Jurnal Ners
p-ISSN 1858-3598
e-ISSN 2502-5791

Supplementary

SUPPLEMENTARY 2

Table S1. Detail of awake prone position characteristics and outcomes in each studies

Authors/ Year	Detail of Protocol	Time from onset/admission to PP	Actual duration and/or frequency of PP	Oxygenation Parameters	Time to follow up (position)	Mortality (n/N, %)	Intubation (n/N, %)	LOS
Aisa et al./2022	**Criteria to start**: - **Medication**: Anxiolytics **Procedure**: As tolerated **Duration**: >3 hours without adverse effects, discomfort or asking for supination **Frequency**: - **Criteria to stop**: Not tolerated	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: 8.5±3.13 hours/day	PF ratio; PaO_2; SpO_2; FiO_2; RR	30 mins after initiated (prone); 1 hour after initiated (prone)	NR	7/50 (14%)	NR
Althunayyan et al./2022	**Criteria to start**: After 10 mins oxygen support required given **Medication**: No **Procedure**: The position change cycle **Duration**: 4 hour/cycle (PP 90 mins, RLD 30 mins, PP 90 min, LLD 30 mins) **Frequency**: 1 Cycle **Criteria to stop**: Requiring mechanical ventilation	**Onset to PP**: NR **Admission to PP**: Upon arrival	**Duration**: 4 hours/day	SF ratio; SpO_2; RR	After finished (supine)	In-hospital 7/49 (14.3%)	6/49 (12.2%)	Hospital 10.12±5.33
Altinay et al./2022	**Criteria to start**: - **Medication**: No **Procedure**: As tolerated **Duration**: 12 hours/day intermittently **Frequency**: - **Criteria to stop**: Not tolerated, PF ratio<150, SpO_2 <93%, Glasgow coma scale score <12, respiratory acidosis	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: 12 hours/day	PF ratio; PaO_2; SpO_2	1 day after initiated (supine)	28-day PP: 9/25 (36%) CG: 16/23 (69.5%)	PP: 8/25 (32%) CG: 19/23 (82.6%)	ICU PP: 6.7±5.5 CG: 8±6.3
Bahloul et al./2021	**Criteria to start**: Within 6 hours after ICU admission **Medication**: No **Procedure**: As tolerated **Duration**: 2-4 hours, followed by 2 hours of supine during the day, and sleep in prone at night when possible **Frequency**: - **Criteria to stop**: Not tolerated	**Onset to admission**: 9.7±5.8 days **Admission to PP**: Within 6 hours	**Duration**: NR	SpO_2; RR	1 hour after initiated (prone)	28-day PP: 14/21 (66.7%) CG: 12/17 (70.5%)	PP: 9/21 (42.8%) CG: 4/17 (23.5%)	ICU PP: 9.5±6.6 CG: 7.6±3.7
Cammarota et al./2021	**Criteria to start**: Using NIV with SpO_2 92-96% **Medication**: Mild sedation, analgesics **Procedure**: As rescue therapy **Duration**: - **Frequency**: - **Criteria to stop**: Not tolerated and/or severe worsening of clinical conditions	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: NR	SpO_2; RR	1 hour after initiated (prone)	NR	9/20 (45%)	NR
Caputo et al./2020	**Criteria to start**: - **Medication**: No **Procedure**: As tolerated **Duration**: 30-120 mins, followed by 30-120 mins in LLD, RLD, and upright sitting position **Frequency**: -	**Onset to PP**: NR **Admission to PP**: Upon arrival	**Duration**: NR	SpO_2	5 mins after initiated (prone)	NR	24-hour 13/50 (26%) 24-48 hour 5/50 (10%)	NR

