

Online Data Supplement for:

Predicting 30-day mortality in patients with Sepsis; an exploratory analysis of process of care and patient characteristics

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Table E1 Age and sex of patients with severe sepsis and univariate association with 30 day mortality

Variable	Dead (N=119)	Alive (N=336)	OR ^a	95%CI ^b	P-value
	% (n)	% (n)			
Age (years) mean (SD ^c)	12.1 (70.3)	17.4 (61.8)			<0.001
Sex					
Female N(%)	25.9 (50)	74.1 (143)	1.00		
Male N(%)	26.3 (69)	73.7 (193)	1.02	0.67-1.56	0.92

^a Odds Ratio

^b 95% Confidence Interval

^c Standard Deviation

Table E2 Symptoms of systemic inflammatory response syndrome and univariate association with 30 day mortality

SIRS* Criteria	Dead (N=119)	Alive (N=336)	OR ^a	95%CI ^b	P-value
	% (n)	% (n)			
Fever - Core temperature >38.3°C	17.8 (48)	82.2 (221)	0.35	0.23-0.55	<0.001
Hypothermia - Core temperature <36°C	51.5 (24)	48.9 (23)	3.44	1.83-6.45	<0.001
Heart Rate >90/min	26.6 (102)	73.4 (282)	1.15	0.64-2.07	0.65
Respiratory Rate >25/min	27.1 (71)	72.8 (190))	1.14	0.74-1.74	0.56
Altered mental status	36.8 (32)	63.2 (55)	1.88	1.14-3.10	0.01
Oedema	30.8 (4)	69.2 (9)	1.26	0.38-4.19	0.75
Blood Glucose >6.6mmol/L	31 (22)	69 (49)	1.33	0.76-2.31	0.31
Leukocytosis - White blood cells>12x10 ⁹ /L	26.2 (66)	173.8 (86)	1.00	0.66-1.53	0.98
Leukopenia - White blood cells<4x10 ⁹ /L	29.5 (18)	70.5 (43)	1.21	0.67-2.20	0.52
C-Reactive Protein >30mg/L	26.5 (81)	73.5 (225)	1.05	0.67-1.65	0.83

*Systemic inflammatory response syndrome

^a Odds Ratio

^b 95% Confidence Interval

Table E3 Symptoms of organ dysfunction or tissue hypoperfusion and univariate association with 30 day mortality

Criteria for organ dysfunction or tissue hypoperfusion	Dead (N=119) % (n)	Alive (N=336) % (n)	OR^a	95%CI^b	p-value
Saturations (<92% room air) or (PaO ₂ /FiO ₂ ^c <40)	27.1 (62)	72.9 (167)	1.10	0.72-1.67	0.65
Urine Output <30ml per hour for 2 hours	26.7 (23)	73.3 (63)	1.04	0.61-1.77	0.89
Creatinine >175µmol/L or increased >45µmol/L	29.4 (50)	70.6 (120)	1.30	0.85-2.00	0.22
Coagulation Abnormalities ^d	50 (7)	50 (7)	2.94	1.00-8.61	0.04
Thrombocytopenia (<100x10 ⁹ /L)	48.3 (14)	52.7 (15)	2.85	1.32-6.15	0.01
Hyperbilirubinaemia (>35mmol/L)	35.0 (14)	65.0 (26)	1.59	0.80-3.16	0.18
Ileus	25.0 (1)	75.0 (3)	0.94	0.10-9.13	1.00
Hyperlactaemia (>2mmol/L)	29.0 (83)	71.0 (203)	1.51	0.96-2.37	0.07
Capillary refill >5 seconds	37.5 (6)	62.5 (10)	1.73	0.61-4.88	0.29
Mottling	60.0 (9)	40.0 (6)	4.50	1.55-13.08	<0.001
Arterial Hypotension ^e	25.5 (76)	74.5 (222)	0.91	0.59-1.41	0.66

^a Odds Ratio

^b 95% Confidence Interval

^c Partial Pressure of Oxygen in arterial blood/Fraction of inspired oxygen

^d International Normalised Ratio>1.5 or Activated Pro-Thrombin Time >60seconds

^e Systolic blood pressure <90mmHg, mean arterial pressure <70mmHg or Systolic blood pressure decrease >40mmHg

Table E4 Locations of Early Care and univariate association with 30 day mortality

