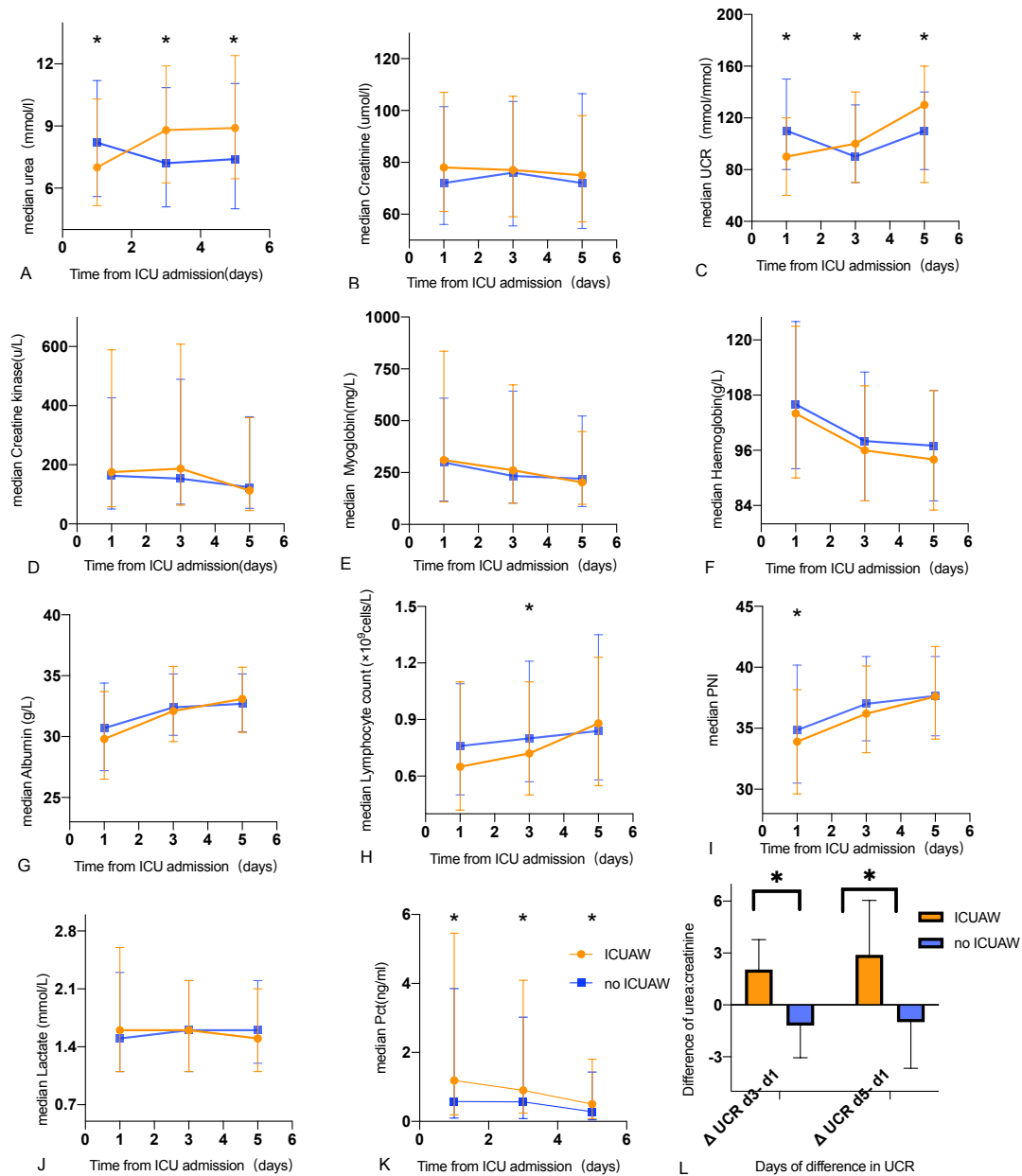


Fig.S2 Blood biochemical parameter of ICUAW and no ICUAW patients

*: $p < 0.05$, ICUAW intensive care unit-acquired weakness, UCR urea-to-creatinine ratio, Δ UCR d3-d1 UCR on day 3 minus UCR on day 1, Δ UCR d5-d1 UCR on day 5 minus UCR on day 1, PCT procalcitonin, PNI prognostic nutrition