Authors/ Year	Detail of Protocol	Time from onset/admission to PP	Actual duration and/or frequency of PP	Oxygenation Parameters	Time to follow up (position)	Mortality (n/N, %)	Intubation (n/N, %)	LOS
	Criteria to stop: Not tolerated, SpO_2 <90% or worsening tachypnea with use of accessory muscle, altered mental status or hypercarbia on blood gas							
Chiumello et al./2021	**Criteria to start**: Using helmet CPAP with SpO_2 >94% **Medication**: Analgesics **Procedure**: As tolerated **Duration**: - **Frequency**: - **Criteria to stop**: Not tolerated	**Onset to admission**: 7±3.8 days **Admission to PP**: 2.6±1.53 days	**Duration**: 3 hours/day	PF ratio; PaO_2; RR	3 hours after initiated (prone)	28-day 4/40 (10%)	7/40 (17.5%)	NR
Coppo et al./2020	**Criteria to start**: - **Medication**: No **Procedure**: Encouraged to maintain as long as possible, allowed to sleep or rest **Duration**: At least 3 hours/day, allowed to maintain for up to 8 hours/day **Frequency**: - **Criteria to stop**: Not tolerated	**Onset to admission**: 7.8±4.2 days **Admission to PP**: 3.5±3.1 days	**Duration**: 3.33±0.76 hours/day	PF ratio; PaO_2; SpO_2; SaO_2; FiO_2; RR	10 mins after initiated (prone); 1 hour after finished (supine); 5 days after initiated (supine)	In-hospital 5/46 (10.8%)	13/46 (28.2%)	NR
Ding et al./2020	**Criteria to start**: SpO_2 after 1 hour on HFNC is stable (>90% with $FiO_2 \leq 0.6$) or SpO_2 on HFNC/NIV <90% for >10 min **Medication**: No **Procedure**: As tolerated **Duration**: At least 30 mins/session **Frequency**: Twice a day for 3 days **Criteria to stop**: Not tolerated	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: 1.84±1.07 hours/session **Frequency**: 2.04±1.22 session/day **Given for**: 3.32±3.09 days	PF ratio	30 mins after initiated (prone)	In-hospital 1/20 (5%)	9/20 (45%)	NR
Dubosh et al./2021	**Criteria to start**: According to physician discretion **Medication**: No **Procedure**: Allowed to use lateral position, encouraged to maintain as long as possible, allowed to take a respite as needed **Duration**: - **Frequency**: - **Criteria to stop**: Not tolerated, worsening respiratory status, admission to ICU or floor	**Onset to PP**: NR **Admission to PP**: Upon arrival	**Duration**: 111±74.49 minutes	SF ratio; SpO_2; FiO_2; RR	30 mins after initiated (prone)	In-hospital 2/22 (9%)	48-hour 5/22 (22.7%) In-hospital admission 7/22 (31.8%)	NR
Duenas-Castell et al./2021	**Criteria to start**: Able to maintain PP for 15 mins **Medication**: No **Procedure**: Allowed to use RLD, LLD, and upright position during prone time **Duration**: 120 mins **Frequency**: - **Criteria to stop**: Not tolerated	**Onset to admission**: 6.06±4.62 days **Admission to PP**: NR	**Duration**: NR **Given for**: 1.73±1.64 days	PF ratio; SpO_2; RR	After finished (supine)	In-hospital 73/212 (34.4%)	NR	ICU 9±8.2 Hospital 10±8.2
Ehrmann et al./2021	**Criteria to start**: Before or after 1 hour meal **Medication**: No **Procedure**: Encouraged to maintain as long and as frequently as possible to ≥16 hours/day **Duration**: At least 30 minutes/session **Frequency**: Twice a day in the first 3 days **Criteria to stop**: Not tolerated, discharge, death	**Onset to PP**: NR **Admission to PP**: 1.1±1.1 days	**Duration**: 5.6±4.4 hours/day; 2.73±2.08 hours/session **Given for**: 14 days	SF ratio; RR; ROX index	30 min to 1 hour after initiated (prone); 30 min to 1 hour after finished (supine)	28-day PP: 117/564 (20.7%) CG: 132/557 (23.6%)	28-day PP: 185/564 (32.8%) CG: 223/557 (40%)	Hospital PP: 16.4±10.5 CG: 16.5±9.7

Authors/ Year	Detail of Protocol	Time from onset/admission to PP	Actual duration and/or frequency of PP	Oxygenation Parameters	Time to follow up (position)	Mortality (n/N, %)	Intubation (n/N, %)	LOS
Elharrar et al./2020	**Criteria to start**: - **Medication**: No **Procedure**: As tolerated **Duration**: At least 3 hours **Frequency**: 1 session **Criteria to stop**: Not tolerated	**Onset to PP**: NR **Admission to PP**: 0.83±1.18 day	**Duration**: >3 hours/day	PaO_2	1-2 hours after initiated (prone); 6-12 hours after finished (supine)	NR	5/24 (20.8%)	NR
Fazzini et al./2022	**Criteria to start**: - **Medication**: No **Procedure**: As tolerated **Duration**: - **Frequency**: - **Criteria to stop**: Not tolerated	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: 6.3±9.9 hours/session **Frequency**: 1-6 session/day	PF ratio; SF ratio; RR	During (prone); 1-4 hours after finished (supine)	90-day 14/36 (30.4%)	24 hour 2/46 (4.3%)	ICU 10.3±13.7 Hospital 14.9±19.6
Fralick et al./2022	**Criteria to start**: - **Medication**: No **Procedure**: Encouraged to adhere the protocol, allowed to use additional pillow **Duration**: Up to 2 hours/session and sleep in prone overnight **Frequency**: 4 times/day **Criteria to stop**: Not tolerated	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: 2.5 hours/day; 6.76±8.47 hours/3days **Given for**: 3 days	SF ratio	3 days after initiated (supine)	In-hospital PP: 1/126 (0.7%) CG: 1/122 (0.8%)	PP: 6/126 (4.7%) CG: 5/122 (4%)	Hospital PP: 5.7±4.5 CG: 5±3.8
Gad/2021	**Criteria to start**: Received NRM 10-15 L/min **Medication**: No **Procedure**: As tolerated, allowed to use additional pillow, reposition every 2 hours **Duration**: 1-2 hours/session **Frequency**: 3 hours apart during waking hours **Criteria to stop**: Not tolerated, need intubation and invasive ventilation	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: 1-2 hours/session **Given for**: 3 days	PaO_2; SaO_2	3 days after initiated (supine)	In ICU PP: 3/15 (20%) CG: 3/15 (20%)	PP: 3/15 (20%) CG: 3/15 (20%)	ICU PP: 8±3 CG: 7±2 Hospital PP: 28±5 CG: 26±5
Ibarra-Estrada et al./2022	**Criteria to start**: SpO_2 92-95% **Medication**: No **Procedure**: Encouraged to maintain as long as possible, allowed to use additional pillows, encouraged to use personal cell phone with internet connection to increase tolerance **Duration**: At least 1 hour/day **Frequency**: - **Criteria to stop**: Need for NIV or intubation, death, meet HFNC weaning criteria	**Onset to PP**: 8.3±2.2 days **Admission to PP**: 17±9.3 hours	**Duration**: 9.3±5.4 hours/day; 3.33±0.44 hours/session **Frequency**: 4±1.5 session/day **Given for**: 6.23±3.95 days	SF ratio; ROX index; RR	1 hour after initiated (prone); 1 hours after finished (supine)	28-day PP: 71/216 (32.8%) CG: 79/214 (36.9%)	28-day PP: 65/216 (30%) CG: 92/214 (42.9%)	Hospital PP: 11.3±3.7 CG: 13.3±5.2
Jagan et al./2020	**Criteria to start**: - **Medication**: No **Procedure**: Instructed to self-prone intermittently during day and overnight **Duration**: ≥ 1 hour/session and ≥ 1 hour overnight **Frequency**: ≥ 5 session/day **Criteria to stop**: Not tolerated	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: NR **Given for**: 28 days	SF ratio	Every 4 hour for the first 48 hours (NS)	In-hospital PP: 0/40 (0%) CG: 16/65 (24.6%)	PP: 4/40 (10%) CG: 18/65 (27.6%)	Hospital PP: 9 (95%CI 6-14) CG: 14 (95% CI 10-20)
Jayakumar et al./2021	**Criteria to start**: SpO_2 ≥92% **Medication**: No	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: 1.67±0.7 hours/session; 4 hours/day	PF ratio	2 hours after finished (supine)	In-ICU PP: 2/30 (6.6%) CG: 3/30 (10%)	PP: 4/30 (13.3%) CG: 4/30 (13.3%)	ICU PP: 9.9±5.7 CG: 11.5±6.9

