

Table S1. Missing data reported in the cohort of 263 patients treated with CPAP after COVID-19 infection.

Variable	Missing data	Percentage
COVID-19 first wave	0	0.0
Age, years	0	0.0
Male sex	0	0.0
Arterial hypertension	0	0.0
T2DM	0	0.0
Cardiovascular comorbidity	0	0.0
Liver comorbidity	0	0.0
Asthma	0	0.0
Chronic lung disease	0	0.0
Renal comorbidity	0	0.0
Neurological comorbidity	0	0.0
Obesity	0	0.0
HIV or malignancy	0	0.0
Hospital stay, days	0	0.0
Need for ICU stay	0	0.0
Orotracheal intubation	0	0.0
Death	0	0.0
CPAP use days	0	0.0
CT scan damage percentage right lung	7	2.7
CT scan damage percentage left lung	7	2.7
CT scan mean damage percentage	7	2.7
P/F ratio	25	9.5
Any comorbidity	0	0.0
Lymphocytes, 10³ cells/μL	0	0.0
LDH, mU/mL	11	4.2
Call Score	11	4.2
SpO₂	15	5.7
C-reactive protein, mmol/L	4	1.5
D-dimer, ng/mL	5	1.9

Abbreviations: COVID-19, coronavirus disease 19; T2DM, type 2 diabetes mellitus; HIV, human immunodeficiency virus; ICU, intensive care unit; CPAP, continuous positive airway pressure; CT, computed tomography; P/F, partial pressure of oxygen in arterial blood/ fraction of inspired oxygen; LDH, lactate dehydrogenase; SpO₂, peripheral capillary oxygen saturation.

Table S2. Identification of the best CPAP threshold to use for identifying the risk of CPAP failure after COVID-19 infection.

CPAP use days	Centile	Sensitivity	Specificity	Youden's index
2	10	0.88	0.11	0.02
4	20	0.78	0.16	0.06
5	30	0.66	0.22	0.12
6	40	0.52	0.33	0.15
7	50	0.45	0.42	0.13
8	60	0.34	0.48	0.18
10	70	0.19	0.59	0.23
13	80	0.08	0.71	0.20
20	90	0.06	0.88	0.06

Abbreviations: CPAP, continuous positive airway pressure.

Table S3. Diagnostic ability of the CPAP Failure Score compared to other relevant clinical factors for the potential failure of CPAP support: validation of the model in the pre- and post-IPTW population.

Variable	Post-IPTW (N=168)				Pre-IPTW (N=263)			
	AUC	SE	95.0%CI	P-value	AUC	SE	95.0%CI	P-value
CPAP Failure Score	0.87	0.03	0.81 - 0.93	<0.0001	0.78	0.03	0.72 - 0.83	<0.0001
Age	0.77	0.04	0.69 - 0.85	<0.0001	0.66	0.03	0.59 - 0.73	<0.0001
D-dimer	0.73	0.05	0.64 - 0.82	<0.0001	0.60	0.04	0.53 - 0.67	0.007
1 - (P/F ratio)	0.71	0.04	0.62 - 0.79	<0.0001	0.68	0.04	0.61 - 0.74	<0.0001
Call Score	0.69	0.04	0.60 - 0.79	<0.0001	0.68	0.03	0.61 - 0.74	<0.0001
1 - (SpO2)	0.69	0.05	0.59 - 0.79	<0.0001	0.65	0.04	0.58 - 0.72	<0.0001
Comorbidity	0.63	0.05	0.53 - 0.72	0.01	0.63	0.04	0.57 - 0.70	<0.0001
Chronic lung disease	0.59	0.05	0.49 - 0.69	0.08	0.54	0.04	0.47 - 0.61	0.30
C-reactive protein	0.43	0.05	0.33 - 0.53	0.15	0.47	0.04	0.39 - 0.54	0.35
Male sex	0.45	0.05	0.35 - 0.55	0.31	0.55	0.04	0.48 - 0.62	0.20
CT scan lung damage %	0.53	0.06	0.41 - 0.65	0.52	0.59	0.04	0.51 - 0.66	0.02

Abbreviations: IPTW, inverse probability therapy weighting; AUC, area under the curve; SE, standard error; 95.0%CI, 95.0% confidence intervals; CPAP, continuous positive airway pressure; SpO2, peripheral capillary oxygen saturation; P/F, partial pressure of oxygen in arterial blood/ fraction of inspired oxygen; CT, computed tomography.

Table S4. Stratification of the CPAP-FS in quartiles and deciles.

CPAP-FS cut-off	CPAP-FS value
1 st decile	-4.13
2 nd decile	-3.20
1 st quartile	-2.90
3 rd decile	-2.47
4 th decile	-1.98
Median	-1.60
6 th decile	-0.91
7 th decile	-0.51
3 rd quartile	-0.10
8 th decile	0.24
9 th decile	0.80