Literature Update

Critical Care BC

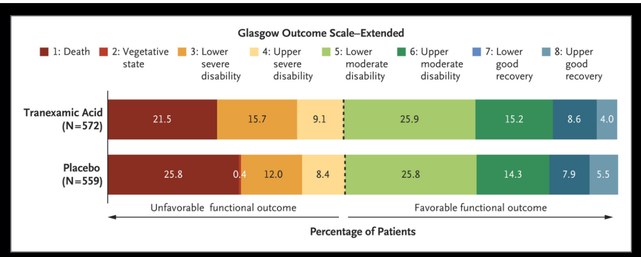
Sept 2023

Review

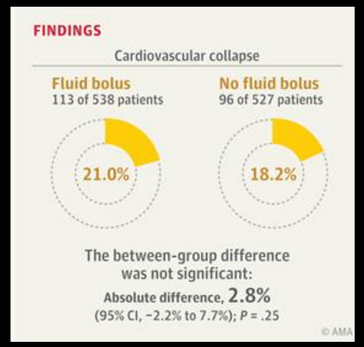
ORIGINAL ARTICLE

Prehospital Tranexamic Acid for Severe Trauma

The PATCH-Trauma Investigators and the ANZICS Clinical Trials Group*



PREPARE II



Pro-MEDIC Trial

tic Melatonin &Delirium

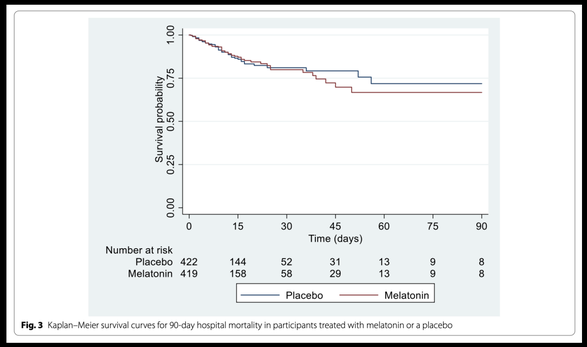
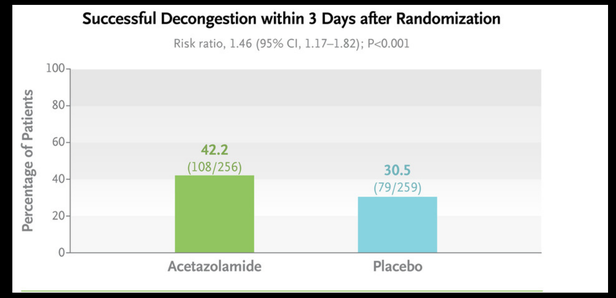


Fig. 3 Kaplan–Meier survival curves for 90-day hospital mortality in participants treated with melatonin or a placebo

ADVOR



This Month

Tight Glucose Control

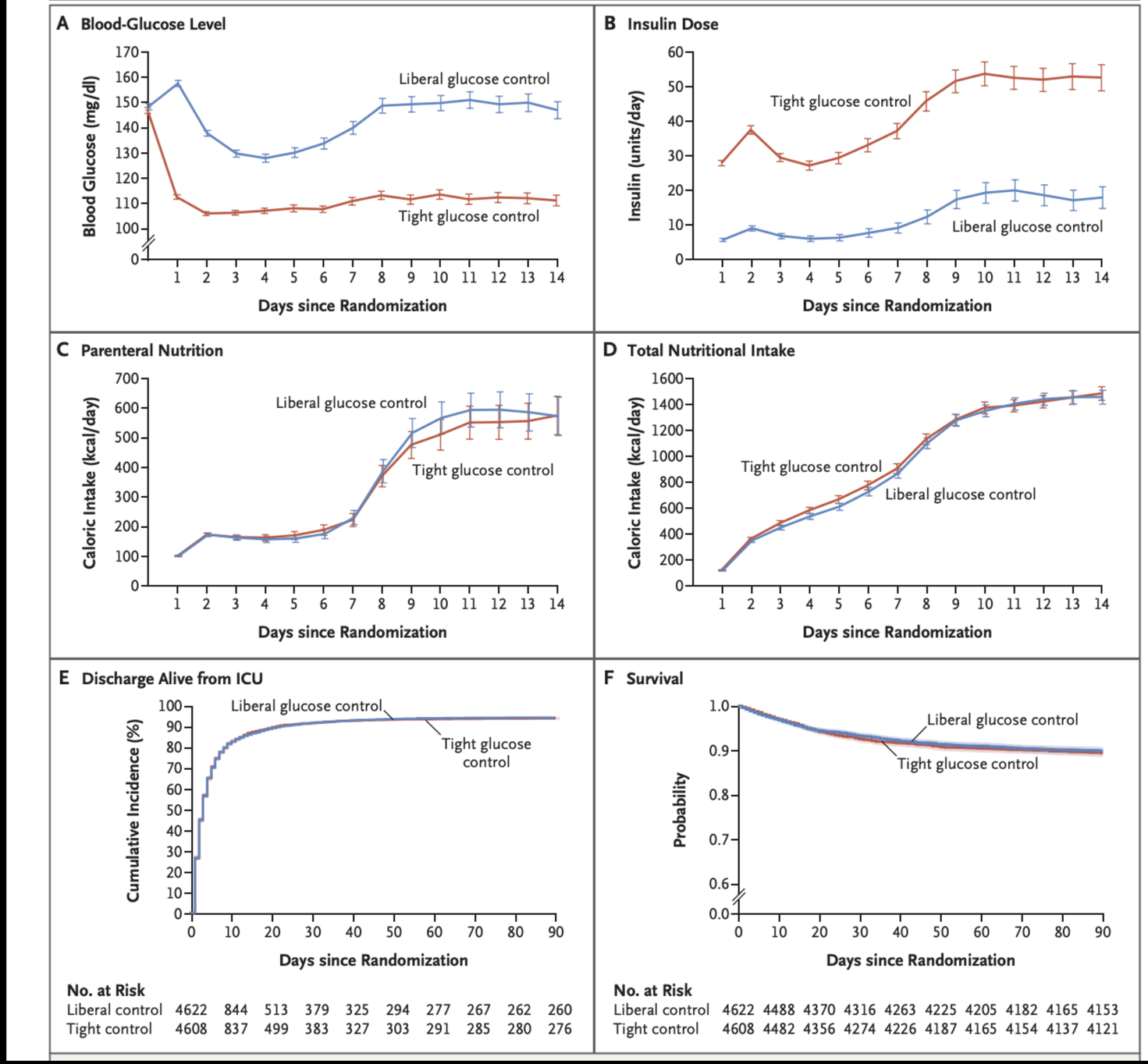
Again!