Authors/ Year	Detail of Protocol	Time from onset/admission to PP	Actual duration and/or frequency of PP	Oxygenation Parameters	Time to follow up (position)	Mortality (n/N, %)	Intubation (n/N, %)	LOS
	Procedure: Encourage to maintain as long as possible, allowed to use additional pillow **Duration**: 30 mins/session, and at least 6 hours/day (cumulative) **Frequency**: - **Criteria to stop**: need intubation, discharge, death,							
Khanum et al./2021	**Criteria to start**: According to physician discretion **Medication**: No **Procedure**: As tolerated **Duration**: - **Frequency**: - **Criteria to stop**: Not tolerated	**Onset to admission**: 6.3±4.7 days **Admission to PP**: 1.33±0.79 days	**Duration**: 2.5-16 hours/day **Given for**: 6±3.16 days	PF ratio	At the last session (supine)	In-ICU 1/23 (4.3%)	1/23 (4.3%)	Hospital 16.7±23.7 Covid-19 unit 6±3.1
Kharat et al./2021	**Criteria to start**: - **Medication**: No **Procedure**: Encouraged to alternate body position every 4 hour **Duration**: Maximum 12 hours/day **Frequency**: - **Criteria to stop**: Not tolerated	**Onset to PP**: 10.6±5.1 days **Admission to PP**: NR	**Duration**: 4.91±3.6 hours/day	SF ratio; RR	24 hour after initiated (supine for 1 hour)	NR	NR	NR
Koike et al./2022	**Criteria to start**: FiO_2 ≥0.4 **Medication**: Mild sedation, analgesics **Procedure**: As tolerated **Duration**: >30 minutes in 1st session **Frequency**: 2 session/day **Criteria to stop**: intolerable respiratory distress, tachypnea >35, unacceptable back pain, discharge, need intubation	**Onset to PP**: 9.3±3.1 days **Admission to PP**: NR	**Duration**: 3±1.56 hours/session **Frequency**: 2.3±0.7 session/day **Given for**: 12±7.04 days	SF ratio; ROX index; RR	3 days after initiated (NS); 1 week after initiated (NS); 2 weeks after initiated (supine); 3 weeks after initiated (supine)	In-ICU PP: 3/27 (11.1%) CG: 8/31 (25.8%) In Ward PP: 2/27 (7.4%) CG: 0/31 (0%)	PP: 2/27 (7.4%) CG: 13/31 (41.9%)	Hospital PP: 20±7.8 CG: 23.3±12.4
Kumar et al./2022	**Criteria to start**: SpO_2 >90% on HFNC 50-60 L/min with FiO_2 0.6-1.0 **Medication**: No **Procedure**: Cyclical repositioning protocol, allowed to use additional pillow **Duration**: PP 30-120 minutes, RLD 30-60 minutes, semi sitting position (30-60°) 30-60 minutes, LLD 30-60 minutes **Frequency**: Continued until meet one of criteria to stop **Criteria to stop**: SpO_2 <90% on HFNC with FiO_2 1, RR >24, altered sensorium, not tolerated, PF ratio ≥150 on HFNC ≤45 L/min with FiO_2 ≤0.6 for 4 hour	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: 6.8±3.9 hours/session	PF ratio; SF ratio; PaO_2; RR;	After first session (supine); After last session (supine)	NR	24/102 (23.5%)	NR
Liu et al./2021	**Criteria to start**: - **Medication**: No **Procedure**: - **Duration**: Morning 2 hours, afternoon 2 hours, night 6 hours, total time 10-14 hours/day **Frequency**: 3 times/day **Criteria to stop**: Not tolerated	**Onset to PP**: NR **Admission to early PP**: 0.2±0.44 days **Admission to late PP:** 5.9±2.53 days	**Duration of early PP**: 12.5±0.66 hours/day **Duration of late PP**: 12.6±0.78 hours/day **Early PP given for**: 11.1±4.17 days **Late PP given for**: 16.9±5.2 days	PF ratio; RR	1 day after initiated (supine)	In-hospital 0/29 (0%)	NR	Hospital 18.2±7.2