Table S2 Biochemical and treatment measures of ICUAW and no ICUAW patients

	Day 1					Day 3					Day 5				
	All patient (N=482)	ICUAW group (N=271)	no ICUAW group (N=211)	<i>p</i>	ROAUC for ICUAW (95% CI)	All patients (N=482)	ICUAW group (N=271)	no ICUAW group (N=211)	<i>p</i>	ROAUC for ICUAW (95% CI)	All patients (N=482)	ICUAW group (N=271)	no ICUAW group (N=211)	<i>p</i>	ROAUC for ICUAW (95% CI)
Creatinine (umol/L) (median [IQR])	76.50 (59.00, 105.00)	78.00 (61.00, 107.00)	72.00 (56.00, 101.50)	0.104	0.54 (0.49, 0.60)	76.50 (58.00, 104.75)	77.00 (59.00, 105.50)	76.00 (55.50, 103.50)	0.803	0.54 (0.48,0.59)	74.00 (56.00, 99.00)	75.00 (57.00, 98.00)	72.00 (54.50, 106.50)	0.922	0.49 (0.42, 0.56)
ΔCreatinine d3- d1 (umol/L) (median [IQR])						-1.00 (-15.00, 11.00), 0.590	-2.00 (-16.00, 9.00), 0.011*	0 (-12.00, 14.00), 0.674							
ΔCreatinine d5- d1 (umol/L) (median [IQR])											-5.00 (-21.00, 11.00), 0.090	-5.00 (-24.00, 9.00), 0.002*	-1.00 (-17.00, 12.00), 0.298		
Urea (mmol/L) (median [IQR])	7.45 (5.30, 10.67)	7.00 (5.15, 10.30)	8.20 (5.60, 11.20)	0.013*	0.43 (0.38, 0.48)	8.00 (5.70, 11.78)	8.80 (6.25, 11.90)	7.20 (5.10, 10.85)	0.006*	0.59 (0.53, 0.64)	8.40 (5.60, 12.00)	8.90 (6.45, 12.40)	7.40 (5.00, 11.05)	0.001*	0.56 (0.49, 0.63)
ΔUrea d3- d1 (mmol/L) (median [IQR])						0.20 (-1.70,2.30), 0.026*	1.20 (-0.69, 3.00), 0.001	-1.00 (-2.60, 0.80), <0.001*							
ΔUrea d5- d1 (mmol/L) (median [IQR])											0.50 (-1.90, 3.50), 0.001*	1.49 (-0.89, 4.80), 0.001*	-0.59 (-3.10, 1.90), 0.026*		
UCR (median [IQR])	0.10 (0.07, 0.13)	0.09(0.06, 0.12)	0.11 (0.08, 0.15)	<0.001*	0.36(0.31, 0.41)	0.10 (0.07, 0.14)	0.10 (0.08, 0.15)	0.09 (0.07, 0.13)	0.010*	0.56 (0.50, 0.62)	0.12 (0.08, 0.15)	0.13 (0.07, 0.16)	0.11 (0.08, 0.14)	<0.001*	0.59 (0.52, 0.66)
ΔUCR d3-d1 (median [IQR])						0.46 (-1.52, 2.83)	2.04 (0.36, 3.78)	-1.20 (-3.06, 0.14)	<0.001*	0.79 (0.75, 0.84)					

