Medtronic

Shiley™ pediatric oral/nasal endotracheal tubes

Designed for your smallest patients

Kids are not little adults. That's why they need endotracheal tube solutions customized to their unique anatomy.

What makes pediatric airways unique

Compared to adult anatomy, children have a floppier epiglottis and vocal cords that slant upward. They also have a funnel-shaped larynx, which can be difficult to navigate around, especially due to the narrowing of the cricoid cartilage.[1]

Those factors make using scaled-down versions of adult endotracheal tubes (ETTs) on children risky because doing so can result in airway damage, oxygen deprivation, and ventilation complications.[1,2]

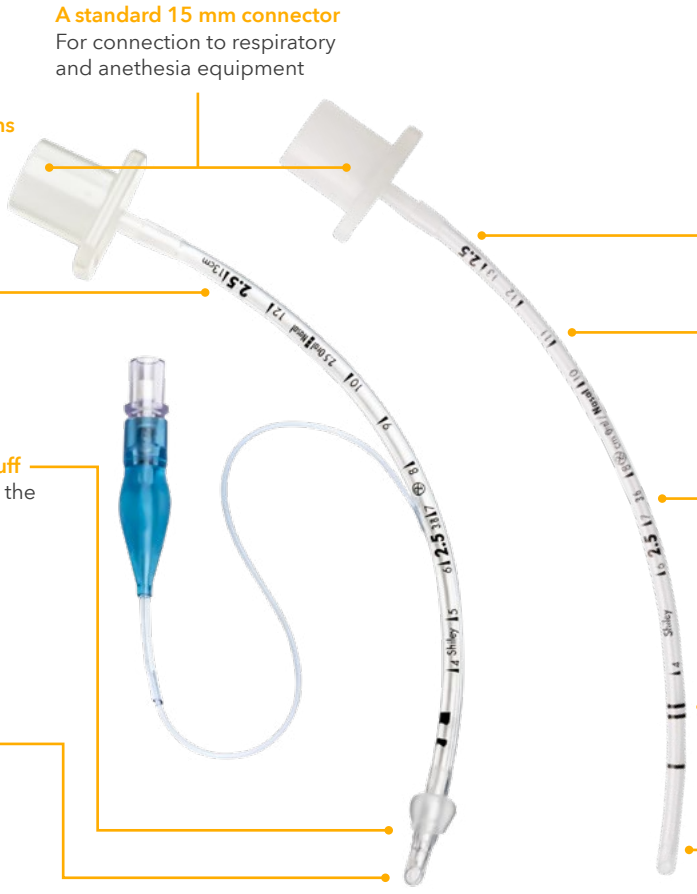
15%
of intubation procedures leave pediatric patients hoarse or with stridor[3]

30%
of pediatric patients require multiple intubation attempts[3]

82%
of airway traumas in pediatric patients were caused by excessively large ETTs[3]

Help better secure pediatric airways

The Shiley™ pediatric oral/nasal endotracheal tube (ETT) with TaperGuard™ cuff technology and the Shiley™ pediatric oral/nasal endotracheal tubes (ETTs), cuffless, are designed with a number of features that are intended to meet the needs and improve the margin of safety for your smaller patients.



A standard 15 mm connector
For connection to respiratory and anethesia equipment

Clinically-appropriate tube lengths
Based on patient size, to help avoid unintentional endobronchial intubation[7]

Wide range of size options
Cuffless from 2.0 mm to 6.0 mm; cuffed from 2.5 mm to 6.0 mm

Shorter†, inverted TaperGuard™ cuff
To help support cuff placement in the trachea and to improve sealing[8,9]

No Murphy eye
Enabling the cuff to be located more distally on the ETT

Radiopaque filament
Visible on x-ray, embedded within and throughout the length of the tube wall

Depth marks in centimeter increments
Anatomically based markings to help place the ETT more accurately[5,7]

Magill curve
To support easier tube insertion

Glottic print marks
To help determine optimal placement of the cuff below the vocal cords and above the carina††

