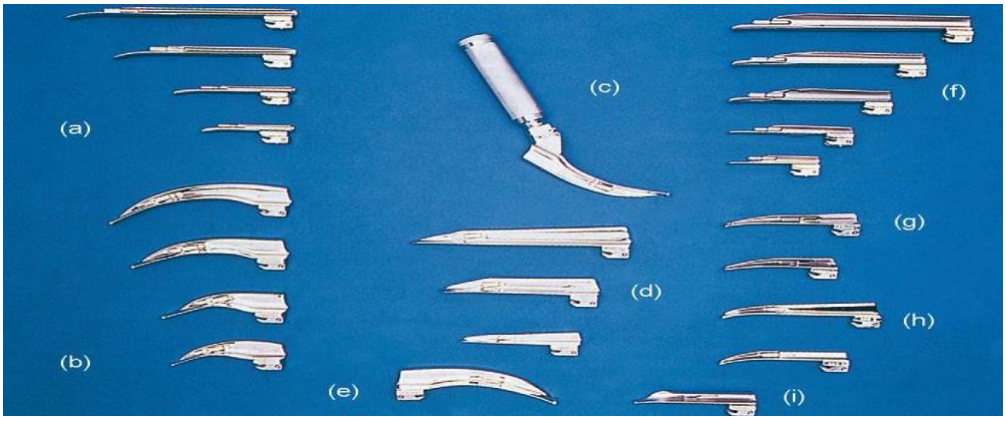
"*Laryngoscopes* and *intubation aids*"

Laryngoscopes

These devices are used to perform direct laryngoscopy and to aid in tracheal intubation.

Components

1. The handle houses the power source (batteries) and is designed in different sizes.
2. The blade is fitted to the handle and can be either curved or straight. There is a wide range of designs for both curved and straight blades. And a light source.



A wide range of laryngoscope blades.
(A) Miller blades (large, adult, infant, premature).
(B) Macintosh blades (large, adult, child, baby).
(C) Macintosh polio blade.
(D) Soper blades (adult, child, baby).
(E) left-handed Macintosh blade.
(F) Wisconsin blades (large, adult, child, baby, neonate).
(G) Robertshaw's blades (infant, neonatal).
(H) Seward blades (child, baby). (I) Oxford infant blade

Mechanism of action

1. Usually the straight blade (**Miller blade**) is used for intubating neonates and infants. The blade is advanced over the posterior border of the relatively large, floppy V-shaped epiglottis which is then lifted directly in order to view the larynx. There are larger size straight blades that can be used in adults.
2. The curved blade (**Macintosh blade**) is designed to fit into the oral and oropharyngeal cavity. It is inserted through the right angle of the mouth and advanced gradually, pushing the tongue to the left and away from the view until the tip of the blade reaches the vallecula. The laryngoscope is lifted upwards elevating the larynx and allowing the vocal cords to be seen. The Macintosh blade is made in four sizes.
3. In the standard designs, the light source is a bulb screwed on to the blade and an electrical connection is made when the blade is opened ready for use. In more recent designs, the bulb is placed in the handle and the light is transmitted to the tip of the blade by means of fiberoptic.
4. A left-sided Macintosh blade is available. It is used in patients with right-sided facial deformities making the use of the right-sided blade difficult.
5. The (**McCoy laryngoscope)** is based on the standard Macintosh blade. It has a hinged tip which is operated by the lever mechanism present on the back of the handle. It is suited for both routine use and in cases of difficult intubation.



