Current Concepts In the Management of The Difficult Airway

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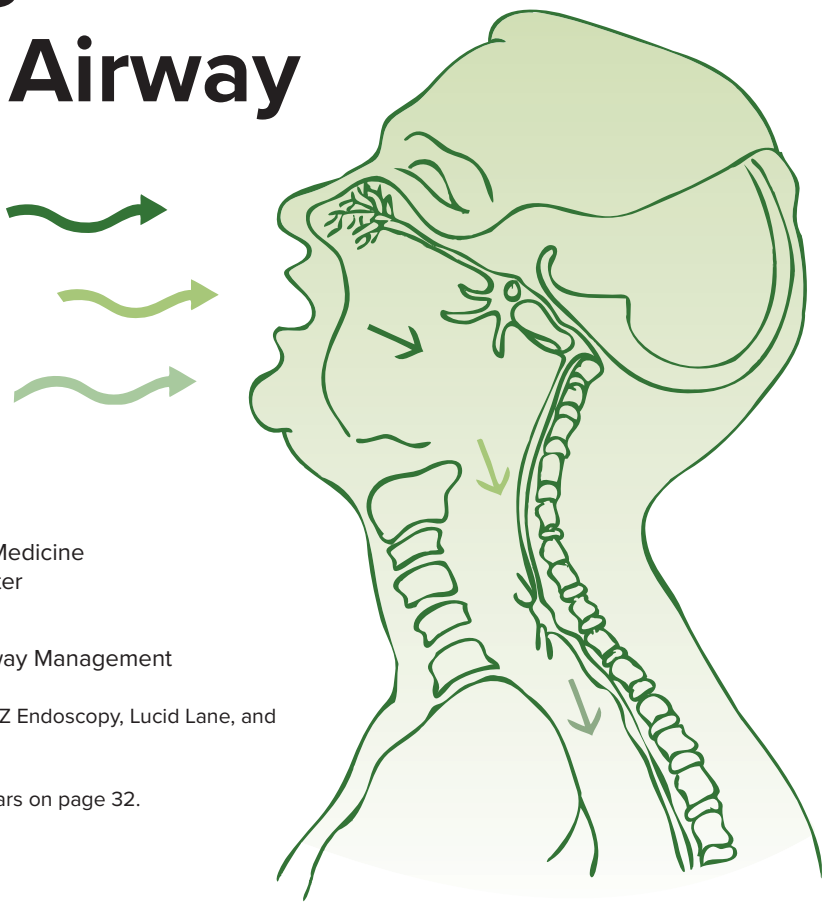
Current Concepts In the Management of The Difficult Airway



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Editor's note: A key of abbreviations and acronyms appears on page 32.

This edition of "Current Concepts in the Management of the Difficult Airway" marks the 23rd anniversary of this biannual review of airway devices and techniques that are currently available to manage both routine and difficult airways, regardless of setting.

Management of the difficult airway remains one of the most relevant and challenging clinical situations encountered by anesthesia practitioners, as major adverse consequences can occur if the airway is not secured in a timely fashion. Most airway problems can be solved with relatively simple devices and techniques, but clinical judgment born of experience is crucial to their application. As with any intubation technique, practice and routine use will improve performance and may reduce the likelihood of complications. Each airway device has unique properties that may be advantageous in certain situations, yet limiting in others. Specific airway management techniques are greatly influenced by individual disease and anatomy, and successful management may require combinations of devices and techniques.

Table 1. Endotracheal Tube Guides

Product Name (Company)	Description	Length
Aintree Intubation Catheter (Cook Medical)	Polyethylene 19 Fr AEC allows passage of a FIS through its lumen. It has 2 distal side holes and is packaged with Rapi-Fit adapters. Includes a bronchoscope port. Color: light blue.	56 cm.
AIROD (AIROD Medical)	Telescopic endotracheal intubation bougie. Because of its flexible steel construction, the AIROD can safely lift the epiglottis improving vocal cord exposure and provide direct access to the trachea. It can also be used as a stylet, ETT exchanger, and, in an emergency, a cricothyrotomy introducer.	31 cm (telescopes open to 67 cm).
Arndt Airway Exchange Catheter Set (Cook Medical)	Polyethylene 14 Fr AEC with a tapered end, multiple side ports, packaged with a stiff wire guide, a double swivel bronchoscope connector, bronchoscope port and Rapi-Fit adapters. Color: yellow.	Wire: 160 cm. AEC: 70 cm. (ETTs ≥5.0 mm.)
bébé Vie Scope (Adroit Surgical)	Single-size pediatric laryngoscope. It is used similarly to the Vie Scope, but an age-appropriate ETT is passed directly through the vocal cords using a straight line of sight. The unique blade design facilitates both blade insertion into the vallecula or elevation of the epiglottis.	One size fits most pediatric patients.
Cobra Introducer (Occam Design)	15 Fr airway intubation guide with telescoping extension. Coudé tip and 3 side holes. Color: orange.	60 cm (73 cm when telescopically extended).
Cobralet (Occam Design)	15 Fr airway intubation guide with hollow interior channel. Color: orange.	60 cm.
Cook Airway Exchange Catheter (Cook Medical)	8, 11, 14, and 19 Fr polyethylene design facilitates exchange for single-lumen ETTs. Color: yellow.	8 Fr: 45 cm. Other sizes: 83 cm. For exchange of ETTs with ID mm: 8 Fr: ≥3.0 mm; 11 Fr: ≥4.0 mm; 14 Fr: ≥5.0 mm.; 19 Fr: ≥7.0 mm.
Cook Airway Exchange Catheter Extra-Firm with Soft Tip (Cook Medical)	11 and 14 Fr polyethylene designs facilitate exchange of single-lumen or EF with soft tip. Color: green catheter; soft tip is purple.	100 cm. For exchange of ETT/DLT with ID minimum: 11 Fr: ≥4.0 mm. 14 Fr: ≥5.0 mm.
Cook Staged Extubation Set (Cook Medical)	Soft-tipped marked extubation wire to maintain continuous airway access, wire holder, and Tegaderm for securement, soft-tipped Reintubation Catheter, Rapi-Fit adapters to assist in O_2 delivery, if necessary. Available outside of United States only.	Wire: 145 cm. AEC: 83 cm.
CoPilot VL Disposable Bougie (Dilon Technologies)	14 Fr polyethylene single-use ETT introducer with coudé tip. Color: orange.	60 cm (ETTs ≥6.0 mm).
CoPilot VL Rigid Intubation Stylet (Dilon Technologies)	Reusable CoPilot VL intubation stylet.	ETTs ≥6.0 mm ID.
D-BLADE Reusable Stylet (KARL STORZ)	Reusable stylet designed especially for the C-MAC reusable and single-use adult D-BLADE. Individually peel packed in boxes of 10.	31 cm; diameter shaft: 3-mm tip: 5 mm ID (ETTs ≥5.5 mm).
ETT Exchanger (Instrumentation Industries)	Rigid yet flexible with rounded tip and graduated marks for easy placement. Available in 9 sizes from 2.5 to 7.5 mm ID.	Nine sizes (15- to 29-inch lengths). (ETTs 2.5-7.5 mm.)
Frova Intubating Introducer (Cook Medical)	Polyurethane 8.0 and polyethylene 14 Fr malleable introducer with curved distal tip with 2 side ports. Has hollow lumen and is packaged with a stiffening cannula and removable Rapi-Fit adapters. 14 Fr also available, individually sterile packaged in box of 10, catheter only without stiffening cannula. Colors: 8 Fr, yellow; 14 Fr, blue.	8 Fr: 35 cm. 14 Fr: 70 cm.
GlideRite Reusable Stylets (Verathon)	GlideRite Reusable Stylets are designed to complement hyperangulated GlideScope VLs and facilitate placement of ETTs.	ETTs and DLTs ≥6.0 mm.
GlideRite Single-Use Stylets (Verathon)	GlideRite Stylets are designed to complement hyperangulated GlideScope VLs and facilitate placement of ETTs.	Large: ETTs ≥6.0 mm. Medium: ETTs 4.5-5.5 mm. Small: ETTs 3.0 mm, 4.0 mm.
i-Bougie (VBM)	14 Fr introducer with angled tip and hollow lumen for oxygenation. Color: orange.	70 cm.
Insighter Rigid Stylet (Teleflex)	Reusable and sterilizable. Designed to work with GVL, C-MAC, and Insight VLs, or any other VLs.	34 cm. 3.8 mm OD. (ETTs ≥4.5 mm.)

	Clinical Applications	Special Features
	Exchange of SGAs for ETTs ≥7.0 mm using a FIS. Its hollow lumen allows insertion of a FIS directly through the catheter so that the airway can be indirectly visualized.	Large lumen (4.7 mm) allows passage of a maximum OD 4.2 mm FIS. Rapi-Fit adapters allow both jet ventilation and ventilation with 15-mm adapter (anesthesia circuit or Ambu bag). Two distal side ports. Single-use.
	Tracheal introducer for use in any airway, especially a difficult airway. Can also be used for ETT exchange. For use with ≥4.5 mm ETT.	Can be bent into any configuration for use with any laryngoscope be it DL or VL. Optimal for storage; does not deform like plastic bougies and can be quickly expanded from 1-2 feet in an emergency. Single-use.
	Exchange of LMAs and ETTs using a FIS.	Tapered end and distal multiple side ports. The 160-cm–long wire can be inserted through the working channel of the FIS. Single-use.
	Can be used in any pediatric difficult airway, including critically ill pediatric patients.	Has a large right-sided slot for ETT insertion and a long rubber tooth guard built in. Proximally positioned LEDs that illuminate the entire length of the blade like the Vie Scope.
	Facilitates tracheal intubation, especially in situations of difficult airway anatomy. Facilitates both DL and VL. Works as a traditional bougie, then additionally extendable while in use, when desired.	Telescoping segment to enhance glottis entry. Malleable, reversible, and controllable from middle or either end.
	Facilitates tracheal intubation.	Malleable, hollow interior for O_2 insufflation.
	Intended for uncomplicated, atraumatic ETT exchange for both single-lumen tubes.	Rapi-Fit adapters as above but should be used primarily for jet ventilation because of length. Two distal side ports. Single-use.
	The soft tip is intended for uncomplicated, atraumatic ETT exchange for both single-lumen tubes and DLTs.	Rapi-Fit adapters as above but should be used primarily for jet ventilation because of length. Two distal side ports. Single-use.
	Provides a tool for a more complete extubation strategy, which should be in place for every patient. ETTs >5.0 mm ID.	Uses an atraumatic wire to maintain continuous airway access and a soft-tipped reintubation catheter to facilitate a successful reintubation if required and delivery of O_2 when desired. Multiple distal side ports. Single-use.
	Facilitates tracheal intubation. May also be used for tube exchange.	Single-use.
	Reusable stylet for use with VL to facilitate ETT placement.	Reusable, easy to high-level disinfect or sterilize.
	The angle of the reusable stylet complements the angle of the C-MAC laryngoscope to help facilitate placement of an ETT. The pre-shaped stylet improves maneuverability of the ETT toward the target.	Sateen finish allows the stylet to pass more easily into ETTs. Packaged ready to use; no reprocessing necessary for first use.
	Facilitates simple ETT exchange.	Specific exchanger for each ETT. Single-use.
	Facilitates tracheal intubation; not intended for ETT exchange. Can also be used by placing it first in the ETT, with its tip protruding, or placing it directly into the glottis and then placing the ETT over it. Used straight or slightly curved with DL or definitively curved with VL.	Blunt, angled tip, 2 distal side ports. Rapi-Fit adapters allow both jet ventilation and ventilation with 15-mm adapter (anesthesia circuit or Ambu bag). Hollow lumen allows oxygenation/ventilation/CO_2 detection in all sizes. Single-use.
	Both: for use with hyperangulated blades. Rigid preformed design enhances ETT control during intubation. DLT Stylet: for use with DLTs.	Reusable. Compatible with high-level disinfectants, autoclave, and other sterilization methods. Easy-to-use handle design for simple ET securement and stylet removal.
	For use with hyperangulated blades. Rigid, preformed design enhances ETT control during intubation.	Sterile, individually packaged (sold in boxes of 10). Small, Medium, and Large Sizes: Easy-to-use handle design for simple ETT securement and stylet removal. Small size: adjustable stopper. Single-use.
	Facilitates tracheal intubation. Low friction material is shapeable and allows easy tube passage.	Supplied with 2 types of O_2 connectors to allow oxygenation through the lateral openings at the tip. Single-use.
	Preformed curve matches that of Insight VL, GlideScope and C-MAC.	Reusable, durable stainless steel; easy to clean and sterilize.

table continues on next page

Table 1. Endotracheal Tube Guides *(continued)*

Product Name (Company)	Description	Length	
Introes Pocket Bougie (BOMImed)	14 Fr (4.7 mm) malleable ETT introducer made from special blend of Teflon.	60 cm (ETTs ≥5.0 mm).	
Infrared Red Intubation System (IRRIS) and Amber (Guide In Medical Ltd.)	IRRIS Amber infrared device is based on an electronic illumination patch, which is placed on the patient's neck. IRRIS transmits light of a specific wavelength at specific density and frequency into the subglottic space, which guides the user for ETT placement.		
Obturating Introducer for Nasal ETT (Genesis Airway Innovations)	ETT introducer/dilator for nasal endotracheal intubation.	For sizes ID 5.0-8.0 mm Genesis Airway ETT with posterior-facing bevels.	
Pocket Introducer (VBM)	Single-use 15 Fr Introducer with coudé tip. Color: blue.	65 cm.	
Portex Single-Use Bougie (Smiths Medical)	15 Fr, PVC ETT introducer with coudé tip. Has a hollow lumen that discourages reuse and is provided sterile. Color: ivory.	70 cm.	
Portex Tracheal Tube Introducer (Smiths Medical)	15 Fr ETT introducer made from a woven polyester base, with a coudé tip (angled 35 degrees at its distal end). Also known as the gum elastic bougie. Color: golden brown.	60 cm.	
ProVu Rigid Stylet (Flexicare)	ProVu Rigid Stylets are pre-formed to accompany ProVu Hyper-angulated VLs and accommodate a broad range of patients and procedures.	Large: ETTs ≥6.0 mm. Medium: ETTs 4.5-5.5 mm.	
Rhinoguard (Davis Medical)	ETT introducer/dilator.	25.4 cm: small for ETTs 3.0-4.5 mm; 35.5 cm: large for ETTs 5.0-8.0 mm.	
Rapid Positioning Intubation Stylet (RPiS) (Airway Management Enterprises)	Flexible stylet with tip that allows 180-degree flexion and retroflexion. Tip protrudes 5 cm from the end of ETT. Color: blue.	38 cm (ETTs ≥6.0 mm).	
Runnels Steerable Introducer (RSI) (Through The Cords)	Steerable introducer allows dynamic navigation and precision tracheal access. Designed to solve tracheal access problems associated with VL. Articulating tip and flexible shaft allows active serpentine navigation of primary and secondary curves of the airway when VL is used for visualization.	(ETTs ≥4.5 mm 35-41 Fr DLT.) Adult and pediatric sizes available.	
S-Guide (VBM)	Single-use 15, 11, and 8 Fr stylet, malleable, with atraumatic coudé tip and hollow for oxygenation (only 15 and 11 Fr).	65 cm.	
Steerable Tip Intubation Guide (STIG) (Sharn by Marketlab)	Steerable ETT introducer with soft, flexible and controllable tip. Ideal when there is a great view but advancing the ETT is problematic.	65 cm, 15 Fr (ETTs ≥7.0 mm).	
TOAD Video Bougie/Tube Changer (Total Oral Airway Devices)	Single-use 5.5 mm OD bougie with angulated tip and embedded HD camera at distal tip. Locking cap secures bougie into ETT and enables suction or oxygenation capability.	5.5 mm OD, 60 cm length	
Universal Stylet Bougie (USB) (Intersurgical)	The Universal Stylet Bougie is a hybrid stylet and bougie. Features a low-friction hexagonal shape providing optimal grip, eliminates the potential for rolling, and facilitates removal due to less contact with the ETT.	Available in 1 size (15 Fr OD 5.0 mm); suitable for use with all adult patients. (ETTs 7.0-10.0 mm.)	
Vie Scope (Adroit Surgical)	Battery-powered, disposable scope that uses a closed circular tube with a beveled end to visualize the vocal cords.	Adult, one size fits all.	
Voir Bougie (Adroit Surgical)	Single-use 15 Fr polyethylene ETT introducer with formable tip. Colored safety bands: light blue bougie with green and red safety depth marking bands gives the user immediate depth insertion distance for rapid intubation.	70 cm, 15 Fr (ETTs ≥6.0 mm).	
X-Changer (VBM)	11, 14, and 19 Fr hollow catheter with lateral openings to allow oxygenation. Unique atraumatic flexible soft tip. Color: blue.	80 cm.	