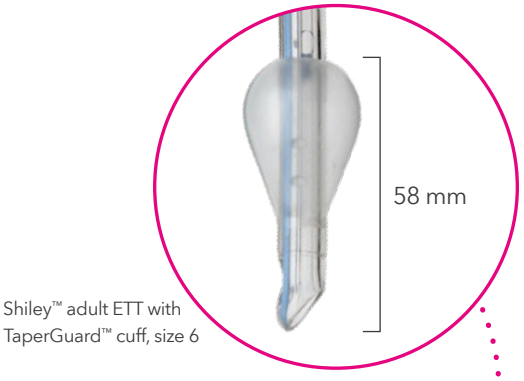
Murphy eye
Helps aid in airway maintenance if the tube becomes obstructed

Advantages of no Murphy eye on the cuffed configuration

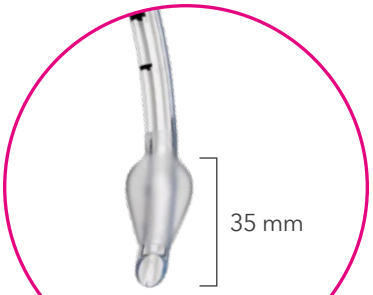
ETT placement in pediatric patients has a small margin of error, due to the anatomical shortness of the tracheal region. Located at the distal tip, the Murphy eye presents a challenge for cuff placement on smaller ETTs. If the cuff is placed too high, it can lead to tube misplacement and tracheal damage.

Removing the Murphy eye on the cuffed Shiley™ pediatric oral/nasal ETT improves the margin of safety by:[2,4]

- Allowing the TaperGuard™ cuff to be located closer to the tube tip,† to help ensure the cuff is reliably placed within the trachea
- Preventing the cuff from pressuring the laryngeal wall
- Reducing the risk of endobronchial intubation



Shiley™ adult ETT with TaperGuard™ cuff, size 6



Shiley™ pediatric ETT with TaperGuard™ cuff, size 6

Shiley™ Hi-Lo adult ETT with barrel-shaped cuff

Shiley™ pediatric ETT with TaperGuard™ cuff

Benefits of the TaperGuard™ cuff

Compared to traditional barrel-shaped cuffs, the thin-walled, taper-shaped, low-volume, low-pressure (LVLP) TaperGuard™ cuff:[8,9]

- Uses less material, which helps ease insertion past the vocal cords
- Requires less volume to fill the cuff
- Improves sealing
- Decreases aspirations
- Reduces cuff pressure on tracheal tissues
- Helps ease insertion past the cricoid due to the shorter cuff-to-tip distance

Low-pressure cuffs also have similarly low rates of post-extubation complications compared to uncuffed tubes.[11]

Benefits of a hooded tip

Standard ETTs have a flat, beveled tip. Sizes 2.5 mm and 3.0 mm of the Shiley™ pediatric oral/nasal ETT with TaperGuard™ cuff feature a hooded tip to provide additional protection in the smallest airways.

Hooded tips are created via a secondary mold step to round the end of the beveled edge. The rounded, beveled shape of the hooded tip can help make it easier for the tube to pass through the vocal cords, which can decrease trauma during intubation.[12]

Benefits of DEHP-free material

Di(2- ethylhexyl) phthalate (DEHP) is a manufactured chemical commonly added to plastics to make them flexible.[10] Children absorb greater amounts – and metabolize and retain larger amounts – of MEHP, the toxic metabolite of DEHP.[10]

Because children may be more sensitive to the adverse effects of DEHP compared to adults, DEHP exposure may negatively impact pediatric patients in the following ways:[10]

- Contribute to the development of hyaline membrane disease and necrotizing enterocolitis
- Adversely affect male reproductive tract development
- Damage the liver and lungs

The Shiley™ pediatric ETT is made with latex-free, non-DEHP PVC material, which softens at body temperature and molds to the airway.

