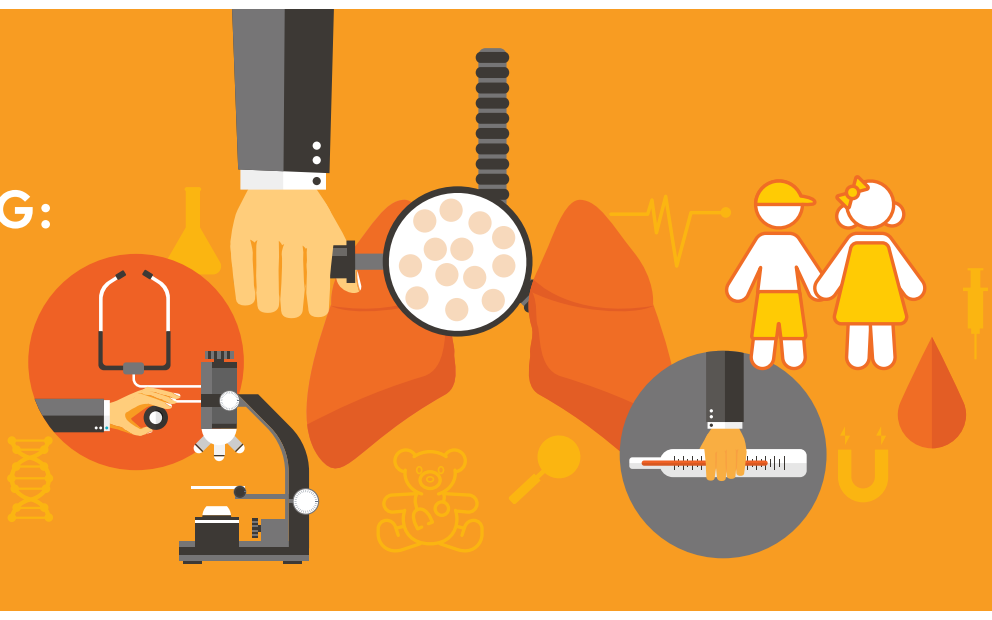
AVANOS

ENDOTRACHEAL TUBE POSITIONING: A CRITICAL ISSUE FOR PEDIATRIC AIRWAY MANAGEMENT



Neonates, infants and small children have short tracheas, making endotracheal tube placement difficult.[1]

Correct endotracheal tube positioning in the pediatric patient involves: [2]

- Placement of endotracheal tube (ETT) into the trachea (avoiding endobronchial intubation)[2]
- Achieving **proper depth of ETT insertion**[2]

COMPLICATIONS OF MALPOSITIONING OF ETT:

Malpositioning of ETTs within the trachea in pediatric patients is common, reaching a peak of over **35%**.[2]

Too deep placement[3]

- Injury to carina
- Endobronchial intubation

Not enough placement depth[3]

- Accidental extubation
- Laryngeal injury, that could cause inadequate ventilation, hypoxia, brain damage and death

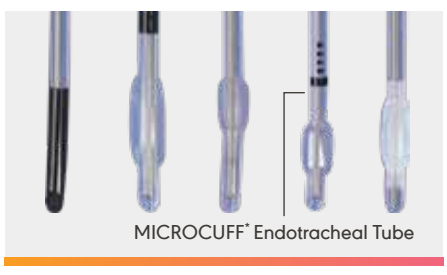
WAYS USED BY CLINICIANS TO CONFIRM PROPER ETT POSITIONING:

- Presence of auscultated breath sounds in all lung fields[2]
- Continuous presence of a normal end-tidal CO_2 ($ETCO_2$) curve[2]
- Bilateral chest rise[2]

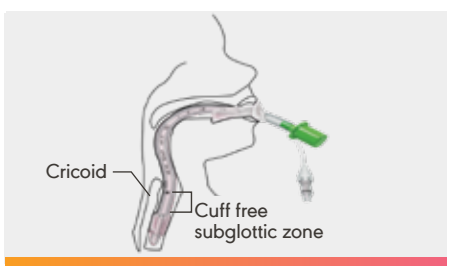
But, the above ways do not ensure ideal ETT positioning. These indications may be present even when the ETT is too shallow or too deep[2]

OUR SOLUTION:

The Avanos Pediatric MICROCUFF* is designed for pediatric anatomy.



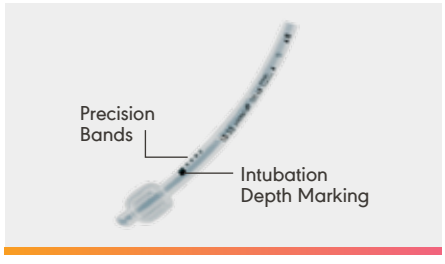
Short, cylindrical cuff placed near the tracheal tube tip, secures cuff placement in the trachea and not the pressure-sensitive larynx



Anatomically-based intubation depth mark results in correct placement and a cuff-free subglottic zone

Tube Size I.D	Age/Weight Years/kg
3.0 mm	term/ ≥ 3kg – 8 months
3.5 mm	8 months- 2 years
4.0 mm	2-4 years
4.5 mm	4-6 years
5.0 mm	6-8 years
5.5 mm	8-10 years
6.0 mm	10-12 years
6.5 mm	12-14 years
7.0 mm	14-16 years

Size selection chart allows easy, accurate tube selection, proven 98.4% accurate as cited in a 500 patient study[4]



Four precision bands to facilitate and confirm optimal tube placement

DID YOU KNOW

- Many of the currently available cuffed pediatric tracheal tubes have intubation depth marks that were absent or misleading with up to three marks (in contrast to Avanos Pediatric MICROCUFF* that has four precision bands).[5]
- Intubation depth markings allow instant appropriate placement of the tube in children and are superior to the conventional age based formula for oral tube insertion depth.[1]

References: 1. Weiss M, Balmer C, Dullenkopf A, Knirsch W, Gerber AC, Bauersfeld U, Berger F. Intubation depth markings allow an improved positioning of endotracheal tubes in children. Can J Anaesth. 2005; 52(7):721. 2. Harris EA, Arheart KL, Penning DH. Endotracheal tube malposition within the pediatric population: a common event despite clinical evidence of correct placement. Can J Anaesth. 2008; 55(10):685-90. 3. Neunhoeffer F, Wahl T, Hofbeck M, et al. A new method for determining the insertion depth of tracheal tubes in children: a pilot study. Br J Anaesth. 2016; 116(3):393-7. 4. Dullenkopf A, Gerber AC, Weiss M. Fit and seal characteristics of a new paediatric tracheal tube with high volume–low pressure polyurethane cuff. Acta Anaesthesiol Scand. 2005; 49(2):232-7. 5. Weiss M, Dullenkopf A. Cuffed tracheal tubes in children: past, present and future. Expert review of medical devices. 2007; 4(1):73-82.