	Clinical Applications	Special Features
	Designed to facilitate both DL and VL tracheal intubation. Unique curvature designed to follow natural path of the airway. Flexibility: Customizable coudé tip angles allow for manipulation of the distal tip for anterior airways.	Self-lubricated bougie, tactiglide technology for tactile sensation, optimal curve with shape memory, balanced rigidity with soft-tissue protection, depth markings, packaged sterile. Packaged in box of 10. Single-use.
	Guides intubation in both routine and difficult airway situations by light identification of the subglottic space. Suitable for hospital and pre-hospital use.	Device is externally placed over cricothyroid membrane and adheres to the skin. Light emitted through the neck tissue to illuminate the subglottic space, which assists in identifying the trachea and vocal cords.
	Atraumatic nasal intubation. Posterior-facing bevel of ETT assists with first-pass intubation and reducing hang-up on anterior tracheal wall.	Tapered soft silicone introducer inserts into the lumen of and mates with the tip of an ETT, avoiding an increase to the external diameter of the complex, thus increasing the risk factor for nasal trauma. No soiling of the lumen of the ETT during nasal passage.
	Facilitates tracheal intubation.	Folded to only 20 cm, unfolds to 65 cm within seconds; ideal space solution for emergency bags. Single-use.
	Single-use product reduces risk for cross-contamination. Otherwise, same as Portex Venn Tracheal Tube Introducer.	Similar to Portex Venn Tracheal Tube Introducer, but hollow lumen allows oxygenation/ventilation. Single-use.
	Proven useful in patients with an anterior larynx (grades 2b, 3, and 4) and those with limited mouth opening. Can be used by slightly protruding through the ETT or placing directly into the glottis and then placing an ETT over it.	Nondisposable and reusable. Size 5.0 Fr is single-use. Has memory properties. Coudé tip effectively detects "tracheal clicks" to confirm correct placement.
	Pre-shaped for use with hyperangulated blades. Semi-rigid material allows for custom shaping of the stylet.	Equipped with a spacious handle for improved control. Extends to the ideal depth—distal tip of the stylet ends below the Muphy Eye to help reduce the risk for trauma and allow room for anchoring and flexion of the ETT tip.
	Facilitates nasal intubation.	Optimized longitudinal stiffness to facilitate passage of an ETT, especially in challenging nasal passages although customized for 3.0-8.0 mm ETTs, OD taper provides ability to utilize larger ETT, if desired.
	Provides greater visibility and control of tip similar to a FIS (with one provider) in difficult and routine intubation with VL.	Stylet with atraumatic soft tip. Single-use.
	Allows a single-operator combined technique using VL for visualization and steerable introducer for steerable tracheal access. Facilitates tracheal access for adult oral and nasal tracheal intubations in awake or asleep patients with any VL.	Dynamic ETT introducer with articulating tip, pre-lubricated flexible shaft, removable pistol grip handle that controls tip articulation and is compatible with any non-channeled VL blade. Single-use.
	Difficult intubation. Ideal for non-channeled VL.	Malleable stylet with color-coded soft tip. Supplied with 2 types of O_2 connectors to allow oxygenation (only 15 and 11 Fr).
	Useful with DL or VL, single-use steerable tip intubation guide facilitates ETT placement and is particularly helpful when advancement in the airway or a traditional bougie is difficult. Helpful with anterior airway or when tracheal tumors are present and have to be navigated past.	Sliding "tabs" are moved with user's thumb to flex or retroflex the tip to maneuver around the anatomy. Phosphorus tip for improved visualization under UV illuminated laryngoscopy. Useful with DL and VL.
	Facilitates difficult tracheal intubation. Allows for dual visualization when combined with TOAD™ Video Laryngoscope. Enables tube exchange under direct vision and allows visual confirmation of trachea and proper tube placement. Provides visualization for scalpel, video bougie technique.	Provides oxygenation and suction within ETT during placement. Single-use.
	For use as an intubating stylet tracheal tube introducer (bougie) to help facilitate oral tracheal intubation with an ETT in adult patients in the pre-hospital and in-hospital settings.	Features a low-friction hexagonal shape making for less contact with the ETT, metal inserts leading to increased mechanical amplification, coudé tip for optimal insertion, flattened (non-patient) end and folded design for a smaller footprint making it easy to store.
	Allows for a straight line-of-sight view with 360 degrees maximal illumination to pass a bougie between the vocal cords. Provides the ability to intubate the patient when awake in trauma, routine, and difficult situations both in the hospital and in the field.	Patented LED ring illumination located at the proximal end of a self-enclosed clear tube allows light to be transmitted through the lumen of the tube as well as the sidewall to avoid obstruction of light by secretions or blood. Single-use.
	Facilitates tracheal intubation and increases patient safety.	Clearly marked color bands (patent pending) permit the user to note the correct depth upon insertion to avoid lung or tracheal injury.
	Facilitates tracheal tube exchange.	Supplied with 2 different O_2 connectors.

Table 2. Stylets

Product Name (Company)	Description	Size
Lighted Stylets		
Aaron Surch-Lite (Apyx Medical)	10-inch sterile, single-use, flexible stylet.	Adult.
AincA Lighted Stylet (Anesthesia Associates; AincA)	Easily malleable, lighted stylet with adjustable ETT holder. Shapes and guides ETT while forwardly illuminating passage. Completely reusable device consisting of removable handle with xenon bulb.	Adult and pediatric (ETTs ≥5.0 mm). Infant (ETTs ≥3.0 mm).
Bougie Stylet (Total Oral Airway Devices)	Flexible stylet with central bougie port.	Stylet: 44 cm. Bougie: 70 cm.
InterForm (Intersurgical)	InterForm is a malleable ETT stylet, allowing the user to form the ETT into a suitable shape to ease insertion and enhance control of the airway device.	Available in 3 sizes: 14, 10, and 6 Fr.
InterGuide (Intersurgical)	InterGuide is a flexible ETT introducer commonly known as a bougie. It allows positive location of the trachea and subsequent placement of the ET in difficult airway situations.	Available in 3 sizes: 15, 10 and 6 Fr.
Viewing Optical Stylets		
AincA VideoStylet (Anesthesia Associates)	Easily malleable, video imaging stylet with built-in ETT holder. Shapes and guides ETT while forwardly illuminating the passage and providing full-color image. Completely reusable device consisting of removable VideoStylet and attached rechargeable LCD monitor.	Adult and pediatric (ETTs ≥6.0 mm).
C-MAC Video Stylet (KARL STORZ)	A high-resolution chip at the distal end of the endoscope. The tip can be angulated anteriorly by up to 90 degrees, which helps in the narrow conditions of the oral cavity. The patented active bend mechanism can be used with an attached ETT and simultaneously supports the passive return.	With ETT adapter ETTs ≥6.0 mm.
Clarus Levitan (Clarus Medical)	Portable high-resolution fiberoptics enclosed in a malleable stainless-steel stylet provide a view from the tip of ETT. Built-in tube stops to hold ETT in place with integral O_2 port for O_2 insufflation during intubation. Assist with DL/VL like regular stylet to provide an added view from the tip of the tube or can be used independently as an easier-to-learn, less expensive alternative to FIS. Also, malleable to be used through intubating supraglottic ventilatory devices. Optional adapter uses smartphones to transform optics to video.	Adult (ETTs ≥5.5 mm).
Clarus Pocket Scope (Clarus Medical)	Conveniently sized, easy-to-clean, and cost-effective (reusable) flexible stylet that has a patented, deflected, non-directable tip. Optional adapter uses smartphones to transform optics to video. Often used to confirm placement and patency of airways.	Adult (ETTs ≥4.0 mm).
Clarus Shikani (Clarus Medical)	Viewing stylet: high-resolution, stainless steel, malleable fiberoptic stylet. Has adjustable tube stop and integral O_2 port for insufflation. Can be used to either assist with DL/VL (like regular stylet) to add a view from the tip of the tube or be used independently as an alternative to the use of a bronchoscope. Also, malleable for use through intubating supraglottic ventilatory devices. Optional adapter uses smartphones to transform optics to video.	Adult (ETTs ≥5.5 mm). Pediatric (ETTs 2.5-5.0 mm).
Clarus Video Stylet 3000V (Clarus Medical)	Malleable rigid stylet scope with attached LCD screen and adjustable curve shape provides view from end of stylet; built-in tube stop to hold ETT in place with integral port for O_2 insufflation during intubation. Assist with DL/VL like regular stylet to provide view from the tip of the tube or used as independent device as an easier, less expensive alternative to FIS. Also malleable to be used through intubating supraglottic ventilatory devices.	5 mm OD; ETTs ≥5.5 mm.
Hugemed Video Lighted Stylet (Bell Medical)	Disposable and reusable options in sizes 3.0, 3.9, and 5.0 mm with an adjustable ETT stop.	3.0 mm: 300 mm length. 3.9 mm, 5.0 mm: 380 mm length.
Insighter Lighted Video Stylet (Bell Medical)	Malleable rigid stylet video scope with attached HD video display and adjustable curve shape provides view from end of stylet; built-in tube stop to hold ETT in place with integral O_2 port for insufflation during intubation.	34 cm; 3.8 mm OD (ETTs ≥4.5 mm).
J-Wand/J-Wand Advantage (D-R Burton Healthcare Products)	Semirigid intubating stylet that can be used with both video and standard laryngoscopy equipment. Flexible angled introducer tip to facilitate ETT placement. Oxygenation port built into handle enables providers to perform apneic oxygenation techniques during intubation process.	ETTs ≥6.0 mm.

	Clinical Applications	Special Features
	Usable for routine blind intubation or additional illumination during laryngoscopy, but especially useful when FIS unavailable (outside locations, ambulances), or when bronchoscopy is difficult (obscured airway or limited head motion allowed).	Can be used alone or with other techniques. Completely disposable. Individually packaged in boxes of 3. Single-use.
	Same as Aaron Surch-Lite.	Can be used alone or with other techniques. Handle-mounted xenon light source is always on and keeps stylet tip cold. Uses 2 AA batteries. System is completely reusable and sterilizable.
	Intended to be used with a VL or standard laryngoscope in guidance and placement of 6.5 mm.	Combines the benefits of a stylet with the advantage of placing a bougie, assisting intubation. Sterile. Single-use.
	Allows the user to form the ETT into a suitable shape to ease insertion and give more control of the airway device.	Latex-free and supplied sterile in easy-to-open individual packs. Aluminum core allows the user to easily form suitable shapes.
	Allows positive location of the trachea and subsequent placement of the ETT in difficult airway situations.	Latex-free and supplied sterile in easy-to-open individual packs. Atraumatic coudé tip to reduces the potential for patient trauma.
	Usable for routine intubation or video imaging during laryngoscopy, but especially useful when a FIS is unavailable (e.g., outside locations or ambulances), or when bronchoscopy is difficult to perform.	Provides rapid learning curve due to similar standard ETT advancement techniques, but with added benefit of an attached, clear video image of all landmarks forward of ETT tip.
	Can elevate a large, floppy epiglottis and navigate through oropharynx of patients with excess pharyngeal soft tissue, midline obstruction, limited mouth opening or fragile veneers on incisors. Intuitive handling with universal C-MAC System interface for C-MAC Monitor (8403 ZXK) and C-MAC PM (8403 XD).	Adjustable distal tip to aid in intubating the most anterior airways. Becomes a highly portable device when connected to the C-MAC Pocket Monitor. Includes ETT adapter, in addition to adapter for fixation of ETTs and O_2 insufflation. Portable, rugged, and better maneuverability than flexible FIS.
	Similar to Shikani and Clarus Video Stylet Scope. Originally designed as adjunct to DL for improved first-pass success. For easy intubation, it is used as a standard stylet. Or, when faced with an unexpected grade 3 or 4 DL view, it offers additional view from "around the corner" via the tip of the tube for successful first-pass intubation. May also be used as a stand-alone device as an alternative to FIS for awake (or anesthetized). See Clarus Video Stylet 3000V.	GreenLine laryngoscope handle or a Turbo LED can be used for light sources. Otherwise, similar to the Clarus Video Stylet 3000V but requires user to cut the ETT because it does not have a movable tube stop. Able to connect to an endoscopic tower monitor or a smartphone adapter to connect to a smartphone screen for video viewing. Portable and small enough to carry in airway bag/crash cart when FIS may not be readily available.
	Allows for visualization during intubation through ILMA or quick confirmation of SGA, DLT or ETT placement/positioning patency. May also be used prior to extubation.	Has been modified with a patented deflected tip for a view from the end of the device. Able to connect to an endoscopic tower monitor or a smartphone adapter to connect to a smartphone screen for video viewing.
	Similar to Clarus Video Stylet 3000V.	Comes in adult and pediatric sizes. Light source options are light cable, Turbo LED or GreenLine laryngoscope handle with adapter. Otherwise, similar to Levitan Viewing Stylet.
	Similar to Shikani and Levitan viewing stylets. Many use it as a stand-alone device as an alternative to FIS for awake (or anesthetized) intubation. Provides access with limited mouth openings, anterior airways, radiation or ENT patients. Malleable stylet allows shaping to reduce cervical movement. May also be used to intubate through a supraglottic airway or checking placement of ETTs or SGAs.	Has the simple form of a standard stylet, plus the advantage of a fiberoptic view. Portable, rugged, and able to lift tissue. Malleability allows for more universal use in multiple techniques and various airway situations. Red LED provides transillumination. Portable and small enough to carry in airway bag/crash cart when FIS may not be readily available.
	Facilitates tracheal intubation for adults and infants.	Available in both reusable and disposable options. Display on stylet is reusable HD with 16 million pixels, >400 lux illumination. The 3.0- and 3.9-mm diameter stylets are malleable, and the 5.0 mm is rigid.
	Similar to Shikani and Clarus Video Stylet Scope. Used as a standard stylet and ideal for patients with reduced mouth-opening ability. New wireless or wired communication to the 13-inch HD iWorkstation. Color display.	Malleable stylet is a semirigid tube core that returns to original shape after use. HD display, ETT secure stop, and O_2 insufflation allows recording of pictures and videos.
	Can be used with both standard and VL equipment. Facilitates placement of ETT, especially in anterior airway. Ability to provide direct apneic O_2 delivery from the ETT during intubation.	Flexible, angled introducer tip and stylet design that mimics modern curved-blade VL. Apneic oxygenation port built into handle. Semirigid stainless steel support within ETT. Ergonomic design facilitates easy insertion and removal of the stylet. Single-use.

table continues on next page

Table 2. Stylets *(continued)*

Product Name (Company)	Description	Size
Safe-Cam Video-Stylet System (Medical Safe-Cam)	Malleable stylet with integrated camera at tip. Image is displayed via a monitor, a cable or Wi-Fi on phone.	ID ≥6.5 mm (for adults); ≥2.5 mm for pediatrics.
TOAD Video Wand (Total Oral Airway Devices)	Malleable Video Wand with an integrated HD camera. Locking cap secures wand into ETT and enables suction or oxygenation capability.	2 sizes: 4.8 mm OD and 4.0 mm OD. Fits adult single-lumen ETT (≥5.5 mm). Fits adult DLT (≥35 Fr).
VivaSight-SL (Ambu)	Single-use ETT with an integrated camera at the tip. Image is displayed on a monitor via a cable.	ID 7.0, 7.5, and 8.0 mm.

