



Figure S1. Schematic representation of the helmet CPAP equipment. (A) shows the mounted deflated helmet just before being connected to the high flow oxygen circuit. When connected to gas flow (B) the antisuffocation valve must be in place and the helmet must remain inflated during inspiratory efforts. 1 = double oxygen flow meter (maximal flows of 5 and 30 L, respectively). The right combination of flows to obtain the desired FiO_2 depending on the PEEP setting is usually reported in a leaflet and depends on the available high-flow mechanism (e.g., air + oxygen blender). 2 = venturimeter valve must be closed to obtain 100% FiO_2 . 3 = anti-bacterial filter. 4 = antisuffocation valve (compare with (B)); valve in place. The curved arrow indicates a screw like mechanism); 5 = inflatable air pillow that runs around patients' neck for improved comfort and air seal; 6 = small additional operational ports to allow the passage of the nasal gastric tube or for maintaining the seal and reduce contamination while the patient drinks by means of a straw; 7 = armpit straps for anchoring the helmet; 8 = 100% anti-viral and anti-bacterial filter; 9 = PEEP valve, which can be regulated with a spring mechanism (see also the curved arrow in (B)); 10 = manometer column, to have a direct reading of the real-time pressure changes inside the helmet; depending on the helmet design, it can be replaced by spot reading by means of a hand-held manometer through a small port usually placed on the filter crown; 11 = plastic hood (deflated). CPAP = continuous positive airway pressure; FiO_2 = inspired oxygen fraction; PEEP = positive end-expiratory pressure.

Table S1. COVID-19 patients' severity and in-hospital mortality rate for studies published until 8 April 2020.

Region	Setting	Median (IQR) P/F #	Respiratory Support	In-Hospital Mortality
30 provinces, China [21]	ICU and other	225 (158–293) * severe patients	46.9% MV (32.4% NIV–14.5% IMV)	8.1%
		165 (120–304) * composite outcome **	80.6% MV (43.3% NIV–37.3% IMV)	22.4%
Wuhan, China [33]	ICU and other	54% of patients with P/F ≤ 300 31% of patients with P/F ≤ 200	21% HFNC; 31% MV (14% NIMV–17% IMV)	28.3% (80.7% †)
Wuhan, China [34]	ICU and other	76% of patients with P/F ≤ 300	20% MV (12.3% NIV–7.7% IMV)	18%
Wuhan, China [35]	ICU	198 (147–255)	30.1% HFNC; 30.2% MV (11% NIV–19.2% IMV)	28.8%
Wuhan, China [36]	ICU	279 (157–328)	10.2% HFNC; 40% MV (9.9% NIV–29.1% IMV)	38.7%
Lombardy, Italy [37]	ICU	160 (114–220)	99% MV (11% NIV–88% IMV)	26%
Seattle area, WA (US) [38]	ICU	142 (94–177) ‡	100% IMV	50%
Division of Respiratory Diseases, "L. Sacco" University Hospital, Milano, Italy	RICU	138 (87–267)	73% Helmet CPAP	24%

ICU = intensive care unit; RICU = respiratory intermediate care unit; P/F = PaO₂/FiO₂ ratio; IQR = inter quartile range; MV = mechanical ventilation; IMV = invasive mechanical ventilation; NIV = non-invasive mechanical ventilation; HFNC = high flow nasal cannula; CPAP = continuous positive airway pressure. The study by Cao et al. [39] was excluded from the present report because among the 58 patients with ARDS none was deceased at the time of the publication. # when available; * missing for 81,3% of patients. Converted in mmHg from kPa; ** including death, ICU or need for invasive mechanical ventilation; † among patients with respiratory failure; ‡ at day 1 of mechanical ventilation.