Taking the “difficult” out of difficult airway.
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DIFFICULT AIRWAY ALGORITHM

1. Assess the likelihood and clinical impact of basic management problems:
   A. Difficult Ventilation
   B. Difficult Intubation
   C. Difficulty with Patient Cooperation or Consent
   D. Difficult Tracheostomy

2. Actively pursue opportunities to deliver supplemental oxygen throughout the process of difficult airway management.

3. Consider the relative merits and feasibility of basic management choices:
   A. Awake Intubation
   B. Non-Invasive Technique for Initial Approach to Intubation
   C. Preservation of Spontaneous Ventilation

4. Develop primary and alternative strategies:

   **A. AWAKE INTUBATION**
   - Airway Approached by Non-Invasive intubation
   - Invasive Airway Access®
   - Succeed* \\
   - Fail
   - Cancel Case
   - Consider Feasibility of Other Options®

   **B. INTUBATION ATTEMPTS AFTER INDUCTION OF GENERAL ANESTHESIA**
   - Initial Intubation Attempts Successful*
   - Initial Intubation Attempts UNSUCCESSFUL
   - FROM THIS POINT ONWARDS CONSIDER:
     1. Calling for Help
     2. Returning to Spontaneous Ventilation
     3. Awakening the Patient

   **CONSIDER / ATTEMPT LMA**
   - LMA ADEQUATE*
   - LMA NOT ADEQUATE OR NOT FEASIBLE
   - EMERGENCY PATHWAY
     - Ventilation Not Adequate, Intubation Unsuccessful
     - Call for Help
     - Emergency Non-Invasive Airway Ventilation®

   **FACE MASK VENTILATION NOT ADEQUATE**
   - IF BOTH FACE MASK AND LMA VENTILATION BECOME INADEQUATE
   - Consider Feasibility of Other Options®
   - Awake Patient®

   **FACE MASK VENTILATION ADEQUATE**
   - Non-Emergency Pathway
     - Ventilation Adequate, Intubation Unsuccessful
     - Alternative Approaches to Intubation®
     - Successful Intubation* \\
     - Fail After Multiple Attempts


* Confirm ventilation, tracheal intubation, or LMA placement with exhaled CO₂.

**a.** Other options include (but are not limited to): surgery utilizing face mask or LMA anesthesia, local anesthesia infiltration or regional nerve blockade. Pursuit of these options usually implies that mask ventilation will not be problematic. Therefore, these options may be of limited value if this step in the algorithm has been reached via the Emergency Pathway.

**b.** Invasive airway access includes surgical or percutaneous tracheostomy or cricothyrodisomy.

**c.** Alternative non-invasive approaches to difficult intubation include (but are not limited to): use of different laryngoscope blades, LMA as an intubation conduit (with or without fiberoptic guidance), fiberoptic intubation, intubating stylet or tube changer, light wand, retrograde intubation, and blind oral or nasal intubation.

**d.** Consider re-preparation of the patient for awake intubation or canceling surgery.

**e.** Options for emergency non-invasive airway ventilation include (but are not limited to): rigid bronchoscope, esophageal-tracheal combitube ventilation, or transtracheal jet ventilation.


Melker Universal Emergency Cricothyrotomy Catheter Set

Used for emergency airway access when conventional endotracheal intubation cannot be performed.

FEATURES & BENEFITS
- Airway access is achieved by percutaneous entry (Seldinger) or surgical technique via the cricothyroid membrane.

COMPONENTS
Seldinger Technique
- Introducer needle
- TFE catheter introducer needle
- Syringe
- Scalpel
- Wire guide
- Curved dilator
- Airway catheter

Surgical Technique
- #11 safety scalpel
- Trousseau dilators
- Tracheal hook
- Blunt, curved dilator

Intended for one-time use.

<table>
<thead>
<tr>
<th>Global Product Number</th>
<th>Order Number</th>
<th>Airway Catheter Length cm</th>
<th>Airway Catheter Inner Diameter mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>G32193</td>
<td>C-TCCSB-500-UNI</td>
<td>9</td>
<td>5</td>
</tr>
</tbody>
</table>
Melker Emergency Cricothyrotomy Catheter Sets
Used for emergency airway access when conventional endotracheal intubation cannot be performed.

