

SUPPLEMENTAL MATERIAL

Supplemental Table I. COVID-19 modified early warning score (COVID-19 MEWS) calculation

	3	2	1	0	1	2	3
Age (years)				<65			≥65
Respiration rate (breaths/min)	≤8		9-11	12-20		21-24	≥25
Ambient O ₂ saturation (%)	≤91	92-93	94-95	≥96			
Any supplemental oxygen		yes		no			
Systolic blood pressure (mmHg)	≤90	91-100	101-110	111-219			≥220
Heart rate (beats/min)	≤40		41-50	51-90	91-110	111-130	≥131
consciousness				alert			Drowsiness lethargy coma confusion
Temperature (Celsius)	≤35.0		35.1-36.0	36.1-38.0	38.1-39.0	≥39.1	

Supplemental Table II. Baseline echocardiography and ECG in patients stratified by lung ultrasound score

Parameter	All patients n = 120	Lung Ultrasound Score 0-18 n = 80	Lung Ultrasound Score 19-36 n = 40	P-value
Baseline echocardiography				
Left ventricular ejection fraction, %, mean \pm SD	57.7 \pm 5	58.2 \pm 3.7	56.7 \pm 6.9	0.22
Left ventricular end-diastolic diameter, mm, mean \pm SD	43.3 \pm 6.6	43.0 \pm 6	43.9 \pm 7.6	0.51
Left ventricular end-systolic diameter, mm, mean \pm SD	28.1 \pm 6.4	27.6 \pm 5.2	28.3 \pm 6.3	0.55
Left atrial volume, mL, mean \pm SD	55.2 \pm 25.4	56.4 \pm 25.5	52.6 \pm 25.4	0.48
E/A, mean \pm SD	1.07 \pm 0.5	1.09 \pm 0.5	1.01 \pm 0.3	0.42
E/e' average, mean \pm SD	10.3 \pm 6.3	10.3 \pm 7.2	10.3 \pm 4.2	0.99
Right atrial pressure, mmHg, mean \pm SD	8 \pm 4	8 \pm 4.1	8.1 \pm 4	0.86
Tricuspid annular plane systolic excursion, mm, mean \pm SD	2.3 \pm 1.1	2.3 \pm 0.4	2.4 \pm 1.8	0.76
Right ventricular S', cm/s, mean \pm SD	11.2 \pm 3.2	11.2 \pm 3.1	11.2 \pm 3.4	0.94
Baseline ECG findings				
Normal sinus rhythm, n (%)	88 (73.3)	58 (90.6)	30 (85.7)	0.51
Atrial fibrillation/flutter, n (%)	9 (7.5)	5 (7.8)	4 (11.4)	0.72
RBBB, n (%)	6 (5)	3 (4.7)	3 (8.6)	0.66
LBBB, n (%)	3 (2.5)	0 (0)	3 (8.6)	0.042
ST-segment elevation, n (%)	2 (1.7)	2 (3)	0 (0)	0.54

ST-segment depression, n (%)	5 (4.2)	3 (4.7)	2 (5.7)	0.99
T wave inversion, n (%)	15 (12.5)	9 (14.1)	6 (17.1)	0.77
Long QT, n (%)	7 (5.8)	3 (4.7)	4 (11.4)	0.24
QTc, msec, median (IQR)	417 (395.75 - 440)	417 (396 - 438.7)	416.5 (393.7 - 451.7)	0.84

Supplemental Table III. Lung ultrasound in clinically-deteriorating patients

Parameter	Baseline n=20	Follow up n=20	P-value
Pleural effusion, n (%)	1 (5)	1 (5)	NS
Homogenous diffuse B-lines, n (%)	0 (0)	0 (0)	NS
Pleural thickening, n (%)	19 (95)	20 (100)	NS
Lung ultrasound score, median (IQR)	17 (7 – 22)	20 (17 - 26)	0.0009

Supplemental Table IV. Univariable analysis of baseline predictors of clinical deterioration and death