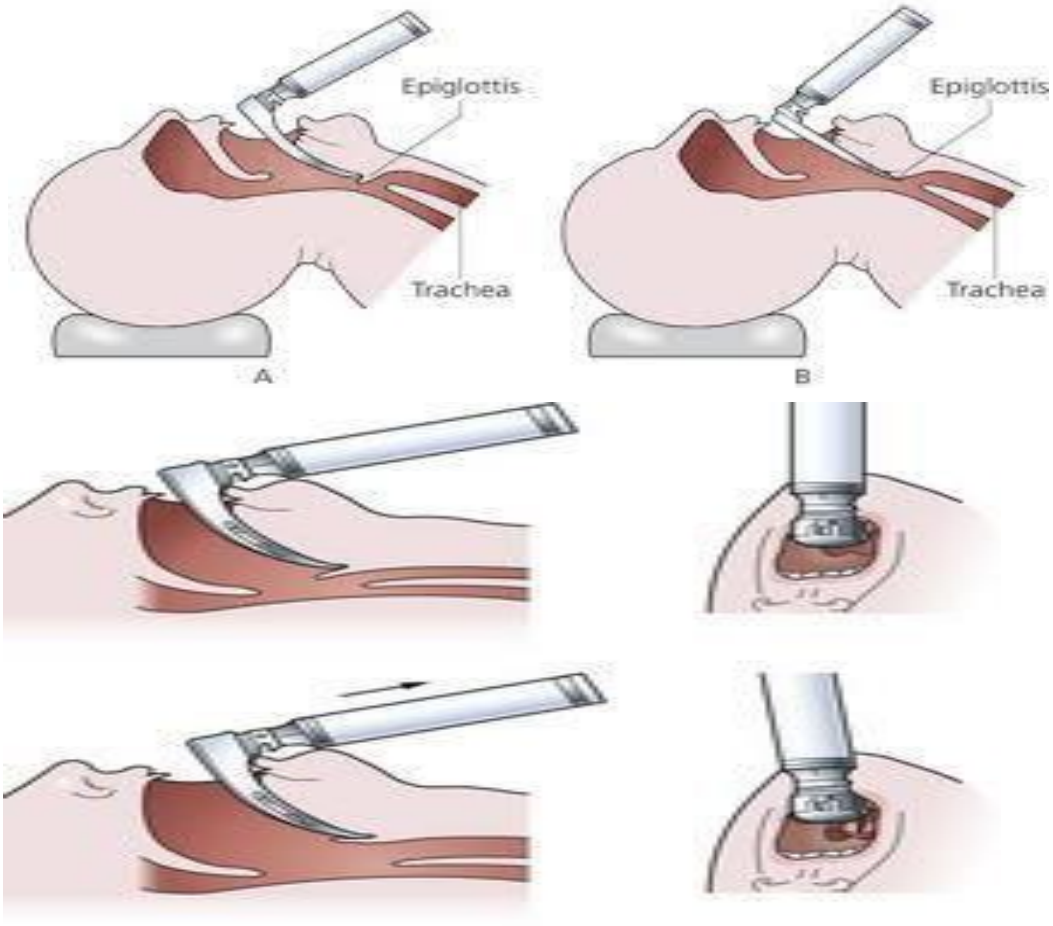
Standard disposable laryngoscope blade (top) with the light bulb mounted on the blade; fibreoptic disposable laryngoscope blade (bottom).

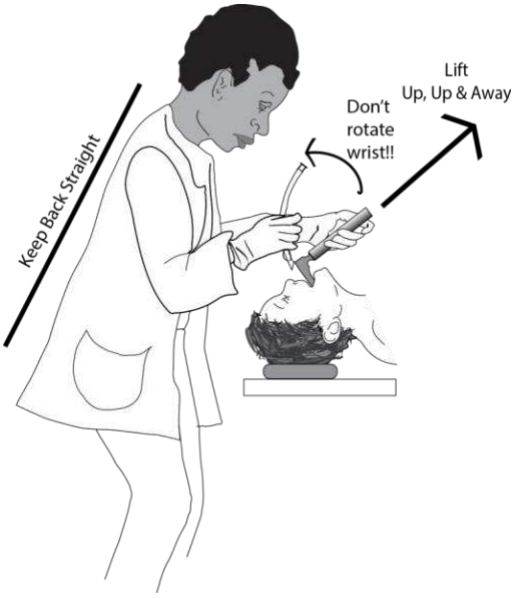


The McCoy laryngoscope, based on a standard Macintosh blade.



Demonstrating the McCoy laryngoscope's hinged blade tip.





Problems in practice and safety features

1. The risk of trauma and bruising to the different structures is higher with the straight blade.
2. It is of vital importance to check the function of the laryngoscope before anesthesia has commenced.
3. Patients with large amounts of breast tissue present difficulty during intubation. Insertion of the blade into the mouth is restricted by the breast tissue impinging on the handle. To overcome this problem, specially designed blades are used such as the (***polio blade)***. The polio blade is at about 120° to the handle allowing laryngoscopy without restriction. The polio blade was first designed to intubate patients ventilated in the iron lung during the poliomyelitis epidemic in the 1950s. A Macintosh laryngoscope blade attached to a short handle can also be useful in this situation.
4. To prevent cross-infection between patients, a disposable blade is used. A PVC sheath can also be put on the blade of the laryngoscope. The sheath has low light impedance allowing good visibility.
5. Laryngoscope handles must be decontaminated between patients to prevent cross-infection.

