Evidence-based Humidification

Patient Indications





These contraindications to HME use can be classified into two main categories of concerns:



Sub-optimal humidity

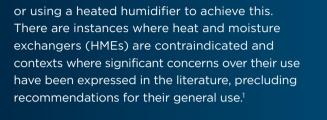
- Passive devices result in a net loss of moisture from the respiratory tract, which increases the risk of mucosal dysfunction and airway occlusion.
- Any situation that reduces the delivery of expired gas to the device or reduces the heat and humidity in expired gas further impacts performance.



Sub-optimal ventilation

- The position of a passive device in the circuit increases dead space, resistance to flow and work of breathing (WOB).
 - Without compensation, this means reduced alveolar ventilation and increased PaCO₂.
- Any condition which increases the risk of fluids contacting the HME risks occlusion and further elevation of both resistance to flow and WOB.

Using a heated humidifier assists natural defenses in the airway, promotes efficient gas exchange and ventilation, supports lung-protective strategies and can improve comfort with noninvasive respiratory support.



There are no contraindications to heating and humidifying inspired gases to physiological conditions

Absolute contraindications to HME use

- Secretions that are thick, copious, bloody or tenacious¹⁻⁷
- Bronchopleural fistula^{1,4,7,8}
- Large mask leak^{1,9}
- Incompetent or absent endotracheal tube cuff^{1,4,7,10,11}
- Expired tidal volume (Vt) < 70% of delivered Vt¹
- Neonates and infants¹²
- Hypothermia (body temperature < 32 °C)^{1,3,5-8}
- Nebulized medications, including during aerosol treatments^{1,3,5}
- High minute volume (> 10 L/min)^{1,8,15}

Relative contraindications* to HME use

- Noninvasive ventilation^{1,7,9,13}
- Low tidal volumes, including lung-protective ventilation^{1,6,7,14}
- Acute respiratory distress syndrome (ARDS)^{6,8,9,11,16,17}
- Hypercapnia management^{6,13}
- Long-term ventilation^{2,5,8,9}
- Airway burns^{6,8,18}
- Dehydration
- Acute respiratory failure^{1,9,13,19,20}
- Chronic respiratory failure²¹
- Asthma¹⁸
- Atelectasis⁸
- Chronic obstructive pulmonary disease (COPD)^{6,8}
- Difficult to wean patients^{7,8,21}
- Airway hemorrhage or trauma^{8,18}
- Pulmonary edema^{3,7}
- Immunocompromise⁸

* Relative contraindications refer to those contexts in which concerns about the use of HMEs have been expressed throughout the clinical literature.



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