Table 3. Flexible Intubation Scopes

Product Name (Company)	Description	Size
aScope 3 (Ambu)	FIS with OD: 3.8 mm; working channel ID: 1.2 mm. FIS with OD: 5.0 mm; working channel ID: 2.2 mm. FIS with OD: 5.8 mm; working channel ID: 2.8 mm.	Slim: ETTs ≥5.0 mm. Regular: ETTs ≥6.0 mm. Large: ETTs ≥7.0 mm. All 60 cm in length.
aScope 4 Broncho (Ambu)	FIS with OD: 3.8 mm; working channel ID: 1.2 mm. FIS with OD: 5.0 mm; working channel ID: 2.2 mm. FIS with OD: 5.8 mm; working channel ID: 2.8 mm.	Slim: ETTs ≥5.0 mm. Regular: ETTs ≥6.0 mm. Large: ETTs ≥7.0 mm. All 60 cm length.
BFlex 2 (Verathon)	Single-use flexible intubation scopes (bronchoscopes) designed for airway endoscopy, compatible with GlideScope® Core and legacy GlideScope video monitor systems.	Ultraslim: 2.8/-; ≥ 4.0 ETT; ≥ 32 Fr DLT; (6 months-6 years) Slim: 3.8/1.2; ≥5.0 ETT; ≥ 35 Fr DLT; (≥6 years) Regular: 5.0/2.2; ≥6.0 ETT Large: 5.8/3.0; ≥7.0 ETT All 61 cm length.
FIVE S Single-Use Flexible Intubation Video Endoscope (KARL STORZ)	New single-use FIVE S is compatible with the C-MAC and C-HUB Video Intubation Platform. Like the reusable FIVE Scope, the distal chip provides 160,000-pixel resolution and a wide angle of view, and its rigid sheath easily maneuvers to facilitate intubation in even the most challenging situations.	3.5 mm width/65 cm length with 1.2-mm suction channel. 5.3 mm width/65 cm length with 2.2-mm suction channel.
Flexible Intubation Video Endoscope (KARL STORZ)	Compact, mobile endoscope. The FIVE Scope complements the C-MAC video intubation devices. Distal chip technology enhances image quality, field of view and aspect ratio to facilitate intubation. Real-time viewing on the C-MAC HD 8-inch touch screen LCD monitor with picture in picture (PIP) and split-screen capability.	5.5 mm with 2.3-mm suction channel; 4.0 mm with 1.5-mm suction channel; 2.85 mm without suction channel.
Flexible Intubation Video Endoscope (FIVE) (KARL STORZ)	Same as FIVE 3.0.	4.0 mm with 1.5-mm suction channel. 65-cm length. (ETTs >4.5 mm, DLT >35 Fr.)
Hugemed Flexible Video Intubation Endoscope, VL3S (Bell Medical)	System comes with a video display or remote display viewing option.	2.8, 3.9, 5.2, 5.8 mm diameter; 650-mm working length.
Insighter Flexible Articulating Video Endoscope (Bell Medical)	Has a universal HD Insight Color Display that is 3.5-inch and stores 70 hours of video and 80,000 photos. Multiple-diameter scopes to work with infants and adults. New wireless or wired communication to the 13-inch HD iWorkstation Color Display.	2.8, 4.0, 4.5 mm with 1.2-mm channel; 5.8 mm with and without channel.
Insighter Flexible Video Endoscope (Bell Medical)	2.2 mm flexible video endoscope, non-articulating.	2.2-mm flexible scope.
TOAD Flexible Laryngoscope (Total Oral Airway Devices)	Flexible VL for difficult intubation or for placement of DLT. Articulating tip with flexion and retroflexion. HD picture quality for adult sizes. 400 x 400 picture quality for pediatric sizes.	2.0-5.8 mm OD. Some sizes include suction channels.

	Clinical Applications	Special Features
	Direct view during intubation, including placement and verification of optimal position during intubation and beyond; with adult and pediatric sizes. Indicated for use during routine or difficult intubation.	Optimal, clear image resolution, with malleability allows tube visualization throughout, without blind spots, and no more invasive than the ETT (as within tube at all times of normal operation). Single-use.
	Facilitates routine and difficult intubation. Can be combined with TOAD™ VL to provide dual visualization technique.	Can be used with an intubating oral airway. Can facilitate placement of DLT (≥35 Fr). Single-use.
	Direct view during intubation; useful for verifying ETT and endobronchial blocker placement and repositioning. Indicated for use during routine or difficult intubation.	Continuous visualization allows real-time observation and monitoring of ETT or endobronchial blocker position throughout the procedure. Single-use.

	Clinical Applications	Special Features
	Equivalent to standard reusable pediatric FIS. Especially useful for positioning DLTs and bronchial blockers (Slim). Alternative to reusable FIS with large working channel (e.g., for BAL or secretion management).	Fully disposable, sterile FIS avoids cleaning/reprocessing issues and repair costs. Attaches to high-quality aView monitor with onboard recording of video and images.
	Alternative to reusable FIS with large working channel (e.g., for BAL or secretion management).	Same as aScope 3 Large but with improved image quality, better bending and new ergonomic design.
	Airway endoscopy to support tracheal intubation and tube position confirmation, with secretion management and bronchoscopy capabilities in adult and pediatric patients in OR, ICU, and ED settings.	Compatible with GlideScope® Core monitors, enabling simultaneous bronchoscopy and video laryngoscopy views on a single display, particularly useful in difficult airway cases. Pediatric indication available with Ultraslim 2.8 and Slim 3.8 models.
	Oral and transnasal intubation and lung separation. Small diameter of the FIVE S 3.5 scope is ideal for DLT placement (smallest is 35 Fr DLT) with bronchial blockers, ped airways, and maneuvering around challenging anatomy and obstructions. Scopes compatible with C-MAC monitor and C-HUB Interface, offering a complete airway management distal chip video solution.	Fully disposable, sterile FIS eliminates need for reprocessing. Ideal in emergent settings such as the ICU, ED, and code carts for airway assessment and intubation. Reinforced distal tip prevents passive deflection. Minimal production variance in diameter results in ETT compatibility.
	Oral and transnasal intubation and lung separation. Small diameter of the FIVE 3.0 scope is ideal for pediatric airways and 26 Fr DLT. The 4.0 is compatible with a 35 Fr DLT. The FIVE scopes easily maneuver around challenging anatomy and obstructions to access the vocal cords when rigid devices fail to do so. All FIVE scopes are compatible with the C-MAC monitor and C-HUB Interface.	4:3 aspect ratio and 300,000-pixel distal chip resolution allows improved visualization of anatomy, facilitating ETT placement. Part of a system approach: 8404ZX C-MAC HD Monitor includes dual device input with split screen and PIP capabilities providing a "Plan B," enabling use and simple exchange of several airway devices on a portable video platform.
	Oral and transnasal intubation and lung separation. Small diameter of the FIVE 4.0 scope is ideal for DLT placement (smallest is 35 Fr DLT) use with bronchial blockers, pediatric airways, and maneuvering around challenging anatomy and obstructions to access the vocal cords when rigid devices fail to do so.	Same as KARL STORZ FIVE 3.0.
	2.8-mm flexible scope with no channel. 3.9-mm flexible scope with 1.2-mm working channel. 5.2-mm flexible scope with 2.2-mm working channel. 5.8-mm flexible scope with 2.6-mm working channel.	Flexible angulation range 160 degrees up, 130 degrees down.
	Features the 3.5-inch HD color display integrated with endoscope. Easily removed for cleaning and sterilization.	Uses LED light and LED camera at tip of endoscope eliminating the fiberoptic bundles that can so easily be damaged. Articulates fully and easily to aid clinician in verifying DLT placement or in passing an ETT in a difficult intubation.
	Connects to a 3.5-inch HD display, wireless transmitter or wired HDMI cable.	Ideal for verification of DLT and for continuous monitoring of placement.
	Facilitates difficult intubations, asleep or awake. Provides for combined use with the TOAD™ LIVVE™ and other LMAs. Enables confirmation of proper ETT placement (single lumen or DLT).	Can provide picture-in-picture display on TOAD™ 10-inch monitor when paired with the TOAD™ VL.

Table 4. Video Laryngoscopes

Product Name (Company)	Description	Size
Airtraq Plus (Prodol Meditec)	New all-in-one portable VL. The same VL fits all blade types and sizes—Macintosh, Hyperangulated, and Channeled—facilitating the multiple options for airway management. Single-use blades are made from recycled polycarbonate, providing a VL eco-friendly alternative. It allows intubation from any position and can be wirelessly connected to the optional 10.4-inch max view display, allowing for team image sharing and education. The 3.5-inch screen swivels and flips in 2 axes. It records videos and snapshots, includes auto-recording and playback capabilities, and features a VL + fiberscope light intensity mode that helps facilitate hybrid intubations.	Available in sizes 1, 2, 3, 4; in hyperangulated and channeled blades. Regular (ETTs 7.0-8.5 mm); small (ETTs 6.0-7.5 mm); pediatric (ETTs 4.0-5.5 mm); and infant (ETTs 2.5-3.5 mm).
Airtraq SP (Prodol Meditec)	The SP model is single-use with all the features of the Avant but fully disposable. Optional camera has an integrated touch screen and can be attached to all Airtraq models. It records and can connect via Wi-Fi to smartphone/iPad/iPhone/PC.	Regular (ETTs 7.0-8.5 mm); small (ETTs 6.0-7.5 mm); pediatric (ETTs 4.0-5.5 mm); infant (ETTs 2.5-3.5 mm); non-channeled blade; and DLTs.
APA (Venner Medical)	Offers continuous O_2 delivery during laryngoscopy, MAC and MIL style blades for use in pediatric, adult, and difficult airway patients. APA VL's modular design, along with its 3.5-inch monitor, allows the user to choose the airway management technique required based on each patient. A disposable cover for the device is also available to protect it from contamination risks and a stylet to assist laryngoscopy.	10 disposable blade types: MIL 1 and 2 (pediatric); MAC 3 and 4 (adult); DAB and U-DAB (channeled and non-channeled difficult airway blades); APA Oxy Blade; MAC 3, 4, DAB, and U-DAB (oxygenation blades).
ClearVue (Infinium)	Includes a 2.0-megapixel full-view camera with high-resolution monitor. Rechargeable lithium-ion battery for extended use. Anti-fog capability is also provided.	MAC 1-5 (disposable and reusable blades); MIL 0, 1.
C-MAC HD (KARL STORZ)	Instant-on, battery-powered VL with interchangeable MAC and MIL blades for neonates to obese adults and a difficult airway blade (D-BLADE) for adult and pediatric anterior airways. Blades house 800P HD distal chip and LED technology. The D-BLADE has angle of view with about 80-degree acute curvature design. Real-time viewing on the C-MAC 8-inch HD touch screen LCD monitor with PIP and split screen capability or portable 3.5-inch Pocket Monitor. Recording conveniently located at the laryngoscope handle.	MAC 0, 2, 3, 4; MIL 0, 1, 2, MAC 3, and MAC 4 with channel for suction; adult and pediatric D-BLADE.
C-MAC Pocket Monitor (KARL STORZ)	Highly portable rescue device, 3.5-inch monitor fits directly on all C-MAC premium class reusable and single-use blades and the C-MAC Video stylet. LCD 4:3 ratio high-resolution screen works in direct sunlight; rechargeable and removable lithium-ion battery lasts 1 hour; ergonomic screen can be moved in several directions and folded away for transport; fully immersible. Offers video and still picture recording conveniently located at the laryngoscope handle.	Can be used with reusable and single-use blades. Reusable: MAC 0, 2, 3, 4; MAC 3 and 4 with suction channel; MIL 0, 1, 2; adult and pediatric D-BLADE Single-use: MAC 3, 4; adult D-BLADE; MIL 0, 1.
C-MAC S Imager (KARL STORZ)	Highly versatile, reusable S-Imager can be used with the C-MAC 7-inch LCD monitor or portable 3.5-inch Pocket Monitor. Both modalities offer video and still picture recording conveniently located at the laryngoscope handle. Imager is available in adult and pediatric sizes.	NEW Slimline MAC 3, 4; NEW Slimline adult D-BLADE; Pediatric MIL 0, 1.
CoPilot VL+ (Dilon Technologies)	Portable VL designed to be used in multiple settings for every intubation. Rechargeable lithium polymer battery provides >2 hours continuous use. Durable and portable.	Slim sheath sizes 1, 2, 3, 4, 5, and Standard sheath sizes 3, 4, 5 with bougie port.

	Clinical Applications	Special Features
	Intended to facilitate intubation in both routine and difficult airway situations.	Hand-held VL with 3.5-inch touch screen LCD. Two-axis rotation of camera screen allowing intubation from any position. Camera enables image capture/record and Wi-Fi streaming. Optics fully isolated from patient, minimizing risk for cross-contamination. Eco-friendly blades and packaging made from 100% upcycled polycarbonate. Can be used with standard ETTs.
	Same as Airtraq Avant. Six color-coded sizes.	Lightweight, hand-held VL. Camera enables image capture/record and Wi-Fi streaming. Optics fully isolated from patient, minimizing risk for cross-contamination. Built-in antifog system and low-temperature light source. Can be used with standard ETTs. A built-in guide channel helps direct ETT through the vocal cords. Disposable and self-contained. 3-year shelf life.
	Suitable for use in EMS, military, ED, ICU, pediatric units, crash cart settings, and teaching hospitals to assist DL and indirect laryngoscopy in routine and difficult airways.	APA VL offers 6 styles of laryngoscopy on a single device: traditional, MIL, pediatric, MAC, difficult airways, and its newest range of oxygenation blades for improving apnea time. Dual battery system allows device to be used as a traditional or VL, offering users a customized solution with a single device. APA Oxy Blade allows oxygenation directly into oropharynx at recommended flow rates of 15 L/min during laryngoscopy.
	High-resolution view of the glottis enables first-attempt success while minimizing any chance of a complication during the intubation process.	Quick shot camera button for video recording. Optional HDMI port to connect to an external monitor.
	Useful for anterior airways, obese patients, and patients with limited mouth opening or neck extension. Variety of blade sizes and designs accommodates patients ranging from neonate (500 g) to morbidly obese. Additionally, useful for teaching purposes, verification of ETT position, aiding application of external laryngeal manipulation or passage of an intubating introducer. May also be used for nasal intubation and ETT exchange.	Unique platform design is compatible with multiple intubation devices, including VL, the FIVE distal chip flexible video scopes and standard eyepiece scopes (fiberoptic and semirigid) via C-CAM camera head. Built-in still and video image capture on memory card, with real-time playback on monitor. Dual input capability allows for toggling between 2 devices, always ready for "Plan B." Angled distal lens provides 80-degree field of view. Inherent anti-fog design.
	Ideal for ICU, crash carts, ED and all prehospital environments including EMS, ambulatory services, air transport, and military. Has familiar blade design and 80-degree field of view.	Lightweight, hand-held, and battery-operated device well suited for areas outside the OR. Waterproof. Proprietary data transfer cable allows for better patient information control. Extension cable allows for tomahawk approach when intubating patients in difficult positions (prehospital/emergency setting). Battery-saving auto shut-off feature with warning indicators enables user to extend the reset timer with a push of the ergonomically placed blue button.
	Same as C-MAC VL. When used with Pocket Monitor, most ideal for the OR, ED, and all prehospital environments including EMS, ambulatory services, air transport, and military, where reprocessing of blades can be a challenge. Also, suitable for NICU and PICU because of MIL 0 and 1 blade offering.	Available with a USB connector cable that can be used with RDT Tempus Pro vital signs monitor. Anti-fog feature. Single-use blades.
	Blade angle useful for both routine and difficult airways. Disposable sheath blades with anti-fog coating.	Bright, full-color high-resolution camera and display. Only VL with patented bougie port to facilitate ETT placement. 4.3-inch display. Fog-free disposables.

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Table 4. Video Laryngoscopes *(continued)*

Product Name (Company)	Description	Size
GlideScope Core 10 FHD (Verathon)	Complete airway system that features a 10-inch FHD touch screen monitor and comprehensive workstation for streamlined workflow. Compatible with GlideScope's portfolio of VLs and BFlex single-use bronchoscopes. Comprehensive and flexible airway visualization system for VL, bronchoscopy, and dual-view airway procedures.	Spectrum QC and Spectrum QC eco single-use hyperangle S1, S2, S2.5, S3, and S4; Miller S00, S0, S1, and S2; Mac S1, S2, S3, and S4. Spectrum single-use LoPro S1, S2, S2.5, S3, and S4; Miller S0 and S1; DirectView Mac S3, S4. Video Baton QuickConnect Large with single-use Hyperangle 3 and 4 covers; ClearFit Video Baton with single-use covers: Hyperangle 3 and 4, Mac 2, 3, 4, Miller 2. Titanium Reusable LoPro T2, T3, and T4 angled blades, and MAC-style 3 and 4 blades; BFlex 2 single-use bronchoscope sizes 2.8, 3.8, 5.0, and 5.8 mm.
GlideScope Core 15 FHD (Verathon)	Complete airway system which features a 15-inch FHD touch screen monitor for team-based care and a comprehensive workstation for streamlined workflow. Compatible with GlideScope's extensive portfolio of VLs and BFlex single-use bronchoscopes. Most comprehensive and flexible airway visualization system for VL, bronchoscopy, and dual-view airway procedures.	Same as GlideScope Core 10 FHD.
GlideScope Go 2 (Verathon)	Hand-held, high-resolution VL system. Durable, portable and intuitive, with a broad portfolio of fully disposable, designed to maximize first-pass success and minimize infection rates in routine and difficult intubation, in a wide range of patient sizes and types.	Spectrum QC and Spectrum QC eco single-use VLs: Hyperangle S1, S2, S2.5, S3, and S4; Miller S00, S0, S1, and S2; Mac S1, S2, S3, and S4; Video Baton QuickConnect with single-use Hyperangle 3 and 4 covers. ClearFit Video Baton with single-use covers: Hyperangle 3 and 4, Mac 2, 3, 4, Miller 2.
Hugemed VL3D (Bell Medical)	3.5-inch display that uses disposable MAC blades.	MAC 1, 2, 3, and 4, and strong curved.
Hugemed VL3R (Bell Medical)	3.5-inch display that uses reusable (1000+ uses) stainless steel MIL and MAC blades.	MIL 00, 0 and 1 blades plus MAC 0, 1, 2, 3, and 4 reusable 316 medical grade stainless steel.
Insighter VL iS6 (Teleflex)	Portable, 3.5-inch HD color display. VL with 1-million-pixel camera, compatible with the 4 single-use blades.	Disposable blade sheaths. MAC SS, S, M, L. For infant to adult.
IS-PF2 Insighter VL Workstation (Teleflex)	A versatile VL system with a 13.3-inch HD touch screen. Compatible with the IS6 handle and 4 blade sizes with the option to connect wirelessly or by cord to the screen.	Four disposable blade sheaths. MAC SS, S, M, L. Ideal for infant to adult.
i-view (Intersurgical)	VL that incorporates a MAC blade to allow for both direct and video laryngoscopy. The ergonomic design and integral LCD screen provide an optimal view in a variety of light conditions. i-view features an LED light source to facilitate optimal visualization.	One adult size comparable to a MAC 4 blade.
King Vision (Ambu)	Durable, fully portable digital VL with a high-quality reusable display and disposable blades. Hand-held, on-board display avoids cables and encourages patient focus; disposable blades incorporate camera and light source so fresh optics for each use.	Size 3 standard (13-mm minimum mouth opening) and size 3 channeled (18-mm minimum mouth opening); channeled blade allows ETTs 6.0-8.0 mm.
King Vision aBlade (Ambu)	Reusable video adapter attaches to existing display to allow use of aBlades. Durable, fully portable digital VL with a high-quality reusable display and disposable aBlades. Hand-held, on-board display avoids cables and encourages patient focus.	aBlade sizes 1, 2, 2 channeled, 3, and 3 channeled.

