

P/V Tool[®] Pro Quick Reference Card

Assessing lung recruitability and performing recruitment maneuvers in adult patients

BASIC PROTOCOL

Step 1: Diagnostic P/V waveform to assess recruitability

Settings

Pstart: 5 cmH2O **Ramp speed:** 2 cmH2O/s
Ptop: 40 cmH2O **Tpause:** 0 s
End PEEP: 5 cmH2O **Cuff pressure:** > Ptop

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

▶ Start the maneuver

$$\text{NMD\%} = \frac{\text{Max. delta volume (dV) between inflation and deflation}}{\text{Maximum volume}} > 41\%$$

No

No recruitment

Yes

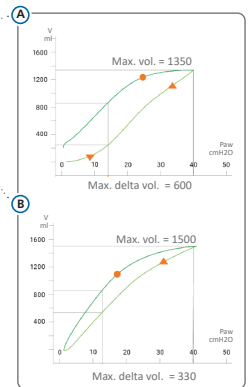
Consider:

- PEEP < 10 cmH2O
- Prone positioning
- Persistent hypoxemia
→ consider ECMO

Calculate normalized maximum distance (NMD%) from the diagnostic recruitment maneuver waveform using the equation above.

Examples:

Image A to the right, the max. delta volume is 600 ml, max. volume is 1350. NMD% = 600/1350 = 0.44 = 44%. **High potential for recruitment.**
 Image B, the max. delta volume is 330, and max. volume is 1500. NMD% = 330/1500 = 22%. **Low potential for recruitment.**



Yes

Patient shows potential for recruitment

Step 2a: Recruitment maneuver (first)

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

Settings

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

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

* or current PEEP if current PEEP is > 15 cmH2O

▶ Start the maneuver

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

No

Ineffective recruitment

Yes

Effective recruitment

ADVANCED protocol
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ONLY use this protocol if the first recruitment maneuver (BASIC protocol) was well tolerated hemodynamically.

ADVANCED PROTOCOL

Step 2b: Recruitment maneuver (second)

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

Settings			
Pstart:	Current PEEP	Ramp speed:	5 cmH ₂ O/s
Ptop:	50 cmH ₂ O	Tpause:	10 s
End PEEP:	20–25 cmH ₂ O	Cuff pressure:	> Ptop

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

▶ Start the maneuver

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

No

Ineffective recruitment

Consider esophageal manometry.

For details, see the *P/V Tool User Guide* (PN 10067117) and *Esophageal Balloon Catheter Reference Card* (PN 10067119)

Yes

Effective recruitment

Decremental PEEP titration

Consider decreasing Oxygen before the recruitment maneuver 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)

Step 3. Recruitment maneuver (third)

Settings			
Pstart:	Optimal PEEP	Ramp speed:	5 cmH ₂ O/s
Ptop:	50 cmH ₂ O	Tpause:	10 s
End PEEP:	Optimal PEEP	Cuff pressure:	> Ptop

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

▶ Start the maneuver

For additional information and clinical references, see the *P/V Tool Pro User Guide* (PN 10067117).

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