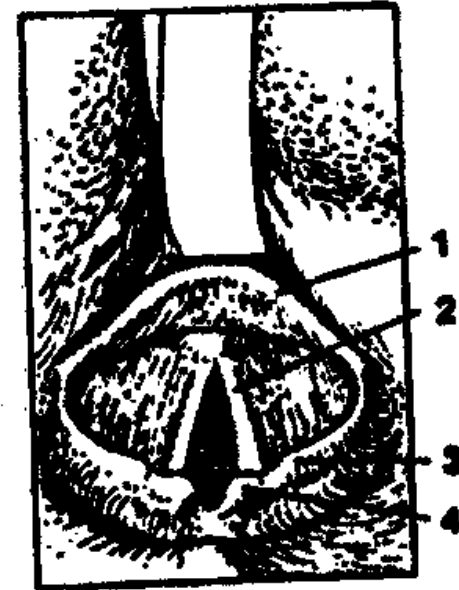
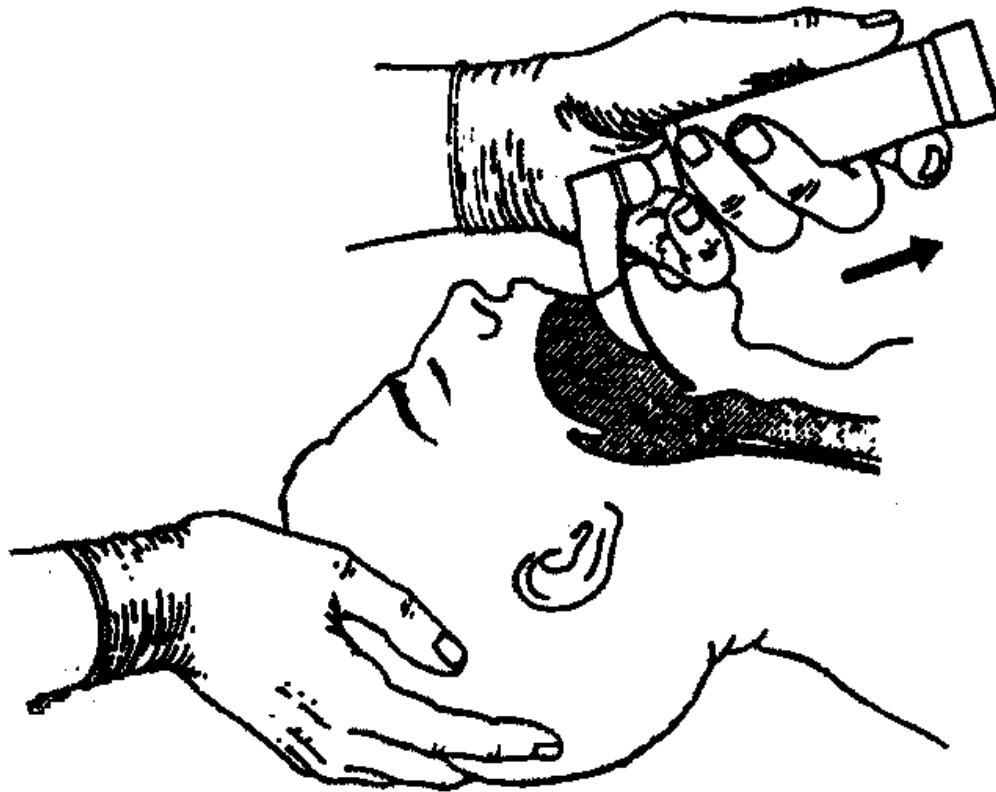


