



SNS COLLEGE OF ALLIED HEALTH SCIENCES
SNS Kalvi Nagar, Coimbatore - 35
Affiliated to Dr MGR Medical University, Chennai



DEPARTMENT OF CARDIOPULMONARY PERFUSION CARE TECHNOLOGY

COURSE NAME : INTRODUCTION TO SURGERY AND CSSD

3RD YEAR

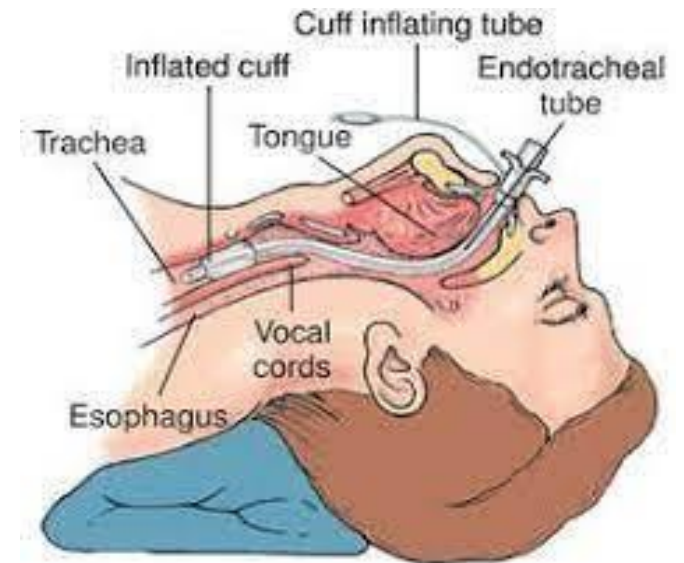
TOPIC : ENDOTRACHEAL INTUBATION



ENDOTRACHEAL INTUBATION

DEFINITION

- Endotracheal intubation is the placement of a flexible plastic tube into the trachea to maintain an open airway or to serve as a conduit through which to administer certain drugs.
- The endotracheal tube is then connected to a ventilator, which delivers oxygen to the lungs. **The process of inserting the tube is called endotracheal intubation.**



