Medtronic

Pediatric airway management product catalog

Airway solutions for your smaller patients

Sized just right for safe and effective airway control

When you're caring for younger patients, the right airway management devices make all the difference. With significant anatomical and physiological differences between the pediatric and adult airway, securing smaller airways is no minor undertaking. Protecting them from airway damage, oxygen deprivation, and intubation and ventilation complications takes a size-appropriate approach.

Our portfolio of pediatric airway solutions is designed to be a lifeline for your littlest patients' unique airway needs. So you can breathe easier when small patients depend on your skills and expertise.

Improve airway visibility and first-attempt intubation success[1]

McGRATH™ MAC video laryngoscope

Pediatric tracheal intubation complications are often unpredictable, leading to multiple intubation attempts. Each additional attempt may cause increased desaturation and intubation-associated complications – especially for younger patients.[1]

The McGRATH™ MAC video laryngoscope combines your core laryngoscopy skills with our innovative technology – so your first intubation attempt is your best.

Engineered for everyday use, the McGRATH™ MAC video laryngoscope – compared to the traditional direct visualization technique – provides:

- Better first-attempt intubation success rates[2,3]
- Reduced time to intubation[4]
- Better subglottic visualization[3]
- Reduced airway complications[3]
- Less hemodynamic response to intubation[5]
- Minimized exposure to airborne pathogens[6,7]
- Enhanced clinician safety[6,7]

Ordering information

McGRATH™ MAC video laryngoscope		
CFN	**Description**	**Quantity**
301-000-000	McGRATH™ MAC handle	1
350-072-000	McGRATH™ MAC blade size 1	50/box
350-017-000	McGRATH™ MAC blade size 2	50/box
340-000-000	Battery pack, 250-minute	1
300-000-100	Carry case	1

A sound way to secure small airways

Shiley™ pediatric oral/nasal endotracheal tube with TaperGuard™ cuff

The Shiley™ oral/nasal endotracheal tube (ETT) with TaperGuard™ cuff technology is specifically designed for smaller patients. By addressing the margin of safety within the trachea of developing anatomies, it minimizes the risk of airway damage, oxygen deprivation, and ventilation complications.[8,9]

Features include:

- Removal of the Murphy eye, which allows the cuff to be placed closer to the ETT tip
- A shortened† taper-shaped, thin-walled, low-pressure TaperGuard™ cuff
- A hooded tip to ease insertion and provide additional protection in the smallest airways[9,10]
- Anatomically based print rings to help place the ETT more accurately[8,9]

These features help:

- Ensure the cuff is more reliably positioned within the trachea[8,9]
- Prevent the cuff from pressuring the laryngeal wall[11]
- Reduce the risk of endobronchial intubation[8,9]

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

Carton quantity: 10; all tubes are delivered sterile packed, for single use only.

LATEX Not made with natural rubber latex

PHT DEHP Not made with DEHP

MR MR Conditional

†Compared to the adult version of the TaperGuard™ cuff

Our tiniest tubes come cuffless

Shiley™ pediatric oral/nasal endotracheal tube, cuffless

Because uncuffed endotracheal tubes are the most common choice for intubation in children, the Shiley™ oral/nasal endotracheal tube (ETT) is available in a cuffless version.

Features and benefits include:

- Distal tip reference marks and depth marks at every centimeter to assist with placement
- A thin, but strong tube wall with a large inner diameter for proper ventilation
- A hooded tip with Murphy eye
- Full Magill curve to support tube insertion
- Suitable for both oral and nasal intubation

Ordering information

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

Carton quantity: 10; all tubes are delivered sterile packed, for single use only.

LATEX Not made with natural rubber latex
PHT DEHP Not made with DEHP
MR MR Conditional

Designed for the distinct anatomy of neonate and pediatric airways

Shiley™ flexible neonatal and pediatric tracheostomy tubes

Shiley™ flexible neonatal and pediatric tracheostomy tubes each feature a distinct flange designed specifically for neonatal or pediatric patients. Soft and flexible to support patient comfort and transparent to aid in visualization of the skin below, the flange features:

- Raised outer eyelets for easier access when inserting the tube holder/tape
- A comfort recess on the bottom of the connector to help reduce stoma irritation
- A 15-mm connector integrated into the outer cannula to enable ventilation with or without an inner cannula