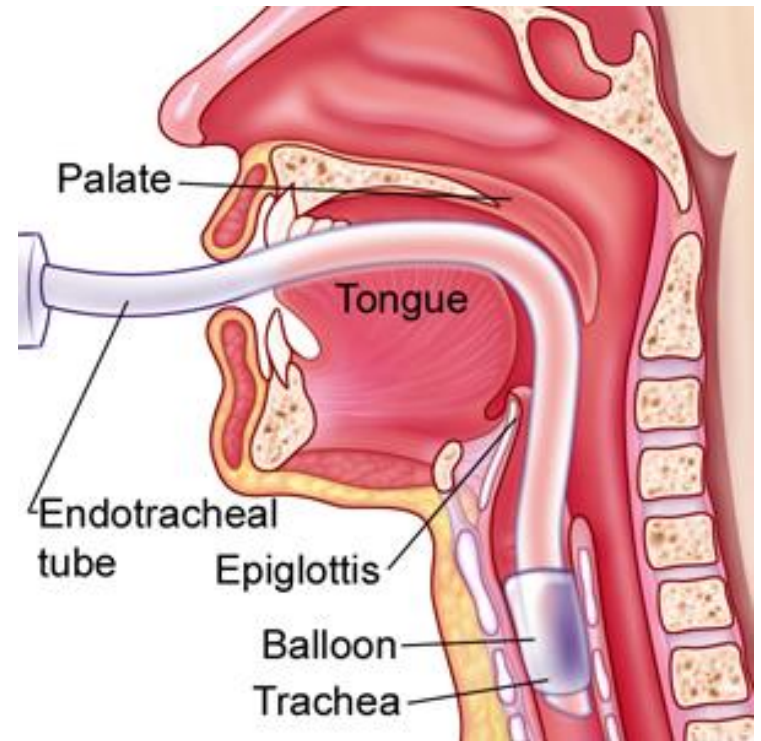
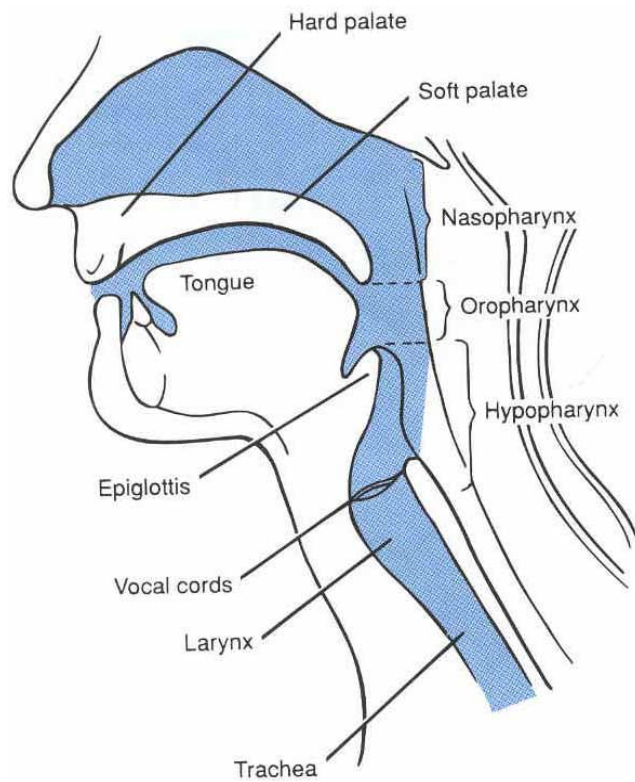
ENDOTRACHEAL INTUBATION

Prof BK PRADHAN,
Dr KHAGESWAR ROUT)



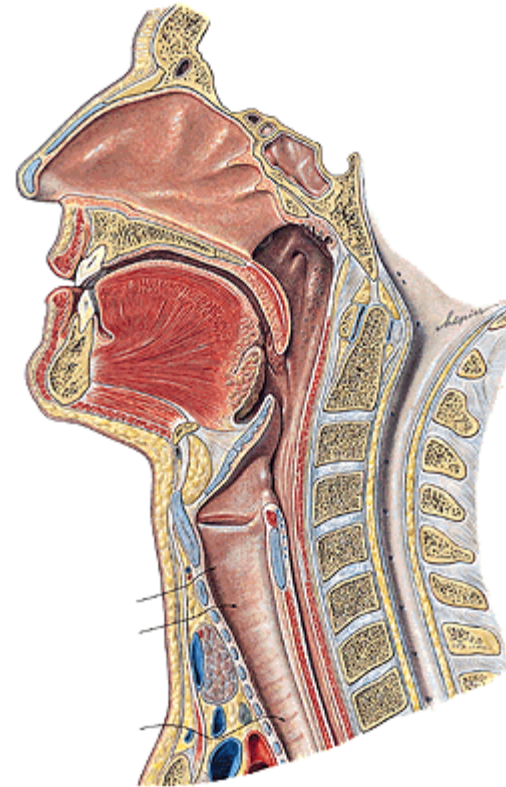
Endotracheal intubation is a procedure by which a tube is inserted into the trachea