Authors/ Year	Detail of Protocol	Time from onset/admission to PP	Actual duration and/or frequency of PP	Oxygenation Parameters	Time to follow up (position)	Mortality (n/N, %)	Intubation (n/N, %)	LOS
Lupieri et al./2022	**Criteria to start**: - **Medication**: Analgesics **Procedure**: As tolerated, allowed to use additional pillows; provided recreational means (music) **Duration**: 45 minutes/session **Frequency**: - **Criteria to stop**: not tolerated, need intubation	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: ≥45 minutes/session **Frequency**: 3.3±3.9 session/patient	PF ratio; PaO_2; SpO_2; FiO_2; RR;	After the first session initiated (prone)	In-ICU 2/31 (6.4%)	10/31 (32.2%)	NR
Misra et al./2021	**Criteria to start**: - **Medication**: No **Procedure**: As tolerated, allowed to use lateral position, combined with convention respiratory physiotherapy **Duration**: 45-60 minutes/session **Frequency**: 1 session **Criteria to stop**: Not tolerated	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: NR	SpO_2	After finished (supine)	NR	NR	NR
Musso et al./2022	**Criteria to start**: Within 24 hours after IMCU admission and a brief period of NIV (1-8 hours) **Medication**: Mild sedation, analgesics **Procedure**: Encouraged to maintain as long as possible, allowed to use additional pillows, duration could be extended daytime and/or integrated by additional daytime session, daily breaks lasting no more than 2 hours **Duration**: ≥8 hours/session, scheduled overnight **Frequency**: 1 session/day **Criteria to stop**: 1) PF >300 with FiO_2 ≤40%, RR≤24 during NIV for 2 hours, or 2) SpO_2 ≥92% with FiO_2 ≤40% using venturi mask/nasal cannula 10 L/min, RR≤24 and no signs of altered respiratory mechanics for 2 hours	**Onset to PP**: NR **Admission to PP**: 2±1.5 days	**Duration**: 12.03±2.79 hours/day **Frequency**: 2±1.5 sessions/day **Given for**: 6.3±2.2 days	PF ratio; PaO_2; FiO_2; RR	7 days after initiated (supine for 1 hour)	28-day PP: 10/81 (12.3%) CG: 59/162 (36.9%)	28-day PP: 8/81 (9.8%) CG: 44/162 (27.1%)	Hospital PP: 15±7.5 CG: 16±5.9
Oliveira et al./2022	**Criteria to start**: - **Medication**: Anxiolytics **Procedure**: Encourage to maintain as long as possible, allowed for another session based on physician's discretion **Duration**: 2 hours/session **Frequency**: 1 session **Criteria to stop**: worsening of dyspnea, worsening of saturation, low back pain, or general discomfort within 10-60 minutes of session	**Onset to PP**: 8.7±3.4 days **Admission to PP**: NR	**Duration**: 1.78±0.6 hours/session **Frequency**: 1.84±2.01 sessions/day **Given for**: 1.5±1.2 days	PF ratio; SF ratio; PaO_2; SpO_2; FiO_2; RR	After 1st session finished (supine)	In-hospital 10/41 (24.4%)	24-48 hours 15/41 (36.5%)	Hospital 15.9±12.4
Othman et al./2022	**Criteria to start**: 45 mins to 1 hour after meals **Medication**: No **Procedure**: Encouraged to maintain as long as possible, allowed to use additional pillows **Duration**: 1 hour/session **Frequency**: 1 session **Criteria to stop**: Not tolerated	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: ≥3 hours/session	PF ratio; PaO_2; SpO_2; FiO_2; RR;	10 minutes after initiated (prone); 1 hour after initiated (prone)	NR	PP: 0/42 (0%) CG: 1/42 (2.3%)	NR
Perez-Nieto et al./2022	**Criteria to start**: According to physician discretion **Medication**: No **Procedure**: As tolerated	**Onset to PP**: NR **Admission to PP**: 23.8±29.7 hours	**Duration**: 14.6±11.8 hours during in-hospital stay	SF ratio	Within 1 hour after initiated (prone)	In-hospital PP: 100/505 (19.8%)	PP: 119/505 (23.5%) CG: 130/322 (40.3%)	NR

