

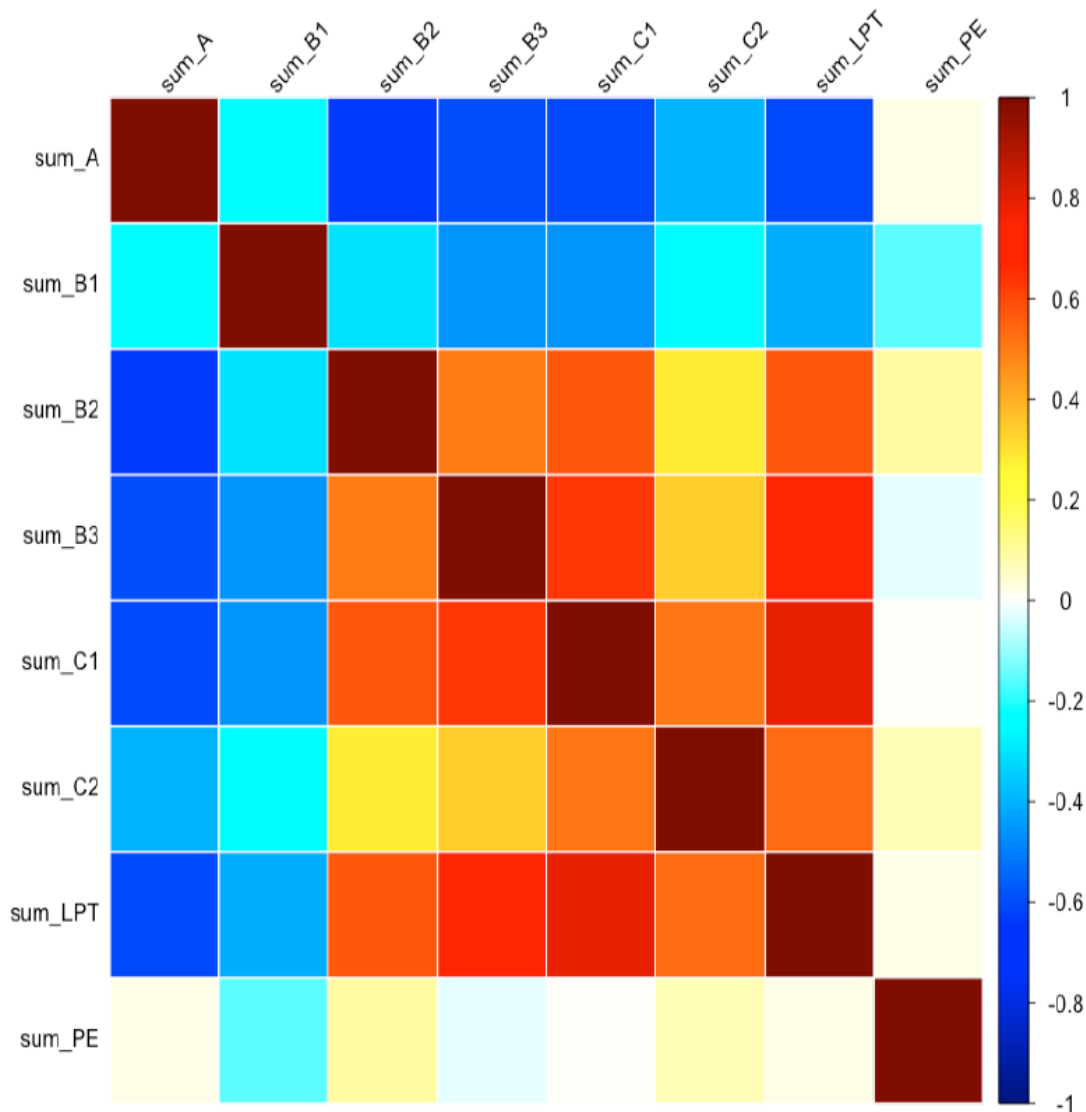
Topography			LUS pattern	All patients (n = 140)	24-hours Critical Respiratory Illness		p value
Left, N (%)					Yes (n = 53)	No (n = 87)	
	Inferior	Anterior	A	41 (29.3)	4 (7.5)	37 (42.5)	<0.001
			B1	47 (33.6)	9 (17.0)	38 (43.7)	0.002
			B2	18 (12.9)	10 (18.9)	8 (9.2)	0.120
			B3	19 (13.6)	17 (32.1)	2 (2.3)	<0.001
			C1	13 (9.3)	11 (20.8)	2 (2.3)	<0.001
			C2	2 (1.4)	2 (3.8)	0 (0.0)	0.142
			LPT	26 (18.6)	20 (37.7)	6 (6.9)	<0.001
			PE	NA	NA	NA	NA
		Middle	A	57 (40.7)	9 (17.0)	48 (55.2)	<0.001
			B1	34 (24.3)	3 (5.7)	31 (35.6)	<0.001
			B2	12 (8.6)	9 (17.0)	3 (3.4)	0.010
			B3	23 (16.4)	20 (37.7)	3 (3.4)	<0.001
			C1	14 (10.0)	12 (22.6)	2 (2.3)	<0.001
			C2	NA	NA	NA	NA
			LPT	24 (17.1)	15 (28.3)	9 (10.3)	0.010
			PE	NA	NA	NA	NA
		Posterior	A	53 (37.9)	48 (55.2)	5 (9.4)	<0.001
			B1	26 (29.9)	5 (9.4)	31 (22.1)	0.006
			B2	20 (14.3)	15 (28.3)	5 (5.7)	<0.001
			B3	1 (1.1)	9 (17.0)	10 (7.1)	0.001
			C1	13 (9.3)	10 (18.9)	3 (3.4)	0.005
			C2	9 (6.4)	7 (13.2)	2 (2.3)	0.027
			LPT	22 (15.7)	18 (34.0)	4 (4.6)	<0.001
			PE	5 (3.6)	3 (5.7)	2 (2.3)	0.367
	Superior	Anterior	A	56 (40.0)	8 (15.1)	48 (55.2)	<0.001
			B1	38 (27.1)	8 (15.1)	30 (34.5)	0.018