	Clinical Applications	Special Features
	Delivers an all-in-one system to visualize the airway and tracheobronchial tree for routine to difficult intubation and bronchoscopy procedures in a wide range of patient sizes and types. Enhances airway management visualization with live PIP imaging to help secure difficult airways via dual-view airway procedures. Ideal for the OR, ICU, and ED, and in teaching environments.	Dual connection ports for 2 video inputs; simultaneous dual view with PIP for difficult airways; MagnaView to enlarge the bronchoscopy view; still image and video capture; video playback and image gallery; patient notes annotation feature; SpO_2 and pulse rate reading on screen and on captured videos; 180-degree image rotation; HDMI output for external video display; coupled with a premium workstation that offers an adjustable arm, cable organizer, prep tray, storage bin, and disposal bin.
	All-in-one system to visualize the airway and tracheobronchial tree for routine to difficult intubation and bronchoscopy procedures in a wide range of patient sizes and types. Delivers dual-views of the airway with side-by-side images for difficult airway management.	Dual connection ports for 2 video inputs; simultaneous side-by-side dual view for difficult airways; MagnaView to enlarge the bronchoscopy view; still image and video capture; video playback and image gallery; patient notes annotation feature; SpO_2 and pulse rate reading on screen and on captured videos; 180-degree image rotation; HDMI output for external video display; coupled with a premium workstation that offers an adjustable arm, cable organizer, prep tray, storage bin, and disposal bin.
	Ideal for use in small spaces, emergent procedures, and whenever the situation demands mobility for routine and difficult airways. Certified for use in EMS environments: IEC 60601-1-12:2014.	Go 2 features magnetic QuickConnect technology; 3.5-inch landscape color display with touch screen; customizable settings via touch screen; snapshots, recording, playback, onboard storage; vertical tilt adjustment; fully submersible IP67 rating; durable Corning Gorilla Glass screen; integrated battery delivers up to 100 minutes of continuous use on a full charge; encryption export available. Single-use blades.
	High-quality airway view facilitates both routine and difficult intubation in a wide range of patient sizes and types.	HD display improves laryngeal visualization; single-use blades.
	Unique ability to use a MIL blade with benefits of a VL. High-quality airway view enables intubation in a wide range of patient sizes.	HD display improves laryngeal visualization; reusable and sterilizable.
	Ideal for use in emergent intubations and small spaces.	3.5-inch color display with left, right, forward, and backward rotation with 160-degree camera angle of view. Rechargeable battery lasts up to 4 hours.
	Designed to visualize the airway with versatile configurations. Compatible with wireless NFC connector for a cord-free experience.	Ability to take photo and video and save to patient record. HDMI output to connect to external video display. Rechargeable battery lasts up to 6 hours.
	Designed to provide direct and indirect visualization of the larynx. Helps to facilitate ETT intubation in adults. Can be used in prehospital, ED, code carts, OR, ICU, anesthesia, difficult airway, and satellite areas of the hospital.	Up to 4-hour battery life with 5-year shelf life from the date of manufacture. Camera and LED light creates optimal visualization. LCD screen with a resolution of 320H x 240V pixels.
	Hyperangulated blade design facilitates both routine and difficult intubation.	Can be used alone or with other techniques. Powered by 3 AAA batteries; high-fidelity 2.4-inch screen allows wide-angle viewing; anti-fog coating on distal lens; side of channel is soft for separation of ETT. Video out for connection to external display or video-capture device.
	Hyperangulated blade design facilitates both routine and difficult intubation. Can be used alone or with other techniques.	Powered by 3 AAA batteries; high-fidelity 2.4-inch screen allows wide-angle viewing; anti-fog coating on blade window; side of channel is soft for separation of ETT. Video out for connection to external display or video-capture device.

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Table 4. Video Laryngoscopes *(continued)*

Product Name (Company)	Description	Size	
McGrath MAC (Medtronic)	Portable VL intubation platform designed for routine and ease of use. Equipped with either disposable MAC blades or hyperangulated blades for more anterior airways. Durable and easy to clean. Screen displays minute-by-minute battery life countdown with an auto-off feature which conserves battery life.	MAC blade sizes: 1, 2, 3, and 4. X3 (hyperangulated).	
ProVu VL (Flexicare)	Complete VL system with a sterile, single-use, 100% metal blade and handle. Pairs with both a portable 3.5-inch and a mounted 8-inch display. High-quality image with specialty blades for improved airway views.	MAC: 1, 2, 3 and 4. Hyperangulated: 1, 2, 3, 3.5, and 4. MIL:00, 0, 1, 2. Display sizes: 3.5- and 8-inch. Range of accessories including tabletop and pole mount options.	
TOAD Video Laryngoscope (Total Oral Airway Devices)	Hand-held VL with rechargeable battery and detachable 3.5-inch HD monitor. The 3.5-inch HD Monitor integrates with single-use TOAD™ Video Wand and single-use TOAD™ Video Bougie/tube changer. 10-inch HD monitor supports PIP with VL & TOAD™ Video Wand or TOAD™ Video Bougie/tube changer.	MAC 1-4 and hyperangulated blades.	
VividTrac (FUJIFILM SonoSite)	Video intubation device that works on many computer systems equipped with USB II port as a standard USB camera, using available video camera applications on Windows, Mac, and Linux systems. Alternatively, automated video display software (VividVision) can be downloaded.	ETTs 6.0-8.5 mm.	

Table 5. Specialty Rigid Laryngoscopes

Product Name (Company)	Description	Size	
Dörges Emergency Laryngoscope Blade (KARL STORZ)	Developed in Europe as a universal blade that combines features of both the MAC and MIL laryngoscope blades.	One size only for patients >10 kg to adults.	
Modified MAC Blades			
AincA Flex-Tip Fiber-Optic Laryngoscope Blade (Anesthesia Associates)	Flexible tip or levering fiberoptic MAC laryngoscope blades designed with a hinged tip controlled by a lever at the proximal end. Designed to fit standard handles.	Adult sizes 3 and 4; pediatric size 2.	
AincA Macintosh Viewing Prism (Anesthesia Associates)	Prism for attachment to most MAC blades (conventional or fiberoptic). Repositions practitioner's viewpoint to forward portion of the MAC curve via 30-degree refraction without inverting image. Clips to vertical flange to "look around the curve of the blade."	Sizes 2, 3, and 4 for use on MAC laryngoscope blades of sizes 2, 3, and 4.	
bébé Vie Scope (Adroit Surgical)	Gives the user a straight line-of-sight view with patented proximal illumination to pass an age-appropriately sized ETT using the open right-sided slot.	Pediatric, one size fits all. Toddlers to age 10 years.	
NOVALITE Flex-Tip Fiber Optic Blade (NOVAMED USA)	Designed with an integrated fiberoptic bundle for maximized light transmission and optimal task illumination. Uses advanced xenon light technology.	MAC 2, 3, and 4.	
NOVALITE MRI Conditional Laryngoscope (NOVAMED USA)	Featuring NOVAMED "ULTRA BRITE" fiberoptic laryngoscope technology to afford clinicians a solution for intubation within the magnetic resonance (MR) environment—ensuring improved response time, enhanced patient safety, and minimized risk for trauma.	MAC 0-5; MIL 00-4.	
NOVALITE Reusable Fiber Optic Laryngoscope Blades (Green System) with Removable FO Bundle (NOVAMED USA)	Reusable fiberoptic laryngoscope blades with added benefits beyond enhanced illumination. Designed with a removable fiberoptic bundle to optimize cleaning and patient safety. The classic, reusable design is affordably priced, compatible with Green System handles. Available in a complete range of neonatal to adult sizes. Green System handles available in Medium, Penlight, and Stubby.	Blades: MAC 0, 1, 2, 3, 3.5, 4. MIL 00, 0, 1, 1.5, 2, 3, 4. Wis-Hipple 1, 1.5. Robert Shaw 0, 1.	
NOVALITE Single-Use LED Laryngoscope (NOVAMED USA)	Stainless steel blades available in a complete range of neonatal to adult sizes. Medium/Penlight/Stubby handles are preloaded with batteries, packaged separately.	Blades: MAC 0, 1, 2, 3, 4. MIL 00, 0, 1, 1.5, 2, 3, 4. Wis-Hipple 1.5. Handles: Medium, Penlight, Stubby.	
NOVAMED USA Single-use Fiber Optic Laryngoscope Blades (Green System) (NOVAMED USA)	Fiberoptic hybrid Green System laryngoscope blades with improved illumination and low-profile design for ease of intubations. The combination of stainless steel with polished acrylic bundle duplicates the light output of reusable fiberoptic blades. Available in a complete range of neonatal to adult sizes.	Blades: MAC 0, 1, 2, 3, 4. MIL 00, 0, 1, 2, 3, 4.	

	Clinical Applications	Special Features
	Combines the benefits of video-assisted and direct visualization with a complete blade range to encourage routine use of VL in the OR, ICU/ED, and EMS setting.	Requires no specialized training. Low-profile blades for improved agility and reduced dental interaction. Portrait-oriented display may help reduce blind spot. Highly portable, easy-to-clean handle with no external cables.
	An ultra—low-profile blade with no sheath, provides more space for maneuverability and ETT delivery. Familiar ergonomic feel and handling, with both pediatric and adult-sized handles available. Wide portfolio of blade shades and sizes to support all patient populations.	Optimized camera positioning with bright white LED light, vertical tilt adjustment, and blackout reduction technology for clear visualization. Displays are rechargeable and wipe down–capable.
	Facilitates both routine and difficult intubation.	3.5-inch HD Monitor swivels and tilts for ergonomic viewing. Features rechargeable lithium-ion battery. Easily captures high-definition pictures and video for playback for education and documentation purposes. Compact, mobile platform with optional ability to integrate with home base TOAD™ 10-inch HD monitor/trolley.
	Facilitates both routine and difficult intubation.	VividTrac is inserted more like an oral airway device (or SGA) than a laryngoscope blade. The ETT can be preloaded or inserted once visualization is achieved in the VividTrac tube channel.

	Clinical Applications	Special Features
	Blade is inserted into oropharynx to appropriate depth, which correlates with patient's size.	10- and 20-kg markings on the blade.
	Controlled manipulation of large or floppy epiglottis. Useful in patients with a recessed mandible and decreased mouth opening.	A lever controls the tip angle through 70 degrees during intubation to lift the epiglottis, if necessary, to improve laryngeal visualization.
	Allows viewing of the vocal cords even in a patient with an anterior airway position. Also useful during nasal intubation (with impaired view) and for postoperative examination of the larynx.	Built-in clip on each prism allows attachment to any MAC-type laryngoscope blade that has a standard thickness vertical flange. Usable on both conventional and fiberoptic-type MAC blades. Reusable and sterilizable.
	Routine, difficult, and awake intubation in trauma applications.	Allows flexibility depending on the case. The blade design can be used to elevate the epiglottis or within the vallecula to expose the glottic opening.
	Positioning of the 5.0-mm fiberoptic bundle closer to the tip of the blade further enhances visibility and ensures ease of intubation.	Designed for interchangeability with universal Green System. NOVALITE fiberoptic laryngoscopes deliver enhanced illumination for safer intubation.
	Powered by lithium xenon technology, NOVALITE MRI Conditional fiberoptic laryngoscopes deliver enhanced illumination for safer intubation in the MR suite.	Certified to meet FDA MRI Conditional requirements up to 3.0 tesla.
	Provides optimal illumination for enhanced clarity to facilitate safer intubations. Reusable blades with removable fiberoptic bundle facilitate sterilization, helping to prevent cross-contamination and improve reliability. Compatible with Green System fiberoptic handles.	Removable fiberoptic bundle ensures optimal cleaning to improve patient safety. Classic fiberoptic blade design as preferred by clinicians.
	Ideal for code carts and large facilities with infection control concerns and cost-efficiency requirements.	Fixed LED light source remains cool. Low-profile neonatal/pediatric design for MIL 00, 0, 1, and 1.5 sizes. Single-use.
	Provides optimal illumination for enhanced clarity to facilitate safer intubations. Single-use blades prevent cross-contamination, improve reliability. Compatible with Green System fiberoptic handles.	Hybrid stainless steel/polished acrylic bundle is optimal in single-use laryngoscope blade design. Closely resembles the construction of reusable fiberoptic blades while affordably offering the multiple benefits of single-use.

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Table 5. Specialty Rigid Laryngoscopes *(continued)*

Product Name (Company)	Description	Size
Vie Scope (Adroit Surgical)	Allows for a straight line-of-sight view with 360 degrees maximal illumination to pass a bougie between the vocal cords. Provides the ability to intubate the patient when awake in trauma situations both in the hospital and in the field.	Adult, one size fits all.

Table 6. Supraglottic Ventilatory Devices

Product Name (Company)	Description	Size
AES Ultra (AES)	All-silicone laryngeal mask with standard cuff valve.	Adult sizes 3-6.
AES Ultra Clear (AES)	Silicone cuff and PVC tube, laryngeal mask with standard cuff valve.	Adult sizes 3-6.
AES Ultra EX (AES)	All-silicone, multiple-use laryngeal mask.	Pediatric to adult sizes 1-6.
AES Ultra Flex EX (AES)	All-silicone, wire-reinforced, multiple-use laryngeal mask.	Pediatric to adult sizes 1-6.
Air-Q3 (AirLife)	Anatomically curved all-silicone SGA uniquely designed to provide ease of ETT placement. Removable, color-coded 15 mm connector accommodates standard ETTs up to 9.0 mm. Integrated bite block reinforces the tube while diminishing need for a separate bite block.	Sizes (0, 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0) that can accommodate standard ETTs size 3.0-9.0 mm.
Air-Q3G (AirLife)	Combines the features of Air-Q3 SGA, with the addition of dual gastric channels. These channels provide access to the esophagus with a NGT or allows the clinician to apply suction to one of the channels and create a circle (or sump) drain at the distal tip in the esophagus.	Sizes (0, 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0) that can accommodate standard ETTs size 3.0-9.0 mm.
Air-Qsp3 (AirLife)	Combines features of the Air-Q3 SA with the added advantage of a self-pressurizing mask. No inflation line or pilot balloon is needed. PPV or spontaneously breathing patients inflate the mask during the uptake of ventilation.	Sizes (0, 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0) that can accommodate standard ETTs size 3.0-9.0 mm.
Air-Qsp3G (AirLife)	Combines features of the Air-Q3G SGA with dual gastric channels, plus a self-pressurizing mask. No inflation line or pilot balloon is needed. PPV or spontaneously breathing patients inflate the mask during the uptake of ventilation.	Sizes (0, 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0) that can accommodate standard ETTs size 3.0-9.0 mm.
AuraFlex (Ambu)	Disposable wire-reinforced flexible laryngeal mask. Color-coded pouch.	Pediatric to adult sizes 2-6. (6 sizes, including 2.5).
AuraGain (Ambu)	Second-generation laryngeal mask, featuring anatomic curve for rapid placement, gastric access for suction and decompression of the stomach via a gastric tube, and integrated direct intubation capability for management of expected or unexpected difficult airway. Can be used as a conduit for intubation, assisted by a FIS. Color-coded pouch.	Pediatric to adult sizes 1-6. (8 sizes, including 1.5 and 2.5).
Aura-i (Ambu)	Laryngeal mask with built-in curve and bite blocker designed as a conduit for tracheal intubation. Featuring helpful navigation marks for FISs. Color-coded pouch.	Pediatric to adult sizes 1-6. (8 sizes, including 1.5 and 2.5).
AuraOnce (Ambu)	Laryngeal mask with a special built-in curve that replicates natural human anatomy. Molded in 1 piece with an integrated inflation line and no epiglottic bars on the anterior surface of the cuff. Color-coded pouch.	Pediatric to adult sizes 1-6. (8 sizes, including 1.5 and 2.5).
AuraStraight (Ambu)	Straight laryngeal mask featuring a single-mold design and an extra-soft, thin cuff that easily conforms to the airway. Color-coded pouch.	Pediatric to adult sizes 1-6. (8 sizes, including 1.5 and 2.5).
Big Mouth Oral Airway (Total Oral Airway Devices)	Flexible, 2-lumen channel device with inflatable balloon for the general purpose of ventilation and assisting video intubation assisted by TOAD™ Video Bougie, TOAD™ Flexible Laryngoscope, or flexible bronchoscope.	Adult oral airway