Fiberoptic intubating laryngoscope

These devices have revolutionized airway management in anesthesia and intensive care. The insertion cord consists of glass fibers arranged in bundles. Light is transmitted through the glass fibers. Damage to the fibers causes loss of image. The insertion cords vary in length and diameter. The latter determines the size of the tracheal tube that can be used. Smaller scopes are available for intubating children. The outer diameter ranges from 1.8 to 6.4 mm allowing the use of tracheal tubes of 3.0–7.0-mm internal diameter.

Uses:-

1- They are used to perform oral or nasal tracheal intubation.

2- to evaluate the airway in trauma, tumour, infection and inhalational injury.

3- to confirm tube placement (tracheal, endobronchial, double lumen or tracheostomy tubes).

4- to perform tracheobronchial toilet.



Video laryngoscopes

These video laryngoscopes, offering indirect laryngoscopy, combine features of both the flexible fiberoptic scopes and the standard rigid laryngoscopes. The images are transmitted using fiberoptic or lenses and prisms with the light pathways encased in a rigid device. The cameras used offer wide views so allowing the user to see around corners, similar to the fiberoptic scopes. video laryngoscopes improve the view of the glottis, as the camera eye is only centimeters away from the glottis. Some designs use direct viewing through an eyepiece or an attached or remote screen. Their use requires minimal neck movement and can make laryngoscopy and hopefully successful tracheal intubation easier.



Magill forceps

These forceps are designed for ease of use within the mouth and oropharynx. Magill forceps come in small or large sizes. During tracheal intubation, they can be used to direct the tracheal tube towards the larynx and vocal cords. Care should be taken to protect the tracheal tube cuff from being damaged by the forceps. Other uses include the insertion and removal of throat packs and removal of foreign bodies in the oropharynx and larynx.



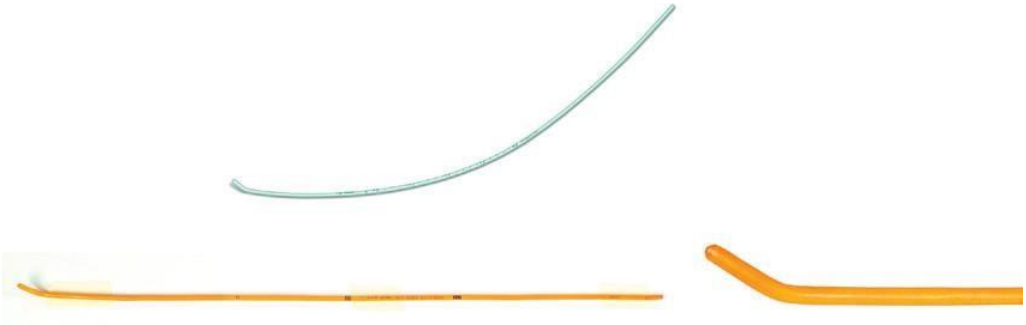
An introducer or stylet

An introducer or stylet is used to adjust the curvature of a tracheal tube to help direct it through the vocal cords.



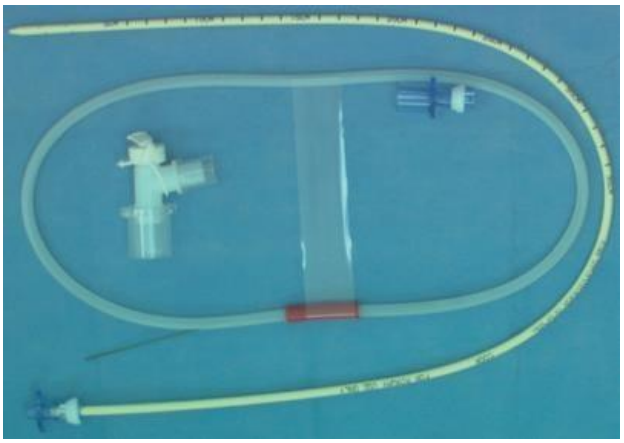
bougie

A gum elastic bougie is used when it is difficult to visualize the vocal cords. First, the bougie is inserted through the vocal cords, then the tracheal tube is railroaded over it. Single use intubating bougies are available.



airway exchange catheter

The airway exchange catheter (AEC) allows the exchange of tracheal tubes. It is a long hollow tube that can be inserted through a tracheal tube. This can then be withdrawn and another tracheal tube is inserted over it. Specially designed detachable 15-mm male taper fit and LuerLok connectors can be used to provide temporary oxygenation.



Retrograde intubation set

This set is used to assist in placement of a tracheal tube when a difficult intubation is encountered. The introducer needle is inserted through the cricothyroid. The guidewire is advanced in a cephalic direction. Pneumothorax and hemorrhage are potential complications.