ΔUCR d5-d1 (median [IQR])											1.39 (-1.66, 5.11)	2.89 (0.66, 6.04)	-0.99 (-3.66, 1.52)	<0.001*	0.76 (0.72, 0.80)
Creatine kinase (u/L) (median [IQR])	171.50 (52.00, 486.50)	175.00 (52.00, 589.00)	163.00 (50.50, 426.50)	0.429	0.52 (0.47, 0.57)	172.50 (63.75, 563.50) N=456	187.00 (63.50, 608.00) N=255	153.00 (67.00, 489.00) N=201	0.492	0.51 (0.45, 0.57)	120.50 (47.00, 363.00) N=420	113.00 (45.00, 359.75) N=238	124.00 (53.00, 362.50) N=182	0.870	0.49 (0.42, 0.56)
Myoglobin (mg/L) (median [IQR])	307.50 (110.00, 692.75)	310.00 (109.00, 835.50)	299.00 (112.50,609.00)	0.514	0.52 (0.46, 0.57)	245.00 (102.00, 672.00) N=401	261.50 (102.00, 673.50) N=226	234.00 (103.00, 643.50) N=175	0.704	0.50 (0.45, 0.56)	213.00 (93.00, 492.00) N=285	203.00 (97.00, 448.00) N=167	220.50 (86.25, 523.50) N=118	0.932	0.49 (0.42, 0.56)
Hemoglobin (g/L) (median [IQR])	106.00 (91.00, 123.00)	104.00 (90.00, 123.00)	106.00 (92.00, 124.00)	0.410	0.48 (0.43, 0.53)	96.00 (85.00, 111.00)	96.00 (85.00, 110.00)	98.00 (85.00, 113.00)	0.393	0.46 (0.41, 0.52)	95.00 (84.00, 109.00)	94.00 (83.00, 109.00)	97.00 (85.00, 109.00)	0.661	0.49 (0.42, 0.56)
Lactate (mmol/L) (median [IQR])	1.60 (1.10, 2.50)	1.60 (1.10, 2.60)	1.50 (1.10, 2.30)	0.123	0.54 (0.49, 0.59)	1.60 (1.10, 2.20)	1.60 (1.10, 2.20)	1.60 (1.10, 2.20)	0.503	0.52 (0.46, 0.57)	1.60 (1.10, 2.20)	1.50(1.10, 2.10)	1.60(1.20,2.20)	0.263	0.44(0.37,0.51)
PCT (ng/ml) (median [IQR])	0.89 (0.14, 4.81)	1.19 (0.19, 5.46)	0.58 (0.10, 3.85)	0.019*	0.56 (0.51, 0.62)	0.80 (0.12, 3.50)	0.90 (0.24, 4.09)	0.57 (0.08, 3.02)	0.037*	0.57 (0.51, 0.62)	0.43 (0.05, 1.72)	0.50 (0.08, 1.80)	0.28 (0.05, 1.43)	0.042*	0.53 (0.46, 0.60)
Lymphocyte count (×10 ⁹ cells/L) (median [IQR])	0.70 (0.47, 1.09)	0.65 (0.42, 1.10)	0.76 (0.50, 1.09)	0.069	0.45 (0.39, 0.50)	0.76 (0.52, 1.11)	0.72 (0.50, 1.10)	0.80 (0.57, 1.21)	0.031*	0.42 (0.36, 0.47)	0.85 (0.57, 1.29)	0.88 (0.55, 1.23)	0.84 (0.58, 1.35)	0.798	0.51 (0.43, 0.58)