Anatomy of airway

- ▶ Upper Airway
 - all structures located above the glottic opening
- ▶ Lower Airway
 - Below the Vocal Cords and into the lungs



ORAL CAVITY

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Soft palate ——— Hard palate

Tonsil ———

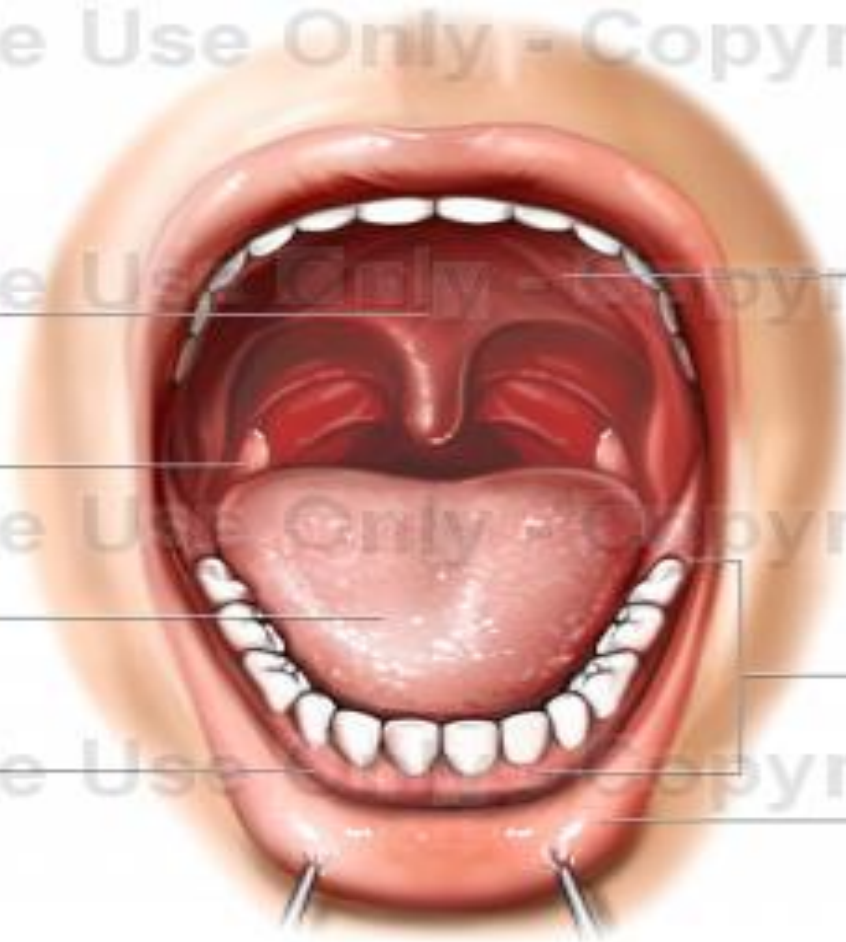
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Tongue ———