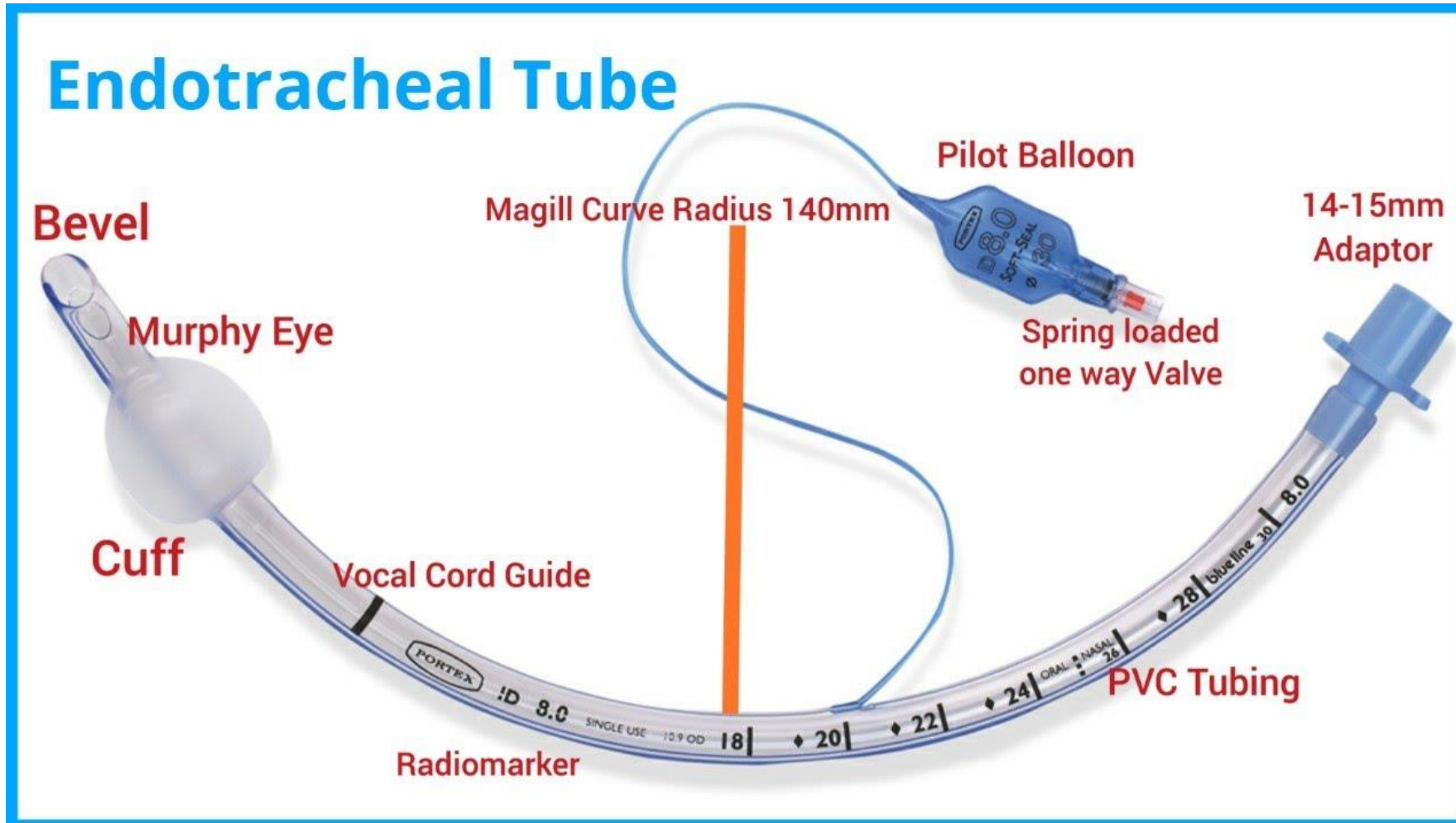


Types of ET Tube



- Oral or nasal
- Cuffed or uncuffed
- Preformed reinforced tubes
- Double-lumen endobronchial tubes.

Parts of ET Tube





- **The Cuff**

This prevents gastric contents from entering the trachea and facilitates the execution of positive pressure ventilation. The cuff inflates by attaching an appropriate size syringe (10 to 20 ml for adult ETT) to the pilot balloon.

- **The Bevel**

To facilitate placement through the vocal cords and to provide improved visualization ahead of the tip, the ETT has an angle or slant known as a bevel.



