

# Evidence-based Humidification

## Minimizing instrumental dead space

ISSUE

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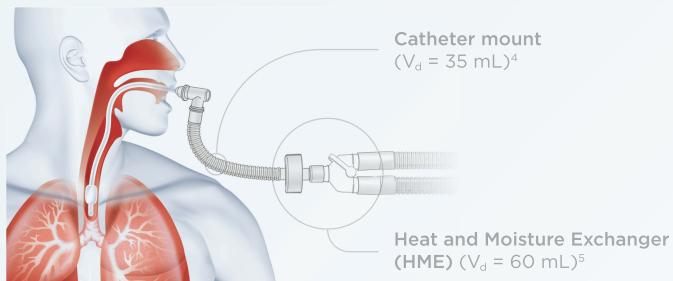
2023



Instrumental dead space is the most modifiable component of a patient's dead space ventilation. Heated humidification reduces instrumental dead space, facilitating a reduction in tidal volume and driving pressure for a constant  $\text{PaCO}_2^{1,2}$  and supports optimal lung-protective ventilation (LPV) practices.<sup>3</sup>

### Patient characteristics

- Male
- Height: 180 cm
- Predicted body weight (PBW): 75 kg
- Actual weight: 85 kg
- Normothermic
- In intensive care
- Intubated with an 8.0 mm ETT



### Initial settings

LPV Strategy: 6 mL/kg PBW

$V_t$  450 mL

RR 25

$V_E$  12.5 L/min

### Dead space ( $V_d$ )

Physiological	Instrumental	Alveolar ventilation ( $\dot{V}_A$ )
83 mL	113 mL	6.4 L/min

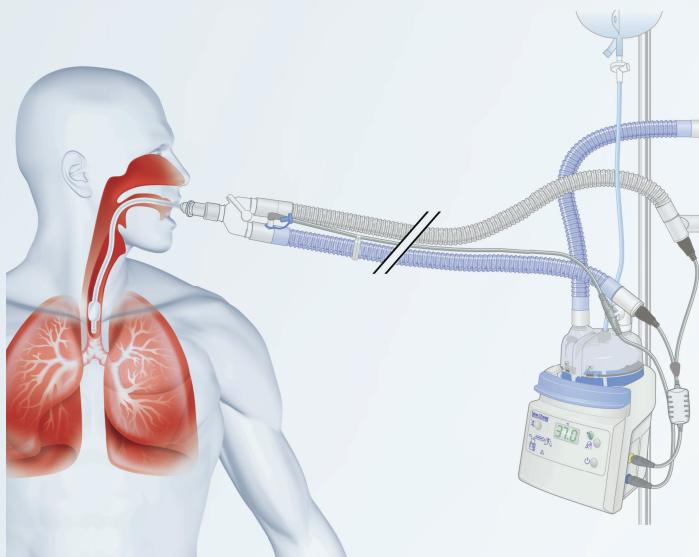
### Alveolar ventilation ( $\dot{V}_A$ )

LPV is universally accepted as the gold standard of care for mechanically ventilated patients and is strongly recommended in clinical guidelines,<sup>6,7</sup> with experts recommending maximal reduction of dead space to apply these protocols effectively.<sup>7</sup> This can be achieved:

### With a simple switch from HME to a heated humidifier

Instrumental dead space  
 $\downarrow 60 \text{ mL} (-53\%)$

Alveolar ventilation  
7.9 L/min  
 $+23\%$   
( $\uparrow 1.5 \text{ L/min}$ )



### With removal of the HME and the catheter mount

Instrumental dead space  
 $\downarrow 95 \text{ mL} (-84\%)$

Alveolar ventilation  
8.8 L/min  
 $+37\%$   
( $\uparrow 2.4 \text{ L/min}$ )



See how dead space is impacting your patients with the Ventilo™ app.

## References

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