Admissions and Early Treatment locations	Dead (N=119) %(n)	Alive (N=336) %(n)	OR^a	95%CI^b	P-value
Admission Source					
Emergency Department	24.6 (71)	75.4 (218)	1.00		
Elective	25 (5)	75 (15)	1.02	0.36-2.92	
General Practitioner	29.5 (43)	70.6 (103)	1.28	0.82-2.00	0.28
GP referral?					
Yes	29.5 (43)	70.6 (103)	1.27	0.82-1.99	0.27

No	24.6 (76)	75.4 (233)	1.00		
Speciality at Time Zero					
Medical	28.0 (106)	72.0 (273)	1.00		
Surgical	18.2 (12)	81.8 (54)	0.57	0.29-1.11	0.124
Other	10.0 (1)	90.0 (9)	0.29	0.04-2.29	
Surgical ward at Time Zero?					
Yes	18.2 (12)	81.8 (54)	0.59	0.30-1.14	0.111
No	27.5 (107)	72.5 (282)	1.00		

^a Odds Ratio

^b 95% Confidence Interval

Table E5 Sepsis source and control and univariate association with 30 day mortality

	Dead (N=119) %(n)	Alive (N=336) %(n)			P- value
			OR^a	95%CI^b	
Provisional Sepsis Source at 6Hrs^c					
Identified N(%)	25.4 (107)	74.6 (315)	0.59	0.28-1.25	0.17
Not identified N(%)	36.4 (12)	63.7 (21)	1.00		
Location					
Lungs N(%)	28.8 (66)	71.2 (163)	1.32	0.87-2.01	0.19
Liver N(%)	30.2 (13)	69.8 (30)	1.25	0.63-2.49	0.52
Unperforated bowel N(%)	0 (0)	100 (4)			0.58
Peritoneum N(%)	28.6 (4)	71.4 (10)	1.13	0.35-3.69	0.77
Urinary tract N(%)	20.0 (14)	80.0 (56)	0.67	0.36-1.25	0.20
Intracranial N(%)	33.3 (1)	66.8 (2)	1.42	0.13-15.8	1.00
Heart N(%)	33.3 (1)	66.7 (2)	1.42	0.13-15.8	1.00
Skin N(%)	11.4 (4)	88.6 (31)	0.34	0.12-0.99	0.04
Bone N(%)	22.2 (2)	78.8 (7)	0.80	0.16-3.92	1.00
Ear nose throat N(%)	0 (0)	100 (2)			1.00
Gynaecological N(%)	16.7 (1)	83.3 (5)	0.56	0.06-4.85	1.00
Line N(%)	0 (0)	100 (3)			0.57
Imaging					
Appropriate Imaging N(%)	25.5 (109)	74.5 (319)	0.58	0.26-1.31	0.19
No appropriate Imaging N(%)	37.0 (10)	63.0 (17)	1.00		
Time to imaging - median (IQR*)^d	0.92(0.07-2.78)	0.60 (0.00-2.50)			0.59
Source Control					
Source control appropriate immediately?					
Yes N(%)	18.9 (10)	81.1 (43)	0.63	0.30-1.29	0.20
No N(%)	72.9 (293)	27.1 (109)	1.00		
When appropriate, source control within 6 Hours?					
Yes N(%)	22.2 (6)	77.8 (21)	1.57	0.39-6.37	0.44
No N(%)	15.4 (4)	84.6 (22)	0.62	0.23-1.69	