Parameter	Outcome					
	Death N=23 HR (95% CI)	P-value	Intubation N= 14 HR (95% CI)	P-value	Composite N= 30 HR (95% CI)	P-value
Age	1.04 (1.02-1.06)	0.001	1.00 (0.98-1.03)	0.7	1.03 (1.01-1.05)	0.001
Male gender	1.02 (0.36-3.2)	0.9	1.4 (0.46-5.0)	0.6	1.06 (0.47-2.6)	0.93
Modified early warning score (per point)	1.3 (1.17-1.5)	<0.001	1.35 (1.16-1.6)	<0.001	1.4 (1.26-1.56)	<0.001
Temperature (per degree Celsius)	1.18 (0.65-2.04)	0.5	1.89 (1.03-3.3)	0.04	1.8 (1.18-2.7)	0.005
O ₂ saturation (per %)	0.85 (0.78-0.92)	<0.001	0.87 (0.79-0.97)	0.01	0.85 (0.79-0.91)	<0.001
Heart Rate (per 1 beat per minute)	1.00 (0.97-1.03)	0.6	1.04 (1.00-1.07)	0.02	1.03 (1.00-1.05)	0.05
Systolic blood pressure (per 1 mmHg)	0.98 (0.96-1.01)	0.4	0.98 (0.95-1.01)	0.2	0.99 (0.98-1.02)	0.92
Diastolic blood pressure (per 1 mmHg)	0.97 (0.95-1.00)	0.2	0.99 (0.96-1.03)	0.7	0.99 (0.97-1.02)	0.92
Lung crepitation	2.0 (0.6- 5.9)	0.2	2.1 (0.6- 7.1)	0.2	1.9 (0.7- 4.5)	0.21
Leg edema	2.3 (0.11- 2.7)	0.3	2.2 (0.5- 6.9)	0.2	1.3 (0.2- 4.7)	0.74
C-reactive protein (per mg/L)	1.00 (0.99-1.01)	0.1	1.01 (1.00-1.02)	<0.001	1.01 (1.00-1.01)	0.002
D-dimer (per mg/L)	1.07 (0.91-1.18)	0.3	1.18 (1.06-1.3)	0.005	1.12 (0.99-1.22)	0.06

Troponin-I (per ng/L)	1.0 (0.99-1.00)	0.8	1.00 (1.00-1.01)	0.03	1.00 (0.99-1.00)	0.24
Brain natriuretic peptide (per pg/mL)	1.00 (1.0-1.02)	0.02	1.00 (0.99-1.01)	0.9	1.00 (0.99-1.01)	0.08
Chest X-ray						
Bilateral infiltrates	2.5 (1.07-6.1)	0.03	2.5 (0.8-9.6)	0.1	1.9 (0.8-4.4)	0.09
Lobar infiltrates	1.2 (0.2-4.3)	0.8	1.7 (0.3-6.6)	0.5	1.8 (0.5-4.8)	0.31
Pleural effusion	1.7 (0.5-5.0)	0.4	1.8 (0.4-6.1)	0.4	1.2 (0.3-3.2)	0.71
Hilar congestion	3.7 (1.07-10.2)	0.04	0.7 (0.05-4.0)	0.8	2.4 (0.55-7.0)	0.21
Lung Ultrasound						
Lung ultrasound score (per point)	1.08 (1.02-1.16)	0.008	1.2 (1.1-1.3)	<0.001	1.12 (1.05-1.2)	0.0008
LUS score>18	2.65 (1.14-6.3)	0.02	11.5 (1.4- 235)	0.02	4.24 (2.06-9.2)	<0.0001
Pleural effusion	3.7 (1.07-10)	0.04	1.2 (0.06-6)	0.9	2.4 (0.6-6.9)	0.22
Pleural thickening	4.6 (1.1-14)	0.04	14 (5-22)	0.01	5.2 (1.08-10.2)	0.03
Subpleural consolidations	1.4 (0.5-4.8)	0.5	15 (2.0-31)	0.007	1.6 (0.6-5.5)	0.3

Supplemental Figure I. Lung ultrasound in a selected patient at baseline (**A**) and after clinical deterioration (**B**). Note the shift from A-lines in anterior segment and B-lines at posterior segments at baseline to a predominant B-lines pattern including the anterior segments. This change corresponds to significant worsening in lung aeration.