	Clinical Applications	Special Features
	Routine, difficult, and awake intubation in trauma applications.	Patented LED ring illumination located at the proximal end of a self-enclosed clear tube allows light to be transmitted through the lumen of the tube, as well as the sidewall to avoid obstruction of light by secretions or blood. Single-use

	Clinical Applications	Special Features
	Standard all-silicone SGA.	All silicone. Single-use.
	Combines all-silicone cuff with PVC tube for cost savings.	All-silicone cuff with PVC tube. Single-use.
	Reusable, standard SGA.	40 uses.
	Designed to accommodate repositioning of the head and neck during surgery.	40 uses. Reusable, wire-reinforced SGA.
	Allows easy access for FIS devices. Use as routine mask laryngeal airway. Removable connector allows intubation with standard ETTs ≤8.5 mm.	Color-coded removable connectors tethered to the airway tube, avoiding episodes of misplaced connectors. Patented epiglottis elevator helps lift the epiglottis for successful airway access and visualization. ETT ramp helps direct ETT toward laryngeal inlet. Built-up mask heel helps effectively seal airway. Single-use.
	Enhanced version of the standard Air-Q3. Indicated as primary airway device when oral ETT is not necessary or as aid to intubation in difficult situations.	All-silicone design with the same features and benefits as the standard Air-Q3. The dual gastric channels are especially suited for suction catheters and NGTs up to size 18.0 Fr. Single-use.
	More secure than a face mask and less invasive than intubation with an ETT when tracheal intubation is not necessary or during unexpected difficult airway situation.	Incorporates the Air-Q3 design with PPV self-pressurizing mask cuff. On exhalation, mask cuff decompresses to level of PEEP. Removable connector allows intubation with standard ETTs. Single-use.
	Same as regular Air-Q3G but eliminates need for mask inflation.	PPV self-pressurizes mask cuff. On exhalation, mask cuff decompresses to level of PEEP. Removable connector allows intubation with standard ETTs. The dual gastric channels are especially suited for suction catheters and NGTs up to size 18.0 Fr.
	Intended to achieve and maintain control of the airway during routine and emergency anesthetic procedures in fasted patients. Designed for use in ENT, ophthalmic, dental, and other head and neck procedure, as well as torso surgeries. Convenient depth marks for monitoring correct mask position.	Integrated pilot tube and high flexibility enable positioning away from surgical field, without loss of seal. Easy glide texture and extra-soft cuff ease insertion and removal. Kink-free wire reinforced airway tube; cuff design and reinforced tip prevent tip backfolding.
	Intended to achieve and maintain control of the airway during routine and emergency anesthetic procedures. Useful for ventilation and intubation. Appropriate for management of expected or unexpected difficult airway. Pediatric sizes 1 and 1.5 feature an innovative connector that reduces dead space by 39%.	Allowable ETT size is designated on each device; maximum OG tube size included (e.g., 16 Fr for sizes 3-6), as well as navigation markings for FIS guidance. Bite absorption area protects against occlusion.
	Intended to achieve and maintain control of the airway during routine and emergency anesthetic procedures in patients evaluated as eligible for a SGA. Combines everyday routine use of SGA with direct intubation capability in case of difficult airway situations.	Anatomically correct curve designed as Ambu AuraOnce, slightly wider airway tube compared to AuraOnce/Straight to accommodate the passage of an ETT, specially designed as a conduit for intubation with navigation markings on the backplate. Compatible with standard ETTs.
	Intended to achieve and maintain control of the airway during routine and emergency anesthetic procedures in fasted patients. Allows easy access for FIS devices. One-piece mold.	Easy glide texture for ease of insertion. Convenient depth marks for monitoring correct position of the mask. Extra-soft cuff. If intubation is necessary or desired, recommend intubation over Aintree AEC.
	Intended to achieve and maintain control of the airway during routine and emergency anesthetic procedures in fasted patients.	Easy glide texture for ease of insertion. Convenient depth marks for monitoring correct position of the mask. Cuff design and reinforced tip prevents tip backfolding. Size identification on pilot balloon. Phthalate-free and latex-free. MR safe. Sterile, single-use.
	Facilitates oxygenation, stenting the airway. Integrates with TOAD™ Video Bougie and TOAD™ Flexible Laryngoscope for intubation.	One central lumen and 1 slit lumen side by side. Inflatable cuff to stent open airway.

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Table 6. Supraglottic Ventilatory Devices *(continued)*

Product Name (Company)	Description	Size
Flexi 2G SAD (Genesis Airway Innovations)	A second-generation, single-use, flexible LMA with a sliding bite block. Wide-bore, wire-reinforced, silicone gastric drainage channel allows drainage of large volumes of fluid and easy insertion of a large-bore OG tube. Introducer converts SGA into anatomically curved SGA for insertion into larynx.	Sizes 3-5.
i-gel (Intersurgical)	A second-generation, single-use latex and PVC-free SGA with a non-inflating cuff, designed to mirror the pharyngeal and perilaryngeal structures minimizing the risk for compression trauma. The device incorporates a gastric channel for improved safety (except size 1), an integral bite block to reduce the possibility of airway occlusion, and a buccal cavity stabilizer to aid in rapid insertion and reduce the potential for rotation.	Adult sizes 3-5 and pediatric sizes 1-2.5. Adult sizes accommodate the following ETT sizes: Size 3, 6.0 mm ETT. Size 4, 7.0 mm ETT. Size 5, 8.0 mm ETT.
i-gel O_2 Resus Pack (Intersurgical)	A second-generation, single-use SGA with a supplementary O_2 port designed for the administration of passive oxygenation during CCR. The color-coded hook ring is used to secure the i-gel O_2 in position with the airway support strap and aids in size identification. The non-inflating cuff is designed to mirror the pharyngeal, laryngeal and perilaryngeal structures minimizing compression trauma. Incorporates a gastric channel for improved safety, an integral bite block to reduce the possibility of airway occlusion, and a buccal cavity stabilizer to aid in rapid insertion and reduce the potential for rotation.	Adult sizes 3-5; adult sizes accommodate: Size 3, 6.0 mm ETT. Size 4, 7.0 mm ETT. Size 5, 8.0 mm ETT.
KING LT-D (Ambu)	Disposable, single-lumen tube with 2 low-pressure cuffs. Intended for insertion into upper esophagus with ventilatory openings aligned with tracheal inlet; distal cuff seals the esophagus and proximal cuff seals the oropharynx.	Adult sizes 3-5 and pediatric sizes 2, 2.5.
KING LTS-D (Ambu)	Disposable double-lumen laryngeal tube with separate ventilation and gastric access channels. Intended for insertion into upper esophagus with ventilatory openings aligned with tracheal inlet; distal cuff seals the esophagus and proximal cuff seals the oropharynx.	Adult sizes 3-5 and pediatric sizes 0, 1, 2, 2.5.
LarySeal Pro (Flexicare)	Next-generation SGA with integrated suction, reinforced bite guard, preformed anatomic curve, and ETT insertion capabilities.	Adult sizes 3-5 and pediatric sizes 1, 1.5, 2, 2.5.
LIVVE (Total Oral Airway Devices)	Soft, non-inflatable SGA. Two separate lumens can be used to simultaneously provide visualization and ventilation while attempting intubation.	2 Adult sizes: size 3.5: 55-90 kg, size 4.5: > 90 kg
LMA™ Classic™ Airway (Teleflex)	General-purpose airway for routine elective inpatient and outpatient surgical procedures.	Adult sizes 3-6 and pediatric sizes 1, 1.5, 2, 2.5.
LMA™ Fastrach™ Airway System (Teleflex)	Designed to facilitate blind intubation without moving head or neck, allowing for single-handed insertion. Allows continuous ventilation between intubation attempts.	Adult sizes 3-5 that can accommodate special ETTs 6.0-8.0 mm.
LMA™ Flexible™ Airway (Teleflex)	Has a reinforced airway tube that allows it to be positioned away from the surgical field while maintaining a good seal.	Adult sizes 3-5 and pediatric sizes 2, 2.5.
LMA™ Flexible™ Pre-Curved Airway (Teleflex)	Partially pre-curved, wire-reinforced, flexible airway tube. Designed for use in procedures requiring shared airway access.	Adult sizes 3-5 and pediatric sizes 2, 2.5.
LMA™ Gastro™ Airway with Cuff Pilot™ Technology (Teleflex)	Specifically designed to give clinicians control of their patients' airways while facilitating direct endoscopic access via the integrated endoscope channel. Once placed, supraglottic airway facilitates end-tidal CO_2 monitoring to support patient safety.	Adult sizes 3-5.
LMA™ ProSeal™ Airway (Teleflex)	Enables seal pressures ≥32 cm H_2O to be achieved, and the drain tube separates the alimentary and respiratory tracts.	Adult sizes 3-5 and pediatric sizes 1, 1.5, 2, 2.5.

	Clinical Applications	Special Features
	For use in situations where a flexible SGA is required for surgical access and the use of a first-generation flexible SGA is unsuitable (see NAP4 guidelines). May be used in any situation where a SGA is required.	Single-use, wide-bore, reinforced silicone gastric channel, introducer converts the flexible SGA into an anatomically curved SGA for insertion and prevents rotation and folding over of the mask in the larynx. Sliding bite block gives versatility to positioning of the airway and gastric tubes. Can be exchanged for an ETT using the Aintree AEC.
	For use in securing and maintaining a patent airway in routine and emergency anesthetics of fasted patients, during spontaneous or intermittent PPV, during resuscitation of the unconscious patient, and as a conduit for intubation under FIS guidance (sizes 3-5) in a known difficult or unexpectedly difficult intubation.	Single-use, non-inflating cuff allows easy and rapid insertion, provides high seal pressures, and minimizes risk for tissue compression trauma. Gastric channel (except size 1) provides an early warning of regurgitation and allows for the passing of a gastric tube to empty stomach contents and facilitates venting. Epiglottic rest reduces the possibility of epiglottic "downfolding" and airway obstruction. Buccal cavity stabilizer reduces the risk for rotation or displacement, and an integral bite block prevents occlusion of airway channel. The airway channel also allows for i-gel to be used as a conduit for intubation under fiberoptic guidance (sizes 3-5).
	For use in securing and maintaining a patent airway in routine and emergency anesthetics of fasted patients, during spontaneous or intermittent positive pressure ventilation, during resuscitation of the unconscious patient, and as a conduit for intubation under fiberoptic guidance. Can be used to provide supplementary O_2 during postoperative care or patient transfer. Gastric channel provides early warning of regurgitation, allows for passing of a gastric tube to empty stomach contents and facilitate venting.	Single-use, non-inflating cuff allows easy and rapid insertion, provides high seal pressure, and minimizes risk for tissue compression trauma. A supplementary O_2 port allows for administration of passive oxygenation as a component of CCR. Gastric channel provides an early warning of regurgitation. Epiglottic rest reduces the possibility of epiglottic "downfolding" and airway obstruction. Buccal cavity stabilizer reduces the risk for rotation or displacement, and an integral bite block reduces the possibility of airway channel occlusion. The airway channel also allows for i-gel to be used as a conduit for intubation under fiberoptic guidance (sizes 3-5).
	Useful for routine or emergency airway management. Two cuffs provide elevated ventilatory seal; esophageal cuff provides physical barrier in esophagus, reducing gastric insufflation and providing potential aspiration protection. Commonly used in EMS.	Both cuffs are inflated with a single pilot tube/valve; printed depth marks; color-coded 15-mm connectors for each size. Also available in a compact, vacuum-sealed kit with inflation syringe and lube.
	Useful for routine or emergency airway management. Two cuffs provide elevated ventilatory seal; esophageal cuff provides physical barrier in esophagus, reducing gastric insufflation and providing potential aspiration protection. Separate gastric access channel allows venting and active removal of gastric fluids. Commonly used in EMS.	Both cuffs are inflated with a single pilot tube/valve; printed depth marks; color-coded 15-mm connectors for each size. Large gastric port (sizes 3-5 allow 18 Fr OG tube passage). Also available in a compact, vacuum-sealed kit with inflation syringe and lubricant.
	Rapid and secure management for any airway. Equipped with features for difficult airways.	Large channel for improved suction. Epiglottic fenestrated flap prevents blockage and elevates the epiglottis for ETT or FIS insertion.
	Ability to intubate and ventilate with continued visualization.	Can be used with the TOAD™ Video Wand, TOAD™ Video Bougie, TOAD™ Flexible Laryngoscope, and flexible bronchoscope. Facilitate ventilation and conduit for easy intubation/extubation during interventional pulmonology and complex airway procedures.
	Developed for airway management of routine cases with spontaneous ventilation. Included in the ASA Difficult Airway Algorithm as an airway ventilatory device or a conduit for tracheal intubation. For pediatric and adult patients in whom ventilation with a face mask or intubation is difficult or impossible.	Aperture bars designed to prevent blockage of the airway by the epiglottis. Reusable ≤40 times. Silicone cuff. Not made with natural rubber latex. Can also be used as bridge to extubation and with pressure support or PPV.
	Designed for anatomically difficult airway and included in AHA's and ASA's difficult airway algorithms.	Single-use, silicone cuff. Not made with natural rubber latex. Epiglottic elevating bar designed to protect and elevate the epiglottis during ETT insertion.
	Ideal for ENT, ophthalmic and dental surgery, or other procedures where the surgeon and anesthesiologist compete for airway access.	Aperture bars designed to prevent blockage of the airway by the epiglottis. Supplied as a sterile version for single use only. Not made with natural rubber latex.
	Ideal for ENT, ophthalmic and dental surgery, or other procedures where the surgeon and anesthesiologist compete for airway access.	Aperture bars designed to prevent blockage of the airway by the epiglottis. Supplied as a sterile version for single use only. Silicone cuff. Available with integrated Cuff Pilot™ Technology or pilot balloon. Not made with natural rubber latex.
	Designed to provide control of a patient's airway while enabling direct access to the esophagus and upper GI tract in adult patients undergoing endoscopic procedures. Adjustable holder and strap maintain the device in a neutral position during endoscope manipulation.	Endoscope channel enables an endoscope (max OD, 14 mm) to be passed through the device under vision. Cuff Pilot™ Technology, an integrated cuff pressure indicator with constant at-a-glance feedback, alerts to changes in cuff pressure.
	For routine procedures or to manage higher-risk patients. Allows for easy insertion and higher seal pressures, and provides gastric access to suction or decompress the stomach. Designed to provide a passive conduit for un-expected regurgitation.	Second cuff allows tighter seal for PPV. Silicone cuff. Reusable ≤40 times. Not made with natural rubber latex.