Teeth

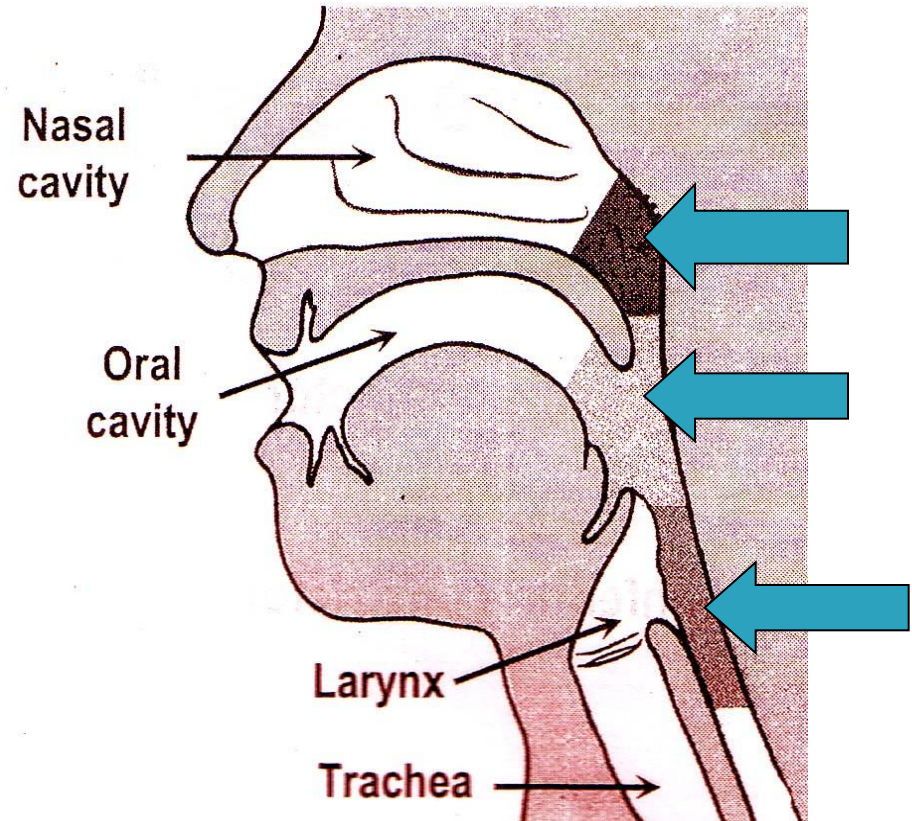
Gums ———

Lip



Anatomy of The pharynx

- ▶ **Nasopharynx**
- ▶ **Oropharynx**
- ▶ **Laryngopharynx**
(Hypopharynx)



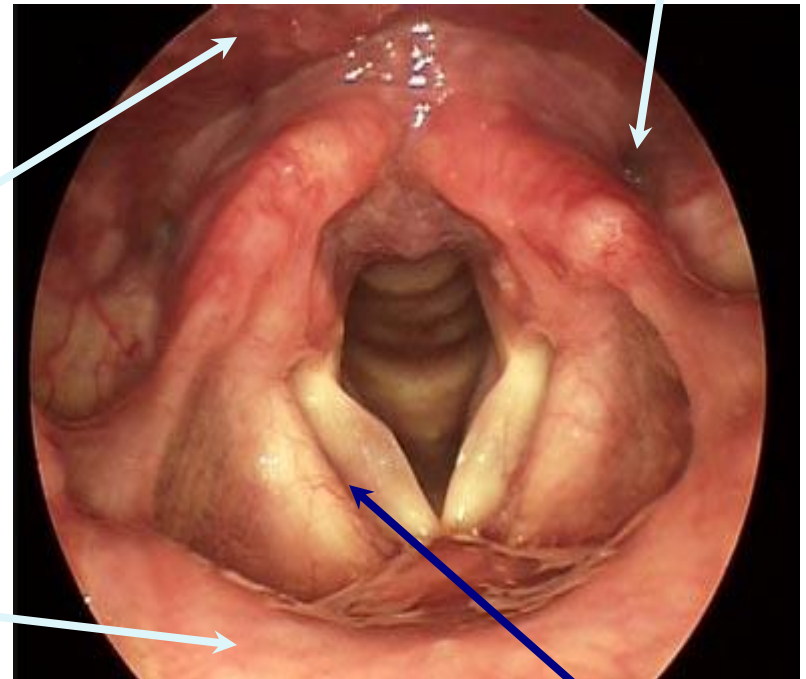
The Larynx

Superior surface anatomy:

Major Landmarks - II

Posterior Wall of
Hypopharynx
(Leading to
Esophagus)

