Endotracheal Tube (ETT) Depth and Tidal Volume Calculator

**Introduction:** The Endotracheal Tube (ETT) Depth and Tidal Volume Calculator estimates depth of optimal ETT placement and target tidal volume by height.

**Why to Use**
Placing the ETT too deep may cause right mainstem intubation, hypoxemia, and pneumothorax. However, placing the ETT too shallow may risk injury to the vocal cords and accidental extubation. Standard approaches to verify ETT depth (eg, bilateral auscultation) are insensitive. Use of lower tidal volumes appears to prevent the development of acute respiratory distress syndrome, even in patients who do not have lung injury.

**When to Use**
Use in adult patients (aged > 20 years) requiring orotracheal intubation.

**Next Steps**
- ETT position should still be verified with a chest radiograph for patients who will remain intubated for an extended period of time.
- For tidal volume, 6 to 8 mL/kg ideal body weight is generally a safe initial setting, but further ventilator adjustment may be required, depending on the adequacy of ventilation and airway pressures.

**Formula**
Chula formula: ETT depth = 0.1 * [height (cm)] + 4

**Additional Formulas**
- IBW, men = 50 kg + 2.3 * [height (in) - 60]
- IBW, women = 45.5 kg + 2.3 * [height (in) - 60]
- Usual tidal volume target = 6-8 mL/kg IBW

**Abbreviation:** IBW, ideal body weight
Pak et al in 2010 and Hunyady et al in 2008 developed similar assessments of optimal ETT placement. The average of the 3 scores (Pak, Hunyady, and Chula) is nearly identical to the Chula formula.

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References

Original/Primary References

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