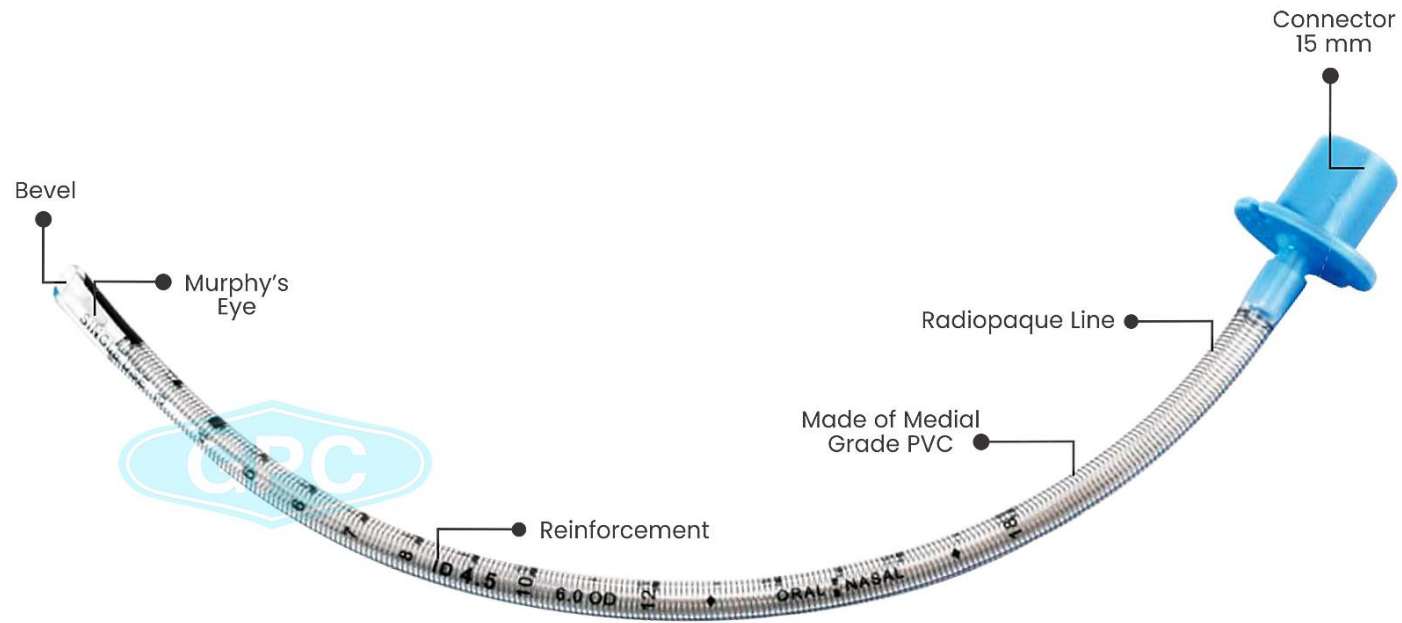
- **The Murphy's Eye**

If the distal end of the ETT should become obstructed by the wall of the trachea or by touching the carina, gas flow can still occur via Murphy's eye, This prevents complete obstruction of the tube.

- **The Connector**

ETT connectors attach the ETT to the mechanical ventilator tubing or an Ambu bag. For adult and pediatric ETTs, it is customary to use the universal 15 mm connector.

Uncuffed ET Tube





Types of ET Tubes

- **Non cuffed**
 - In the pediatric population, the cricoid ring is sufficiently narrow to form a seal all by itself
 - cricoid ring is ellipsoid rather than circular
- **Cuffed**
 - In the adults, the trachea is considerably wider
 - The cuff helps to
 - **seal the trachea, so that positive pressure cannot escape from the lower airway**
 - **seal the upper airway, so that material above the glottis cannot enter the trachea**



SIZE OF ET TUBE



- The size of an ETT signifies the inner diameter of its lumen in millimeters. Available sizes range from 2.0 to 12.0 mm in 0.5 mm increments.
- For oral intubations, a 7.0-7.5 ETT is generally appropriate for an average woman and a 7.5-8.5 ETT for an average man.
- The appropriate tube size is a multifactorial clinical decision based on patient height and weight, type of procedure or surgery, and the presence of pulmonary or airway disease.

SIZE OF ET TUBE (Paediatric)



Size $\frac{\text{Age}}{4} + 4$

Minus ½ Size for Cuffed Tube!

Depth $3 \times \text{Size ETT}$



Purpose



Intubation is necessary when your airway is blocked or damaged or you can't breathe spontaneously. Some common conditions that can lead to intubation include:

- Airway obstruction (something caught in the airway, blocking the flow of air).
- Cardiac arrest (sudden loss of heart function).
- Injury or trauma to your neck, abdomen or chest that affects the airway.
- Loss of consciousness or a low level of consciousness, which can make a person lose control of the airway.
- Need for surgery that will make you unable to breathe on your own.
- Respiratory (breathing) failure or apnea (a temporary stop in breathing).
- Risk for aspiration (breathing in an object or substance such as food, vomit or blood).



Procedure



During the procedure, healthcare providers will:

- Insert an IV needle into your arm.
- Deliver medications through the IV to put you to sleep and prevent pain during the procedure (anesthesia).
- Place an oxygen mask over your nose and mouth to give your body a little extra oxygen.
- Remove the mask.
- Tilt your head back and insert a laryngoscope into your mouth (or sometimes your nose when necessary). The tool has a handle, lights and a dull blade, which help the healthcare provider guide the tracheal tube.
- Move the tool toward the back of your mouth, avoiding your teeth.



- Raise the epiglottis, a flap of tissue that hangs in the back of the mouth to protect your larynx (voice box).
- Advance the tip of the laryngoscope into your larynx and then into your trachea.
- Inflate a small balloon around the endotracheal tube to make sure it stays in place in the trachea and all air given through the tube reaches the lungs.
- Remove the laryngoscope.
- Place tape on the side of your mouth or a strap around your head to keep the tracheal tube in place.
- Test to make sure the tube is in the right place. This can be done by taking an X-ray or by squeezing air through a bag into the tube and listening for breath sounds.