FEATURES & BENEFITS
- Airway access is achieved by standard wire-guided (Seldinger) technique via the cricothyroid membrane.
- Subsequent dilation of the tract and tracheal entrance site permits passage of the emergency airway.
- Airway catheter is radiopaque and has standard 15 mm connector.

COMPONENTS
- Introducer needle
- TFE catheter introducer needle
- Syringe
- Scalpel
- Wire guide
- Curved dilator
- Airway catheter

<table>
<thead>
<tr>
<th>Global Product Number</th>
<th>Order Number</th>
<th>Airway Catheter Length cm</th>
<th>Airway Catheter Inner Diameter mm</th>
<th>Notes</th>
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<tbody>
<tr>
<td>G06245</td>
<td>C-TCCS-350</td>
<td>3.8</td>
<td>3.5</td>
<td>airway catheter has radiopaque stripe</td>
</tr>
<tr>
<td>G06246</td>
<td>C-TCCS-400</td>
<td>4.2</td>
<td>4.0</td>
<td>airway catheter has radiopaque stripe</td>
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<tr>
<td>G04652</td>
<td>C-TCCS-600</td>
<td>7.5</td>
<td>6.0</td>
<td>airway catheter has radiopaque stripe</td>
</tr>
</tbody>
</table>

Modified Set
- G07546 C-TCCS-400-TT 7.5 airway catheter has radiopaque stripe; TT plug supplied with set.

<table>
<thead>
<tr>
<th>Global Product Number</th>
<th>Order Number</th>
<th>Small Airway Catheter Length cm</th>
<th>Small Airway Catheter Inner Diameter mm</th>
<th>Large Airway Catheter Length cm</th>
<th>Large Airway Catheter Inner Diameter mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

Special Operations - combines 4.0 mm catheter with a 6.0 mm catheter in a slip peel-pouch package for easy transportation.

- G10699 C-TCCS-600-SPOPS 4.2 4.0 7.5 6.0
Melker Emergency Cricothyrotomy Catheter Sets

CUFFED

Used for emergency airway access when conventional endotracheal intubation cannot be performed.

FEATURES & BENEFITS

- Airway access is achieved by standard wire-guided (Seldinger) technique via the cricothyroid membrane.
- Subsequent dilation of the tract and tracheal entrance site permits passage of the emergency airway.
- Catheter is cuffed to protect and control airway once placed.
- Airway catheter is radiopaque and has standard 15 mm connector.

COMPONENTS

- Introducer needle
- TFE catheter introducer needle
- Syringe
- Scalpel
- Wire guide
- Curved dilator
- Airway catheter

Intended for one-time use.

<table>
<thead>
<tr>
<th>Global Product Number</th>
<th>Order Number</th>
<th>Airway Catheter Length cm</th>
<th>Airway Catheter Inner Diameter mm</th>
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<tbody>
<tr>
<td>G29432</td>
<td>C-TCCSB-500</td>
<td>9</td>
<td>5</td>
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Special Operations - 5.0 mm catheter in a slip peel-pouch package for easy transportation.

| G10699                 | C-TCCSB-500-SPOPS | 5                         | 5                                 |
Cook® Airway Exchange Catheters
Used for uncomplicated, atraumatic endotracheal tube exchange.

FEATURES & BENEFITS
• Removable Rapi-Fit® Adapter permits use of ventilatory device if necessary during exchange procedure.
• Through-lumen design of catheter with distal sideports ensures adequate airflow.
• Blunt tip of catheter is atraumatic to internal structures.
• Centimeter marks facilitate accurate placement with shortened endotracheal tubes.

