

P/V Tool® Quick Reference Card

Assessing lung recruitability and recruitment in adult patients

While the information contained herein is believed to be accurate, it does not represent an official recommendation from Hamilton Medical, nor may it substitute an opinion, assessment, or instructions provided by a trained healthcare professional. Depending on device and software version, the default settings may vary. For details, see your ventilator *Operators Manual*.

Assessment

Step 1: Diagnostic P/V waveform to assess recruitability

Settings

Pstart: 5 cmH₂O
Ptop: 40 cmH₂O
End PEEP: 5 cmH₂O

Ramp speed: 2 cmH₂O/s
Tpause: 0 s
Cuff pressure*: > Ptop

► Start the maneuver

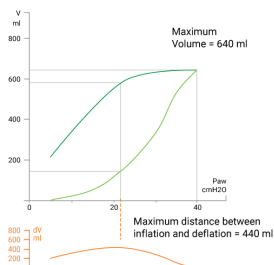
NOTICE Depending on device and software version, you are asked about changing the PEEP setting post-maneuver. Select **No**.

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

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

Yes

No

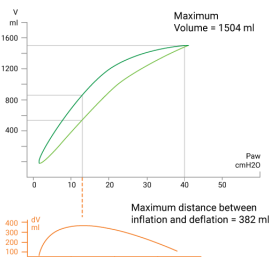


The max. delta volume is 440 ml, and max. volume is 640 ml. $\text{NMD\%} = 440/640 = 68\%$

High potential for recruitment

Consider:

- Recruitment (proceed to Step 2)
- Higher PEEP strategy and PEEP titration



The max. delta volume is 382 ml, and max. volume is 1,504 ml. $\text{NMD\%} = 382/1,504 = 25\%$

Limited potential for recruitment

NMD% close to 41% can be a signal for medium potential

Consider:

- Prone positioning
- Avoiding a high PEEP strategy



Only perform a recruitment maneuver if the assessment for recruitability was well tolerated hemodynamically.

Recruitment and monitoring

Your patient shows high potential for recruitment

Step 2: Recruitment maneuver (RM)

Consider titrating FiO₂ to maintain an SpO₂ value ≤ 95%.

Settings

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

- NOTICE**
- Default EndPEEP is either 15 cmH₂O (configurable) or current PEEP, whichever is higher.
 - Set EndPEEP to a level you consider appropriate for the patient or to the level at which to start a decremental PEEP titration.
 - Always check the hemodynamic tolerance of your patient.

► Start the maneuver

NOTICE Depending on device and software version, you are asked about changing the PEEP setting post-maneuver. Select **Yes**.

Volume increase at Ptop (V_{rm}) > 2 ml/kg IBW**
and
Improvement in SpO₂ within 5 minutes of the maneuver

NOTICE Effective lung recruitment increases respiratory system compliance, and results either in an increase in the VT or a reduction in driving pressure (ΔP).

Yes

No

Improvement of SpO₂ remains stable or even increases

Consider whether the new PEEP level is appropriate or too high:

- Consider decremental PEEP titration according with your institution protocol and full clinical assessment
- If decremental PEEP titration results in a drop in SpO₂, consider performing a new RM and set EndPEEP to minimum the same PEEP level as before the SpO₂ drop

Ineffective recruitment OR Improvement in SpO₂ vanishes rapidly

- Consider repeating the RM with the same settings except for a higher EndPEEP level
- The clinical decision to set a higher recruitment pressure (Ptop) can be supported by incorporating transpulmonary pressure in the P/V Tool using esophageal manometry (Peso)

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

* If using IntelliCuff, cuff pressure is maintained and monitored automatically

** IBW or PBW, depending on device and software version