Albumin (g/L) (median [IQR])	30.20 (27.00, 34.00)	29.80 (26.50, 33.70)	30.70 (27.20, 34.40)	0.102	0.46 (0.41, 0.51)	32.25 (29.80, 35.68)	32.10 (29.60, 35.75)	32.40 (30.10, 35.15)	0.804	0.48 (0.42, 0.54)	32.80 (30.40, 35.50)	33.10 (30.35, 35.70)	32.70 (30.40, 35.15)	0.461	0.46 (0.41, 0.54)
PNI (median [IQR])	34.35 (30.20, 38.75)	33.90 (29.62, 38.17)	34.85 (30.50, 40.17)	0.038*	0.44 (0.39, 0.49)	36.77 (33.65, 40.30)	36.20 (33.00, 40.10)	37.00 (33.97, 40.88)	0.133	0.44 (0.38, 0.49)	37.65 (34.20, 41.34)	37.60 (34.12, 41.70)	37.65 (34.38, 40.88)	0.807	0.49 (0.41, 0.56)
Types of Nutrition (n)%				0.767					0.319					0.222	
Non	367 (76.1)	209 (77.1)	158 (74.9)			76 (15.8)	46 (17.0)	30 (14.2)			38 (7.9)	25 (9.2)	13 (6.2)		
EN	112 (23.2)	60 (22.1)	52 (24.6)			376 (78.0)	204 (75.3)	172 (81.5)			400 (83.0)	220 (81.2)	180 (85.3)		
PN	3 (0.6)	2 (0.7)	1 (0.5)			24 (5.0)	17 (6.3)	7 (3.3)			28 (5.8)	14 (5.2)	14 (6.6)		
EN+PN	0 (0)	0 (0)	0 (0)			6 (1.2)	4 (1.5)	2 (0.9)			16 (3.3)	12 (4.4)	4 (1.9)		
Calorie intake (kcal/kg/24h) (median [IQR])	0 (0, 0)	0 (0, 0)	0 (0, 0)	0.757	0.49 (0.45, 0.53)	12.5 (6.25, 16.67)	12.5 (5.56, 16.67)	12.5 (6.67, 16.67)	0.537	0.48 (0.43, 0.53)	16.67 (11.76, 21.42)	15.63 (11.11, 21.43)	16.67 (12.5 0, 21.43)	0.127	0.46 (0.41, 0.51)
Glucose (mmol/L) (median [IQR])	8.70 (6.90, 12.38)	8.90 (6.80, 11.75)	8.60 (7.00, 12.55)	0.769	0.49 (0.44, 0.55)	8.80 (6.80, 11.78)	8.80 (6.90, 11.75)	8.90 (6.75, 11.70)	0.903	0.48 (0.43, 0.54)	8.22 (6.60, 10.80)	8.30 (6.70, 11.25)	8.20 (6.50, 10.40)	0.237	0.49 (0.42, 0.56)
Insulin (IU/24h) (median [IQR])	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.621	0.51 (0.48, 0.55)	0.00 (0.00, 8.00)	0.00 (0.00, 10.00)	0.00 (0.00, 4.00)	0.552	0.52 (0.47, 0.56)	0.00 (0.00, 4.00)	0.00 (0.00, 4.00)	0.00 (0.00, 0.00)	0.985	0.49 (0.43, 0.55)
MAP (mmHg) (median [IQR])	75.00 (71.00, 78.00)	75.00 (71.50, 78.00)	76.00 (70.00, 79.00)	0.508	0.48 (0.43, 0.54)	76.00 (73.00, 80.00)	76.00 (73.00, 80.00)	77.00 (72.00, 80.00)	0.819	0.48 (0.42, 0.54)	78.00 (74.00, 81.00)	77.00 (74.00, 80.00)	78.00 (74.50, 81.00)	0.369	0.48 (0.41, 0.55)
Sum VDI (NEE mg) (median [IQR])	3.60 (0.00, 12.60)	4.20 (0.00, 14.40)	2.70 (0.00, 12.00)	0.621	0.51 (0.46, 0.56)	3.60 (0.00, 16.80)	3.84 (0.00, 16.00)	3.60 (0.00, 17.16)	0.978	0.49 (0.43, 0.54)	0.00 (0.00, 11.52)	0.00 (0.00, 11.52)	0.00 (0.00, 13.68)	0.584	0.48 (0.41, 0.55)

Neuromuscular blocker use. n (%)	32 (6.64)	18 (6.64)	14 (6.63)	0.499	0.50 (0.49, 0.52)										
RASS score (median [IQR])	-1 (-2, 0)	-1 (-2, 0)	-1 (-2, 0)	0.086	0.46 (0.41, 0.51)	-1 (-2, 0)	-1 (-2, 0)	-1 (-2, 0)	0.641	0.49 (0.44, 0.55)	0 (-2, 0)	0 (-2, 0)	0 (-2, 0)	0.404	0.50 (0.43, 0.56)

* $p<0.05$, ICUAW intensive care unit-acquired weakness, CI confidence interval, IQR interquartile range, AUROC area under the receiver operating characteristic, ICUAW intensive care unit-acquired weakness, CI confidence interval, UCR urea-to-creatinine ratio, Δ Creatinine d3-d1 creatinine on day 3 minus creatinine on day 1, Δ Creatinine d5-d1 creatinine on day 5 minus creatinine on day 1, Δ Urea d3-d1 urea on day 3 minus urea on day 1, Δ Urea d5-d1 urea on day 5 minus urea on day 1, Δ UCR d3-d1 UCR on day 3 minus UCR on day 1, Δ UCR d5-d1 UCR on day 5 minus UCR on day 1, PCT procalcitonin, PNI prognostic nutritional index, EN enteral nutrition, PN parenteral nutrition, MAP mean arterial pressure, Sum VDI=24-hour vasopressor dose equivalence, NEE norepinephrine equivalent dose, be calculated as [norepinephrine ($\mu\text{g}/\text{min}$)] + [dopamine ($\mu\text{g}/\text{kg}/\text{min}$) $\div$ 2] + [epinephrine ($\mu\text{g}/\text{min}$)] + [phenylephrine ($\mu\text{g}/\text{min}$) $\div$ 10], RASS score, richmond agitation-sedation scale score.

