

Prone Positioning in an Acute Care Patient Setting

Developed and prepared based on material adapted from the Intensive Care Society, United Kingdom and other evidence-based resources.

Preamble:

Although there remains limited evidence on the best therapies for patients with SARS-CoV-2, what has been demonstrated repeatedly across the world is the high prevalence of Acute Respiratory Distress Syndrome (ARDS) in this patient cohort. Clinical diagnosis of ARDS in the hospitalized COVID-19 patient population range from 17% to 41% (1, 2).

Globally, critical care clinicians have noted that patients with moderate to severe ARDS appear to have responded well to invasive ventilation in the prone position; this has led to prone positioning being recommended in international guidelines for the management of COVID-19 (3). This is consistent with previously published evidence on the benefits of early prone positioning in patients with ARDS to improve oxygenation and reduce overall mortality (4-7).

The traditional supine position leads to:

- Over-inflation of the ventral alveoli and atelectasis of the dorsal alveoli.
- Compression of alveoli secondary to direct pressure from the heart and the diaphragm being pushed cranially by the intra-abdominal contents.
- V/Q Mismatch – As dorsal alveoli are preferentially perfused due to the gravitational gradient in vascular pressures they are poorly ventilated and highly perfused which manifests as hypoxaemia.

The benefits of prone positioning include:

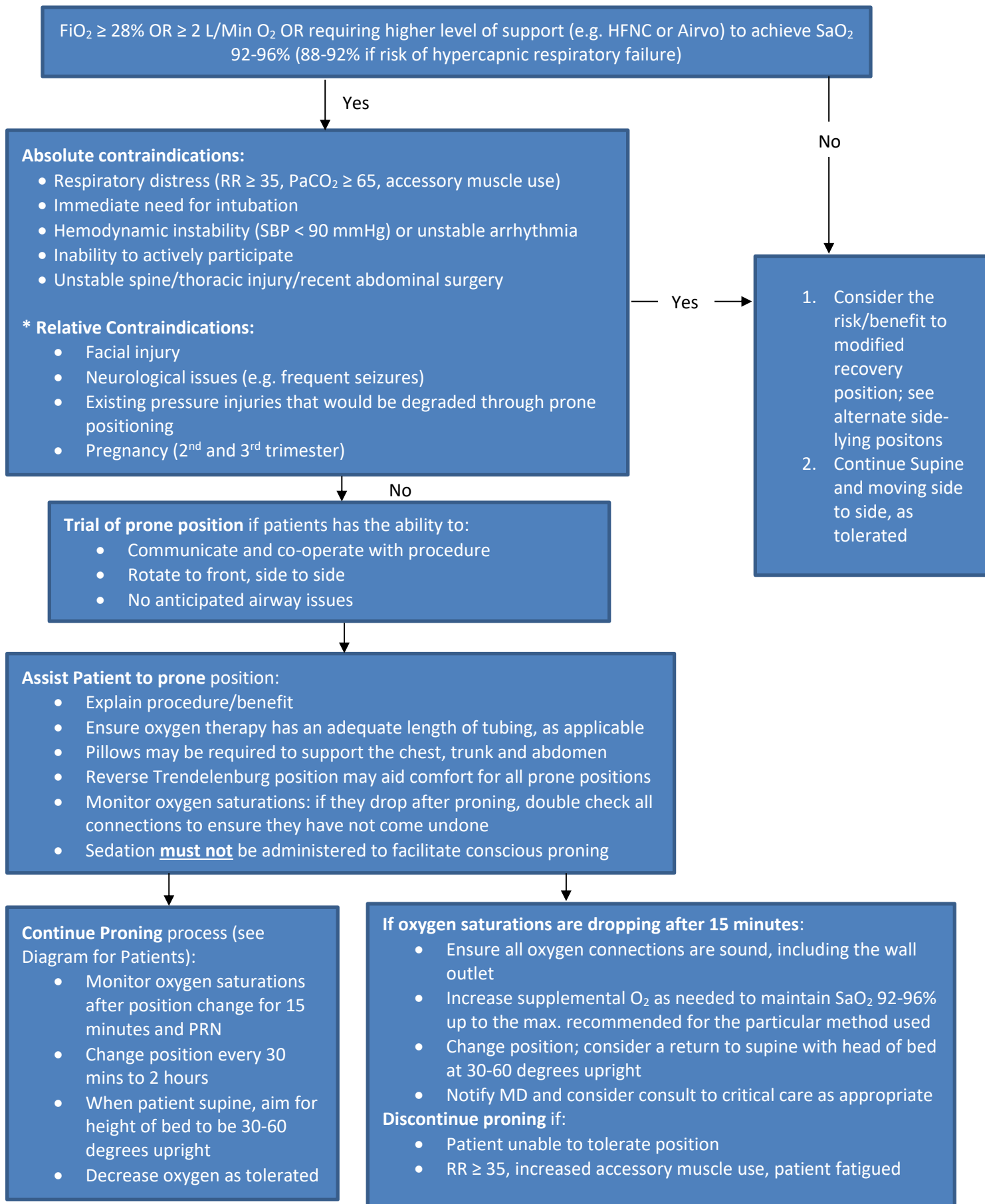
- Improved VQ matching and reduced hypoxemia (secondary to more homogeneous aeration of lung and improved VQ matching)
- Reduced shunt (perfusion pattern remaining relatively constant while lung aeration becomes more homogenous)
- Recruitment of the posterior lung segments due to reversal of atelectasis
- Improved secretion clearance