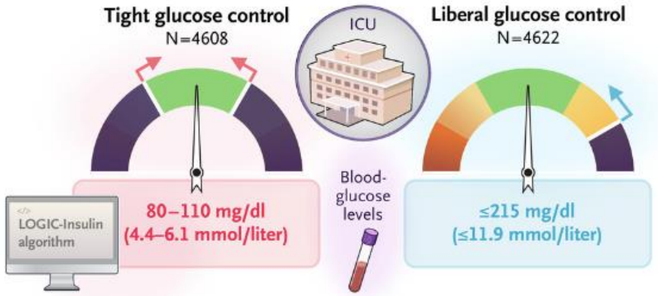
The NEW ENGLAND JOURNAL of MEDICINE

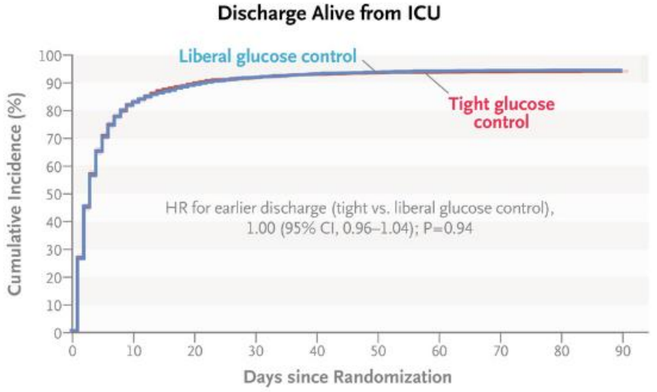
ORIGINAL ARTICLE

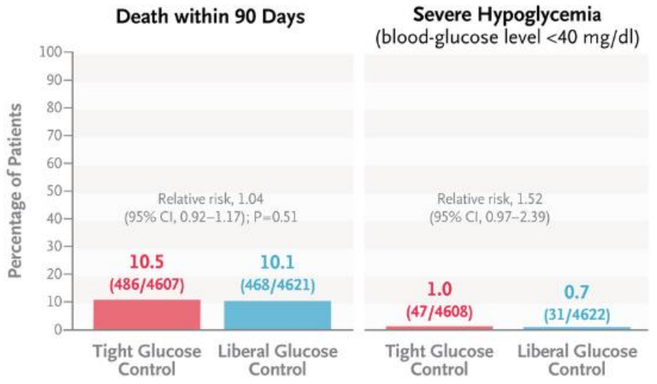
Tight Blood-Glucose Control without Early Parenteral Nutrition in the ICU

J. Gunst, Y. Debaveye, F. Güiza, J. Dubois, A. De Bruyn, D. Dauwe, E. De Troy, M.P. Casaer, G. De Vlieger, R. Haghedooren, B. Jacobs, G. Meyfroidt, C. Ingels, J. Muller, D. Vlasselaers, L. Desmet, L. Mebis, P.J. Wouters, B. Stessel, L. Geebelen, J. Vandenbrande, M. Brands, I. Gruyters, E. Geerts, I. De Pauw, J. Vermassen, H. Peperstraete, E. Hoste, J.J. De Waele, I. Herck, P. Depuydt, A. Wilmer, G. Hermans, D.D. Benoit, and G. Van den Berghe, for the TGC-Fast Collaborators*









CONCLUSIONS

Among critically ill patients in the ICU who had not received early parenteral nutrition, tight blood-glucose control did not affect either the length of time that ICU care was needed or patient mortality.