*Interquartile Range

^a Odds Ratio

^b 95% Confidence Interval

^c 3 patients with missing data

^d 4 patients with missing data

Table E6 Patient escalation and univariate association with 30 day mortality

Patient Escalation	Dead (N=119) %(n)	Alive (N=336) %(n)	OR^a	95%CI^b	P- value
Early Warning Score^c					
0-2 "stable" and 3 "At risk" N(%)	29.6 (8)	70.4 (19)	1.00		
4-5 "Doctor Review" N(%)	28.7 (27)	71.3 (67)	0.96	0.37-2.46	
6+ "Critical Care Outreach Team aware" N(%)	25.4 (84)	74.6 (247)	0.81	0.34-1.92	0.46
Appropriate escalation?					
Yes N(%)	74.4 (325)	25.6 (112)	0.40	0.13-1.23	0.12
No N(%)	46.2 (6)	53.9 (7)	1.00		
N/A N(%)	20.0 (1)	80.0 (4)	0.29	0.02-3.91	
Time to escalation - median (IQR*)	0.0(-0.12- 0.0)	0.0 (-0.02-0.0)			0.96
Critical Care Outreach Team called within 1 Hour?^d					
Yes N(%)	30.4 (21)	69.6 (48)	1.23	0.69-2.19	0.62
No N(%)	26.2 (76)	73.8 (214)	1.00		
Out of Hours	23.7 (22)	76.3 (71)	0.87	0.51-1.51	
Time to Doctor - median (IQR*)	0.17(0.00- 0.55)	0.17 (0.00- 0.50)			0.99
Grade of doctor					
F1 N(%)	12.2 (5)	87.8 (36)	0.49	0.15-1.58	0.15
F2/ST1/ST2 N(%)	28.7 (55)	71.4 (137)	1.42	0.68-2.99	
ST3+/SPR N(%)	27.9 (48)	72.1 (124)	1.37	0.65-2.91	
Consultant N(%)	22.0 (11)	78.0 (39)	1.00		
Critical Care Outreach Team review after Initial diagnosis?					
Yes N(%)	25.6 (33)	74.4 (96)	0.96	0.60-1.53	0.86
No N(%)	26.4 (86)	73.6 (240)	1.00		
Time to Critical Care Outreach Team - median (IQR)	4.08(1.20- 11.00)	5.08(1.76- 0.17)			0.53
Time to Senior Doctor - median (IQR*)^e	0.75(1.30- 2.15)	0.75 (0.13- 2.07)			0.84
No senior doctor seen N(%)	0 (0)	100(1)			

Considered for Intensive Therapy Unit (ITU)?					
Yes N(%)	26.2 (119)	73.8 (335)			
No N(%)	100 (1)	0 (0)			1.00
Time to Intensive Therapy Unit assessment - median (IQR*)^f	3.67(2.00-8.00)	3.56 (2.13-7.39)			0.98
Time to Intensive Therapy Unit Admission - median (IQR*)	7.00(4.05-13.25)	6.80 (4.00-11.13)			0.65
Time to Intensive Therapy Unit Assessment Level 3 - median (IQR*)^g	17.93(6.00-20.91)	15.88(12.40-31.05)			0.57
Time to Intensive Therapy Unit Level 3 - median (IQR*)	21.33(6.00-29.33)	17.83(12.75-31.48)			0.83

*Interquartile Range

^a Odds Ratio

^b 95% Confidence Interval

^c 3 patients with missing data

^d 3 patients with missing data

^e 1 patient with missing data

^f 5 patients with missing data

^g 5 patients with missing data

Table E7 Blood cultures and antibiotics and univariate association with 30 day mortality

Variable	Dead (N=119) %(n)	Alive (N=336) %(n)	OR^a	95%CI^b	P- value
Blood cultures within 6 Hours of time zero?					
1 set N(%)	25.7 (70)	74.3 (202)	0.81	0.50-1.31	0.19
2+ set N(%)	21.2 (14)	78.8 (52)	0.63	0.31-1.29	
No N(%)	29.9 (35)	70.1 (82)	1.00		
Blood culture before Time Zero (if no to previous)					
Yes N(%)	30.1 (22)	69.9 (51)	1.03	0.45-2.34	0.33
No N(%)	29.6 (13)	70.5 (31)	1.00		
Time to Blood Culture - median					

(IQR*)					
Before Time Zero	26.5 (36)	73.5 (100)	1.00		0.73
0-4 Hours	24.6 (58)	75.4 (178)	0.91	0.56-1.47	
4+ Hours	31.8 (14)	68.2 (30)	1.30	0.62-2.73	
Blood culture before antibiotics?					
Yes N(%)	25.0 (61)	75.0 (183)	0.88	1.58-1.34	0.55
No N(%)	27.5 (58)	72.5 (153)	1.00		
Antibiotic after Time Zero					
Yes N(%)	26.2 (119)	73.9 (336)			
Antibiotic adhere local guidelines					
Yes N(%)	26.3 (119)	73.7 (336)			1.00
No N(%)	0 (0)	100 (2)			
Antibiotics before Time Zero					
Yes N(%)	31.0 (27)	69.0 (60)	1.35	0.81-2.26	0.25
No N(%)	25.0 (92)	75.0 (276)	1.00		
Time to antibiotic - median (IQR*)	0.56 (0-1.4)	0.5 (0.07-1.0)			0.69