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Table 6. Supraglottic Ventilatory Devices *(continued)*

Product Name (Company)	Description	Size
LMA™ Protector™ Airway with Cuff Pilot™ Technology (Teleflex)	Second-generation supraglottic airway with silicone cuff designed to achieve an oropharyngeal seal similar to the LMA™ ProSeal™ Airway (>30 cm H_20). Combines a pharyngeal chamber and dual gastric drainage channels, designed specifically to minimize gastric insufflation and facilitate gastric access.	Adult sizes 3-5.
LMA™ Supreme™ Airway (Teleflex)	Combines features of previous LMA™ Airways from Teleflex to provide increased safety and ease of use. The higher seal pressure and gastric access provide a higher degree of safety. Designed to channel fluids away from the airway in the unlikely event of active or passive regurgitation and allows for diagnostic positioning.	Adult sizes 3-5 and pediatric sizes 1, 1.5, 2, 2.5.
LMA™ Unique™ EVO Airway with or without Cuff Pilot™ Technology (Teleflex)	First-generation, silicone cuffed supraglottic airway that offers ETT intubation capabilities.	Adult sizes 3-5 and pediatric sizes 1, 1.5, 2, 2.5.
LMA™ Unique™ (Silicone Cuff) Airway with or without Cuff Pilot™ Technology (Teleflex)	Versatile, single-use, first-generation supraglottic airway with a medical-grade silicone cuff and integrated cuff pressure manometer.	Adult sizes 3-6 and pediatric sizes 1, 1.5, 2, 2.5.
Portex Clear PVC, Oral/Nasal, Soft Seal Cuff Tracheal Tubes (Smiths Medical)	Similar in shape to the first-generation laryngeal mask, but differs in its one-piece design, in which the cuff is softer and there is no "step" between the tube and the cuff, an integrated inflation line, no epiglottic bars on the anterior surface of the cuff, and a wider ventilation orifice.	Pediatric to adult sizes 1-5.
Shiley Esophageal Endotracheal Airway, Double Lumen (Medtronic)	Disposable DLT that combines the features of a conventional ETT with those of an esophageal obturator airway. Has a large proximal latex oropharyngeal balloon and a distal esophageal low-pressure cuff with 8 ventilatory holes in between.	Two adult sizes: 41 Fr, height >5 ft; 37 Fr, height 4-6 ft.
Soft-Seal (Smiths Medical)	Similar in shape to the first-generation laryngeal mask, but differs in its one-piece design, in which the cuff is softer and there is no "step" between the tube and the cuff, an integrated inflation line, no epiglottic bars on the anterior surface of the cuff, and a wider ventilation orifice.	Pediatric to adult sizes 1-5.
Solus Curve (Intersurgical)	A range of single-use SGAs designed for those who prefer the insertion characteristics of a device with a curved airway tube. Includes a classic cuff shape, integral inflation line, and a high-quality valve.	Adult sizes 3-5.
Solus Flexible (Intersurgical)	Single-use SGAs with a wire-reinforced tube, permits flexion without kinking and can be moved at any time mid-procedure without concern for the cessation of gas flow. Includes a classic cuff shape, integral inflation line, and a high-quality valve.	Adult sizes 3-5 and pediatric sizes 2 and 2.5.
Solus MRI Safe (Intersurgical)	Single-use SGAs fitted with specially tested non-ferrous valves, guaranteed not to interfere with the magnet in an MRI scanner. The plastic valve has been selected to ensure full reliability throughout the shelf life of each device.	Adult sizes 3-5 and pediatric sizes 1, 1.5, 2, 2.5.
Solus Satin (Intersurgical)	Single-use SGAs featuring a softer airway tube providing increased flexibility. Includes a classic cuff shape, integral inflation line, and a high-quality valve to ensure continual cuff integrity.	Adult sizes 3-5.
Solus Standard (Intersurgical)	Single-use SGAs featuring a low-friction material, classic cuff shape, integral inflation line, and a high-quality valve.	Adult sizes 3-5 and pediatric sizes 1, 1.5, 2, 2.5.

Table 7. Devices for Special Airway Techniques

Product Name (Company)	Description	Size
Awake Intubation		
DART Nasal (Pulmodyne)	Intranasal mucosal atomization device.	Average particle size: 50 mcm. Applicator dead space: 0.16 mL. Tip diameter: 0.19-inch (4.9 mm). Applicator length: 1.60-inch (41 mm).

	Clinical Applications	Special Features
	For routine procedures or to manage high-risk patients. The airway tube allows for direct flexible scope–aided intubation with ETTs ≤7.5 mm.	Elongated, inflatable silicone cuff is designed to conform to the contours of the hypopharynx and achieve an oropharyngeal seal similar to the LMA™ ProSeal™ Airway (>30 cm H_2O). Cuff Pilot™ Technology, an integrated cuff pressure indicator with constant at-a-glance feedback, alerts to changes in cuff pressure.
	For routine procedures or to manage higher-risk patients. Allows for easy insertion and higher seal pressures, and provides gastric access to suction or decompress the stomach. Designed to provide a passive conduit for un-expected regurgitation.	First Seal Technology is designed to provide adequacy of gas exchange. Second Seal™ Technology is designed to reduce risk for insufflation during ventilation. The angle of the LMA™ Supreme™ Airway facilitates ease of insertion in various head positions. Fixation tab facilitates optimal positioning within the oropharynx, hypopharynx, and upper esophagus.
	Enhanced design is ideal for unforeseen airway complications where intubation becomes necessary, and the silicone cuff is designed to be gentle to the anatomy.	Supplied as a sterile version for single use only. Silicone cuff and available with integrated Cuff Pilot™ Technology or pilot balloon. Not made with natural rubber latex.
	Ideal choice for routine anesthetic procedures, difficult airway situations, or airway management during cardiopulmonary resuscitation.	Supplied as a sterile version for single use only. Silicone cuff is soft and flexible and conforms to the anatomy to create an effective oropharyngeal seal. Available with integrated Cuff Pilot™ Technology or pilot balloon. Aperture bars designed to prevent the blockage of airflow by the epiglottis.
	Allows easy access for flexible scope devices.	If intubation necessary or desired, will accommodate ETT up to 7.5 mm. Single-use.
	Appropriate for prehospital, intraoperative, and emergency use. Especially useful for patients in whom direct visualization of vocal cords is not possible, neck movement is contraindicated, access to airway is limited, and/or massive airway bleeding or regurgitation is occurring.	Ventilation possible with either tracheal or esophageal intubation. Distal cuff seals off the esophagus to prevent aspiration of gastric contents. Allows passage of an OG tube when placed in the esophagus. Single-use.
	Allows easy access for flexible scope devices.	If intubation necessary or desired, will accommodate ETTs ≤7.5 mm. Single-use.
	For use in anesthesia and emergency medicine. Single-use SGAs are latex-free and supplied sterile.	Features a curved airway tube. Classic cuff shape provides optimum anatomic conformance with a firm, smooth-surfaced back plate to aid ease of insertion.
	For use in anesthesia and emergency medicine. An ideal solution for shared airway procedures such as ENT, dental, oromaxillary and eye surgery where the rigidity of airway devices can obscure surgical access.	Classic cuff shape provides optimum anatomic conformance with a firm, smooth-surfaced back plate to aid ease of insertion.
	For use in anesthesia and emergency medicine. Single-use, latex-free, and supplied sterile.	Classic cuff shape provides optimum anatomic conformance with a firm, smooth-surfaced back plate to aid ease of insertion.
	For use in anesthesia and emergency medicine. Single-use, latex-free, and supplied sterile.	Classic cuff shape provides optimum anatomic conformance with a firm, smooth-surfaced back plate to aid ease of insertion.
	For use in anesthesia and emergency medicine. Single-use, latex-free, and supplied sterile.	Classic cuff shape provides optimum anatomic conformance with a firm, smooth-surfaced back plate to aid ease of insertion.

	Clinical Applications	Special Features
	Application for atomizing solutions across the naso- and oropharyngeal mucous membranes.	Delivers medications quickly with onset of action similar to IV delivery.

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Table 7. Devices for Special Airway Techniques *(continued)*

Product Name (Company)	Description	Size
DART-Reach (Pulmodyne)	Laryngotracheal mucosal atomization device. With the flexible stylet, adjust the tube for a customized approach.	Average particle size: 50 mcm. Applicator dead space: REACH600/700 = 0.22 mL; REACH720 = 0.13 mL. Tip diameter: 0.19-inch (4.9 mm). Applicator length: REACH600/700 = 8.60-inch (218 mm); REACH720 = 4.60-inch (117 mm).
EZ-Spray (Pulmodyne)	Designed for rapid anesthetization of patients. Uses an O_2 source to operate (7-10 L/min) according to desired flow rate. The 180-degree directional tip provides the ability to effortlessly direct and deliver medication to the upper pharynx.	Sizes: EZ-Spray (60 cc) with 7-ft O_2 tubing; EZ-Spray (15 cc) with 7-ft O_2 tubing.
Interchangeable Oral/Nasal ETT (Genesis Airway innovations)	Secure the airway with an oral ETT and subsequent controlled retrograde nasal placement of the ETT. No extubation or interruption to ventilation.	Sizes ID 5-8 mm.
MADgic™ Atomization Device (Teleflex)	Mucosal atomization device that incorporates a narrow, malleable tube with an internal stiffening stylet that attaches to a 3 mL syringe for medication delivery via a fine mist throughout the upper airway and beyond the vocal cords.	Typical particle size 14-70 microns. System dead space: 0.12 mL, 0.18 mL, and 0.24 mL. Tip diameter: 0.19 in (4.8 mm). Applicator length: 8.9 in (22.6 cm) and 4.9 in (12.4 cm).
MAD Nasal™ Atomization Device (Teleflex)	Disposable, compact atomization device for delivery of nasal medications across mucosal membranes via a fine, gentle mist.	Typical particle size 14-70 microns. System dead space: 0.06 mL and 0.15 mL. Tip diameter: 0.17 in (4.3 mm). Applicator length: 1.65 in (4.2 cm) and 1.69 in (4.3 cm).
MADomizer™ Bottle Atomizer (Teleflex)	Bottle atomization device for delivering a variety of medications to the nose and hypopharynx via a fine, gentle mist. A new tip is used with every use and features a positive displacement pump with unidirectional flow designed to address risk for cross-contamination.	Typical particle size 14-70 microns. Tip diameter: 0.19 in (4.82 mm). Applicator length: 2.25 in (5.70 cm) and 4.75 in (12.10 cm).
Model 15-RD Glass Atomizer (DeVilbiss Healthcare)	Metal atomizer; includes glass receptacle (for liquid), pair of metal outlet tubes extending from metal atomizing nozzle and adjustable tip for directing spray to inaccessible areas of the throat. Can be used with or without the RhinoGuard tip cover.	Length: 10.5-inch.
Procedural Oxygen Mask (POM) (POM Medical)	Designed for delivering high concentrations of O_2 and monitoring end-tidal CO_2 during procedural or conscious sedation cases, such as upper GI, ERCP, EUS, and EGD.	Pediatric to adult size masks.
Difficult Airway -ETT (Genesis Airway innovations)	Specialized ETT that couples with an airway tube designed for intubation through a SGA over a FIS and subsequent removal of the SGA over the ETT/airway complex.	Sizes ID 5.5-8 mm.
Retrograde Intubation		
Cook Retrograde Intubation Set (Cook Medical)	Available as a complete set in 6, 11 or 14 Fr. The 14 Fr version includes Airway Exchange Catheter with Rapi-Fit adapters allow for delivery of O_2.	6.0 Fr=50 cm; 11 Fr=70 cm; 14 Fr=70 cm; extra-stiff flexible J-tipped guidewire = 110 cm.
Transtracheal Jet Ventilation		
AincA Manual Jet Ventilator (Anesthesia Associates)	Portable jet ventilation device with thumb depression mechanism that initiates controlled burst of O_2 flow. Customizable assembly includes DISS inlet connection, 5 ft of inlet tubing, flow control knob, on/off thumb control, internal filter, back pressure gauge, and 2 ft of outlet hose ending in a Luer lock male fitting. Connects to any tool or port that has a Luer lock female connection (i.e., malleable stylets, various adapters, etc.).	Jet ventilation catheters of malleable copper with Luer lock fittings accommodate adults, children, and infants. Adapters allow direct connection to bronchoscope or ETT.

	Clinical Applications	Special Features
	Application of topical anesthetics to oropharynx and upper airway region. Atomize solutions across the nasopharyngeal, laryngeal, and oropharyngeal mucous membranes.	Flexible stylet to precisely deliver medications. Two sizes of stylets for custom delivery. Nonsterile. Single-use.
	Application of topical anesthetic to the nose, oropharynx and upper airway of patients. Intended to deliver either oil- or water-based solutions, such as topical anesthetics, vasoconstrictors, and other nasal or oral medications in an aerosol form.	Delivery trigger system provides controlled release of compressed gas, along with a 180-degree directional atomizing nozzle, creating a larger plume of liquid spray. Use with either oil- or water-based solutions. Single-use.
	Invaluable in patients with maxillofacial trauma or those patients with a difficult airway where a nasal ETT is required.	Reinforced ETT with posterior-facing bevel and bull-nosed tip designed for first-pass intubation over a FIS/bougie. Soft silicone, tapered Introducer, and flexible airway tubing designed for atraumatic nasal intubation.
	Delivers atomized topical anesthetic to the nasopharyngeal, laryngeal, and oropharyngeal mucosa, and can be advanced through the vocal cords, down supraglottic airways, or into the nasal cavity for upper airway application.	Malleable applicator retains memory to adapt to individual patient's anatomy. Delivery of a fine spray mist generated by a piston syringe. Luer connection adapts to any Luer lock syringe. Nonsterile. Single-use. For use with drugs approved for intranasal and oropharyngeal delivery.
	Intranasal delivery enables rapid, effective administration of select medications without needle injections or the delayed onset associated with oral dosing. For use with drugs approved for intranasal delivery.	Atomized nasal medications rapidly absorb directly into the bloodstream, avoiding first-pass metabolism; atomized nasal medications absorb directly into the brain and cerebrospinal fluid via olfactory mucosa to nose-brain pathway, achieves medication levels comparable to injections. Controlled administration (exact dosing, exact volume, titratable to effect- repeat if needed). Atomizes in any position, and its soft conical tip forms a seal within the nostril to help prevent fluid expulsion. For use with drugs approved for intranasal delivery.
	Delivers topical anesthetics, vasoconstrictors, and other nasal or oral medications. Allows targeted delivery of exact drug doses to the nasal and oral mucosa.	Unique pump design and disposable applicator tip reduces the risk for patient cross-contamination that can occur with compressed air atomizers. One-way check valve ensures unidirectional flow. For use with drugs approved for intranasal and oropharyngeal delivery.
	Intended for the application of topical anesthetics to the nose, oropharynx and upper airway of patients, at the direction/discretion of a clinician.	Includes glass receptacle for dispensing the liquid; adjustable swivel top and vented nasal guard attached to a hand bulb. Can be used with all types of oil or water solutions that are compatible with rhodium metal plating.
	Dual oral and nasal entry ports for endoscopes, optimizes O_2 concentrations, measures capnography even at high O_2 flows, allows easy unobstructed view and access to patient.	Ideal for oral or nasal FSI while keeping patient oxygenated.
	Specifically designed for first-pass intubation through a SGA over a FIS. No interruption to ventilation, vision of ETT position in the trachea can be maintained with the FIS until the SGA is removed.	Available with both plain PVC and wire-reinforced ETTs. ETTs have bull-nosed tips with posterior-facing bevels for first-pass intubation. HVLP cuffs suitable for long-term intubation.
	Technique used for securing a difficult airway, either alone or with other alternative airway techniques. Especially useful in patients with limited neck mobility or patients who have suffered airway trauma.	Packaged as a complete kit with everything needed to perform retrograde intubation. Tapered AEC allows for oxygenation using Rapi-Fit adapters. 6.0 Fr places tubes ≥2.5 mm ID; 11 Fr places tubes ≥4.0 mm; 14 Fr places ETTs ≥5 mm ID. Single-use.
	Jet ventilation catheters of malleable copper with Luer-lock fittings accommodate adults, children, and infants. Adapters allow direct connection to bronchoscope or ETT.	Easy factory customization available for hose lengths and O_2 source connection type (DISS vs. various quick-disconnect types) as well as optional pressure regulator (with gauge) and standard or custom regulator-to-source connection hoses. Adapters, fittings, and connectors available. Completely reusable and sterilizable.

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Table 7. Devices for Special Airway Techniques *(continued)*

Product Name (Company)	Description	Size	
AincA MRI Conditional 3.0-Tesla Jet Ventilator (Anesthesia Associates)	Similar to AincA Manual Jet Ventilator but certified MRI Conditional—compatible for use in units ≤3.0 tesla strength.	Jet ventilation catheters of malleable copper with Luer lock fittings accommodate adults, children, and infants. MRI Conditional 3.0 tesla.	
GO-PAP (Pulmodyne)	Emergency disposable CPAP device, with integrated nebulization.	FiO_2 - approximately 30%. 3 PEEP settings. BiTrac ED Mask.	
Manual Jet Ventilator (Instrumentation Industries)	Complete set includes an on/off valve, 6 ft of high-pressure tubing and 4 ft of small-bore tubing.	Jet ventilation catheter size 13 G can accommodate adults and 14 G children.	
O_2-MAX (Pulmodyne)	Emergency disposable CPAP device, with integrated nebulization.	FiO_2 - approximately 30%. 3-5 PEEP settings (5/7.5/10/12.5/15). BiTrac ED Mask.	
O_2-MAX Trio (Pulmodyne)	Emergency disposable CPAP device, with integrated nebulization.	Three FiO_2 levels. 3-5 PEEP settings (5/7.5/10/12.5/15). BiTrac ED Mask.	
Ventrain (Ventinova Medical BV)	Manually operated ventilation device for ventilation through a transtracheal catheter in cannot-intubate/cannot-oxygenate situations. Ventrain requires a high-pressure O_2 source with pressure compensated flow regulator.	Ventrain has a male Luer lock connector, allowing connection to a transtracheal catheter. Length: 7.5 cm; ID: 2.0 mm.	
Ventilation and Oxygenation			
Ambu Disposable Face Masks	Disposable face masks designed for patient ventilation and oxygenation with an anatomically shaped flexible cushion, that facilitates the establishment of a tight seal around the patient's facial anatomy.	6 sizes.	
Ambu Disposable Open Cuff Face Masks	A range of disposable face masks designed for use with manual and automatic resuscitators and ventilators.	8 sizes.	
Ambu King Mask	Anatomically shaped, disposable anesthetic face mask. Anatomical shape of the mask is designed to allow for improved adjustment to the patient's face during use. Thin cushion material can support the establishment of a tight seal around the patient's face to deliver effective ventilation.	7 sizes.	
Ambu Open Cuff Silicone Face Masks	A range of silicone face masks designed for use with manual and automatic resuscitators and ventilators.	6 sizes.	
Ambu Silicone Face Masks	A range of silicone face masks designed for patient oxygenation and ventilation. They feature a flexible self-inflating cushion that encircles the anatomy of the patient's face to establish a tight seal.	7 sizes.	
Ambu SPUR II Disposable Resuscitator	Single-use manual resuscitator featuring the single-shutter valve system that provides reliable functionality. The self-inflating bag is made of a thin SEBS material that provides excellent recoil and has a SafeGrip™ surface for improved handling.	Adult and pediatric sizes that can be compressed for easier storage.	
Endoscopy Mask (VBM)	Face mask with diaphragm to allow simultaneous ventilation and endoscopy.	Fits newborn, infant, child, and adult.	
Ergomask (Tuoren Medical)	Mask with asymmetrical dome with a contoured ridge and a colored marker for finger placement.	Color-coded adult sizes: 3 (small), 4 (medium), 5 (large).	