Indication



- To secure airway
- To supply oxygen
- General anesthesia : With general anesthesia, the muscles of the body including the diaphragm are paralyzed, and placing an endotracheal tube allows the ventilator to do the work of breathing.
- Cardiopulmonary resuscitation
- Ventilatory therapy ICU



RISKS



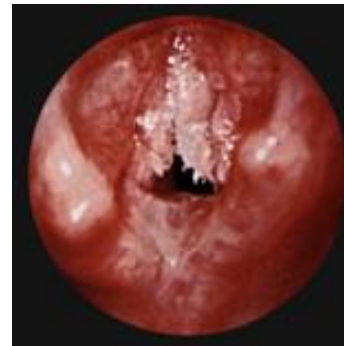
- **Aspiration:** When a person is intubated, they may inhale vomit, blood or other fluids.
- **Endobronchial intubation:** The tracheal tube may go down one of two bronchi, a pair of tubes that connect your trachea to your lung. This is also called mainstem intubation.
- **Esophageal intubation:** If the tube enters your esophagus (food tube) instead of your trachea, it can result in brain damage or even death if not recognized soon enough.
- **Failure to secure the airway:** When intubation doesn't work, healthcare providers may not be able to treat the person.
- **Infections:** People who've been intubated may develop infections, such as sinus infections.
- **Injury:** The procedure can potentially injure your mouth, teeth, tongue, vocal cords or airway. The injury may lead to bleeding or swelling.
- **Problems coming out of anesthesia:** Most people recover from anesthesia well, but some have trouble waking or have medical emergencies.
- **Tension pneumothorax:** When air gets trapped in your chest cavity, this can cause your lungs to collapse.

Condition that associated with difficult intubation

Congenital anomalies ---> Pierre Robin syndrome , Down's syndrome

Infection in airway--> Retropharyngeal abscess, Epiglottitis

Tumor in oral cavity or larynx



Pierre Robin Syndrome

High arched, cleft palate (roof of the mouth)

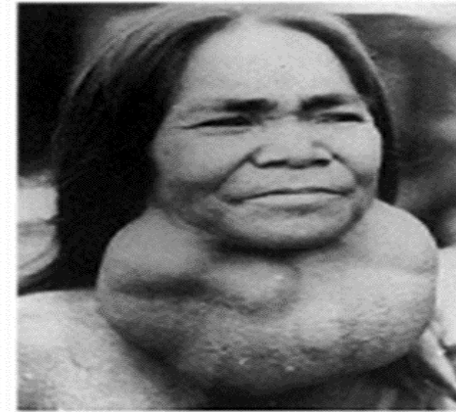
Large tongue obstructing the airway

Underdeveloped, small chin

----- Normal anatomy

Condition that associated with difficult intubation (con't)

- ❑ Enlarge thyroid gland
- ❑ Trachea shift to lateral or compressed tracheal lumen
- ❑ Maxillofacial, cervical or laryngeal trauma
- ❑ Temporomandibular joint dysfunction
- ❑ Burn scar at face and neck
- ❑ Morbidly obese or pregnancy



Airway Assessment

- **Interincisor gap : normal -> more than 3 cms**

The interincisor gap is the maximal distance between the upper and lower incisors.