			B2	15 (10.7)	10 (18.9)	5 (5.7)	0.023
			B3	19 (13.6)	17 (32.1)	2 (2.3)	<0.001
			C1	12 (8.6)	10 (18.9)	2 (2.3)	0.001
			C2	NA	NA	NA	NA
			LPT	24 (17.1)	22 (41.5)	2 (2.3)	<0.001
			PE	NA	NA	NA	NA
		Middle	A	53 (37.9)	5 (9.4)	48 (55.2)	<0.001
			B1	35 (25.0)	5 (9.4)	30 (34.5)	0.001
			B2	15 (10.7)	12 (22.6)	3 (3.4)	0.001
			B3	4 (4.6)	16 (30.2)	20 (14.3)	<0.001
			C1	2 (2.3)	15 (28.3)	17 (12.1)	<0.001
			C2	NA	NA	NA	NA
			LPT	21 (15.0)	18 (34.0)	3 (3.4)	<0.001
			PE	NA	NA	NA	NA
		Posterior	A	54 (38.6)	9 (17.0)	45 (51.7)	<0.001
			B1	32 (36.8)	2 (3.8)	34 (24.3)	<0.001
			B2	18 (12.9)	11 (20.8)	7 (8.0)	0.038
			B3	1 (1.1)	13 (24.5)	14 (10.0)	<0.001
			C1	13 (9.3)	12 (22.6)	1 (1.1)	<0.001
			C2	7 (5.0)	6 (11.3)	1 (1.1)	0.012
			LPT	25 (17.9)	21 (39.6)	4 (4.6)	<0.001
			PE	NA	NA	NA	NA
Right, N (%)							
	Inferior	Anterior	A	57 (40.7)	7 (13.2)	50 (57.5)	<0.001
			B1	34 (24.3)	6 (11.3)	28 (32.2)	0.008
			B2	21 (15.0)	13 (24.5)	8 (9.2)	0.026
			B3	1 (1.1)	14 (26.4)	15 (10.7)	<0.001
			C1	13 (9.3)	13 (24.5)	0 (0.0)	<0.001
			C2	NA	NA	NA	NA

			LPT	18 (12.9)	15 (28.3)	3 (3.4)	<0.001
			PE	NA	NA	NA	NA
		Middle	A	54 (38.6)	7 (13.2)	47 (54.0)	<0.001
			B1	35 (25.0)	5 (9.4)	30 (34.5)	0.001
			B2	22 (15.7)	16 (30.2)	6 (6.9)	0.001
			B3	20 (14.3)	17 (32.1)	3 (3.4)	<0.001
			C1	8 (5.7)	7 (13.2)	1 (1.1)	0.005
			C2	1 (0.7)	1 (1.9)	0 (0.0)	0.379
			LPT	23 (16.4)	20 (37.7)	3 (3.4)	<0.001
			PE	NA	NA	NA	NA
		Posterior	A	46 (32.9)	5 (9.4)	41 (47.1)	<0.001
			B1	43 (30.7)	5 (9.4)	38 (43.7)	<0.001
			B2	9 (6.4)	9 (17.0)	0 (0.0)	<0.001
			B3	13 (9.3)	12 (22.6)	1 (1.1)	<0.001
			C1	15 (10.7)	12 (22.6)	3 (3.4)	0.001
			C2	9 (6.4)	8 (15.1)	1 (1.1)	0.002
			LPT	30 (21.4)	24 (45.3)	6 (6.9)	<0.001
			PE	6 (4.3)	3 (5.7)	3 (3.4)	0.673
	Superior	Anterior	A	45 (32.1)	5 (9.4)	40 (46.0)	<0.001
			B1	43 (30.7)	7 (13.2)	43 (30.7)	0.001
			B2	17 (12.1)	11 (20.8)	6 (6.9)	0.030
			B3	17 (12.1)	15 (28.3)	2 (2.3)	<0.001
			C1	18 (12.9)	15 (28.3)	3 (3.4)	<0.001
			C2	NA	NA	NA	NA
			LPT	31 (22.1)	22 (41.5)	9 (10.3)	<0.001
			PE	NA	NA	NA	NA
		Middle	A	53 (37.9)	8 (15.1)	45 (51.7)	<0.001
			B1	40 (28.6)	4 (7.5)	36 (41.4)	<0.001
			B2	17 (12.1)	14 (26.4)	3 (3.4)	<0.001
			B3	21 (15.0)	19 (35.8)	2 (2.3)	<0.001