Obesity Paradox

Elevated BMI and ECMO

Check for updates

ORIGINAL ARTICLE

Mortality in Patients with Obesity and Acute Respiratory Distress Syndrome Receiving Extracorporeal Membrane Oxygenation

The Multicenter ECMObesity Study

Darya Rudym[1*], Tài Pham[2,3*], Craig R. Rackley[4], Giacomo Grasselli[6,7], Michaela Anderson[8], Matthew R. Baldwin[9], Jeremy Beitler[9,10], Cara Agerstrand[9,10], Alexis Serra[9], Lisle A. Winston[13], Desiree Bonadonna[5], Natalie Yip[9,10], Logan J. Emerson[14], Amy Dzierba[10,11], Joshua Sonett[12], Darryl Abrams[9,10], Niall D. Ferguson[15,16,17,18,19,20], Matthew Bacchetta[21], Matthieu Schmidt[22,23‡], and Daniel Brodie[24‡]; for the ECMObesity Study Group on Behalf of the International ECMO Network (ECMONet)

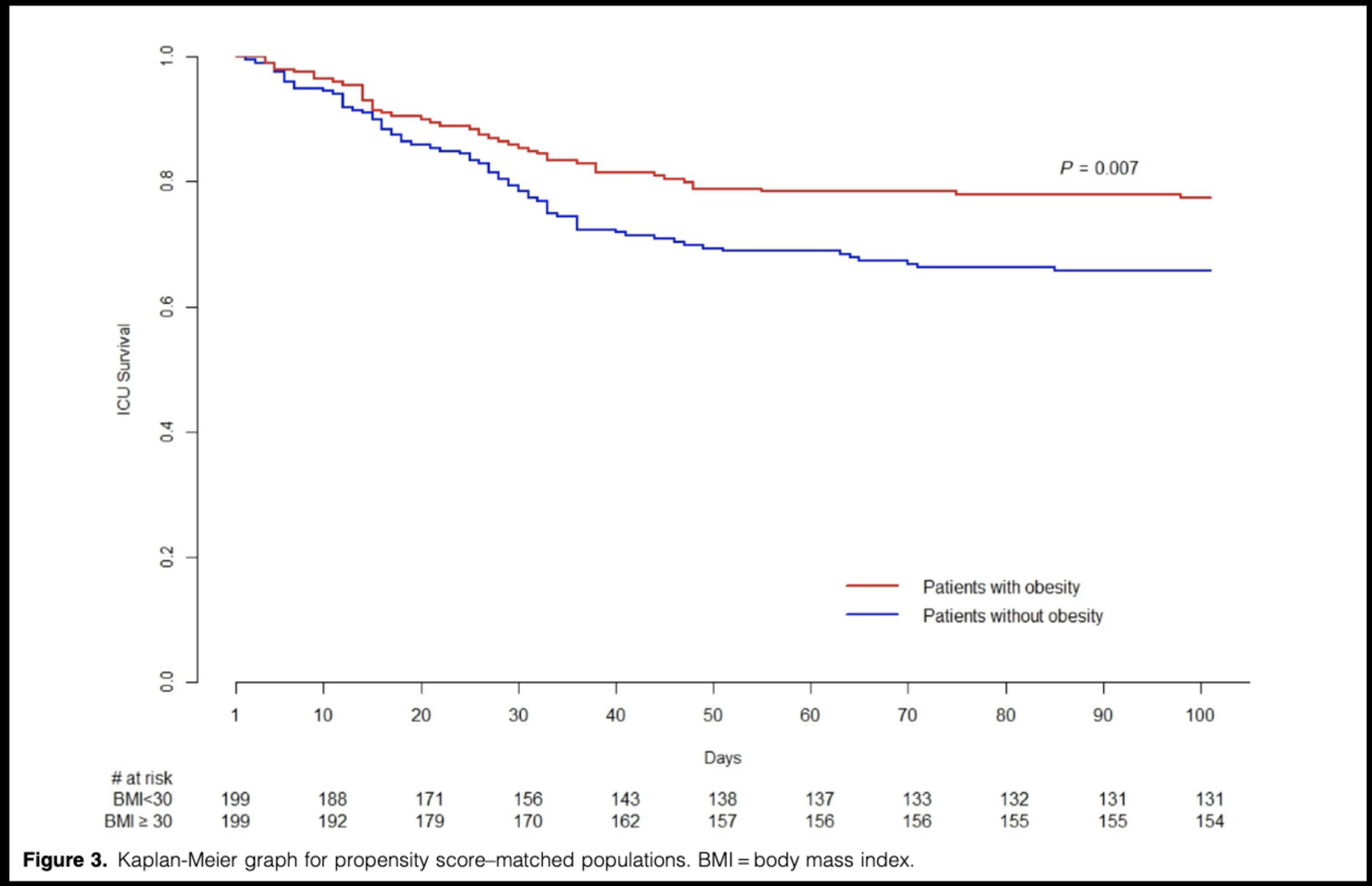


Figure 3. Kaplan-Meier graph for propensity score–matched populations. BMI = body mass index.