*Interquartile Range

^aOdds Ratio

^b 95% Confidence Interval

Table E8 Lactate, the hypotensive patient, and univariate association with 30 day mortality

Variable	Dead (N=119) %(n)	Alive (N=336) %(n)	OR¹	95%CI²	P- value
Lactate Measured?					
Yes N(%)	25.7 (114)	74.3 (330)	0.41	0.12-1.39	0.14
No N(%)	45.5 (5)	54.6 (6)	1.00		
Lactate Value - median (IQR*)	3.30(2.20- 5.40)	2.55 (1.50- 4.10)			<0.001
Time to lactate - median (IQR*)³	0.25 (0- 0.93)	0.38 (0.0- 1.28)			0.16
Hypotension or hyperlactate?					
Yes N(%)	27.2 (98)	72.9 (263)	1.30	0.76-2.22	0.35
No N(%)	22.3 (21)	77.7 (73)	1.00		
Crystalloid or colloid?					
Yes N(%)	27.1 (95)	72.9 (255)	0.99	0.26-3.83	0.65
No N(%)	27.3 (3)	72.7 (8)	1.00		
N/A N(%)	22.3 (21)	77.7 (73)	0.77	0.19-3.15	
Time to fluid - median (IQR*)	0.50(0.17- 1.17)	0.50(0.22- 1.03)			0.60
Fail fluid challenge^a or new renal impairment?^a					
Yes N(%)	26.9 (93)	73.1 (253)	1.17	0.71-1.94	0.53
No N(%)	23.9 (26)	76.2 (83)	1.00		
Urine Catheter?					
Yes N(%)	27.0 (90)	73.0 (243)	1.23	0.33-4.59	0.82
No N(%)	23.1 (3)	76.9 (10)	1.00		
N/A N(%)	23.9 (26)	76.2 (83)	1.04	0.27-4.08	
Fluid balance chart completed?					
Yes N(%)	27.1 (88)	72.9 (237)	1.19	0.42-3.35	0.67
No N(%)	23.8 (5)	76.2 (16)	1.00		
N/A N(%)	23.9 (26)	76.2 (83)	1.00	0.33-3.01	

^a Persistent systolic blood pressure <90mmHg or mean arterial pressure <70mmHg despite fluid resuscitation

*Interquartile Range

¹ Odds Ratio

² 95% Confidence Interval

³2 patients with missing data

Table E9 Interventions for a patient with septic shock, and univariate association with 30 day mortality

Variable	Dead (N=119) %(n)	Alive (N=336) %(n)	OR¹	95%CI²	P-value
Fluid refractory^a sepsis?					
Yes N(%)	23.9 (59)	76.1 (188)	0.60	0.36-1.00	0.09
No N(%)	34.3 (34)	65.7 (65)	1.00		
N/A N(%)	23.9 (26)	76.1 (83)	0.60	0.33-1.1	
Central Venous Catheter placed?					
Yes N(%)	27.0 (90)	73.0 (243)	1.05	0.28-3.94	0.63
No N(%)	23.1 (3)	76.9 (10)	1.00		
N/A N(%)	23.9 (26)	76.2 (83)	1.35	0.36-5.08	
Time to Central Venous Catheter - median (IQR*)	6.91(3.58-12.4)	5.95 (3.32-12.5)			0.64
Vasopressors³					
Yes N(%)	21.1 (54)	72.9 (145)	2.89	0.97-8.56	0.19
No N(%)	11.4 (4)	88.6 (31)	1.00		
N/A N(%)	28.2 (58)	71.8 (148)	3.04	1.03-8.99	
Time to Vasopressors - median (IQR*)	7.75(4.65-15.55)	7.33(4.25-13.75)			0.75
Remain hypotensive^{a?4}					
Yes N(%)	54.6 (12)	45.5 (10)	3.80	1.53-9.40	0.01
No N(%)	24.0 (43)	76.0 (136)	1.00		
N/A N(%)	26.4 (63)	73.6 (176)	1.13	0.72-1.77	
Time to inotropes - median (IQR*)	9.25(4.00-19.35)	7.75 (5.67-14.55)			0.62
If low Haemoglobin (<7.0g/dl), blood transfused?					
Yes N(%)	44.4 (4)	55.6 (5)	2.30	0.61-8.76	0.25
N/A N(%)	25.8 (115)	74.2 (331)	1.00		