Available in both cuffless and cuffed configurations, the cuffed version features the taper-shaped, low-volume, low-pressure TaperGuard™ cuff proven to:

- Reduce fluid leaks by 94.8%[12,†,Ω]
- Significantly improve management of airway leaks[12,‡,Ω]
- Reduce removal force by 58.3%[12,Ω]

Ordering information

Neonatal					
CFN cuffless	**CFN cuffed**	**I.D. (mm)**	**O.D. (mm)**	**Length (mm)**	**Cuff Ø (mm)§**
2.5NEF	2.5NCF	2.5	4.2	28	8.0
3.0NEF	3.0NCF	3.0	4.8	30	9.1
3.5NEF	3.5NCF	3.5	5.4	32	10.1
4.0NEF	4.0NCF	4.0	6.0	34	11.5
4.5NEF	4.5NCF	4.5	6.7	36	12.3
Pediatric					
CFN cuffless	**CFN cuffed**	**I.D. (mm)**	**O.D. (mm)**	**Length (mm)**	**Cuff Ø (mm)§**
2.5PEF	2.5PCF	2.5	4.2	38	8.0
3.0PEF	3.0PCF	3.0	4.8	39	9.1
3.5PEF	3.5PCF	3.5	5.4	40	10.1
4.0PEF	4.0PCF	4.0	6.0	41	11.5
4.5PEF	4.5PCF	4.5	6.7	42	12.3
5.0PEF	5.0PCF	5.0	7.3	44	14.2
5.5PEF	5.5PCF	5.5	7.9	46	15.6
Extra-long pediatric					
CFN cuffless	**CFN cuffed**	**I.D. (mm)**	**O.D. (mm)**	**Length (mm)**	**Cuff Ø (mm)§**
5.0PELF	5.0PLCF	5.0	7.3	50	14.2
5.0PELF	5.5PLCF	5.5	7.9	52	15.6
6.0PELF	6.0PLCF	6.0	8.5	54	17.2
6.5PELF	6.5PLCF	6.5	9.0	56	19.1

Carton quantity: 1; all tubes are delivered sterile packed, for single use only.

Pediatric

Neonatal

†At intracuff pressures of 20 cm H_2O
‡At pressures below 25 cm H_2O
§Applicable to cuffed product only
ΩCompared to legacy Shiley™ tracheostomy tubes

LATEX Not made with natural rubber latex
PHT DEHP Not made with DEHP
MR MR Conditional

Stability for your smallest patients

DAR™ pediatric-neonatal closed-suction system

The DAR™ pediatric-neonatal closed-suction system helps minimize short-term complications associated with endotracheal suctioning in younger patients – including hypoxia, heart rate decrease, and changes in transcutaneous oxygen pressure.[13-15]

Designed around the evidence-based concept that endotracheal suctioning is better tolerated by younger patients without interruption of ventilation,[13,14] our closed system generates less cardiorespiratory distress when removing secretions from the respiratory tract for a faster recovery.[13-15]

Designed specifically for neonatal and pediatric care, our system offers:

- Airway isolation via a special rotating valve
- Efficient suctioning, even in an incubator environment, supported by a no-kinking catheter feature
- A variety of ETT adapters
- Easy inspection of secretions via the transparent valve body
- Safe and effective catheter rinsing
- Protection from infectious agents carried in patient secretions
- Multi-purpose treatment, including bronchoscopy, mucus sampling, BAL, and MDI drug delivery

Ordering information

DAR™ pediatric-neonatal closed-suction system				
CFN	**Connector**	**Size Fr/Ch + Ø ET adapter**	**Length**	**Color**
444S02605	Y-piece connector	5+2.0/2.5 mm	310 mm	
444S02606	Y-piece connector	6+2.5/3.0/3.5 mm	320 mm	
444S02607	Y-piece connector	7+3.0/3.5/4.0 mm	320 mm	
444S02608	Y-piece connector	8+3.5/4.0/4.5 mm	360 mm	
444S02610	Y-piece connector	10+4.5/5.0/5.5 mm	460 mm	
444S02706	Elbow connector	6	320 mm	
444S02708	Elbow connector	8	360 mm	
444S02710	Elbow connector	10	460 mm	
444S02805	Manifold connector	5	310 mm	
444S02808	Manifold connector	8	360 mm	

Carton quantity: 10; delivered sterile packed.

