Assessing lung recruitability and performing recruitment maneuvers in adult patients

**BASIC PROTOCOL**

**Step 1: Diagnostic P/V curve to assess recruitability**

**Settings:**
- Pstart: 0 cmH2O
- Ptop: 40 cmH2O
- End PEEP: 0 cmH2O
- Ramp speed: 2 cmH2O/s
- Tpause: 0 s
- Cuff pressure: >Ptop

▶ Start the maneuver

The shape of the inspiratory limb is convex AND/OR
Volume difference at a pressure of 20 cmH2O is >500 ml

Yes

Patient shows potential for recruitment

No

No recruitment

Consider:
- PEEP < 10 cmH2O
- Prone positioning
- Persistent hypoxemia ➔ consider ECMO

**Step 2a: Recruitment maneuver (first)**

Consider decreasing FiO2 before the recruitment maneuver to reach an SpO2 value of 92%

**Settings:**
- Pstart: Current PEEP
- Ptop: 40 cmH2O
- End PEEP: 15 cmH2O*
- Ramp speed: 5 cmH2O/s
- Tpause: 10 s
- Cuff pressure: >Ptop

▶ Start the maneuver

Volume increase at Ptop >2 ml/kg IBW (or >200 ml) AND
SpO2 is >97% within 5 minutes after the maneuver

Yes

Effective recruitment

No

Ineffective recruitment

* or current PEEP if current PEEP is > 15 cmH2O

**NOTE:** When prompted whether to change the PEEP setting after the maneuver, touch Yes.

**NOTE:** When prompted whether to change the PEEP setting after the maneuver, touch No.
ONLY use this protocol if the first recruitment maneuver (BASIC protocol) was well tolerated hemodynamically.

**ADVANCED PROTOCOL**

**Step 2b: Recruitment maneuver (second)**

Consider decreasing FiO2 before the recruitment maneuver to reach an SpO2 value of 92%

| Settings: |
|-----------------|-----------------|
| **Pstart:** | Current PEEP |
| **Ptop:** | 50 cmH2O |
| **End PEEP:** | 20–25 cmH2O |

**Ramp speed:** 5 cmH2O/s  
**Tpause:** 10 s  
**Cuff pressure:** > Ptop

▶ Start the maneuver

- **Volume increase at Ptop > 2 ml/kg IBW (or > 200 ml)**  
  **AND**  
  **SpO2 is > 97% within 5 minutes after the maneuver**

- **Yes**

  Effective recruitment

  Decremental PEEP titration

  Consider decreasing FiO2 before the decremental PEEP titration to reach an SpO2 value of 92%

  ▶ Decrease PEEP by 2 cmH2O every 3 minutes

  ▶ Monitor SpO2 to determine optimal PEEP:  
  When SpO2 decreases by 2%, revert to previous PEEP value (optimal PEEP)

  Recruitment maneuver (third)

  | Settings: |
  |-----------------|-----------------|
  | **Pstart:** | Optimal PEEP |
  | **Ptop:** | 50 cmH2O |
  | **End PEEP:** | Optimal PEEP |

  **Ramp speed:** 5 cmH2O/s  
  **Tpause:** 10 s  
  **Cuff pressure:** > Ptop

  ▶ Start the maneuver

**NOTE.** When prompted whether to change the PEEP setting after the maneuver, touch Yes.

**Ineffective recruitment**

Consider esophageal manometry.  
For details, see the P/V Tool User Guide and Esophageal Balloon Catheter Reference Card.

**NOTE.** When prompted whether to change the PEEP setting after the maneuver, touch No.