Authors/ Year	Detail of Protocol	Time from onset/admission to PP	Actual duration and/or frequency of PP	Oxygenation Parameters	Time to follow up (position)	Mortality (n/N, %)	Intubation (n/N, %)	LOS
	Duration: 2 hour **Frequency**: 1 session **Criteria to stop**: Not tolerated					CG: 120/322 (37.4%)		
Rocha et al./2022	**Criteria to start**: - **Medication**: Neuromuscular blocking agents **Procedure**: As tolerated **Duration**: - **Frequency**: - **Criteria to stop**: Not tolerated	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: NR	SpO_2; FiO_2; RR	1 hour after initiated (prone)	NR	NR	NR
Scaravilli et al./2015	**Criteria to start**: - **Medication**: Mild sedation **Procedure**: As tolerated **Duration**: - **Frequency**: 1 session **Criteria to stop**: Not tolerated	**Onset to PP**: NR **Admission to PP**: 2±1.63 days	**Duration**: 3±1.63 hours/session **Frequency**: 2±1.63 session/patient	PF ratio; PaO_2; RR	Last hour of PP (prone); 6 hour after finished (supine)	In ICU 3/15 (20%)	NR	NR
Silva Junior et al./2021	**Criteria to start**: - **Medication**: No **Procedure**: Encouraged to maintain as long as possible and change position every 2 hours, allowed to use additional pillows and recreational means as distraction **Duration**: 1 hour/session **Frequency**: 3 session/day **Criteria to stop**: Not tolerated	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: 1.9±0.9 hours/session	PF ratio; SF ratio; PaO_2; SaO_2; SpO_2; RR;	During first session (prone)	In-hospital 8/48 (16.6%)	16/48 (33.3%)	ICU 12.6±7.4 Hospital 17.8±10
Solverson et al./2020	**Criteria to start**: - **Medication**: No **Procedure**: Encouraged to maintain as long as possible **Duration**: According to physician's discretion **Frequency**: According to physician's discretion **Criteria to stop**: Not tolerated	**Onset to PP**: 7.5±3.3 days **Admission to PP**: 2.5±1.6 days	**Duration**: 2.75±2.08 hours/session **Frequency**: 2.75±1.39 session/day **Given for**: 2.5±1.67 days	SF ratio; SpO_2; RR	20 minutes after initiated (supine); 1-2 hours after finished (supine)	In-hospital 2/17 (11.7%)	7/17 (41.1%)	Hospital 14.5±7.1
Sryma et al./2021	**Criteria to start**: - **Medication**: No **Procedure**: Encouraged to maintain as long as possible, allowed to use additional pillows, use reverse Trendelenburg to increase comfort **Duration**: 2 hours/session, with target of 8 hours/day **Frequency**: - **Criteria to stop**: Not tolerated, worsening of hypoxia, recovered (SpO_2 room air >93% for 2 hours)	**Onset to PP**: 8.2±3.1 days **Admission to PP**: NR	**Duration**: 7.7±1.9 hours/day	SpO_2; ROX index; RR;	30 minutes after initiated (prone); 12 hours after initiated (supine)	In-hospital PP: 2/30 (6.7%) CG: 4/15 (26.7%)	PP: 2/30 (6.7%) CG: 5/15 (33.3%)	NR
Taylor et al./2021	**Criteria to start**: - **Medication**: No **Procedure**: Encouraged to maintain as long as possible, allowed to return to the supine position as necessary **Duration**: 12-16 hours/day **Frequency**: - **Criteria to stop**: Intubation, discharge, death, ICU admission	**Onset to PP**: NR **Admission to PP**: 3.6±5.8 hours	**Duration**: 10-120 minutes/day	SF ratio	2 days after initiated (NS)	48-hour PP: 0/13 (0%) CG: 0/27 (0%)	PP: 0/13 (0%) CG: 0/27 (0%)	Hospital PP: 5.3±4.1 CG: 8.3±7.8

Authors/ Year	Detail of Protocol	Time from onset/admission to PP	Actual duration and/or frequency of PP	Oxygenation Parameters	Time to follow up (position)	Mortality (n/N, %)	Intubation (n/N, %)	LOS
Thompson et al./2020	**Criteria to start**: - **Medication**: No **Procedure**: Encouraged to maintain as long as possible, allowed to use additional pillows and rest in lateral or supine position followed by repeat prone positioning **Duration**: Up to 24 hours/day **Frequency**: - **Criteria to stop**: -	**Onset to PP**: 12.66±5.08 days **Admission to PP**: 4.2±2.7 days	**Duration**: 8.7±6.9 hours/day **Given for**: 2.2±0.9 days	SpO_2	1 hour after initiated (NS)	In ICU 3/25 (12%)	12/25 (48%)	NR
Winearls et al./2020	**Criteria to start**: Had no contraindications (imminent intubation, reduced conscious level, significant immobility or current pressure area) **Medication**: No **Procedure**: Given verbal and written information on the rationale and practicalities of PP, allowed to use semiprone **Duration**: - **Frequency**: - **Criteria to stop**: -	**Onset to PP**: NR **Admission to PP**: NR	**Duration**: 8±5 hours/day **Given for**: 10±5 days	PF ratio; SpO_2; ROX index; RR	15 minutes after initiated (prone); 1 hour after finished (supine)	28-day 4/24 (16.7%)	NR	NR
Wormser et al./2021	**Criteria to start**: - **Medication**: No **Procedure**: As tolerated **Duration**: - **Frequency**: At least 1 session **Criteria to stop**: increase of pain, worsening of dyspnea, discomfort, anxiety	**Onset to PP**: NR **Admission to PP**: 2 days	**Duration**: NR	SF ratio	During implementation in each session (prone); After finished in each session (supine)	In-hospital 1/27 (3.7%)	NR	Hospital 16.3±11.7