Effective protection.
Effective humidification.

DAR™ filter heat and moisture exchangers

DAR™ filter heat and moisture exchangers (HMEs) ensure effective airway humidification in patients to lower the incidence of infections. DAR™ HMEs capture heat and water vapor from a patient's exhaled air, then add it to the patient's inspired air to provide optimal humidification.

For smaller patients, DAR™ filter HMEs are available with pleated electrostatic filtration materials in a variety of configurations, so you can choose the product to best suit your clinical needs. When combined with an electrostatic filtering medium, HMEs help protect patients, caregivers, and equipment from microbial contamination.

Electrostatic filter HME, small

Electrostatic filter HME, small, angled port

Pediatric electrostatic filter HME, small

Infant-pediatric electrostatic filter, small

Ordering information

	DAR™ small electrostatic filter HME	DAR™ small electrostatic filter HME, angled port	DAR™ pediatric electrostatic filter HME	DAR™ infant-pediatric electrostatic filter HME
CFN	352/5877	352/5996	355/5430	355/5427
Recommended tidal volume	150-1200 mL	150-1200 mL	75-300 mL	30-100 mL
Internal volume	51 mL	61 mL	29 mL	10 mL
Weight (approx.)	28 g	29 g	21 g	9 g
Moisture output				
Vt 50 mL	---	---	---	28 mg H_2O/L[16]
Vt 250 mL	34.4 mg H_2O/L[16]	34.4 mg H_2O/L[17]	31 mg H_2O/L[16]	---
Vt 500 mL	33.6 mg H_2O/L[16]	33.6 mg H_2O/L[16]	---	---
Vt 1000 mL	32.9 mg H_2O/L[17]	32.9 mg H_2O/L[17]	---	---
Moisture loss at Vt 500 mL†	6 mg H_2O/L[17]	6 mg H_2O/L	6 mg H_2O/L	---
Resistance to flow before use (ISO 9360)				
5 L/min	---	---	---	0.6 cm H_2O
15 L/min	---	---	1.4 cm H_2O	2.5 cm H_2O
30 L/min	1.2 cm H_2O	1.2 cm H_2O	3.0 cm H_2O	---
60 L/min	2.8 cm H_2O	2.9 cm H_2O	---	---
90 L/min	4.8 cm H_2O	5.2 cm H_2O	---	---
Filtration efficiency				
Bacterial	>99.9998%	>99.9998%	>99.999%	>99.999%
Viral	>99.999%	>99.999%	>99.99%	>99.99%
NaCl	>98.352%[18]	>98.352%[18]	>96.263%	>94.186%

Carton quantity: 25

†Internal testing Mirandola (various 2005-2008)

Protect what matters.

DAR™ filters

Filtration is key in reducing cross infections and protecting your smaller patients' airways during ventilation in anesthesia and intensive care. Compact in size, yet high in efficiency, our wide range of DAR™ filters can minimize the spread of infection and the risk of cross-contamination.

By containing airborne viruses and bacteria from the inside out, DAR™ filters remove bacteria and viruses before they enter a patient's airway and reduce the number of pathogens a patient exhales into the air.

DAR™ filters can be either electrostatic or mechanical:

- Electrostatic filters use positive and negative charges to attract and capture particles
- Mechanical filters feature a multilayered, pleated filtration medium that provides greater efficiency than electrostatic filters[19]

Electrostatic filter, small

Mechanical filter, small

Ordering information

	DAR™ small electrostatic filter	DAR™ small mechanical filter
CFN	350/5879	351/5979
Recommended tidal volume	150–1200 mL	150–1200 mL
Internal volume	36 mL	42 mL
Weight (approx.)	19 g	24 g
Resistance to flow before use (ISO 9360)		
30 L/min	0.8 cm H_2O	1.2 cm H_2O
60 L/min	2.1 cm H_2O	2.7 cm H_2O
90 L/min	3.7 cm H_2O	4.5 cm H_2O
Filtration efficiency		
Bacterial	>99.9999%	>99.9999%
Viral	>99.999%	>99.999%
NaCl	>98.096%	>99.512%†

Carton quantity: 25

†Internal testing Mirandola (various 2005-2008)