COMPONENTS
• Radiopaque catheter
• Rapi-Fit Adapter (15 mm connector)
• Rapi-Fit Adapter (Luer lock connector)

<table>
<thead>
<tr>
<th>Global Product Number</th>
<th>Order Number</th>
<th>Fr</th>
<th>Length (cm)</th>
<th>Inner Diameter (mm)</th>
<th>For Placement of Endotracheal Tube with Inner Diameter (mm)</th>
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<tbody>
<tr>
<td>G07833</td>
<td>C-CAE-8.0-45</td>
<td>8.0</td>
<td>45</td>
<td>1.6</td>
<td>3 or larger</td>
</tr>
<tr>
<td>G06732</td>
<td>C-CAE-11.0-83</td>
<td>11.0</td>
<td>83</td>
<td>2.3</td>
<td>4 or larger</td>
</tr>
<tr>
<td>G07873</td>
<td>C-CAE-14.0-83</td>
<td>14.0</td>
<td>83</td>
<td>3.0</td>
<td>5 or larger</td>
</tr>
<tr>
<td>G05880</td>
<td>C-CAE-19.0-83</td>
<td>19.0</td>
<td>83</td>
<td>3.4</td>
<td>7 or larger</td>
</tr>
</tbody>
</table>

Intended for one-time use.
Cook® Airway Exchange Catheters
EXTRA FIRM WITH SOFT TIP
Used for uncomplicated, atraumatic endotracheal tube exchange or double-lumen endobronchial tube exchange.

FEATURES & BENEFITS
• Distal 7 cm of catheter is flexible.
• Extra-firm catheter facilitates exchange of double-lumen tubes.
• Removable Rapi-Fit® Adapter permits use of ventilatory device if necessary during exchange procedure.
• Through-lumen design of catheter with distal sideports ensures adequate airflow.
• Blunt, soft, flexible tip of catheter is atraumatic to internal structures.
• Centimeter marks facilitate accurate placement with shortened endotracheal tubes.

COMPONENTS
• Radiopaque catheter
• Rapi-Fit Adapter (15 mm connector)
• Rapi-Fit Adapter (Luer lock connector)

<table>
<thead>
<tr>
<th>Global Product Number</th>
<th>Order Number</th>
<th>Fr</th>
<th>Length cm</th>
<th>Inner Diameter mm</th>
<th>For Placement of Endotracheal Tube with Inner Diameter mm</th>
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</thead>
<tbody>
<tr>
<td>G36401</td>
<td>C-CAE-11.0-100-DLT-EF-ST</td>
<td>11.0</td>
<td>100</td>
<td>2.3</td>
<td>4 or larger</td>
</tr>
<tr>
<td>G36402</td>
<td>C-CAE-14.0-100-DLT-EF-ST</td>
<td>14.0</td>
<td>100</td>
<td>3.0</td>
<td>5 or larger</td>
</tr>
</tbody>
</table>

Intended for one-time use.

Use of Rapi-Fit Adapter*

TO ATTACH
Position on catheter and push white collar forward and lock into position.

TO REMOVE
Pull white collar back to release and remove from catheter.

*For use of Rapi-Fit Adapter with 15 mm connector or Rapi-Fit Adapter with Luer lock connector.
Aintree Intubation Catheter
Used for fiberoptic-guided placement of endotracheal or nasotracheal tubes. Also used for the exchange of laryngeal mask airway and endotracheal tubes using a fiberoptic bronchoscope.

FEATURES & BENEFITS
• Catheter has large 4.7 mm inner diameter to accept fiberoptic bronchoscope.
• Removable Rapi-Fit® Adapter permits use of ventilatory device if necessary during exchange procedure. Adapters for jet and 15 mm connections.
• Through-lumen design of catheter with distal sideports ensures adequate airflow.
• Blunt tip of catheter is atraumatic to internal structures.
• Centimeter marks facilitate accurate placement with shortened endotracheal tubes.

COMPONENTS
• Radiopaque catheter
• Rapi-Fit Adapter (15 mm connector)
• Rapi-Fit Adapter (Luer lock connector)

<table>
<thead>
<tr>
<th>Global Product Number</th>
<th>Order Number</th>
<th>Fr</th>
<th>Length cm</th>
<th>Inner Diameter mm</th>
<th>For Placement of Endotracheal Tube with Inner Diameter mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>G10789</td>
<td>C-CAE-19.0-56-AIC</td>
<td>19.0</td>
<td>56</td>
<td>4.7</td>
<td>7 or larger</td>
</tr>
</tbody>
</table>
Frova Intubating Introducers

Used to facilitate endotracheal intubation and to allow simple endotracheal tube exchange.