Table 1. Demographic, Clinical, and Mechanical Ventilation Characteristics before Extracorporeal Membrane Oxygenation Cannulation, for the Overall Cohort and Stratified by Obesity

	All Patients ($n=790$)	BMI (kg/cm^2)		*P* Value	SMD
		Patients without Obesity ($n=470$)	Patients with Obesity ($n=320$)		
Age, yr	44.2 ± 15.5	44.1 ± 16.8	44.4 ± 13.4	0.753	0.022
Sex				0.018	0.176
Female	286 (36.2)	154 (32.8)	132 (41.2)	—	—
Male	504 (63.8)	316 (67.2)	188 (58.8)	—	—
BMI, kg/cm^2	30.3 ± 9.2	24.6 ± 3.3	38.8 ± 8.3	<0.001	2.255
BMI ⩾ 30 kg/cm^2	320 (40.5)	0 (0.00)	320 (100)	<0.001	—
BMI ⩾ 35 kg/cm^2	193 (24.4)	0 (0.00)	193 (60.3)	<0.001	—
BMI ⩾ 40 kg/cm^2	110 (13.9)	0 (0.00)	110 (34.4)	<0.001	—
APACHE II score	23.3 ± 9.7 ($n=660$)	23.9 ± 10.1 ($n=425$)	22.2 ± 8.9 ($n=235$)	0.028	0.175
SOFA score	10.0 ± 4.1 ($n=772$)	10.0 ± 4.4 ($n=461$)	9.9 ± 3.7 ($n=311$)	0.795	0.019
Duration of IMV before ECMO, d	2.00 (1.00–6.00)	2.00 (1.00–6.00)	3.00 (1.00–6.00)	0.165	0.020
Ventilation parameters					
F_{IO_2}, mm Hg	100 (100–100) ($n=762$)	100 (100–100) ($n=447$)	100 (100–100) ($n=315$)	0.054	0.155
PEEP, cm H_2O	14 (10–16) ($n=717$)	12 (10–15) ($n=423$)	15 (12–18) ($n=294$)	<0.001	0.466
V_T, ml/kg PBW	6.33 ± 1.88 ($n=419$)	6.13 ± 1.63 ($n=287$)	6.79 ± 2.26 ($n=132$)	0.003	0.335
Plateau pressure, cm H_2O	32 [29–35] ($n=529$)	31 [28–35] ($n=331$)	32 [30–36] ($n=198$)	0.001	0.328
Driving pressure, cm H_2O*	18 [14–22] ($n=274$)	18 [14–23] ($n=148$)	18 [14–22] ($n=126$)	0.951	0.006
Respiratory rate, breaths/min	25.0 ± 7.6 ($n=686$)	24.5 ± 7.7 ($n=402$)	25.8 ± 7.3 ($n=284$)	0.023	0.176
Precannulation arterial blood gas values					
pH	7.24 ± 0.14 ($n=735$)	7.24 ± 0.14 ($n=433$)	7.24 ± 0.14 ($n=302$)	0.774	0.021
Pa_{CO_2}, mm Hg	62.7 ± 26.7 ($n=628$)	61.0 ± 23.6 ($n=402$)	65.6 ± 31.2 ($n=226$)	0.055	0.166
Worst Pa_{O_2}:F_{IO_2} ratio	68.4 ± 30.3 ($n=755$)	71.5 ± 31.1 ($n=447$)	63.9 ± 28.6 ($n=308$)	0.001	0.257
Rescue therapy before ECMO					
Neuromuscular blockade	499 (63.2)	280 (59.6)	219 (68.4)	0.014	0.185
Inhaled nitric oxide	234 (29.6)	141 (30.0)	93 (29.1)	0.838	0.021
Prone positioning	152 (19.2)	94 (20.0)	58 (18.1)	0.572	0.048
HFOV	36 (4.6)	21 (4.5)	15 (4.7)	1.000	0.010
RRT before ECMO	226 (28.6)	131 (27.9)	95 (29.7)	0.635	0.040

Table 3. Variables Associated with ICU Death in Patients Supported by Extracorporeal Membrane Oxygenation in Multivariable Analysis Examining the Association of Body Mass Index as a Continuous Variable with Risk of Death in the ICU