^a Persistent systolic blood pressure <90mmHg or mean arterial pressure <70mmHg despite fluid resuscitation

*Interquartile Range

¹ Odds Ratio

² 95% Confidence Interval

³ 15 patients with missing data

⁴ 15 patients with missing data

Table E10 Interventions within allotted time-frame and univariate association with 30 day mortality

Variable	Dead (N=119) %(n)	Alive (N=336) %(n)	OR^a	95%CI^b	P- value
Lactate measured within 6 Hours?					
Yes N(%)	25.7 (110)	74.3 (318)	0.69	0.30-1.59	0.38
No N(%)	33.3 (9)	66.7 (18)	1.00		
Blood Culture within 6 Hours?					
Yes N(%)	25.6 (105)	74.5 (306)	0.74	0.38-1.44	0.37
No N(%)	31.8 (14)	68.2 (30)	1.00		
Antibiotics within 1 Hour?					
Yes N(%)	24.5 (84)	75.5 (259)	0.71	0.45-1.14	0.16
No N(%)	31.3 (35)	68.8 (77)	1.00		
Fluid resuscitation within 6 Hours?					
Yes N(%)	26.6 (93)	73.4 (257)	0.63	0.18-2.22	0.58
No N(%)	36.4 (4)	26.6 (7)	1.00		
N/A N(%)	23.4 (22)	76.6 (72)	0.53	0.14-2.00	
Urine Catheter within 6 Hours?^c					
Yes N(%)	27.2 (89)	72.8 (238)	1.50	0.41-5.43	0.88
No N(%)	20.0 (3)	80.0 (12)	1.00		
N/A N(%)	23.9 (26)	76.2 (86)	1.25	0.33-4.78	
Missing N(%)	25.0 (1)	75.0 (3)	1.33	0.10-19.20	
Fluid Balance chart completed within 6 Hours?^d					
Yes N(%)	26.6 (87)	73.4 (240)	1.27	0.41-3.96	0.91
No N(%)	22.2 (4)	77.8 (14)	1.00		
N/A N(%)	25.0 (26)	75.0 (78)	1.17	0.35-3.86	
Central Venous Catheter within 6 Hours?					
Yes N(%)	22.7 (29)	77.3 (99)	0.77	0.43-1.39	0.88
No N(%)	27.0 (30)	73.0 (81)			
N/A N(%)	27.8 (60)	72.2 (156)	1.01		
Vasopressors within 6 Hours?					
Yes N(%)	23.4 (22)	76.6 (72)	0.83	0.44-1.54	0.95
No N(%)	27.0 (34)	73.0 (92)			
N/A N(%)	26.8 (63)	73.2 (172)	0.99	0.61-1.62	

Inotropes within 6 Hours?^e					
Yes N(%)	41.7 (5)	58.3 (7)	0.79	0.18-3.37	0.035
No N(%)	47.6 (10)	52.4 (11)	1.00		
N/A N(%)	24.9 (104)	75.1 (313)	0.36	0.15-0.89	
Blood Transfusion within 6 Hours?^f					
Yes N(%)	33.3 (2)	66.7 (4)	1.00	0.09-11.02	0.29
No N(%)	33.3 (2)	66.7 (4)	1.00		
N/A N(%)	26.6 (114)	73.4 (315)	0.72	0.13-4.00	

*Interquartile Range

^a Odds Ratio

^b 95% Confidence Interval

^c 4 patients missing data

^d 6 patients missing data

^e 5 patients missing data

^f 14 patients missing data

Table E11 Hospital-acquired sepsis and resource issues, and univariate association with 30 day mortality

Variable	Dead (N=119) %(n)	Alive (N=336) %(n)	OR^a	95%CI^b	P- value
Hospital-acquired sepsis?					
Yes N(%)	35.8 (34)	64.2 (61)	1.80	1.11-2.94	0.016
No N(%)	23.6 (85)	76.4 (275)			
Resource issues?					
Yes N(%)	23.6 (17)	76.4 (55)	0.85	0.47-1.53	0.59
No N(%)	26.6 (102)	73.4 (281)	1.00		

^a Odds Ratio

^b 95% Confidence Interval