

# PR41: Recruitment Maneuver

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## Applicable To

■ CCP only

## Introduction

A recruitment maneuver is the brief application of a high level of airway pressure, with the goal of recruiting non-gas exchanging parts of the lung. This pressure is input and then held for a period trying to open previously collapsed alveoli. This is part of an open lung strategy for hypoxic ARDS patients due to the heterogeneity of the disease process.

## Indications

- ARDS criteria of moderate to severe hypoxemia as identified by the [Berlin criteria](#). This is despite conventional low Tv ventilation and escalation of the PEEP ladder
- The presence of recruitable lung as identified by CXR, Ct, or ultrasound

## Contraindications

- Hemodynamic instability
- COPD and lung emphysema
- Bronchopleural fistula
- Acute cor pulmonale

### Caution:

- Severe TBI or raised ICP (All options must have failed before a recruitment maneuver in this patient demographic; a risk stratification must be completed)
- Optimal timing and frequency are unknown
- Alveolar overdistension and profound acidosis may occur with multiple maneuvers
- May not be as effective in the fibroproliferate phase

## Procedure

Using the Hamilton ventilator:

1. Select Mode.
2. Choose APRV.
3. Confirm.
4. Set the T High for 40 and set the P High for 40. Other pressures may be considered based on clinical circumstances.
5. The T low and P low do not need to be set from the standard preset but to ensure they are not problematic, or if starting from APRV set them to:
  - T low for 0.60
  - P low for 10
7. The Flow Trigger can be set at 3.
8. The FIO<sub>2</sub> should be left at 1.
9. Confirm.
10. If no breath is started immediately, select the manual breath button as the machine may be in the expiratory phase.

11. If hemodynamic instability occurs during the maneuver, abort the breath hold by pressing the manual breath button.
12. While the ventilator is in an inspiratory hold, SCMV can be selected as the ventilation strategy post recruitment. As the pressure will start low, volume may potentially be lost. The pressure will increase +/- 2 cm/H<sub>2</sub>O per breath and the volume will slowly increase. However, this lag time may lead to de-recruitment of lung tissue. Choose PCV instead, and allow for an increase in PEEP to maintain the newly recruited alveoli. The rest of the settings in PCV are as per patient needs.
13. Confirm.
14. If you want to go back to SCMV after this initial stabilization on PCV you may. This will now maintain your pressure and thus your volume without losing recruitment.

## Notes

- There are other recruitment maneuvers that can be performed (20-20, 30-30).
- Multiple breath holds can be done but caution is advised as respiratory acidosis associated with the breath hold may exacerbate an already acidotic patient.
- Alveolar overdistension does not appear to occur with one breath hold but multiple holds may be associated with alveolar overdistension.

## References

1. Siegle MD, Hyzy RC. Ventilator management strategies for adults with acute respiratory distress syndrome. 2021. [\[Link\]](#)
2. Gertler R. Mechanical ventilation during anesthesia in adults. 2021. [\[Link\]](#)
3. Hamilton T1 Quick Manual. 2021. [\[Link\]](#)