	Odds Ratio for ICU Death (95% CI)	*P* Value
BMI, per 1 kg/m^2 increase	0.97 (0.95–1.00)	0.023
Age, for 10-yr increase	1.36 (1.21–1.53)	<0.001
Se[illegible]	0.93 (0.64–1.34)	0.690
Days of IMV before ECMO, for 1 d	1.07 (1.04–1.12)	<0.001
PEEP before ECMO, for [illegible] increase	0.96 (0.92–1.00)	0.035
pH before ECMO, for 0.01 increase	0.98 (0.97–0.99)	<0.001
PF ratio before ECMO, for [illegible] increase	1.00 (0.94–1.06)	0.951
Use of inhaled nitric oxide before ECMO	1.75 (1.13–2.70)	0.011
Use of NMBA before ECMO	0.73 (0.49–1.08)	0.118
Use of prone positioning before ECMO	0.87 (0.54–1.40)	0.578
Need for dialysis before ECMO	1.62 (1.10–2.39)	0.015

Improving CVC

Biplane for CVC Placement

Li *et al. Critical Care* (2023) 27:366
https://doi.org/10.1186/s13054-023-04635-y

Critical Care

RESEARCH Open Access

Single-plane versus real-time biplane approaches for ultrasound-guided central venous catheterization in critical care patients: a randomized controlled trial

Ying-Ying Li[1,2], Yi-Hao Liu[1], Lin Yan[2], Jing Xiao[2], Xin-Yang Li[2], Jun Ma[2], Li-Gang Jia[2], Rui Chen[3], Chao Zhang[2], Zhen Yang[2], Ming-Bo Zhang[2*] and Yu-Kun Luo[2*]