FEATURES & BENEFITS

- Angled tip assists in proper placement beyond vocal chords.
- Removable Rapi-Fit® Adapter permits use of ventilatory device if necessary during exchange procedure.
- Optional stiffening cannula adds rigidity to all but the distal 5 cm of the catheter

COMPONENTS

- Radiopaque catheter
- Rapi-Fit Adapter (15 mm connector)
- Rapi-Fit Adapter (Luer lock connector)

<table>
<thead>
<tr>
<th>Global Product Number</th>
<th>Order Number</th>
<th>Catheter Length cm</th>
<th>Catheter Inner Diameter mm</th>
<th>For Placement of Endotracheal Tube with Inner Diameter 1 mm</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Catheter Inner Diameter mm</td>
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<td></td>
</tr>
<tr>
<td>G12591 C-CAE-8.0-35-FII</td>
<td>8.0 35 1.6</td>
<td>3 or larger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G11915 C-CAE-14.0-65-FII</td>
<td>14.0 65 3.0</td>
<td>6 or larger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G13307 C-CAE-14.0-65 FI</td>
<td>14.0 65 3.0</td>
<td>6 or larger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G27282 C-CAE-14.0-65-FIC</td>
<td>14.0 65 3.0</td>
<td>6 or larger</td>
<td></td>
<td></td>
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</tbody>
</table>

1Endotracheal tube not included.
2Supplied as 10 catheters only.
Cook® Retrograde Intubation Sets
Used to assist in the placement of an endotracheal tube during difficult airway access procedures.

FEATURES & BENEFITS
• Initial access using the Seldinger technique via the cricothyroid membrane permits retrograde (cephalad-directed) placement of a wire guide exiting orally or nasally.
• Antegrade introduction of a hollow guiding catheter with distal sideports and Rapi-Fit® Adapters allows patient oxygenation and facilitates placement of an endotracheal tube.

COMPONENTS
• Introducer needle
• TFE introducer needle
• Syringe
• Wire guide with positioning marks
• Guiding catheter
• Rapi-Fit Adapter (15 mm connector)
• Rapi-Fit Adapter (Luer lock connector)

<table>
<thead>
<tr>
<th>Global Product Number</th>
<th>Order Number</th>
<th>Catheter Fr</th>
<th>Catheter Length cm</th>
<th>Wire Guide Diameter inch / mm</th>
<th>Wire Guide Length cm</th>
<th>Wire Guide Tip</th>
<th>For Placement of Endotracheal Tube with Inner Diameter mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>G09727</td>
<td>C-RETRO-6.0-50-38J-110</td>
<td>6.0</td>
<td>50</td>
<td>.038 / 0.97</td>
<td>110</td>
<td>straight and 3 mm “J”</td>
<td>2.5 or larger</td>
</tr>
<tr>
<td>G07647</td>
<td>C-RETRO-11.0-70-38J-110</td>
<td>11.0</td>
<td>70</td>
<td>.038 / 0.97</td>
<td>110</td>
<td>straight and 3 mm “J”</td>
<td>4 or larger</td>
</tr>
<tr>
<td>G10554</td>
<td>C-RETRO-14.0-70-38J-110-CAE</td>
<td>14.0</td>
<td>70</td>
<td>.038 / 0.97</td>
<td>110</td>
<td>straight and 3 mm “J”</td>
<td>5 or larger</td>
</tr>
</tbody>
</table>

Replacement Wire Guide
G07622  C-DOC-38-110-0-3-RETRO  .038 / 0.97  110  straight and 3 mm “J”
Enk Fiberoptic Atomizer Sets
Used for atomizing local anesthetics in connection with flexible fiberoptic intubation techniques.

FEATURES & BENEFITS
• The Enk Fiberoptic Atomizer Set provides adequate topical anesthesia by atomizing small doses of local anesthetics through the working channel of the bronchoscope using a flow of oxygen.
• Reduced doses of anesthetics together with the atomizer effect enhance patient comfort.
• Repeated administration of local anesthetic solutions and a flow of oxygen (“spray as you go”) keep the front lens clear during bronchoscope advancement.

COMPONENTS
• Introducer catheter
• Connecting tube with atomizer

Intended for one-time use.

