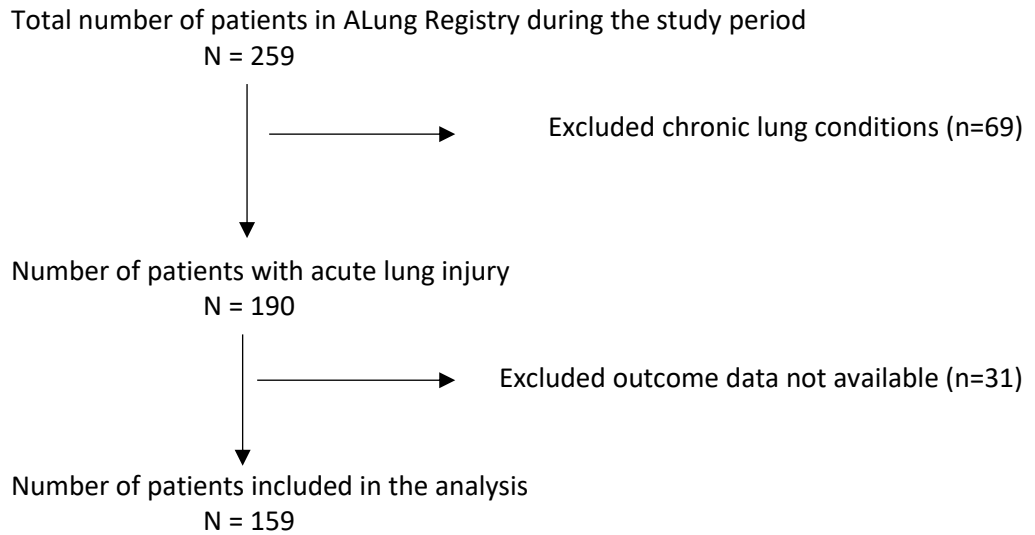
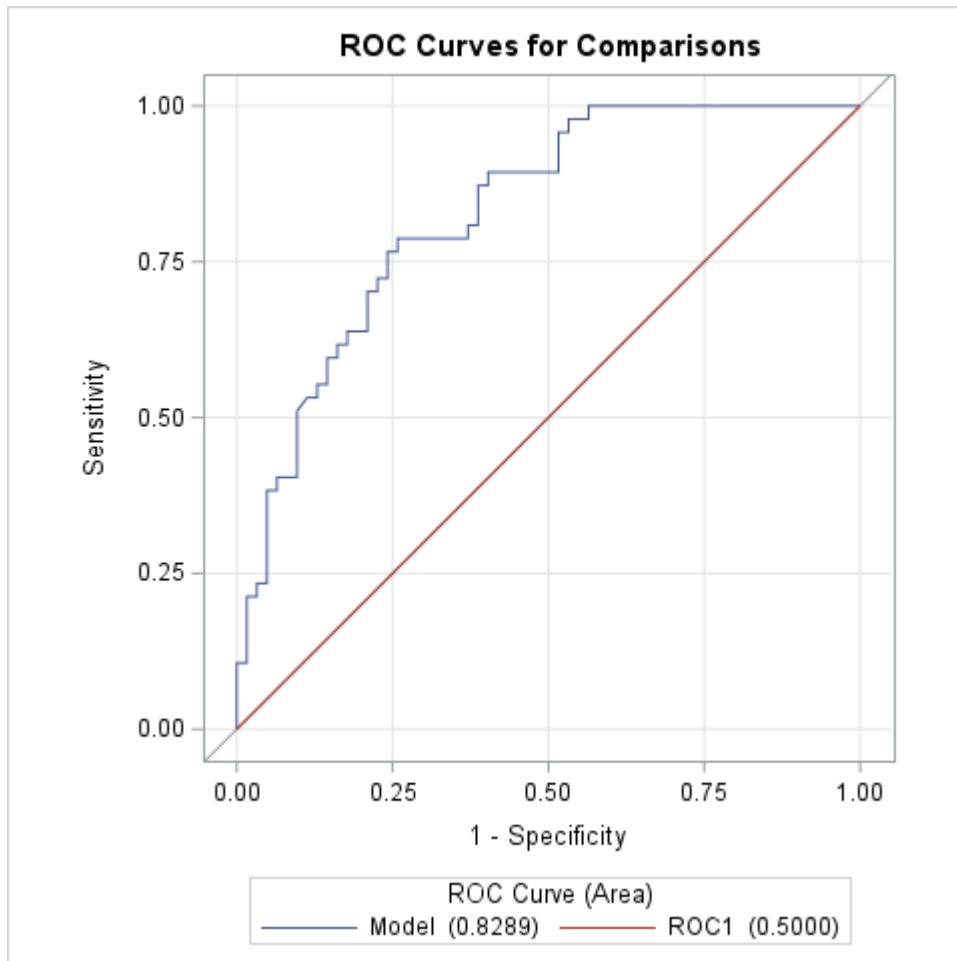