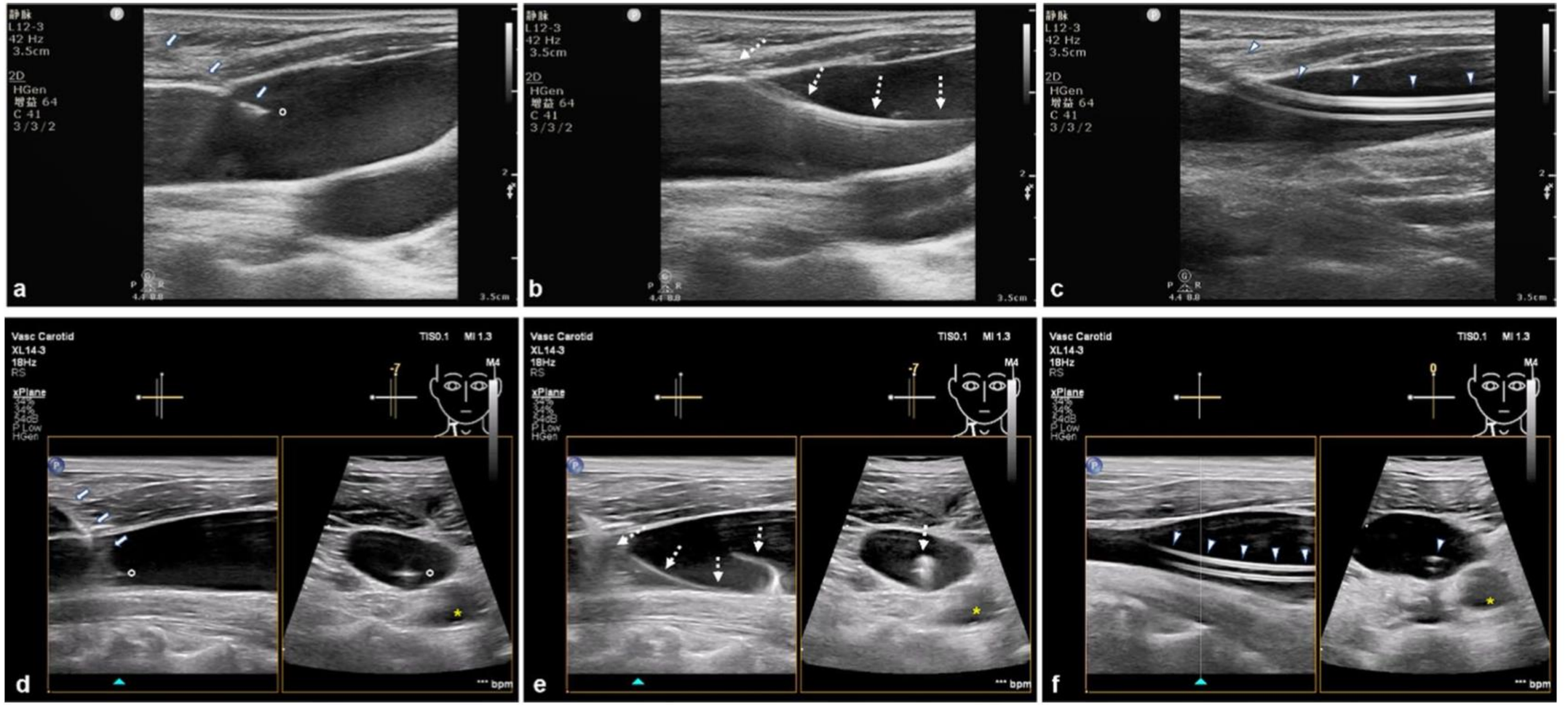


Fig. 2 Upper panels show **a** 91-year male underwent the internal jugular vein catheterization using the single-plane approach, with two puncture attempts, with cannulation time of 335 s. Lower panels show a 69-year female underwent the internal jugular vein catheterization using the x-plane approach (simultaneous imaging both longitudinal and transverse views) with cannulation time of 179.6 s with the first-puncture single-pass catheterization success. **a**, **d** represents the needle was punctured into the target vein; **b**, **e** represents the guidewire was inserted into the target vein; **c**, **f** shows that the catheter was located within the vein after catheterization. *White arrows* show the needle track, *white circle* point of the needle, *asterisk* the common carotid artery, *dashed arrows* the guidewire, *white triangle* the catheter

Table 2 Comparisons between single-plane and x-plane group for outcomes of central venous catheterization

	Single-plane	x-Plane	*P*	RR	95% CI
IJVC	*n* = 87	*n* = 95			
First-puncture success	65 (74.7%)	87 (91.6%)	0.002	1.226	1.069–1.405
First-puncture single-pass catheterization success	60 (69.0%)	83 (87.4%)	0.003	1.267	1.079–1.487
Successful final catheterization	87/87 (100%)	95/95 (100%)	-		
Puncture attempts (n)	1 [1–2 (1–4)]	1 [1–1 (1–2)]	< 0.001		
Puncture time (s)	70 [45–143 (18–1,079)]	43 [23–100 (9–802)]	< 0.001		
Total catheterization time	311 [243–401 (136–1,223)]	205 [162–283 (66–1,526)]	< 0.001		
Operator confidence score	2 [1–2 (1–3)]	2 [2–3 (1–3)]	0.008		
FVC	n = 41	n = 33			
First-puncture success	28 (68.3%)	30 (90.9%)	0.019	1.331	1.053–1.684
First-puncture single-pass catheterization success	28 (68.3%)	30 (90.9%)	0.019	1.331	1.053–1.684
Successful final catheterization	41/41 (100%)	33/33 (100%)	-		
Puncture attempts (n)	1 [1–2 (1–4)]	1 [1–1 (1–3)]	0.029		
Puncture time	120 [52–248 (25–780)]	56 [34–82 (7.9–1,578.6)]	0.001		
Total catheterization time	340 [246–499 (130–944)]	228 [193–306 (66 –1,669)]	< 0.001		
Operator confidence score	2 [2–2 (1–3)]	3 [2–3 (1–3)]	< 0.001		

***Fisher's Exact Test**

IJVC **Internal jugular vein catheterization;** ***FVC*** **Femoral vein catheterization;** ***RR*** **Relative risk,** ***CI*** **Confidence interval**

Table 3 Catheterization-related complications in patients in the single-plane and x-plane groups

	Single-plane (n = 128)	x-Plane (n = 128)	*P*
IJVC	n = 87	n = 95	
Immediate complications, n (%)	25 (28.7%)	10 (10.5%)	0.002
Undesired puncture	22 (25.3%)	8 (8.4%)	0.002
Hematoma	7 (8.0%)	3 (3.2%)	0.198*
Posterior IJV wall puncture	8 (9.2%)	4 (4.2%)	0.176
Arterial puncture	0	0	-
Pneumothorax	0	0	-
Hemothorax	0	0	-
Late complications, n (%)	11 (12.6%)	8 (8.4%)	0.352
Venous thrombosis	9 (10.3%)	3 (3.2%)	0.051
CLA-BSI	2 (2.1%)	0	0.227*
FVC	*n* = 41	*n* = 33	
Immediate complications, n (%)	14 (34.1%)	3 (9.1%)	0.011
Undesired puncture	11 (26.8%)	2 (6.1%)	0.020
Hematoma	3 (7.3%)	1 (3.0%)	0.624*
Posterior FV wall puncture	0	0	-
Arterial puncture	5 (12.2%)	0	0.061*
Late complications, n (%)	4 (9.8%)	0	0.124*
Venous thrombosis	2 (4.9%)	0	0.499*
CLA-BSI	2 (4.9%)	0	0.499*

Axillary Art Lines

CLINICAL INVESTIGATION

Infraclavicular, Ultrasound-Guided Percutaneous Approach to the Axillary Artery for Arterial Catheter Placement: A Randomized Trial