Laryngeal
Surface of
Epiglottis

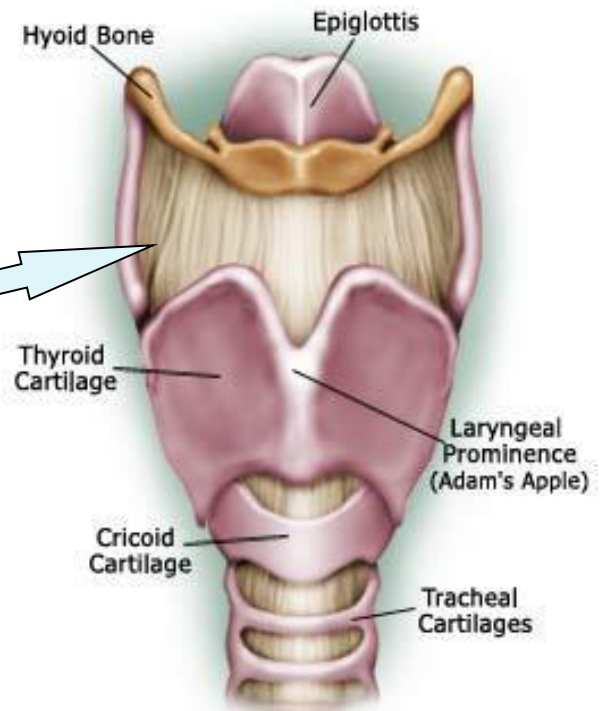


Pyriform
Sinus

Ventricle

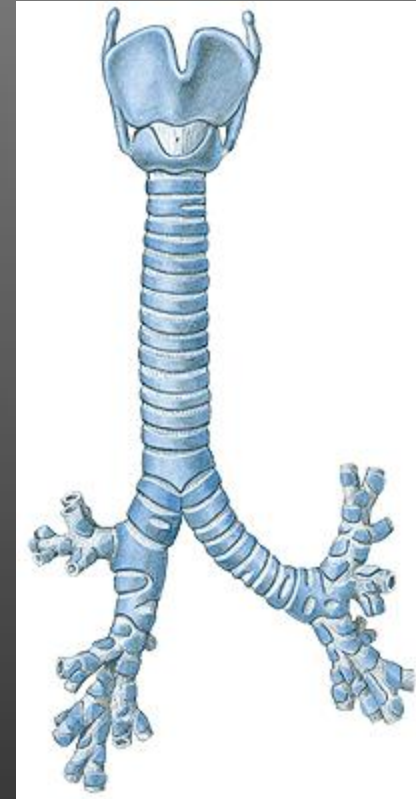
The Larynx: Anatomy

- ▶ The structural rigidity of the larynx is provided by the three median cartilages:
 - The epiglottis
 - Thyroid cartilage
 - Cricoid cartilage ,along with the hyoid bone.
- ▶ The thyrohyoid membrane forms a C-shaped barrier around the anterior and lateral walls of the supraglottis, and inferiorly becomes confluent with the connective tissue in the perichondrium of the tracheal cartilaginous rings.