Given the evidence-informed benefits of prone positioning in the invasively ventilated patients, and the reported chest x-ray findings suggestive of early on-set of pulmonary changes in the Covid-19 patient; adopting and trialling the prone position for conscious COVID-19 intubated and non-intubated patients is recommended in all in-patient care areas(8, 10-12).

References:

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- 2) Gibson, P.G., Qin, L., Puah, S. Covid-19 ARDS: Clinical features and differences to 'usual' pre-COVID ARDS. Preprint: *The Medical Journal of Australia*. 24 April 2020. Accessed: <https://www.mja.com.au/journal/2020/covid-19-ards-clinical-features-and-differences-usual-pre-covid-ards>.
- 3) Alhazzani W., Moller M., Rhodes A. et al. (2020). Surviving Sepsis Campaign: guidelines on the management of critically ill adults with Coronavirus Disease 2019 (COVID-19). *Intensive Care Medicine*. DOI: 10.1007/s00134-020-06022-5.
- 4) Guérin, C., Reignier, J., Richard, J.C. Et al. (2013). PROSEVA Study Group. Prone Positioning in Severe Acute Respiratory Distress Syndrome. *New England Journal of Medicine*, 368(23), p: 2159-2168.
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- 10) Coppo, A., Bellani, G., Winterton, D., et al. (2020). Feasibility and physiological effects of prone positioning in non-intubated patients with acute respiratory failure due to COVID-19: a prospective cohort study. *The Lancet*, 8(8):765-74. DOI: 10.1016/S2213-2600(20)30268-X
- 11) Chad, T and Sampson, C. (2020). Prone positioning in conscious patients on medical wards: A review of the evidence and its relevance to patients with COVID-19 infection. *Clinical Medicine*, 20(4): e97-103. DOI: 10.7861/clinmed.2020-0179.

Flow Diagram for Conscious Proning Process



*Relative Contraindications: consider mitigation strategies to aid in patient being able to prone or achieve some of the side to side positions

Self-Proning: **Instructions for Patients and Caregivers**

Laying on your stomach and in different positions will help your body to get air into all areas of your lung; you may use pillows to help with lying on your side.

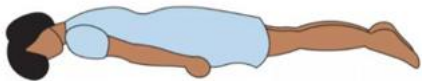
Your healthcare team recommends trying to change your position every 30 minutes to 2 hours and even sitting up is better than laying on your back.

If you are able to, please try this:

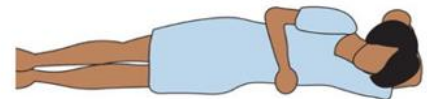
1. 30 minutes up to 2 hours: lying on your belly
2. 30 minutes up to 2 hours: lying on your right side
3. 30 minutes up to 2 hours: sitting up either in bed or in a chair
4. 30 minutes up to 2 hours: lying on your left side; then back to position #1.

And repeat....

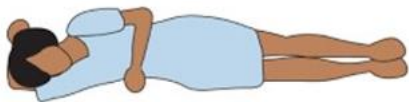
1. 30 minutes – 2 hours: laying on your belly



4. 30 minutes – 2 hours: lying on your left side



2. 30 minutes – 2 hours: laying on your right side



5. Then back to Position 1. Laying on your belly



3. 30 minutes – 2 hours: sitting up



Alternate side-lying positions to consider with pillow supports:



Right/left side up with pillows for support to the legs/hips, back, and chest (instead of numbers 2 or 4)



Right/left side slightly supported to be up with pillows to the leg/hip, neck, and arm (instead of completely doing 1)