Definition of abbreviations: PP, prone position; NR, not reported; PF ratio, arterial partial pressure of oxygen to inspired fraction of oxygen ratio; SF ratio, peripheral oxygen saturation to inspired fraction of oxygen ratio; ROX index, ratio of SF ratio to respiratory rate; PaO2, arterial pressure of oxygen; SaO2, oxygen saturation in arterial blood; SpO2, peripheral oxygen saturation; RR, respiratory rate; FiO2, inspired fraction of oxy-gen; HFNC, high-flow nasal cannula;; NIV, non-invasive ventilation; NRM, non-rebreather mask; LLD, left lateral decubitus; RLD, right lateral decubitus; ICU, intensive care unit; IMCU, intermediate care unit

Table S2. Detail of adverse event reported

Adverse events	Frequency in group				Authors/Year
	APP		Control		
	n	N	n	N	
Pain	1	50			Aisa et al./2022
	10	24			Elharrar et al./2020
	16	216	13	214	Ibarra-Estrada et al./2022
	10	81	14	162	Musso et al./2022
	4	42			Othman et al./ 2022
	2	17			Solverson et al./2020
	2	30			Sryma et al./2021
	NS	27			Wormser et al./2021
Intolerance	3	81	4	162	Musso et al./2022
	0	15			Scaravilli et al./2015
	1	22			Dubosh et al./2021
Discomfort	NS	24			Elharrar et al./2020
	NS	23			Khanum et al./2021
	6	10	0	17	Kharat et al./2021
	NS	400			Misra et al./2021
	12	42			Othman et al./ 2022
	6	17			Solverson et al./2020
	NS	27			Wormser et al./2021
Nausea and vomiting	15	564	18	557	Ehrmann et al./2021
	5	216	10	214	Ibarra-Estrada et al./2022
	0	30			Jayakumar et al./2021
	NS	400			Misra et al./2021
	0	81	0	162	Musso et al./2022
	5	42			Othman et al./ 2022
	0	15			Scaravilli et al./2015
	0	17			Solverson et al./2020
Line dislodgment	26	564	17	557	Ehrmann et al./2021
	14	216	14	214	Ibarra-Estrada et al./2022
	5	81	10	162	Musso et al./2022
	0	17			Solverson et al./2020
Device removal	1	13	0	27	Taylor et al./2021
	0	15			Scaravilli et al./2015
	0	17			Solverson et al./2020
Dyspnea	NS	24			Elharrar et al./2020
	3	27			Koike et al/.2022
	4	81	40	162	Musso et al./2022
Worsening hypoxemia	8	81	44	162	Musso et al./2022
	0	30			Sryma et al./2021
	NS	27			Wormser et al./2021
Hemodynamic decompensation	0	102			Kumar et al./2022
	0	17			Solverson et al./2020
	0	30			Sryma et al./2021
Aspiration pneumonia	2	126	1	122	Fralick et al./2022
	0	102			Kumar et al./2022
	0	17			Solverson et al./2020
Venous thromboembolism	3	126	2	122	Fralick et al./2022
	4	81	5	162	Musso et al./2022
	8	564	10	557	Ehrmann et al./2021
Skin breakdown	1	216	3	214	Ibarra-Estrada et al./2022
	2	81	3	162	Musso et al./2022
	0	30			Jayakumar et al./2021
Pressure ulcers	0	41			Oliveira et al./2022
	0	17			Solverson et al./2020
	0	13	0	27	Taylor et al./2021
Facial edema	6	81	5	162	Musso et al./2022
	0	15			Scaravilli et al./2015
Nerve compression	0	30			Jayakumar et al./2021
	0	15			Scaravilli et al./2015
	0	27			Koike et al/.2022
Altered mental status	0	81	1	162	Musso et al./2022
	1	17			Solverson et al./2020
Fever (>38)	2	27			Koike et al/.2022
Anxiety	4	50			Aisa et al./2022
Dry cough	1	27			Koike et al/.2022
Tachypnea (>25)	4	27			Koike et al/.2022
Emergent intubation	0	13	0	27	Taylor et al./2021
Pneumothorax	0	81	1	162	Musso et al./2022
Pneumomediastinum	4	81	4	162	Musso et al./2022
Thoraco-abdominal hematoma	3	81	2	162	Musso et al./2022

Adverse events	Frequency in group				Authors/Year
	APP		Control		
	n	N	n	N	
Respiratory muscle fatigue	6	81	22	162	Musso et al./2022
Pressure neuropathies	0	15			Scaravilli et al./2015
Bloating sensation	2	30			Sryma et al./2021
Definition of abbreviations: NS, not specific					