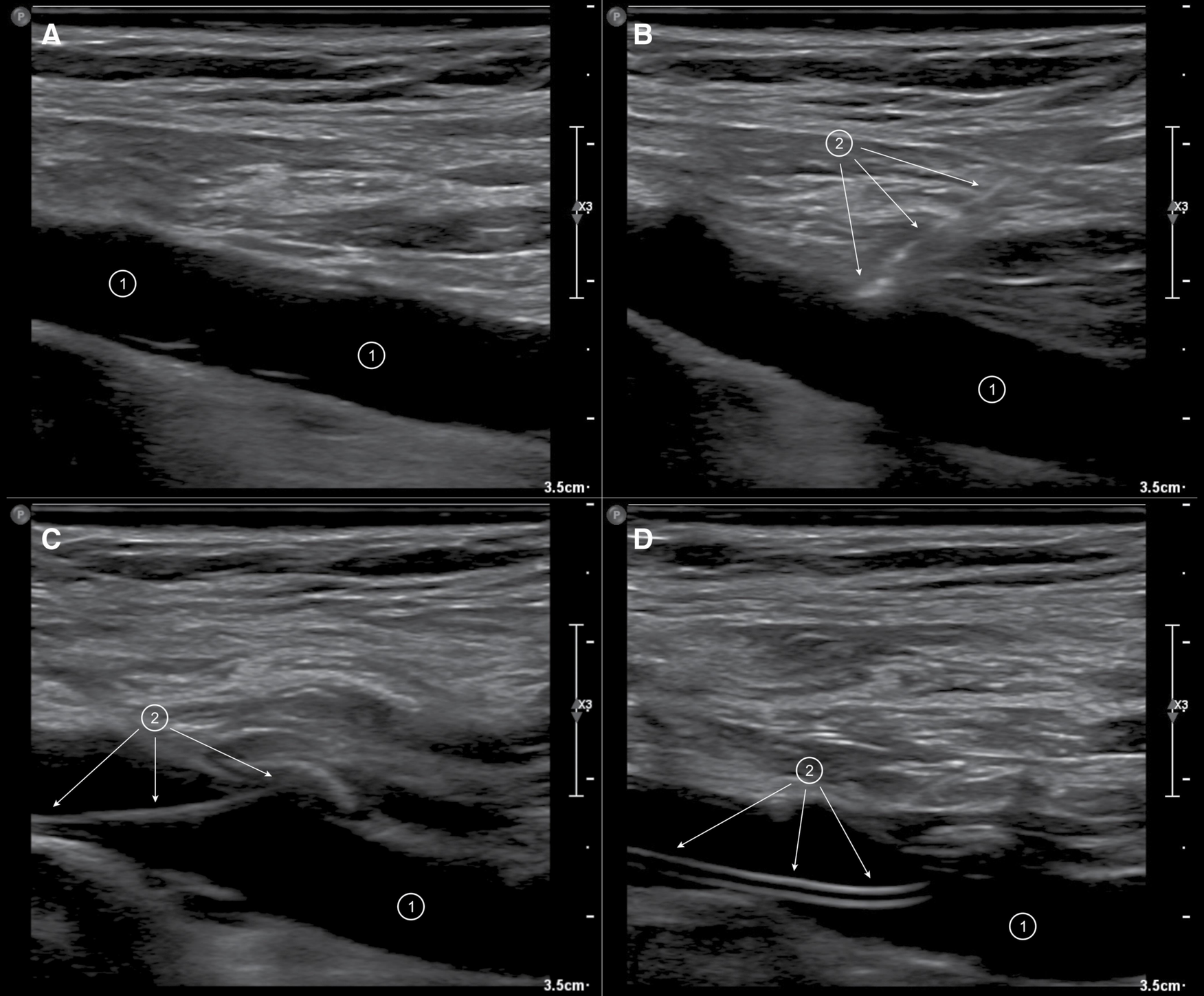

A
1
1
3.5cm
B
2
1
3.5cm
C
2
1
3.5cm
D
2
1
3.5cm

TABLE 2.
Secondary Outcomes and Complications in Patients in the Axillary and Femoral Groups

	A Group ($n = 55$)	F Group ($n = 54$)	p
Secondary outcomes			
Puncture success rate	55 (100.0)	54 (100.0)	< 1.000
First-pass success rate	38 (69.1)	40 (74.1)	0.564
Number of arterial puncture attempts			
Two attempts	13 (23.6)	10 (18.5)	0.513
Three attempts	4 (7.3)	4 (7.4)	< 1.000
Procedural complications			
Puncture of the opposite wall of the artery	3 (5.5)	8 (14.8)	0.105
Puncture of the adjacent vein	0 (0.0)	2 (3.7)	0.243
Periarterial blood extravasation	18 (32.7)	11 (20.4)	0.144
Postprocedural complications			
Ischemia of the extremity	1 (1.9)	1 (1.9)	< 1.000

Values are number (proportion).

Reasons for catheter removal, *n* (%)			
End of monitoring	42 (79.2)	50 (96.2)	0.058
Dysfunction of arterial pressure curve	8 (15.1)	1 (1.9)	0.016
Catheter clotting	1 (1.9)	0 (0.0)	0.319
Inadvertent spontaneous removal	2 (3.9)	1 (1.9)	0.569
Days of catheter maintenance, median (interquartile range)	5 (2–9)	4 (2–9)	0.898

Keppra Dosing

750mg-1000mg

ONLINE CLINICAL INVESTIGATION

Optimal Dosing of Levetiracetam for Seizure Prophylaxis in Critically Ill Patients: A Prospective Observational Study

Just for fun…

JAMA®

QUESTION What is the efficacy and safety of single-dose psilocybin in patients with major depressive disorder?