SUPPLEMENTAL DIGITAL CONTENT

Supplemental Figure 1: Study profile



Supplemental Figure 2: ROC curve of the final model



Supplemental Table 1: Estimated mean changes in pH, PaCO₂, respiratory rate, tidal volume, minute ventilation, peak inspiratory and PEEP before initiation and at successive time points.

pH					Change in pH post Hemolung RAS initiation				
Variable	N	Estimate	Lower bound	Upper bound	N	Estimate	Lower bound	Upper bound	P Value
Pre-Hemolung	155	7.23	7.21	7.25	.	.	.	.	.
0-4	62	7.29	7.27	7.32	60	0.05	0.03	0.08	<.001
4-8	112	7.32	7.30	7.34	110	0.10	0.08	0.12	<.001
8-16	65	7.32	7.30	7.35	63	0.09	0.06	0.12	<.001
16-35	128	7.34	7.33	7.36	126	0.12	0.09	0.14	<.001
PaCO ₂ [mmHg]					Change in PaCO ₂				
Pre-Hemolung	155	77.24	73.34	81.13	.	.	.	.	.
0-4	62	66.25	61.74	70.76	60	-9.35	-13.35	-5.36	<.001
4-8	112	59.27	56.33	62.21	110	-19.65	-23.89	-15.41	<.001
8-16	65	63.00	58.89	67.11	63	-12.92	-16.86	-8.98	<.001
16-35	128	57.62	55.05	60.19	126	-21.02	-25.36	-16.67	<.001
Respiratory Rate [l/min]					Change in Respiratory Rate				
Pre-Hemolung	142	26.59	25.40	27.79	.	.	.	.	.
0-4	57	26.97	25.09	28.85	54	-0.92	-2.39	0.55	0.213
4-8	102	24.12	22.48	25.76	99	-2.05	-3.29	-0.81	0.001
8-16	63	26.46	24.93	27.99	61	-0.97	-2.64	0.71	0.253
16-35	119	24.30	23.00	25.60	110	-2.23	-3.62	-0.85	0.002
Tidal Volume [mL]					Change in tidal volume				
Pre-Hemolung	132	396.20	374.49	417.91	.	.	.	.	.
0-4	47	364.79	330.30	399.28	41	-47.80	-67.27	-28.34	<.001
4-8	93	364.37	341.30	387.43	89	-22.27	-41.19	-3.36	0.022
8-16	54	376.41	345.03	407.78	48	-22.80	-49.66	4.06	0.094
16-35	109	383.25	361.59	404.92	99	-16.34	-37.75	5.08	0.133
Minute ventilation [L/min]					Change in minute ventilation				
Pre-Hemolung	132	10.36	9.71	11.01	.	.	.	.	.
0-4	48	9.76	8.52	10.99	42	-1.88	-2.71	-1.05	<.001
4-8	96	8.43	7.80	9.05	92	-1.61	-2.26	-0.96	<.001
8-16	55	9.49	8.51	10.48	49	-1.32	-2.44	-0.21	0.021
16-35	112	8.79	8.21	9.37	102	-1.42	-2.07	-0.78	<.001
Peak inspiratory pressure [cmH ₂ O]					Change in peak inspiratory pressure				
Pre-Hemolung	100	32.32	30.24	34.40	.	.	.	.	.
4-8	81	30.12	28.01	32.22	67	-2.78	-4.59	-0.96	0.003
16-35	91	29.11	27.39	30.84	68	-3.44	-5.33	-1.56	<.001
Positive end expiratory pressure [cmH ₂ O]					Change in positive end expiratory pressure				
Pre-Hemolung	140	10.23	9.47	10.99	.	.	.	.	.
4-8	102	10.01	9.10	10.92	97	-0.24	-0.67	0.19	0.269
16-35	117	10.07	9.28	10.85	109	-0.12	-0.64	0.41	0.654

Supplemental Table 2 Comparison of CO₂ removal, changes in PaCO₂, pH and reduction of ventilation between survivors to those died.