			C1	9 (6.4)	8 (15.1)	1 (1.1)	0.002
			C2	NA	NA	NA	NA
			LPT	33 (23.6)	26 (49.1)	7 (8.0)	<0.001
			PE	NA	NA	NA	NA
		Posterior	A	49 (35.0)	6 (11.3)	43 (49.4)	<0.001
			B1	36 (25.7)	8 (15.1)	28 (32.2)	0.029
			B2	21 (15.0)	9 (17.0)	12 (13.8)	0.632
			B3	16 (11.4)	14 (26.4)	2 (2.3)	<0.001
			C1	17 (12.1)	16 (30.2)	1 (1.1)	<0.001
			C2	NA	NA	NA	NA
			LPT	28 (20.0)	20 (37.7)	8 (9.2)	<0.001
			PE	NA	NA	NA	NA
Overall LUS patterns, Median (IQR)							
SUMA				3.0 (0.0 to 10.0)	0.0 (0.0 to 1.0)	5.0 (3.0 to 11.0)	<0.001
SUM B1				1.0 (0.0 to 6.0)	1.0 (0.0 to 1.0)	4.0 (0.0 to 8.0)	<0.001
SUM B2				1.0 (0.0 to 3.0)	3.0 (1.0 to 4.0)	0.0 (0.0 to 1.0)	<0.001
SUM B3				0.0 (0.0 to 3.0)	3.0 (2.0 to 5.0)	0.0 (0.0 to 0.0)	<0.001
SUM C1				0.0 (0.0 to 3.0)	3.0 (1.0 to 4.0)	0.0 (0.0 to 0.0)	<0.001
SUM C2				0.0 (0.0 to 0.0)	0.0 (0.0 to 1.0)	0.0 (0.0 to 1.0)	<0.001
SUM LPT				1.0 (0.0 to 4.0)	5.0 (2.0 to 7.0)	0.0 (0.0 to 1.0)	<0.001
SUM PE				0.0 (0.0 to 0.0)	0.0 (0.0 to 0.0)	0.0 (0.0 to 0.0)	0.455

Supplemental Digital Content 1. LUS patterns according to patient's outcomes. Number of lung quadrants depicting the same LUS pattern at patients' hospital admission for each outcome group (patients with or without critical respiratory illness at 24 hours from hospital admission). Sum = number of quadrants depicting the same LUS profile (A, B1, B2, B3, C1, C2, TPL, PE). For a detailed description of LUS patterns (A, B1, B2, B3, C1, C2, TPL, PE) please see Methods section. A p-value < 0.05 was considered as statistically significant.



Supplemental Digital Content 2. Correlation matrix. Pearson correlation (r) coefficients between lung ultrasound variables. The direction and strength of the linear relationship between the variables (whether causal or not) are represented by r values (ranging from -1 to +1; coded in blue and red, respectively). A correlation matrix is symmetric because the correlation between X_i and X_j is the same as the correlation between X_j and X_i . The reported LUS dataset data showed a high degree of multicollinearity amongst predictor variables, meaning that predictor variable can be linearly predicted from the others with a non-trivial degree of accuracy. In this situation, the reliability of a regression model can be affected. We handled this issue by using a PLS model that reduces and takes into account exact (non-stochastic) linear regression amongst the regressors.

Variable	Group	AUC (IC 95)	p value	Cutoff	Se (%)	Sp (%)	PPV (%)	NPV (%)	Correctly classified (%)
LUS	Learning	0.966 (0.914 - 1)	0.000	0.5	92	100	100	96	97
	Validation	0.80 (0.682 - 0.915)	0.000		72	88	81	82	81
Clinical	Learning	0.791 (0.701 - 0.917)	0.000	0.5	54	85	65	78	74
	Validation	0.559 (0.408 - 0.71)	0.417		43	82	63	67	66

Supplemental Digital Content 3. Predictive classifiers accuracy. Data included the 95% CI. AUC = area under the receiver-operating curve; Se = sensitivity; Sp = specificity; PPV = positive predictive value; NVP = negative predictive value.