Global Product Number Order Number
G27286 C-EFNS-100
Emergency Transtracheal Airway Catheters
Used for emergency airway access when conventional endotracheal intubation cannot be performed.

**FEATURES & BENEFITS**
- Catheter is coil-reinforced to prevent kinking.

**COMPONENTS**
- Reinforced FEP catheter.

<table>
<thead>
<tr>
<th>Global Product Number</th>
<th>Order Number</th>
<th>Catheter Fr</th>
<th>Catheter Length cm</th>
<th>Catheter Inner Diameter mm</th>
<th>Needle Gage</th>
</tr>
</thead>
<tbody>
<tr>
<td>G10338</td>
<td>C-DTJV-6.0-5.0-BTT</td>
<td>6.0</td>
<td>5.0</td>
<td>2</td>
<td>15</td>
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<tr>
<td>G09413</td>
<td>C-DTJV-6.0-7.5-BTT</td>
<td>6.0</td>
<td>7.5</td>
<td>2</td>
<td>15</td>
</tr>
</tbody>
</table>

Intended for one-time use.
Enk Oxygen Flow Modulator Sets

Used with emergency transtracheal catheter ventilation when conventional ventilation by mask or endotracheal tube cannot be performed.

![Enk Oxygen Flow Modulator Sets](image)

**FEATURES & BENEFITS**

- The device allows manually controlled oxygen flow.
- Catheter is kink resistant, wire reinforced to prevent collapsing once placed.
- Catheter is cuffed to protect and control airway once placed.
- Includes Emergency Transtracheal Airway Catheter tubing for attachment to oxygen source and Enk flow modulator.

**COMPONENTS**

- Catheter needle
- Syringe
- Enk Oxygen Flow Modulator

<table>
<thead>
<tr>
<th>Global Product Number</th>
<th>Order Number</th>
<th>Catheter Fr</th>
<th>Catheter Length cm</th>
<th>Catheter Inner Diameter mm</th>
<th>Needle Gage</th>
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<tbody>
<tr>
<td>G12398</td>
<td>C-EFMS-100</td>
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<td>7.5</td>
<td>2</td>
<td>15</td>
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<tr>
<td>G13145</td>
<td>C-EFMS-101</td>
<td>6.0</td>
<td>5.0</td>
<td>2</td>
<td>15</td>
</tr>
</tbody>
</table>

Intended for one-time use.
Wadhwa Emergency Airway Device

Used for emergency airway access when conventional endotracheal intubation cannot be performed.

FEATURES & BENEFITS

- This device and all of its components require preassembly and, once assembled, are nonsterile.

COMPONENTS

- Nasopharyngeal airway catheter
- Cricothyrotomy catheter
- 15 mm adapter

<table>
<thead>
<tr>
<th>Global Product Number</th>
<th>Order Number</th>
<th>Cricothyrotomy Catheter Fr</th>
<th>Cricothyrotomy Catheter Length cm</th>
<th>Nasopharyngeal Airway Catheter Length cm</th>
<th>Nasopharyngeal Airway Catheter Length mm</th>
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</thead>
<tbody>
<tr>
<td>G26948</td>
<td>C-WEAD-100</td>
<td>9.0</td>
<td>6</td>
<td>9.5</td>
<td>7</td>
</tr>
</tbody>
</table>

Intended for one-time use.
• A comprehensive discussion of the basic approach to airway management.

• The volumes describe how to perform each technique in detail and offer solutions to clinical problems and emergencies.

ABOUT DR. PATIL

• Dr. Patil is the recipient of numerous awards for exhibits on airway management equipment, techniques and teaching models at national and international conferences.

ORDERING INFORMATION

• To order this book, please contact your local sales representative.
Management of the Difficult Airway
CD-ROM
CC-BD-DACD-EN-200807

Melker Emergency Cricothyrotomy Catheter
CD-ROM
CC-BD-TCCS-ML-0708

Instructional Multimedia Presentation
Aintree Intubation Catheter

DVD
CC-BD-AIC-ML-EN-200806

Frova Intubating Introducers

CD-ROM
CD-C-FROVA-0604-033-02EN