	Clinical Applications	Special Features
	Similar to the AincA Manual Jet Ventilator but fully certified for use in MRI suites with coil strength to 3.0 tesla. Allows emergency O_2 saturation maintenance while determining how to solve airway issues.	Easy factory customization available for hose lengths and O_2 source connection type (DISS vs. various quick-disconnect types). Adapters, fittings, and connectors available. Completely reusable and sterilizable.
	Offers PEEP levels 5, 7.5, 10 cm H_2O with FiO_2 level of ~30%. Constant flow and PEEP levels maintained, due to PEEP and flow being independent from the O_2 levels in the tank. Uses the barbed valve on a generator with a flow of 10 L/min.	Disposable CPAP generator with 3 combinations of FiO_2 and PEEP. Integrated nebulizer closed-circuit system built directly into the elbow. Neb-Connect Accessory available, which allows nebulization and CPAP therapy off the same tank.
	Same as Manujet III. Can also be used in unobstructed difficult airway management.	Offered with and without an adjustable pressure regulator. Partially reusable outlet tube is disposable. Note: Outlet tube is single-use.
	Offers PEEP levels 2.5-20 cm H_2O. With FiO_2 level of ~30%. Constant flow and PEEP levels maintained, due to PEEP and flow being independent from the O_2 levels in the tank. Uses the 50 PSI port.	Disposable CPAP generator with ≤21 cm H_2O specific combinations of FiO_2 and PEEP. Integrated nebulizer closed-circuit system built directly into the elbow.
	Offers PEEP levels 2.5-20 cm H_2O. Allows dial-in FiO_2 levels of ~30%, 60%, and 90%. Constant flow and PEEP levels maintained, due to PEEP and flow being independent from the O_2 levels in the tank. Uses the 50 PSI port.	Disposable CPAP generator with ≤21 cm H_2O specific combinations of FiO_2 and PEEP. Integrated nebulizer closed-circuit system built directly into the elbow.
	Provides full ventilation for adults through transtracheal small-gauge lumens when large-bore ventilation is not possible (cannot-intubate/cannot-ventilate situations).	Ventilation is based on bidirectional gas flow. Supplies O_2 during the inspiration phase and removes gas from the lungs, by suctioning, during the expiration phase. Can be used in situations when the airway is obstructed, reducing the risk for barotrauma.
	A disposable face mask intended for oxygenating and ventilating airways.	Anatomically shaped cushion. Integrated thumb rest designed to improve grip. Transparent dome to allow for patient observation during use. Product available with or without hook rings. Phthalate-free. MR safe. Single-use.
	Used as the patient interface to connect with breathing circuit which carries air mixes with special medications during anesthesia or artificial ventilation.	Soft anatomically shaped cushion for a comfortable fit. Transparent mask dome to allow for visual check of bleeding, vomitus, and spontaneous breathing. Size recognition via color-coded labeling.
	Intended to direct anesthesia or medical gases into the patient's upper airway without introducing any apparatus into the trachea. Used for respiratory care and support; intended for use during procedures where anesthetic and medical gases are being supplied.	Anatomically shaped for improved adjustment to the patient's face. Has a thin cushion to support a tight seal around the patient's face with minimal pressure. Features a ribbed edge around the cushion to improve user grip. Clear dome to allow for observation of the patient's condition. Check valve allows for seal to be adjusted by inflating or deflating cushion. Mask size is indicated on the mask dome. Size recognition via color-coded labeling. MR safe. Single-use.
	Intended to serve as an interface for delivering respiratory gases from a resuscitator or anesthesia machine to patient's airways.	Soft silicone masks shaped for a comfortable fit. Transparent mask dome to allow for visual check of bleeding, vomitus, and spontaneous breathing. Suitable for autoclaving repeatedly at 134°C. Reusable.
	Intended for oxygenating and ventilating the airways or to direct anesthetic gases to the upper airways in pre-hospital (EMS) and hospital environments, including MR system rooms.	Flexible self-inflating cushion made of silicone. Transparent dome allows for visual check of bleeding, vomitus, and spontaneous breathing. integrated thumb rest to support hand positioning during use. Suitable for autoclaving at a temperature of 134°C/273.2°F (except size 0A). MR Safe. Reusable up to 30 times.
	Intended to be used in situations where a manual cardio-pulmonary resuscitator is needed for assisted ventilation and pulmonary resuscitation, as well as for ventilation and oxygenation of patients until a more definitive airway can be established or patient has recovered.	Integrated handle to support user during prolonged ventilation. Low weight for improved handling during prolonged ventilation. Pressure-limiting valve system prevents delivery of excessive pressures. Variants of the SPUR II with an m-port are available. The m-port may be used for $ETCO_2$ monitoring or injection of medication.
	FSI; airway endoscopy; gastroenterology; transesophageal echocardiography.	Available in different sizes and with different sizes of diaphragms for a perfect seal during endoscopy.
	One- and 2-handed BVM ventilation.	Ergonomic design optimizes the one-handed ventilation technique. Improved seal with chin lift, head extension.

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Table 7. Devices for Special Airway Techniques *(continued)*

Product Name (Company)	Description	Size	
Flow-Safe II+ Disposable BiLevel CPAP (Mercury Medical)	Disposable BiLevel CPAP system with deluxe mask with comfortable head harness, including a color-coded manometer for verifying BiLevel CPAP or CPAP pressure. Works with standard flowmeters that can deliver >10 cm H_2O CPAP pressure or approximately 10 cm H_2O IPAP pressure at 15 L/min. The Bilevel CPAP switch allows clinicians to provide either therapy mode.	Child, small adult, and large adult.	
Flow-Safe II EZ CPAP (Mercury Medical)	System includes an integrated nebulizer that requires only 1 O_2 source to run both the CPAP and nebulizer devices. CPAP system includes color-coded manometer for verifying CPAP pressure and pressure-relief system. Works with standard flowmeters that can deliver >10 cm H_2O at 15 L/min. Higher flow pressures may be necessary when running both CPAP and the nebulizer.	Child, small adult, and large adult.	
i-flo High Flow Nasal Cannula (Intersurgical)	Specifically designed to deliver heated and humidified O_2 directly to the patient's nares at flow rates of up to 60 L/min.	3 adult sizes: small, medium, and large	
McMurray Enhanced Airway (MEA) (McMurray Medical)	Easy-to-use distal pharyngeal airway device that is flexible like a nasal airway but designed for oral use. Opens the obstructed airway beyond the tongue. Soft, flexible tubing with a cushioned bite block that is placed between the molars. With the 15-mm connector, the MEA can attach to an anesthesia circuit or manual resuscitator to allow continuous oxygenation during intubation or intraoral ventilation to ease poor positive pressure mask ventilation.	Medium (size 4) adult.	
Naso-Flo (Pulmodyne)	Nasopharyngeal airway with built-in capnography line, adjustable size, and O_2 port.	4.0 (ID 4.0/18 Fr); 5.0 (ID 5.0/22 Fr); 6.0 (ID 6.0/25 Fr); 7.0 (ID 7.0/29 Fr); 8.0 (ID 8.0/32 Fr); 9.0 (ID 9.0/36 Fr).	
Optiflow THRIVE (Fisher & Paykel Healthcare)	Nasal high flow–heated humidified nasal high-flow oxygenation system with heated humidifier, heated inspiratory tubing, automated humidity delivery, and anatomically designed high-flow nasal interface. Interface option with CO_2 sampling line connection. Single-use or multi-use kits available. Interfaces packaged separately.	Small, medium, and large with CO_2 sampling tube.	
Sentri Intersurgical EcoLite End Tidal CO_2 Mask (Intersurgical)	Oxygen mask with a sampling port that permits sampling of exhausted CO_2 from both the mouth and nose in non-intubated patients during administration of supplementary O_2.	Adult medium concentration O_2 mask.	
SuperNO2VA Et System (AirLife)	Composed of the SuperNO2VA Et Mask, head strap, 2-L hyperinflation bag with its connection accessories, gas sampling line, O_2 tubing, and manometer tubing.	Adult medium (height: 4 ft, 7 inch to 6 ft, 9 inch). Adult large (height: 5 ft, 10 inch to 7 ft, 3 inch).	
Veoflo Pro (Flexicare)	Heated and humidified nasal high-flow oxygen therapy system designed to allow for a range of O_2 concentrations using variable flow rates up to 60 L/min, 100% FiO_2. Complete system with heated humidifier, heated wire circuit, tubing, adjustable humidity delivery, and high-flow nasal interface.	Small, medium, large.	

Table 8. Positioning Devices

Product Name (Company)	Description	Size	
BVM Strap (Pulmodyne)	Silicone strap designed for use with a BVM mask.	35 inch.	
Chin-UP (Dupaco)	Hands-free airway support device used to lift up patient's chin and hold it in position to keep the airway open.		
Elevated Airway Positioner System (Sharn by Marketlab)	Reusable, coated foam positioner system designed to place patient in optimal intubation position. System consists of 2-3 pieces depending on patient size and anatomy. Base, additional insert, and head cradle. Single patient fitted covers are available.		
Face-Cradle (Mercury Medical)	Fully adjustable cushion set accommodates most adult head sizes.		

	Clinical Applications	Special Features
	Requires only 1 O_2 source for delivering CPAP or BiLevel CPAP pressure. Easy EPAP dial allows adjustable EPAP pressure in the BiLevel CPAP mode. Includes a built-in manometer for verified pressure readings. No assembly of separate apparatus, and the pressure relief valve automatically adjusts to avoid excess pressure.	The lightweight disposable feature allows for easy CPAP or BiLevel CPAP therapy setup and therapy delivery during transport. Ideal for situations where backup BiLevel CPAP equipment is scarce or unavailable. The contoured, double-seal deluxe mask is designed to form a very good anatomic seal. The elastic head harness is easy to place, with Velcro straps that easily adjust for patient comfort.
	Respiratory aid intended for use with a face mask, nebulizer, and gas-supplying device to elevate pressure in the patient's lungs while delivering aerosolized medication.	Mask features elastic head harness, quick-disconnect clips, and straight rotating port. Built-in manometer and pressure relief valve. CPAP and nebulization through a single O_2 source.
	Intended for adult patients with hypoxia.	Offers a semirigid, anatomically designed face-mount minimizing strap pressure, while the 180-degree rotating elbow ensures quick positioning. The nasal prongs feature soft material with contoured shape for a secure and comfortable fit, while the elastic head strap ensures optimal stability during wear.
	Alleviates upper airway obstruction by quickly stenting open redundant pharyngeal tissue. Particularly well suited to relieve UAO in spontaneously breathing patients. Also used to provide apneic oxygenation during intubation, allow intraoral ventilation where difficult mask variables are present, and help reduce fire risk. For use in both anesthesia and emergency medicine.	Longer, flexible tubing stents open the distal pharyngeal tissue that current oral airways cannot reach. Smaller-diameter tubing supports easy insertion. An integrated, cushioned bite block helps reduce potential oral injury. The optional connector allows for distal proximity oxygenation during intubation or intraoral positive pressure ventilation when occluding nares and lips.
	Delivers direct O_2, while humidification vents positioned toward the distal tip facilitate heat and moisture transfer. It also supplies an optimal respiratory indicator with or without the hydrophobic filter.	In-line capnography. Direct O_2 port for high flow. Connects to a BVM. Soft tip for easy insertion.
	Provides nasal high-flow O_2 for preoxygenation, oxygenation during intubation (up to 10 minutes) and for spontaneously breathing patients during procedural sedation. Reduces risk for O_2 desaturation and need for airway interventions.	High nasal flows up to 70 L/min, 100% FiO_2. In spontaneously breathing patients, Optiflow will maintain oxygenation, clear CO_2 from the anatomic dead space, provide up to 7 cm H_2O positive airway pressure and increase tidal volume. Humidification enables the high flow to be comfortable, while maintaining normal physiologic conditions of the airway mucosa.
	The $ETCO_2$ monitoring line should be attached to either a side stream capnometer or Microstream (Oridion) capnometer, as well as to the Luer lock port on the mask.	Incurved nose seal, conforms to different nose shapes, designed to prevent O_2 entering patient's eyes. No metal nose clip, MRI compatible. Elastic can be positioned under or over ears; below-ear position eliminates trauma to top of ears.
	Creates a seal when positioned over a patient's nose to direct anesthesia gas, air, and/or O_2 to the upper airway during the continuum of anesthesia care through the compression of the hyperinflated reservoir bag, while allowing $ETCO_2$ sampling from the patient's exhaled breath from the oral/nasal areas.	Uses nasal positive airway pressure to preoxygenate, relieve upper airway obstruction due to decreased level of consciousness, maintain ventilation, rescue ventilate, ease access for intraoral procedures and be used perioperatively.
	High Flow Nasal Cannula provides effective High Flow Oxygen Therapy for spontaneously breathing patients. Used for a range of clinical applications including preoxygenation, oxygenation during intubation, and oxygenation during difficult airway procedures.	Unique swivel design makes it easier to change the orientation of the cannula tubing. Customizable airway temperature and gradient control to optimize patient comfort and compliance.

	Clinical Applications	Special Features
	Assists in securing the BVM mask onto the patient.	Soft flexible silicone.
	Aids during monitored anesthesia care and total IV anesthesia sedation procedures.	Disposable polyurethane foam cushions.
	Aids positioning the obese patient for intubation, mask ventilation, and extubation. Also helpful during regional procedures.	Reusable with fitted single patient covers available.
	For use in prone-position surgeries.	Fully adjustable offering the clinician greater visibility of patient's face.

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Table 8. Positioning Devices *(continued)*

Product Name (Company)	Description	Size	
Jaw Elevation Device (JED) (Hypnoz Devices)	Assists the provider in maintaining a patient's airway by mechanically providing jaw thrust. Once applied, the JED holds a patient's airway open and allows an anesthesia provider to safely administer sedation or anesthesia without having to instrument the airway.	Length: 20.3 cm. Accommodates jaw width 11-21.5 cm.	
LEAFix Laryngeal Endo-Tracheal Airway Fixator (Sharn by Marketlab)	Novel securement device /alternative to tape. LEAFix uses modified Y design providing 2 anchor points (maxillary and mandibular) for superior resistance to exterior forces and unintended extubation.	Adult (can be cut for pediatric).	
Pi's Pillow and Pi's Obesity Pillow (American Eagle Medical)	A foam base and removable pad that supports the head in full-extension (sniffing) position and maintains proper alignment of the upper airway during airway management. Facilitates mask ventilation, DL/VL, and makes intubation easy and efficient in situations of a difficult airway as it creates a very stable head and neck (sniffing) position. This pillow also helps VL.		
Rapid Airway Management Positioner (RAMP) (Airpal Patient Transfer Systems)	Air-assisted medical device that can be inflated to transfer and position patients for various procedures.		
Troop Elevation Pillow (Bone Foam Inc.)	Foam positioning device that quickly achieves the HELP. Includes many accessories (head cradle, arm board pads, and TEPA). An impermeable barrier cover is also offered for infection control and to protect the product.		