PHT
DEHP
DEHP–free

Ordering information

Shiley™ pediatric oral/nasal endotracheal tube with TaperGuard™ cuff					
CFN to order	**CFN on packaging**	**I.D. (mm)**	**O.D. (mm)**	**Length (mm)**	**Cuff Ø (mm)**
86125-RI	86125	2.5	3.8	140	8.0
86130-RI	86130	3.0	4.4	160	9.1
86135-RI	86135	3.5	5.0	180	10.1
86140-RI	86140	4.0	5.7	200	11.5
86145-RI	86145	4.5	6.3	220	12.3
86150-RI	86150	5.0	6.9	240	14.2
86155-RI	86155	5.5	7.5	270	15.6
86160-RI	86160	6.0	8.2	280	17.2

Shiley™ pediatric oral/nasal endotracheal tube, cuffless			
CFN	**I.D. (mm)**	**O.D. (mm)**	**Length (mm)**
86232	2.0	2.9	130
86233	2.5	3.6	140
86234	3.0	4.2	160
86235	3.5	4.9	180
86236	4.0	5.5	200
86237	4.5	6.2	220
86238	5.0	6.8	240
86239	5.5	7.5	270
86240	6.0	8.2	280

Scan the QR code to learn more. Or contact your local Medtronic representative.

††As indicated by ISO 5361:2016.

†Compared to the adult version.

‡Compared to traditional barrel-shaped cuffs.

§Compared to the Hi-Lo high volume, low-pressure cuff.

1. J. Holzki, K Brown, R. Carroll, C. Cote. The anatomy of the pediatric airway: Has our knowledge changed in 120 years? A review of historic and recent investigations of the anatomy of the pediatric larynx. *Pediatric Anesthesia*. 2017 (28): 13-22. **2.** Ho AM, Aun CS, Karmakar MK. The margin of safety associated with the use of cuffed pediatric tracheal tubes. *Anesthesia*. 2002;57(2):173–175. **3.** Nutter J, Oppong E, and Pouliot C. Cuffed pediatric endotracheal tubes. Honors Theses. 2019. 2335. https://digitalworks.union.edu/theses/2335 **4.** Weiss M, Knirsch W, Kretschmar O, et al. Tracheal tube-tip displacement in children during head-neck movement–a radiological assessment. *Br J Anaesth*. 2006;96(4):486–491. **5.** Weiss M, Gerber AC, Dullenkopf A. Appropriate placement of intubation depth marks in a new cuffed paediatric tracheal tube. *Br J Anaesth*. 2005;94(1):80–87. **6.** Weiss M, Balmer C, Dullenkopf A, Knirsch W et al. Intubation depth markings allow an improved positioning of endotracheal tubes in children. *Can J Anaesth*. 2005;52(7):721–726. **7.** Aker J. An Emerging clinical paradigm: the cuffed pediatric endotracheal tube. *AANA Journal*. 2008;76(4):293–300. **8.** Lichtenthal PR, Wood L, Wong A, Borg U. Pressure applied to tracheal wall by barrel and taper shaped cuffs. *Proc Am Soc Anesth Annual Meeting*. 2011: A1054. **9.** Lichtenthal PR, Maul D, Borg U. Do tracheal tubes prevent microaspiration? *Br J Anaesth*. 2011;107(5):821–822. **10.** Latini G, Ferri M, Chiellini F. Materials degradation in PVC medical devices, DEHP leaching and neonatal outcomes. *Curr Med Chem*. 2010;17(26):2,979–2,989. **11.** Bhardwaj N. Pediatric cuffed endotracheal tubes. *J of Anaesthesiol Clin Pharmacol*. 2013; 29(1):13–18. **12.** Haas CF, Eakin RM, Konkle MA, Blank R. Endotracheal tubes: old and new. *Respir Care*. 2014;59(6):933–955.

For trained personnel only. For specific indications and instructions for use, please refer to the IFU.

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