



# Airway Management

As with all acutely unwell patients, your approach to a patient with a potential airway issue should be an ABCDE approach, also known as a primary survey;

- A** – airway and protection of spinal cord
- B** – breathing and ventilation
- C** – Circulation
- D** – Disability
- E** – Exposure and control of the environment

The importance of airway assessment to a critically unwell patient is stressed by it being the first step of the ATLS algorithm. A patient with airway compromise can rapidly lose consciousness and in complete airway obstruction severe hypoxic brain injury and death can occur in as little as 6 minutes. It is therefore essential that you have a good understanding of recognising and managing airway compromise.

## Causes of airway obstruction

The table below shows a table of modes of airway compromise and examples of each.

Mode of obstruction	Example
Intraluminal object	Blood, vomit, foreign body, secretions, intraluminal tumours
Central drive	Head injury (reduced conscious level) Drugs (benzodiazepine, opiates, alcohol) Raised intracranial pressure
External compression	Haematoma, tumour or goitre
Direct trauma	Blunt trauma larynx Burns, smoke inhalation
Artificial airways	Blockage or displacement of tracheostomy

## Signs & Symptoms of airway compromise

- Snoring
- Stridor (caused by obstruction at or above the laryngeal level)
- Expiratory wheeze (obstruction below the larynx)
- Gurgling (vomit, blood or secretions in the airway)
- Reduced conscious level
- Use of accessory muscles e.g. tracheal tug, paradoxical chest and abdominal movement ('see-sawing'), with supraclavicular and intercostal in-drawing.
- Cyanosis (late sign)
- Low pulse oximetry readings (SpO<sub>2</sub>)

## Management

- When the airway compromise is suspected, it is important to call for help early → an anaesthetist or ENT surgeon will be very helpful in this situation
- Try to keep everyone calm - anxiety will only add to the patient's distress
- Intensive monitoring – get the patient to resus or an area where this can be conducted
- Consider the need for an airway adjunct whilst help is coming (see table 1 below)
- High flow oxygen, 15litres/minute via a non-rebreather mask
- A bag valve mask (BVM) should be used for patients who are not breathing or breathing inadequately
- The initial assessment of the airway is to talk to the patient. The talking patient provides some reassurance (at least for the moment) that the airway is patent and not compromised. An appropriate response shows an intact airway, ventilation is intact and brain perfusion is adequate. Failure to respond or inappropriate response suggests reduced conscious level and possible airway compromise → often here a definitive airway is required.
- If the patient is stridulous then administer Nebulised Adrenaline (1ml of 1:1000 adrenaline made up to 5ml with normal saline) PRN
- Take a brief history if possible, probably from friends or relatives
- Complete only a basic ENT examination, wait for senior review of the airway (keep patient in resus!). Do not examine a child's mouth by putting a tongue depressor into it!
- Secure good IV access if it is safe to do so (children may find this distressing)
- Consider medication such as high dose steroids. Nebulised budesonide for children or 8mg IV Dexamethasone for adults
- If able then adult patients should undergo [fiberoptic nasoendoscopy](#) to visualise the airway and further management will depend on the underlying pathology
- Children will not usually have this
- In cases of deterioration intubation will be attempted and if this fails emergency airway access by cricothyrotomy or tracheostomy

A non-rebreather mask



Bag valve mask (BVM)



## Surgical airway

In a “can’t intubate can’t ventilate” situation a surgical airway may be required. It is important here to understand two very distinct terms tracheostomy and cricothyroidotomy.

**Tracheostomy** is an operative procedure that creates a surgical airway in the cervical trachea. This procedure is usually conducted with a fully anaesthetised patient in an operation theatre. This can bypass an upper airway obstruction with a temporary or permanent intubation. A hole is cut around the 2<sup>nd</sup> and 3<sup>rd</sup> tracheal ring. The thyroid isthmus is first divided. A tracheostomy is contraindicated in an emergency, as it is time consuming, hazardous and requires considerable surgical skill and equipment.

**Cricothyroidotomy** also known as a cricothyrotomy is an emergency lifesaving procedure used to obtain an airway when other methods have failed. A scalpel blade is used to make a vertical incision into the cricothyroid membrane (between the thyroid and cricoid cartilage). The back of the scalpel blade is then inserted into the trachea and rotated. An airway is then inserted through this incision. This can be a tracheostomy tube, endotracheal tube or even a biro casing in the emergency setting. Alternatively, a large bore needle can be inserted into the membrane to perform a needle cricothyroidotomy. Use of a needle is a much more temporary procedure providing only short-term oxygenation. Needle cricothyroidotomy has a much higher failure rate (as high as 60%) and as such surgical cricothyroidotomy is first line in most countries.