Mallampati classification: Class 3,4 -> may be difficult intubation

The Mallampati Score



CLASS I
Complete
visualization of
the soft palate



CLASS II
Complete
visualization
of the uvula



CLASS III
Visualization
of only the
base of the uvula

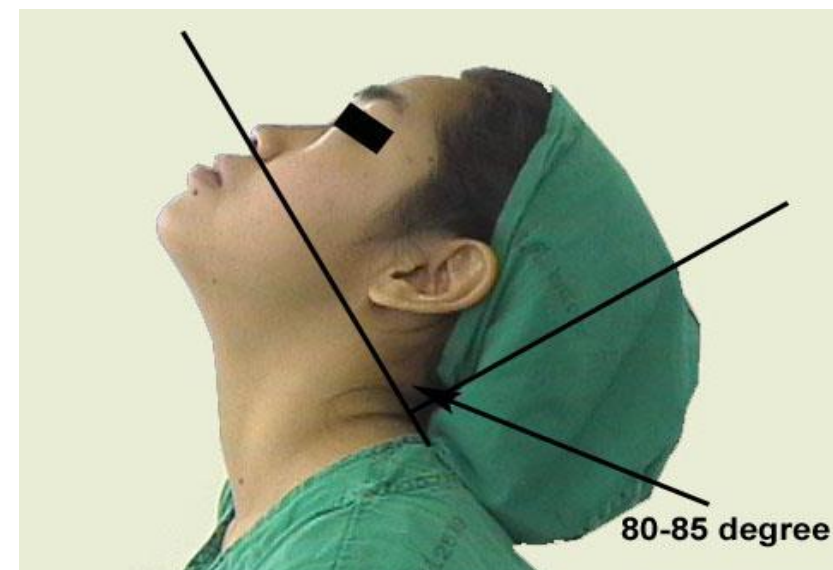
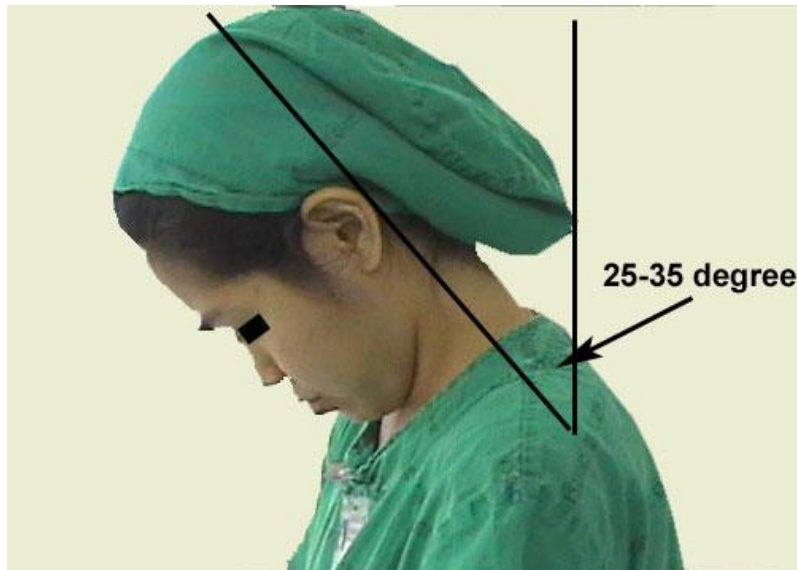


CLASS IV
Soft palate
is not
visible at all

- **Thyromental distance : more than 6 cms**



Flexion and extension of neck



Equipment's used for ETT Intubation

- ▶ size of tube

1) 0-1 yrs.	2.5 to 3.5 mm (plain)
2) 1-3 yrs.	4. to 5 mm
3) 4-6 yrs.	5 to 6 mm
4) 6-10 yrs.	6 to 7 mm (cuffed)
5) adult female.	7 to 8 mm
6) adult male.	8 to 9 mm



Laryngoscope



Magill's forceps (different sizes)

- ▶ laryngoscope
- ▶ magill's forceps
- ▶ Stethoscope
- ▶ syringe
- ▶ source for ventilation
- ▶ suction



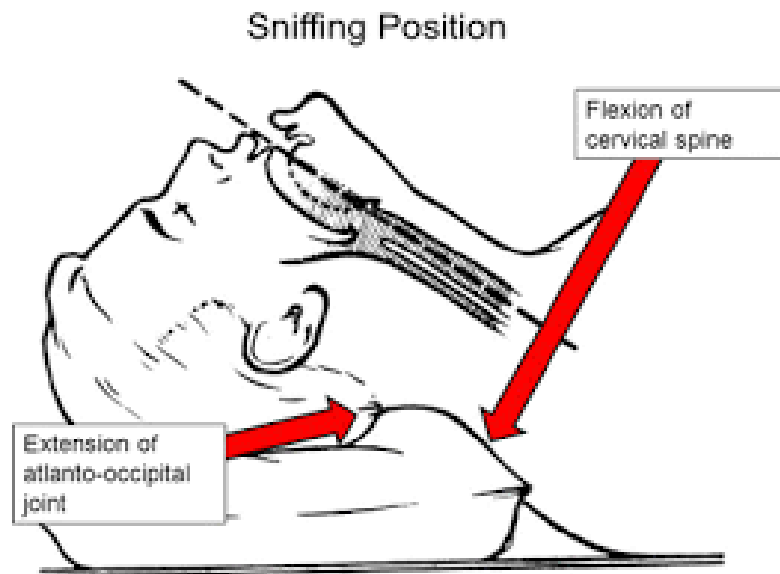
Syringe to inflate cuff



suction

Positioning of the Patient

The sniffing position, a combination of flexion of the neck and extension of the head, is considered to be suitable for the performance of endotracheal intubation.





Side effects of Intubation



- Tachycardia
- Rise in blood pressure
- Increase in secretions
- Laryngospasm
- Bronchospasm



Complications



- Tube in oesophagus
- Endobronchial intubation
- Trauma to lips to tooth
- Bleeding
- Leak
- Tracheitis
- Cough
- Sore throat
- Barotrauma to lungs



THANK YOU