Table 9. Cricothyrotomy Devices

Product Name (Company)	Description	Size	
Percutaneous Cricothyrotomy			
Control-Cric (Pulmodyne)	Contents include a Cric-Knife, which is a dual-sided 10-mm scalpel with integrated sliding tracheal hook, and a Cric-Key, which is a cuffed 5.5-mm cric tube, with a preloaded stylet to allow for tactile feedback of the tracheal rings.	5.5-mm cric tube.	
Melker Cuffed Emergency Cricothyrotomy Catheter Set (Cook Medical)	Complete set including syringe (10 cc), two 18 G introducer needles with TFE catheter (short and long), 0.038-inch diameter Amplatz extra-stiff guide wire with flexible tip, scalpel, curved dilator with radiopaque stripe and PVC airway catheter. Cuffed and uncuffed airway catheter options available. Also available in a Special Operations kit, which includes all of the above in a slip peel pouch and 2 airway catheters.	Uncuffed: 3.5 mm ID/3.8 cm, 4.0 mm ID/4.2 cm, 6.0 mm ID/7.5 cm; Cuffed Seldinger: 5 mm ID/9 cm; Special Ops cuffed: 5 mm ID/9 cm; Special Ops uncuffed: 4 mm ID/4.2 cm and 6 mm ID/7.5 cm.	
Pertrach Emergency Cricothyrotomy Kit (Pulmodyne)	Contents include 2 splitting needles, cuffed or uncuffed trach tube, dilator with flexible leader, twill tape, syringe, extension tube, and scalpel (optional).	Adult: 6.8 cm (5.6 mm ID). Child: 3.9 cm (3 mm ID), 4 cm (3.5 mm ID), 4.1 cm (4 mm ID), and 4.4 cm (5.0 mm ID).	
Quicktrach I Quicktrach II (VBM)	Complete set includes airway catheter, stopper, needle and syringes that come preassembled. Quicktrach I (without cuff). Quicktrach II (with cuff).	Adult (4 mm ID). Child (2 mm ID).	
Surgical Cricothyrotomy			
Control-Cric (Pulmodyne)	Contents include a Cric-Knife, which is a dual-sided 10-mm scalpel with integrated sliding tracheal hook, and a Cric-Key, which is a cuffed 5.5-mm cric tube, with a preloaded stylet to allow for tactile feedback of the tracheal rings.	5.5-mm cric tube.	
Melker Surgical Cricothyrotomy Set (Cook Medical)	Cuffed cricothyrotomy tube, scalpel, tracheal hook Trousseau dilator, and blunt, curved dilator in compact package for convenient storage.	9 cm (5 mm ID).	
Melker Universal Cuffed Emergency Cricothyrotomy Catheter Set (Cook Medical)	Same as Melker Cuffed Emergency Cricothyrotomy Catheter Set for percutaneous technique. Also includes components for surgical technique: tracheal hook, safety scalpel, Trousseau dilator and blunt curved dilator.	9 cm (5 mm ID).	

	Clinical Applications	Special Features
	Assists the provider to maintain an open airway and offers a "hands-free" solution during light or deep sedation (MAC), FOB or anytime the airway is compromised.	The reusable JED is MRI compatible. The mandible cups are single-use only.
	Beneficial for long cases and patients in lateral or prone positions due to combination of superior anchor design and an adhesive that is at once gentle on skin yet provides superior strength.	Perforated tail facilitates easier "pants leg" approach or single limb application of device. Designed in the U.K., launched in the U.S. August 2024.
	Extremely useful when treating morbidly obese patients' airway since it effectively raises a patient's head, neck, and shoulders to chest level and creates an extended-head position. Useful in helping with a patient's breathing when administering MAC anesthesia.	Available in disposable and reusable models. Disposable pillow comes with a vacuum package and can easily be stored even within a small OR. A barrier cover is provided for the pillow. Four sizes: small, medium, large and extra-large (obesity pillow).
	Allows for the positioning of a patient for laryngoscopy, extubation and central venous access. Enhances the safe apnea period, BVM ventilation and chest wall excursion.	Base of RAMP is integrated with an Airpal platform (air-assisted lateral patient transfer and positioning device). Inflates and deflates, thus can remain in place during surgery and reinflate for extubation. Reusable.
	Aids airway management for obese patients by aligning upper airway axes. This improves ease of mask ventilation and facilitates intubation via DL or VL. Allows patients to breathe more comfortably during preoxygenation as well as during regional anesthesia. Increases the desaturation safety period.	Disposable and reusable formats. TEPA may be added to the TEP base unit for super morbidly obese patients (BMI >50 kg/m^2).

	Clinical Applications	Special Features
	Same as Emergency Transtracheal Airway Catheter.	Designed to perform cricothyrotomy without the need for visualization, air aspiration or reliance on fine motor skills. Packaged to simplify the procedure.
	Same as Emergency Transtracheal Airway Catheter, is intended to establish emergency airway access when tracheal intubation cannot be performed. Also intended for use with the Seldinger technique via cricothyroid membrane; however, has capability to be used as a surgical cricothyrotomy.	Different set options available including Seldinger; cuffed or uncuffed. Special Operations kit is packaged in a slip peel pouch. All Melker catheters have a 15-mm connector.
	Use in failed orotracheal or nasotracheal intubation, and/or flexible scope bronchoscopy. Immediate airway control in patients with maxillofacial, cervical spine, head, neck, and multiple trauma. Also used when tracheal intubation is impossible and/or contraindicated. Immediate relief of upper airway block.	Serves as an emergency cricothyrotomy or tracheostomy device that uses a patented splitting needle and dilator to perform rapid and simple procedures.
	Wide-bore cannula cricothyrotomy set.	Packaged as complete set with everything needed to perform a percutaneous cricothyrotomy. Removable stopper is used to prevent a "too-deep" insertion and avoid the possibility of perforating the rear tracheal wall.
	Same as Emergency Transtracheal Airway Catheter.	Designed to perform cricothyrotomy without the need for visualization, air aspiration or reliance on fine motor skills. Packaged to simplify the procedure. Training kit available. MRI-compatible tube (Sterile kit only).
	Provides the tools that clinicians can use if they prefer a surgical approach to performing emergency cricothyrotomy.	Complete and convenient packaging.
	Same as Melker Cuffed Emergency Cricothyrotomy Catheter Set, Seldinger or Surgical Cricothyrotomy.	50% of tray same as Melker Cuffed Emergency Cricothyrotomy Catheter Set for the percutaneous technique. The other half includes all items needed to perform a surgical emergency cricothyrotomy including a Trousseau dilator and tracheal hook.

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Table 9. Cricothyrotomy Devices *(continued)*

Product Name (Company)	Description	Size
CRICOSPEED (DEAS Italy)	Hybrid multi-purpose adult invasive airway access set including either scalpel-bougie technique and Seldinger-based technique with eccentric rigid introducer. Whichever approach adopted, it allows insertion of a 5,3 mm ID PVC reinforced cannula with polyurethane cuff. The set contains syringe and needle, saline, lubricant, non-kinking guide wire, #20 scalpel, 14 Fr-45 cm hollow bougie with oxygen connectors, reinforced cuffed cannula and introducer, fixing strap, and sterile drape.	Adult cuffed reinforced conic 5.3 mm ID cannula
ScalpelCric (VBM)	Scalpel cricothyrotomy set "stab-twist-bougie-tube."	6 mm ID.
Surgicric (VBM)	Surgical cricothyrotomy set. Surgicric II: classic surgical technique; Surgicric III: Seldinger technique.	6 mm ID.

Table 10. Tracheostomy Devices

Product Name (Company)	Description	Size
Percutaneous Dilatational Tracheostomy		
Blom Tracheostomy Tubes (Pulmodyne)	Available in 4 sizes. Each size offers the choice of non-fenestrated and uncuffed tubes, as well as fenestrated cuffed/uncuffed tubes along with other standard inner cannulas.	4, 6, 8, and 10 mm.
Blue Rhino G2-Multi Percutaneous Tracheostomy Introducer Sets and Trays (Cook Medical)	Designed to work with ISO-standard percutaneous tracheostomy tubes, the line consists of multiple configurations offering a wide range of loading dilators to fit a wide range of tracheostomy tubes. (6.5, 7, 7.5, 8, 8.5, 9 and 10 mm). Loading dilators have been specifically tested for an optimal fit with a range of the Shiley Flexible Adult Tracheostomy tubes. Available stand-alone and with Shiley Flexible and Flexible Evac tracheostomy tubes sized 7.5 and 8.5 mm.	Loading dilators: 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, and 10 mm. Shiley Flexible Adult Tracheostomy Tubes, with Disposable Inner Cannula: 7.5 and 8.5 mm. Shiley Flexible Evac Tracheostomy Tubes with Disposable Inner Cannula: 7.5 and 8.5 mm.
Portex Ultraperc Percutaneous Dilation Tracheostomy Kit (Smiths Medical)	Complete set with or without a tracheostomy tube.	70 mm (7 mm ID); 5.5 mm (8 mm ID); 81 mm (9 mm ID).
Shiley Adult Flex Tracheostomy Tube (Medtronic)	Each size features the choice of cuffed (with the patented TaperGuard cuff technology) or uncuffed versions. Offers an EVAC version that removes subglottic secretions above the cuff.	6.5-10 mm ID.
Shiley Tracheostomy Tube XLT Extended-Length Tracheostomy Tubes (Medtronic)	Available in 4 ISO sizes (5, 6, 7, and 8 mm ID). Each size offers the choice of cuffed or uncuffed stylets, and proximal or distal extensions. Disposable inner cannula; replacements sold in packages of 10.	Lengths: 90 mm (5 mm ID); 95 mm (6 mm ID); 100 mm (7 mm ID); 105 mm (8 mm ID).
Venner PneuX Tracheostomy Tube (Venner Medical)	Works with an automated cuff pressure controller that regulates pressure within the tracheostomy tube cuff as a complete VAP prevention system for intensive or critical care patients.	7, 8 and 9 mm ID.
Weinmann-Multi Tracheostomy Exchange Set (Cook Medical)	Includes a Cook Airway Exchange Catheter, 5 ISO-standard tracheostomy loadindilators and a Blue Rhino dilator for redilation, if necessary.	Loading dilators: 7.0, 7.5, 8.0, 8.5, and 9.0 mm for use with tracheostomy tubes with appropriately sized inner diameters.
Surgical Tracheostomy		
Surgical tracheostomies are performed by making a curvilinear skin incision along relaxed skin tension lines between sternal notch and cricoid cartilage. A midline vertical incision is then made dividing strap muscles, and division of thyroid isthmus between ligatures is performed. Next, a cricoid hook is used to elevate the cricoid. An inferior-based flap or Bjork flap (through second and third tracheal rings) is commonly used. The flap is then sutured to the inferior skin margin. Alternatives include a vertical tracheal incision (pediatric) or excision of an ellipse of anterior tracheal wall. Finally, the tracheostomy tube is inserted, the cuff is inflated, and it is secured with tape around the neck or stay sutures.		

	Clinical Applications	Special Features
	CricoSpeed emergency cricothyrotomy set is an invasive airway device to be used whenever oxygen delivery is impossible by any other mean or device.	The hollow bougie is made of red cardinal-colored special thermoplastic and has a curved tip. Anatomic design of the entire device, with unique ergonomically designed thumb plate introducer and unique combination of both scalpel-bougie and Seldinger-based sets in a single packaging (also available separately).
	Same as Melker Cuffed Emergency Cricothyrotomy Catheter Set.	Complete cricothyrotomy set, which includes size 10 scalpel; 40 cm, 14 Fr bougie. 6-mm cuffed tube.
	Two sets that provide clinicians different choices for the performance of emergency cricothyrotomy.	Small pack size ideal for emergency bags. Soft tip is atraumatic. Locking mechanism prevents accidental dislocation.

	Clinical Applications	Special Features
	Features a variety of unique inner cannulas that aid in clearance and management of secretions to help prevent ventilator-associated events and help allow speech.	Subglottic suctioning inner cannula helps manage patient secretions that pool above the cuff intermittently or continuously through fenestrations.
	Intended for percutaneous dilatational tracheostomy for management of the airway in adults only.	Consists of these primary components: an introducer needle, J-tip wire guide, introducer dilator, guiding catheter, loading dilators, and single-staged Blue Rhino G2-Multi dilator. Dilation takes place in 1 step, using the Seldinger technique. Available in procedure packs with tracheostomy tubes, including with the Shiley Flexible Evac Tracheostomy Tubes, which offer the ability to manage subglottic secretions through a separate built-in suction channel.
	Establishes transcutaneous access to the trachea below level of cricoid cartilage. Allows for smooth insertion of the tracheostomy tube over a Seldinger wire.	Packaged as a complete kit with everything needed to perform a percutaneous dilatational tracheostomy. The dilator is single-staged and prelubricated with an ergonomic handle to facilitate insertion. Disposable.
	Single-use device.	Features a soft, flexible shaft, beveled tip for percutaneous use and a clear flange with airflow vents around the integrated 15-mm connector.
	Flexible dual-cannula tube for patients in need of extended distal and proximal sizing.	The only fixed-flange, extended-length tube with disposable inner cannula. Flexible inner cannula conforms to shape of the outer cannula. 16 configurations to fit a wide variety of patients. Disposable.
	Facilitates ventilation and the evacuation or drainage of secretions from the subglottic space for patients requiring extended periods of tracheal intubation up to 30 days.	Single-use silicone tracheostomy tube features a unique low-volume, low-pressure cuff that forms a no-fold seal within the trachea. Intracuff pressure is constantly monitored and maintained by an automated cuff pressure controller. Tracheostomy tube incorporates multiple subglottic channels allowing secretion drainage and irrigation of the subglottic space. Available as MRI compatible and also in ETT format.
	Intended for adult tracheostomy tube exchange.	Helps maintains stoma access and allows redilation of stoma if resistance is met. Five ISO-standard loading dilators facilitate the insertion of a large range of tracheostomy tube sizes.

Abbreviation Key

AEC ..... airway exchange catheter
AHA ..... American Heart Association
ARDS ..... acute respiratory distress syndrome
ASA ..... American Society of Anesthesiologists
AVL ..... Advanced Video Laryngoscope
BAL ..... bronchoalveolar lavage
BMI ..... body mass index
BVM ..... bag-valve-mask
CCD ..... charge-coupled device
CCR ..... cardiocerebral resuscitation
CMOS ..... complementary metal oxide semiconductor
CO_2 ..... carbon dioxide
CPAP ..... continuous positive airway pressure
CPR ..... cardiopulmonary resuscitation
CPV ..... Cuff Pilot Valve
DAB ..... difficult airway blade
DCI ..... direct-coupled interface
DISS ..... diameter index safety system
DL ..... direct laryngoscopy
DLT ..... double-lumen tube
ED ..... emergency department
EF ..... extra firm
EGD ..... esophagogastroduodenoscopy
EMS ..... emergency medical services
ENT ..... ear, nose, and throat
EPAP ..... expiratory positive airway pressure
ERCP ..... endoscopic retrograde cholangiopancreatography
ETT ..... endotracheal tube
EUS ..... endoscopic ultrasound
EVA ..... expiratory ventilation assistance
FDA ..... Food and Drug Administration
FiO_2 ..... fraction of inspired oxygen
FIS ..... flexible intubation scope
FIVE ..... Flexible Intubation Video Endoscope
Fr ..... French
FSI ..... flexible scope intubation
GI ..... gastrointestinal
GVL ..... GlideScope Video Laryngoscope
GVM ..... GlideScope Video Monitor
HD ..... high-definition
HDMI ..... High-Definition Multimedia Interface
HELP ..... head-elevated laryngoscopy position
HVLP ..... high-volume, low-pressure
ICU ..... intensive care unit
ID ..... internal diameter
ILMA ..... intubating laryngeal mask airway
IPAP ..... inspiratory positive airway pressure
ISO ..... International Organization for Standardization
IV ..... intravenous
LCD ..... liquid crystal display
LED ..... light-emitting diode
LM ..... laryngeal mask
LMA ..... laryngeal mask airway
LT ..... laryngeal tube
MAC ..... Macintosh
MIL ..... Miller
MRI ..... magnetic resonance imaging
NGT ..... nasogastric tube
NICU ..... neonatal intensive care unit
OD ..... outer diameter
OG ..... orogastric
OR ..... operating room
O_2 ..... oxygen
PAP ..... positive airway pressure
PEEK ..... polyetheretherketone
PEEP ..... positive end-expiratory pressure
PICU ..... pediatric intensive care unit
POM ..... procedural oxygen mask
PPV ..... positive pressure ventilation
PSI ..... pounds per square inch
PVC ..... polyvinyl chloride
PVP ..... polyvinylpyrrolidone
RDT ..... Remote Diagnostic Technologies
RTCA ..... Radio Technical Commission for Aeronautics
SGA ..... supraglottic airway
SpO_2 ..... oxygen saturation
TEE ..... transesophageal echocardiography
TEP ..... Troop Elevation Pillow
TEPA ..... Troop Elevation Pillow Addition
TFE ..... tetrafluoroethylene
TTJV ..... transtracheal jet ventilation
U-DAB ..... unchanneled difficult airway blade
USB ..... universal serial bus
UV ..... ultraviolet
VAP ..... ventilator-associated pneumonia
VL ..... video laryngoscope/laryngoscopy