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

1. Lee JH, Turner DA, Kamat P, et al. The number of tracheal intubation attempts matters! A prospective multi-institutional pediatric observational study. *BMC Pediatrics*. 2016;16:58. **2.** Kriege M, Alflen C, Tzanova I, et al. Evaluation of the McGrath MAC and Macintosh laryngoscope for tracheal intubation in 2000 patients undergoing general anaesthesia; the randomized multicenter EMMA trial study protocol. *BMJ Open*. 2017; 7;e016907. **3.** Kleine-Brueggeney M, Greif R, Schoettker P, Savoldelli GL, Nabecker S, Theiler LG. Evaluation of six video laryngoscopes in 720 patients with a simulated difficult airway: a multi-centre randomized controlled trial. *British Journal of Anaesthesia*. 2016;116(5):670-679. **4.** Alvis BD, Hester D, Watson D, Higgins M, St Jacques P. Randomized controlled trial comparing the McGRATH MAC video laryngoscope with the King Vision video laryngoscope in adult patients. *Minerva anestesiologica*. 2016;82(1):30-35. **5.** Altun D, Ali A, Çamcı E, Özonur A, Seyhan TÖ. Haemodynamic response to four different laryngoscopes. *Turk J Anaesthesiol Reanim*. 2018;46(6):434-440. **6.** Cook TM, El-Boghdadly K, McGuire B, McNarry AF, Patel A, Higgs A. Consensus guidelines for managing the airway in patients with COVID-19: Guidelines from Difficult Airway Society, Association of Anaesthetists, Intensive Care Society, e Faculty of Intensive Care Medicine, and Royal College of Anaesthetists. Anaesthesia. 2020;75(6):785–799. **7.** Hall D, Steel A, Heij R, Eley A, Young P. Video laryngoscopy increases 'mouth-to-mouth' distance compared with direct laryngoscopy. Anaesthesia. 2020;75(6):822–823. **8.** M. Weiss et al, Tracheal tube-tip displacement in children during head-neck movement–a radiological assessment British Journal of Anaesthesia 96 (4): 486–91 (2006) **9.** A.M.H. Ho, C.S.T Aun, M.K. Karmakar, The margin of safety associated with the use of cuffed pediatric tracheal tubes Anesthesia, 2002, 57, pages 169±182 **10.** Haas CF, Eakin RM, Konkle MA, Blank R. Endotracheal tubes: old and new. *Respir Care*. 2014;59(6):933–955. **11.** Lichtenthal PR, Wood L, Wong A, Borg U. Pressure applied to tracheal wall by barrel and taper shaped cuffs. Paper presented at: Annual Meeting of the American Society of Anesthesiologists; October 15-19, 2011; Chicago, IL. Abstract A1054. **12.** Based on internal testing. Comparative ventilator air leak test performed using the Shiley™ 4.0PCF and 6.5PLCF pediatric tracheostomy tubes with taper-shaped cuff vs. predicate Shiley™ 4.0PDC and 6.5PLC pediatric tracheostomy tubes with barrel-shaped cuff. **13.** Woodgate PG et al. Tracheal suctioning without disconnection in intubated ventilated neonates. The Cochrane Database of Systematic Reviews 2001, Issue 2:1-12. **14.** Clifton-Koeppel R. Endotracheal tube suctioning in the newborn: a review of the literature. Newborn and Infant Nursing Reviews 2006, Vol. 6(2): 94-99. **15.** Kalyn A et al. Closed suctioning of intubated neonates maintains better physiologic stability: a randomized trial. *J Perinatol*. 2003; 23 (3): 218-22. **16.** MHRA. Evaluation no. 04005: Breathing system filters, an assessment of 104 breathing system filters. March 2004. **17.** TIM, Technologie-Institut Medizin GmbH - Universitätsklinikum Göttingen, Germany. HME-Test Report 2008/22 DAR Hygrobac "S". July 2008. **18.** Nelson Laboratories Inc. Sodium chloride aerosol testing of breathing system filters (BSF). Lab No. 717597. November 2013. **19.** Cann C, Hampson MA, Wilkes AR, Hall JE. The pressure required to force liquid through breathing system filters. *Anaesthesia*. 2006;61(5):492-497.

Important: Please refer to the package insert for complete instructions, contraindications, warnings and precautions.

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