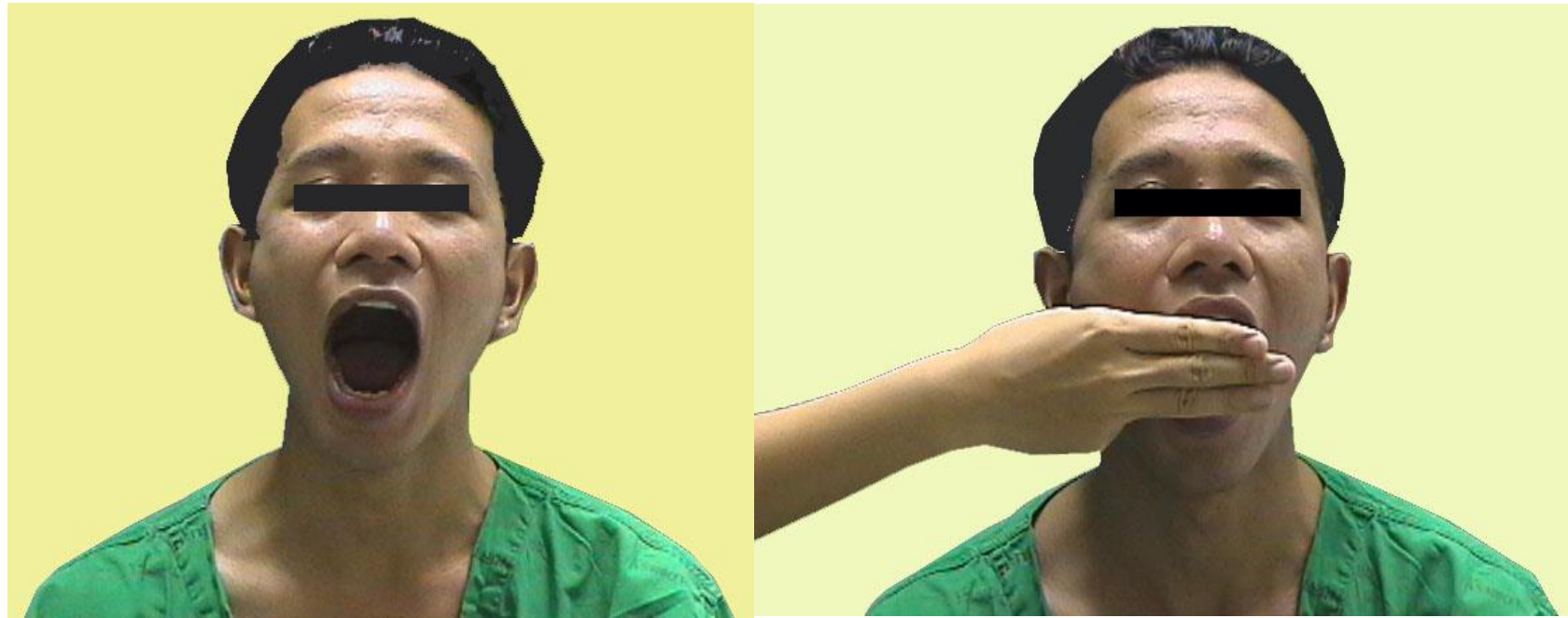
Anatomy of the trachea

- ▶ Length: 9–15 cm
- ▶ Outer diameter: 21–27 mm
- ▶ Internal diameter: 12–18 mm
- 18–22 cartilaginous rings
- Becomes intrathoracic at 6th cartilaginous ring
- Intrathoracic portion: 6–15 cm
- Cross-section area of women about 40% less than men.



AIRWAY ASSESSMENT

1) Interincisor gap



Inter-incisor distance



It is the distance between the upper and lower incisors.

Normal is 4.6 cm or more;

while < 3.8 cm predicts difficult airway.

2) Thyromental distance : more than 6 cms



Mandibular space

Thyromental (T-M) distance (Patil's test)

It is defined as the distance from the mentum to the thyroid notch while the patient's neck is fully extended.

