**Difficult Airways**

**Airway Grading and the Endotracheal Tube Introducer**

Use the navigation buttons to move through the program.

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**Determining a Difficult Airway**

**Step 1** Obtaining the patient’s history

Certain conditions in and of themselves can lead to difficulty when trying to obtain an airway. These conditions must be taken into consideration to determine the equipment and technique to be used for obtaining endotracheal intubation.

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**Step 1** Obtaining the patient’s history

**Pierre-Robin Syndrome**

characterized by micrognathia (small lower jaw), cleft palate, and mandible. The tongue tends to fall back and downwards. Feeding and breathing difficulties are often present in varying degrees of severity.

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**Step 1** Obtaining the patient’s history

**Treacher-Collins Syndrome**

characterized by hypoplasia of the facial bones, especially the zygoma and the mandible. Facial clefting causes a hypoplastic appearance, with possible deformities or deficiencies of the ear, orbit, midface, and lower jaw regions. The clinical appearance is a result of the zygoma (maxar bone) failing to fuse with the maxilla, frontal, and temporal bones.

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**Downs Syndrome**

Down syndrome is the most common and best-known chromosomal disorder in humans. Mental retardation, dysmorphic facial features, and other distinctive traits characterize the syndrome.

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**Step 1** Obtaining the patient’s history

**Gallstone**

Enlargement of the thyroid gland caused by inadequate thyroid hormone production, insufficient iodine in the diet or can be goitrous. Gallstone can lead to compression of the trachea and denudation of the larynx/trachea.

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**Step 1** Obtaining the patient’s history

**Croup**

Croup is a generic term that encompasses a heterogeneous group of relatively acute conditions (mostly infectious) that are characterized by a syndrome of distinctive brassy cough and laryngeal edema.

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**Step 1** Obtaining the patient’s history

**Abcess**

Pus surrounding an area of infection. May extend to directly involve the soft palate, the lateral wall of the pharynx, and, occasionally, the base of the tongue leading to airway compromise.

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**Step 1** Obtaining the patient’s history

**Rheumatoid Arthritis**

Rheumatoid arthritis is an autoimmune disease that causes chronic inflammation of the joints causing decreased mobility. Reduction of mobility in the TMJ can cause a difficult intubation scenario.
Obtaining the patient’s history

**Ankylosing Spondylitis**
A form of chronic inflammation of the spine (including the cervical spine). This lack of mobility to the c-spine can lead to difficult intubation.

**Facial / Cervical Injury**
Instability of the facial bones, cervical spine, the maxilla and mandible can lead to difficulty accessing the airway to place an endotracheal tube. Localized swelling in the area can also complicate matters.

**Determining a Difficult Airway**

**Step 2**
Tests for assessment of the airway

Two methods are recommended pre-hospital to evaluate the difficulty of the airway. The Mallampatti test determines the relative size of the tongue to the pharynx and the Cormack and Lehane test measures the size of the glottic opening using direct laryngoscopy.

These tests can predict the difficulty of the intubation and the results should be documented following intubation.

**Mallampatti**
The ideal way to perform the mallampatti test is with the patient in the seated position with their head in a neutral position, but can be adapted to patients in other positions. The tongue is then protruded to the maximum.

Classifications are assigned according to the extent that the base of the tongue is able to mask the visibility of pharyngeal structures.
**Step 2**  
Tests for assessment of the airway

**Mallampatti**  
Class III

Visualization of the soft palate and base of the uvula

**Class IV**

Only the hard palate is visible. The soft palate is not visible at all

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**Epiglottis**  
Vocal cords

**Cormack and Lehane**

**Grade I**

Visualization of entire laryngeal aperture.

**Grade II**

Visualization of only posterior commissure of laryngeal aperture.

The Cormack and Lehane test is performed during direct laryngoscopy and one of four grades is assigned to the airway based on what is viewed.

If the base of the tongue is proportional to the oropharynx, the exposure of the glottic opening will not be difficult.

A proportionally larger base of the tongue will overshadow the larynx and make intubation more difficult.

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Vocal cords

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**Epiglottis**  
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**Cormack and Lehane**

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Visualization of only posterior commissure of laryngeal aperture.
Tests for assessment of the airway

Cormack and Lehane 

Grade III 

Visualization of only epiglottis 

Grade IV 

Visualization of just the soft palate 

Grade III and IV predict difficult intubation 

For that difficult airway......

The Bougie!

The device is 70 cm in length and designed to be used in lieu of a traditional stylette. 
There are graduations along the side of the bougie to indicate total depth. 
It is flexible, just like a stylette and can be conformed to the shape of the patient's airway. 
Can be used for endotracheal tubes 6.0mm and higher. 
The Coude tip is designed to be easily inserted into the trachea. 

It is a one time use item 

Indications

Predicted difficult airways using the airway grading tests 

When the laryngeal opening is not fully visible 

To control the direction of the endotracheal tube during insertion 

Precautions

Soft tissue damage or bronchial rupture due to: 

Blind intubation 

Positioning past the carina 

Undue pressure is exerted 

Endotracheal tube is threaded over the introducer without using a laryngoscope. 

Technique

The introducer may be lubricated with sterile water or KY jelly prior to insertion. 

Place the introducer into the endotracheal tube just as you would with a stylette. The introducers Coude tip should extend past the end of the tube.
Perform direct laryngoscopy and visualize the tip of the epiglottis at a minimum

Advance the tip of the bougie past the glottic opening

To confirm that the bougie is in the trachea:
You will feel tracheal clicking as the coude tip passes over the cartilaginous rings
You will feel resistance as the tube is advanced and then “held-up” when it meets the tracheal ring
Without these signs there should be a strong index of suspicion that there is an esophageal placement

Advance the bougie to approximately 25cm of depth so that the distal end rests 2-3 cm beyond the glottic opening.

With laryngoscopy being maintained, advance the endotracheal tube while securing the bougie device. (This is best achieved with two practitioners)

Once the tube passes the teeth rotate the endotracheal tube ¼ turn to the left to prevent the bevel from causing trauma to the arytenoid cartilage

Advance the endotracheal tube to the proper depth

Hold the tube securely and remove the bougie

Confirm the tube placement:
Capnography
End-tidal CO2 detectors (colormetric)
Esophageal detection devices
Chest / epigastric auscultation

References