A cricothyroidotomy provides a temporary emergency airway until either the obstruction can be removed or to buy time until semi-elective intubation or tracheostomy is performed

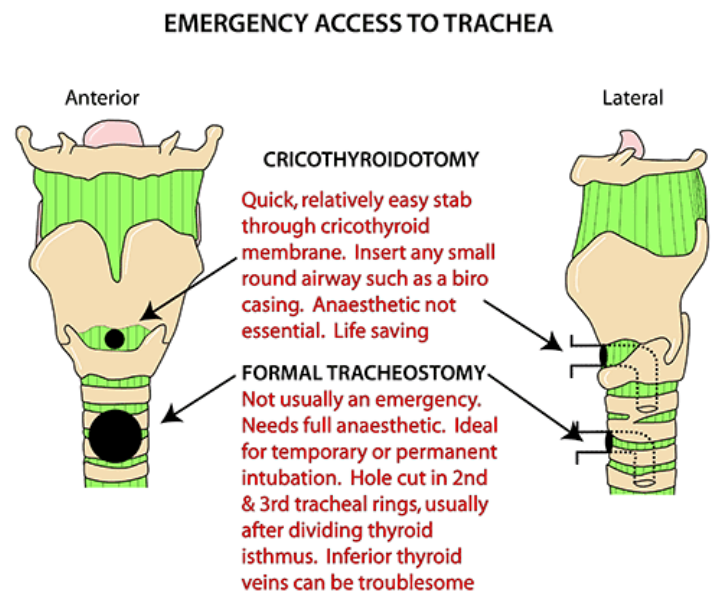



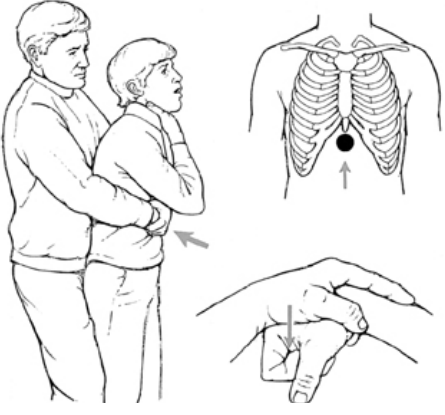


Table 1 - Airway adjuncts / manoeuvres

Airway adjunct	Explanation	Image
Head tilt chin-lift	<p>Gently extends the head into the “sniffing position”. Should only be used when no cervical spine injury is suspected.</p> <p>For an example of the maneuverer please see;  <a href="https://www.youtube.com/watch?v=kxfY-f7EV8M">https://www.youtube.com/watch?v=kxfY-f7EV8M</a></p>	 <p>A line drawing showing a person's head being tilted back and the chin being lifted upwards by a hand, illustrating the head tilt chin-lift maneuver.</p>
Oropharyngeal airway (OPA) / guedel airways	<p>OPA come in a variety of sizes. Sized from corner of the mouth to earlobe. OPA inserted over the tongue. Only a patient with impaired conscious level will tolerate a guedel. If the patient spits this out that’s a good sign they don’t need it.</p> <p>For an example of an OPA being inserted please visit;  <a href="https://www.youtube.com/watch?v=vgqOrmBskaw">https://www.youtube.com/watch?v=vgqOrmBskaw</a></p>	 <p>A photograph showing several oropharyngeal airways (OPAs) of different sizes and colors (green, orange, red, purple) arranged in a row.</p>
Jaw thrust	<p>Mandible is pushed forward with the index fingers. Pulls the tongue forward and prevents it from obstructing the airway. Used when cervical spine injury suspected.</p> <p>For an example of the procedure please visit;  <a href="https://www.youtube.com/watch?v=dN6K62yK0Gw">https://www.youtube.com/watch?v=dN6K62yK0Gw</a></p>	 <p>A line drawing showing a person's head and neck. Two hands are shown pushing the lower jaw forward, with arrows indicating the direction of the force.</p>
Abdominal thrusts / Heimlich manoeuvre	<p>The Heimlich manoeuvre is used as a last non invasive resort in basic first aid in which a foreign body in the airway is suspected.</p> <p>In a patient in the standing position yourself behind the person and reach your arms around his or her waist. Place your fist, thumb side in the position shown opposite. Grasp the fist tightly with the other hand. Make quick, upward and inward thrusts with your fist.</p> <p>For an online example of this please visit  <a href="https://www.youtube.com/watch?v=7CqtlgSyAiU&amp;t=18s">https://www.youtube.com/watch?v=7CqtlgSyAiU&amp;t=18s</a></p>	 <p>A composite image showing the Heimlich manoeuvre. On the left, a person stands behind another person, reaching around their waist. On the right, a diagram of a human torso shows the location of the epigastrium (upper abdomen) with an arrow pointing to it. Below that, a close-up shows a hand forming a fist with the thumb side facing inward.</p>