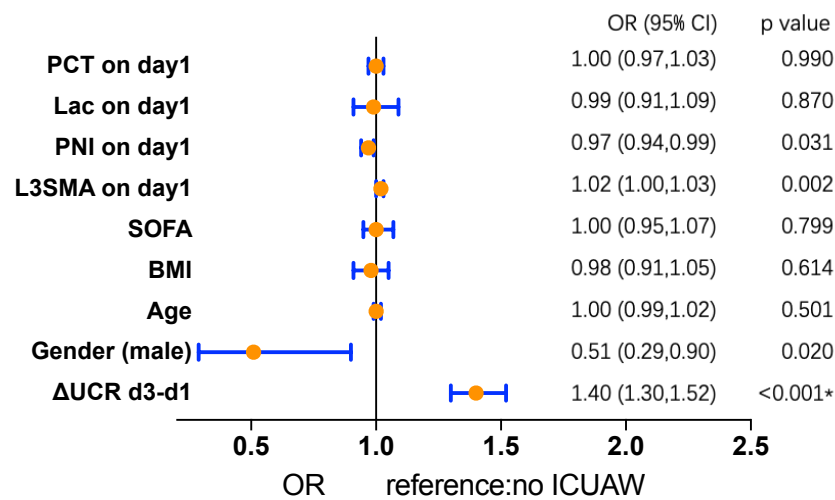


Fig S3 Effect of Δ UCR d3-d1 on the risk of ICUAW

*: $p < 0.001$, The reference group was no ICUAW. OR odds ratio, CI Confidence interval, SOFA sequential organ failure assessment, BMI body mass index, PCT procalcitonin, PNI prognostic nutritional index, L3SMA1 skeletal muscle area at L3 slices on admission day, UCR urea-to-creatinine ratio, Δ UCR d3-d1 UCR on day 3 minus UCR on day 1.

Table S3 AUROC and adjusted AUROC for predicting ICUAW in the sepsis patients

	All patient (N=482)	ICUAW group(N=271)	no ICUAW group (N=211)	<i>p</i>	AUROC for ICUAW (95% CI)	Adjusted AUROC for ICUAW (95% CI)
UCR on day1 (median [IQR])	0.10 (0.07, 0.13)	0.09(0.06, 0.12)	0.11 (0.08, 0.15)	<0.001*	0.36 (0.31, 0.41)	0.41 (0.36, 0.47)
UCR on day3 (median [IQR])	0.10 (0.07, 0.14)	0.10 (0.08, 0.15)	0.09 (0.07, 0.13)	0.010*	0.56 (0.50, 0.62)	0.61 (0.55, 0.67)
UCR on day5 (median [IQR])	0.12 (0.08, 0.15)	0.13 (8.97, 0.16)	0.11 (0.08, 0.14)	<0.001*	0.59 (0.52, 0.66)	0.63 (0.58, 0.69)
Δ UCR d3-d1 (median [IQR])	0.46 (-1.52, 2.83)	2.04 (0.36, 3.78)	-1.20 (-3.06, 0.14)	<0.001*	0.78 (0.74, 0.83)	0.77 (0.75, 0.83)
Δ UCR d5-d1 (median [IQR])	1.39 (-1.66, 5.11)	2.89 (0.66, 6.04)	-0.99 (-3.66, 1.52)	<0.001*	0.74 (0.70, 0.78)	0.75 (0.71, 0.79)

*: $p < 0.05$, ICUAW intensive care unit-acquired weakness, AUROC area under the receiver operating characteristic, OR odds ratio, CI Confidence interval, UCR urea-to-creatinine ratio, Δ UCR d3-d1 UCR on day 3 minus UCR on day 1, Δ UCR d5-d1 UCR on day 5 minus UCR on day 1.