Table S3. Critical appraisal according to JBI

Authors/Years/Design	Questions													% of Yes
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Kharat et al./2021/RCT	Y	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	61.5
Gad/2021/RCT	Y	N	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	69.2
Ehrmann et al./2021/RCT	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	76.9
Taylor et al./2021/RCT	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	69.2
Jayakumar et al./2021/RCT	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	69.2
Fralick et al./2022/RCT	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	69.2
Othman et al./2022/RCT	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	76.9
Ibarra-Estrada et al./2022/RCT	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	76.9
Musso et al./2022/Quasi-experimental	Y	Y	Y	Y	Y	Y	Y	Y	Y					100
Chiumello et al./2021/Quasi-experimental	Y	Y	Y	N	Y	Y	Y	Y	Y					88.8
Sryma et al./2021/Quasi-experimental	Y	Y	Y	Y	Y	Y	Y	Y	Y					100
Misra et al./2021/Quasi-experimental	Y	Y	Y	N	Y	Y	Y	Y	Y					88.8
Fazzini et al./2021/Cohort	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y			81.8
Rocha et al./2022/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			100
Lupieri et al./2022/Cohort	Y	Y	Y	Y	N	Y	Y	Y	N	N	Y			72.7
Koike et al./2022/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y			90.9
Aisa et al./2022/Cohort	Y	Y	N	Y	N	Y	Y	Y	Y	N	Y			72.7
Althunayyan et al./2022/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			100
Altinay et al./2022/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y			90.9
Kumar et al./2022/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y			90.9
Perez-Nieto et al./2022/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			100
Numata et al./2022/Cohort	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y			81.8
Oliveira et al./2022/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y			90.9
Duenas-Castell et al./2021/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y			81.8
Cammarota et al./2021/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y			90.9
Wormser et al./2021/Cohort	Y	Y	Y	Y	N	Y	Y	Y	N	N	Y			72.7
Dubosh et al./2021/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y			90.9
Bahloul et al./2021/Cohort	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y			81.8
Liu et al./2021/Cohort	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y			81.8
Khanum et al./2021/Cohort	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y			81.8
Silva Junior et al./2021/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y			90.9
Thompson et al./2021/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y			90.9
Jagan et al./2021/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y			90.9
Winearls et al./2020/Cohort	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y			81.8
Coppo et al./2020/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y			81.8
Elharrar et al./2020/Cohort	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y			81.8
Ding et al./2020/Cohort	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y			81.8
Scarvilli et al./2015/Cohort	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y			81.8
Solverson et al./2021/Cohort	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y			90.9
Caputo et al./2020/Cohort	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y			81.8

Table S4. Result of potential outlier analysis for studies in PF ratio analysis

Authors/Year	First potential outlier analysis (n=25)		Second potential outlier analysis (n=22)	
	Cook distance	Studentized residual	Cook distance	Studentized residual
Aisa et al. 2022a	0.0307	0.8263	**0.2269**	**2.0966**
Aisa et al. 2022b	**0.2332**	**2.3241**	Excluded	Excluded
Altinay et al. 2022	0.0231	-0.7122	0.0150	-0.5499
Chiumello et al. 2021	0.0154	0.6037	0.1256	1.5958
Coppo et al. 2020a	0.0001	0.0901	0.0317	0.7635
Coppo et al. 2020b	0.0695	-1.2147	0.1075	-1.4179
Coppo et al. 2020c	0.0031	-0.2286	0.0013	0.1977
Ding et al. 2020	0.0158	-0.6003	0.0068	-0.3793
Duenas-Castell et al. 2021	0.0600	-1.0437	0.0925	-1.2435
Fazzini et al. 2022	0.0174	-0.5621	0.0075	-0.3228
Jayakumar et al. 2021	0.0858	-1.4344	0.1228	-1.6993
Khanum et al. 2021	0.0494	1.1274	0.1775	**2.2258**
Kumar et al. 2022a	0.0095	-0.3702	0.0002	-0.0096

Kumar et al. 2022b	0.0000	0.0578	0.0296	0.7236
Liu et al. 2021a	0.1395	**2.2251**	Excluded	Excluded
Liu et al. 2021b	0.0103	0.5419	0.0503	1.2439
Lupieri et al. 2022	0.0020	-0.1792	0.0027	0.2701
Musso et al. 2022	0.0201	-0.5561	0.0094	-0.3207
Oliveira et al. 2022	0.0433	-0.9465	0.0488	-0.9396
Othman et al. 2022	0.0108	-0.4382	0.0015	-0.1242
Scaravilli et al. 2015a	0.0000	-0.0149	0.0062	0.4495
Scaravilli et al. 2015b	0.0360	-0.9655	0.0296	-0.9042
Silva junior et al. 2021	**0.6910**	**4.5543**	Excluded	Excluded
Winearls et al. 2020a	0.0089	-0.4339	0.0011	-0.1290
Winearls et al. 2020b	0.0302	-0.8303	0.0243	-0.7267

Threshold for first and second cook distance analysis is 0.16 and 0.18, respectively; bolded text indicates potential outlier value