	Survived to ICU discharge N=65	Died in ICU N=94	P Value
CO₂ removal [mL/min]			
0 to <4 hours	85.2 (72.5, 97.0)	87.6 (75.3, 101.7)	0.4529 ¹
4 to < 8 hours	83.0 (73.3, 94.0)	85.8 (72.0, 100.2)	0.5563 ¹
8 to < 16 hours			
16 to 35 hours	84.0 (74.0, 93.0)	84.1 (75.9, 95.0)	0.4884 ¹
Blood flow [mL/min]			
0 to < 4 hours	451.4 (427.1, 491.6)	444.1 (379.8, 495.2)	0.2087 ¹
4 to < 8 hours	465.9 (424.5, 497.2)	440.0 (400.0, 495.1)	0.0983 ¹
8 to < 16 hours			
16 to 35 hours	464.5 (418.0, 492.2)	452.2 (404.4, 508.8)	0.8928 ¹
pH			
Prior to initiation of Hemolung RAS	7.3 (7.2, 7.3)	7.2 (7.2, 7.3)	0.3067 ¹
0 to < 4 hours	7.3 (7.2, 7.4)	7.3 (7.2, 7.4)	1.0000 ¹
4 to < 8 hours	7.3 (7.3, 7.4)	7.3 (7.2, 7.4)	0.1250 ¹
8 to < 16 hours	7.3 (7.3, 7.4)	7.3 (7.2, 7.4)	0.6169 ¹
16 to 35 hours	7.4 (7.3, 7.4)	7.3 (7.3, 7.4)	0.0703 ¹
PCO₂ [mmHg]			
Prior to initiation of Hemolung RAS	70.0 (59.5, 88.0)	75.9 (62.6, 91.0)	0.37791
0 to < 4 hours	62.7 (54.9, 78.0)	59.1 (50.5, 84.0)	0.8006 ¹
4 to < 8 hours	54.0 (45.0, 66.8)	61.0 (48.6, 70.2)	0.16611
8 to < 16 hours	60.2 (51.4, 83.2)	58.7 (50.7, 69.0)	0.5705 ¹
16 to 35 hours	54.0 (46.2, 61.5)	57.0 (46.9, 64.4)	0.5480 ¹
PIP [cmH₂O]			
Prior to initiation of Hemolung RAS	30.0 (28.0, 34.0)	32.0 (30.0, 38.0)	0.0736 ¹
4 to < 8 hours	28.0 (25.0, 32.0)	30.0 (27.0, 34.0)	0.1272 ¹
16 to 35 hours	28.0 (25.0, 32.0)	28.3 (26.0, 34.0)	0.5033 ¹
Tidal volumes [mL]			
Prior to initiation of Hemolung RAS	400.0 (320.0, 483.0)	380.0 (315.0, 450.0)	0.2439 ¹
0 to < 4 hours	400.0 (332.0, 420.0)	380.0 (250.0, 455.0)	0.3979 ¹
4 to < 8 hours	400.0 (320.0, 478.0)	336.0 (265.0, 404.0)	0.0105 ¹
8 to < 16 hours	400.0 (361.5, 480.0)	380.0 (284.0, 450.0)	0.4771 ¹
16 to 35 hours	405.0 (330.0, 462.0)	370.0 (286.0, 450.0)	0.1033 ¹
Minute ventilation [mL/min]			

Prior to initiation of Hemolung RAS	10.0 (7.1, 12.0)	10.5 (8.2, 13.3)	0.1850 ¹
0 to < 4 hours	8.0 (4.2, 11.7)	9.7 (7.3, 13.3)	0.3465 ¹
4 to < 8 hours	8.0 (6.3, 9.8)	9.0 (6.4, 10.2)	0.1843 ¹
8 to < 16 hours	9.8 (5.6, 12.8)	9.0 (6.8, 11.2)	0.8312 ¹

¹Wilcoxon rank sum p-value;