CONCLUSION A 25-mg dose of psilocybin was associated with a clinically significant sustained reduction in depressive symptoms and functional disability, without serious adverse events.

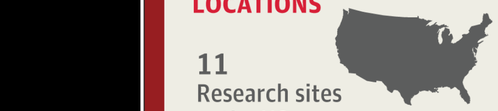
POPULATION

52 Women
52 Men

Adults aged 21-65 years with major depressive disorder with current episode ≥60 days

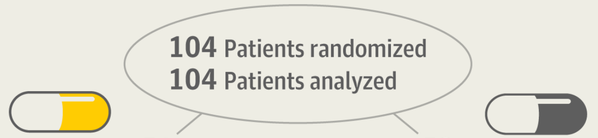
Mean age: 41 years

LOCATIONS



11
Research sites in the US

INTERVENTION



PRIMARY OUTCOME

Difference in change in mean Montgomery-Asberg Depression Rating Scale (MADRS) score from baseline to day 43 (range, 0-60; higher scores indicate more severe depression)

FINDINGS

Mean change in score from baseline

Psilocybin
−19.1 (95% CI, −22.7 to −15.5)

Niacin
−6.8 (95% CI, −10.5 to −3.1)

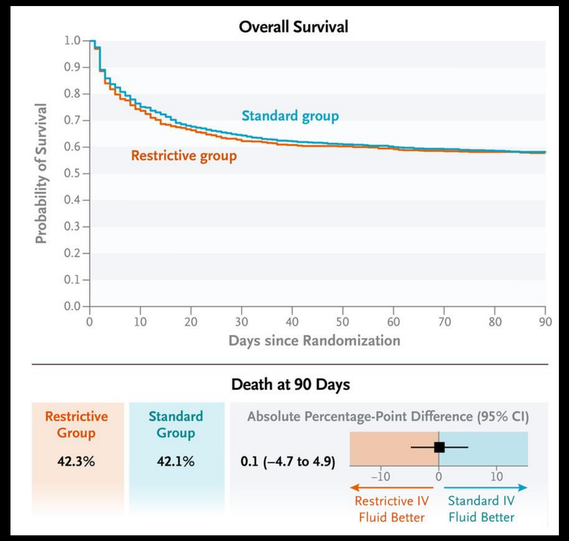
Psilocybin was associated with significantly reduced MADRS scores vs niacin:

Mean between-group difference in change in score,
−12.3 (95% CI, −17.5 to −7.2); *P* <.001

Raison CL, Sanacora G, Woolley J, et al. Single-dose psilocybin treatment for major depressive disorder: a randomized clinical trial. *JAMA*. Published online August 31, 2023. doi:10.1001/jama.2023.14530

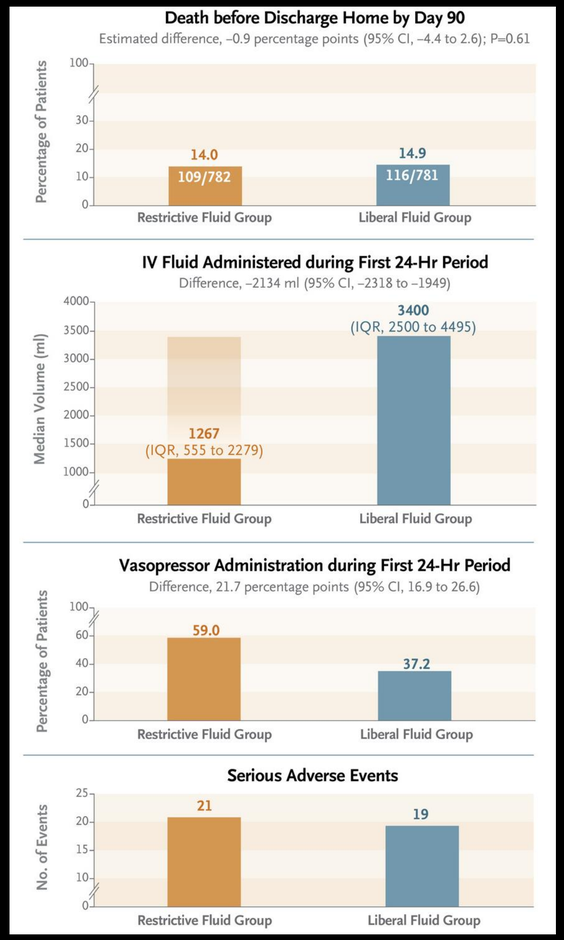
CLASSICS

Restrictive vs standard fluid in septic shock (1.8 vs 3.8L)



CLOVERS

Like CLASSIC, but restrictive added vasopressors early



WATERFALL