Table S5. Result of potential outlier analysis for studies in SF ratio analysis

Authors/Year	First potential outlier analysis (n=27)		Second potential outlier analysis (n=26)	
	Cook distance	Studentized residual	Cook distance	Studentized residual
Althunayyan et al. 2022	0.0050	-0.3553	0.0086	-0.4463
Dubosh et al. 2020	0.0189	-0.7034	0.0446	-1.0805
Ehrmann et al. 2021a	**0.4081**	**6.5483**	Excluded	Excluded
Ehrmann et al. 2021b	0.0218	0.6678	**0.1562**	**2.6214**
Fazzini et al. 2022a	0.0025	0.2478	0.0224	0.7186
Fazzini et al. 2022b	0.0008	0.1349	0.0111	0.5006
Fralick et al. 2022	0.0124	-0.5538	0.0350	-0.8685
Ibarra-Estrada et al. 2022a	0.0005	0.0890	0.0100	0.4206
Ibarra-Estrada et al. 2022b	0.0033	-0.2904	0.0051	-0.3363
Kharat et al. 2021	0.0012	-0.1831	0.0003	-0.1084
Koike et al. 2022a	0.0017	0.2068	0.0151	0.6172
Koike et al. 2022b	0.0078	0.4483	0.0434	1.0647
Koike et al. 2022c	0.0227	0.7721	0.1000	1.6599
Koike et al. 2022d	0.0274	0.8499	0.1163	1.8019
Koike et al. 2022e	0.0008	-0.1427	0.0000	-0.0345
Koike et al. 2022f	0.0008	0.1367	0.0122	0.5119
Oliveira et al. 2022	0.0158	-0.6336	0.0412	-0.9860
Perez-Nieto et al. 2022	0.0059	-0.3808	0.0143	-0.5451
Silva Junior et al. 2021	0.0080	-0.4513	0.0174	-0.6333
Solverson et al. 2021a	0.0087	-0.4820	0.0153	-0.6525
Solverson et al. 2021b	0.0190	-0.7116	0.0415	-1.0733
Wormser et al. 2021a	0.0037	0.3068	0.0240	0.7945
Wormser et al. 2021b	0.0100	-0.5102	0.0203	-0.7220
Wormser et al. 2021c	0.0031	0.2917	0.0178	0.7291
Wormser et al. 2021d	0.0193	-0.7224	0.0407	-1.0810
Wormser et al. 2021e	0.0061	-0.4098	0.0086	-0.5096
Wormser et al. 2021f	0.0372	-1.0111	0.0822	-1.5813

Threshold for first and second cook distance analysis is 0.14 and 0.15, respectively; bolded text indicates potential outlier value

Table S6. Result of potential outlier analysis for studies in intubation rate analysis

Authors/Year	First potential outlier analysis (n=14)	
	Cook distance	Studentized residual
Ehrmann et al. 2021	**0.3903**	1.2259
Ibarra-Estrada et al. 2022	0.1139	0.4392
Taylor et al. 2021	0.0026	0.5889
Altinay et al. 2022	0.1927	-1.3166
Bahloul et al. 2021	0.1112	1.9763
Fralick et al. 2022	0.0401	0.9915
Gad 2021	0.0142	0.6243
Jagan et al. 202	0.0458	-0.9797
Jayakumar et al. 2021	0.0195	0.6859
Koike et al. 2022	0.0937	-1.7171
Musso et al. 2022	0.1550	-1.3203
Othman et al. 2022	0.0002	-0.3810
Perez-Nieto et al. 2022	0.0002	-0.1946
Sryma et al. 2021	0.0534	-1.4234

Threshold for cook distance analysis is 0.28; bolded text indicates potential outlier value

Table S7. Result of potential outlier analysis for studies in mortality rate analysis

Authors/Year	Potential outlier analysis (n=14)	
	Cook distance	Studentized residual
Altinay et al. 2022	0.0356	-0.6046
Bahloul et al. 2021	0.1982	1.0549
Ehrmann et al. 2021	0.2729	0.9722
Ibarra-Estrada et al. 2022	0.2742	1.0027
Musso et al. 2022	**0.3541**	-1.7771
Fralick et al. 2022	0.0019	0.2696
Jagan et al. 2020	0.0393	-1.8129
Perez-Nieto et al. 2022	0.2319	-0.9073
Sryma et al. 2021	0.0342	-1.1518
Gad 2021	0.0125	0.5395
Jayakumar et al. 2021	0.0005	0.0145
Koike et al. 2022a	0.0129	-0.6300
Koike et al. 2022b	0.0097	1.3942
Taylor et al. 2021	0.0026	0.5583

Threshold for cook distance analysis is 0.28; bolded text indicates potential outlier value

Table S8. Sensitivity analysis of potential outlier studies

Analysis	PF ratio				SF ratio				Intubation rate				Mortality rate			
	n	SMD (95% CI)	I^2	p	n	SMD (95% CI)	I^2	p	n	RR (95% CI)	I^2	p	n	RR (95% CI)	I^2	p
Studies with potential outliers	25	0.94 (0.67, 1.22)	88.7	<.001	27	0.91 (0.44, 1.38)	98.1	<.001	14	0.62 (0.49, 0.78)	56	<.0001	14	0.66 (0.51, 0.85)	59	0.001
Studies without potential outliers[a]	22	0.70 (0.51, 0.88)	72.7	<.001	26	0.76 (0.51, 1.01)	92.5	<.001	13	0.57 (0.44, 0.75)	41	<.0001	13	0.71 (0.55, 0.91)	53	0.007
Studies without potential outliers[b]	20	0.61 (0.45, 0.77)	61.6	<.001	25	0.71 (0.52, 0.89)	80.7	<.001								

Definition of abbreviations: SMD, standardized mean difference; CI, confidence interval; [a], excluding Aisa et al. 2022b, Liu et al. 2021a, and Silva Junior et al. 2021 for PF ratio analysis, Ehrmann et al. 2021a for SF ratio analysis, Ehrmann et al. 2021 for intubation rate analysis, and Musso et al. 2022 for mortality rate analysis; [b], excluding Aisa et al. 2022a and Khanum et al. 2021 for PF ratio analysis, Ehrmann et al. 2021b for SF ratio analysis