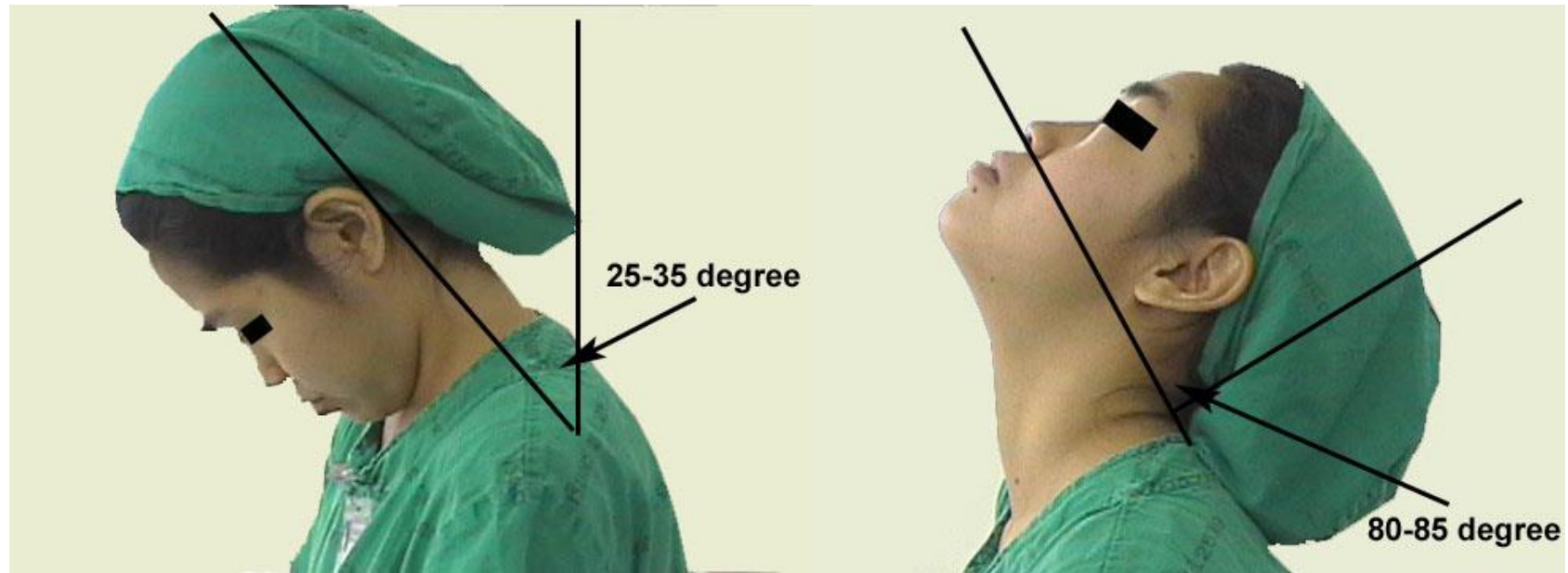
Helps in determining how readily

the laryngeal axis will fall in line with the pharyngeal axis when the atlanto-occipital joint is extended.

- ▶ Alignment of these two axes is difficult if the T-M distance is < 3 finger breadths or < 6 cm in adults;
- ▶ 6-6.5 cm is less difficult,
- ▶ > 6.5 cm is normal

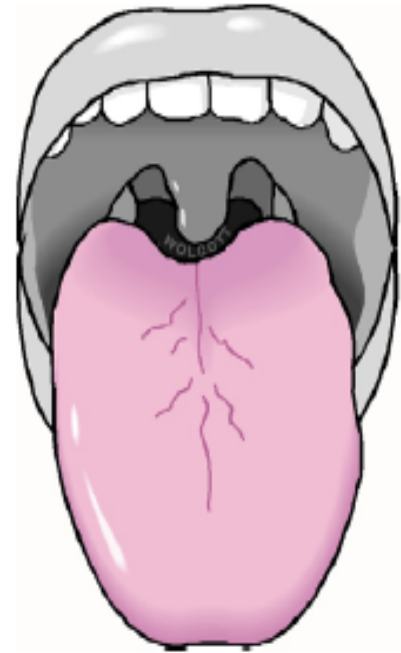


3) Flexion and extension of neck



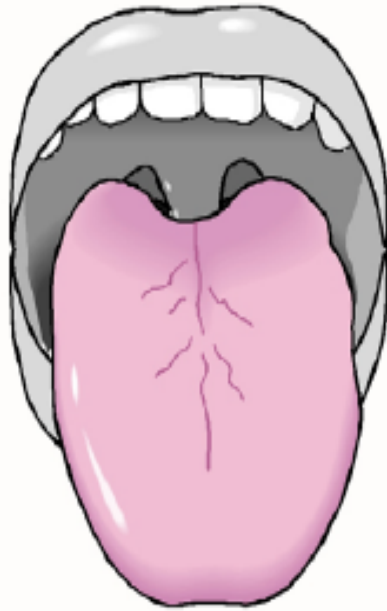
5)

Mallampati Scoring



Class 1

Visualization of the soft palate, fauces, uvula, anterior and posterior pillars.



Class 2

Visualization of the soft palate, fauces and uvula.



Class 3

Visualization of the soft palate and the base of the uvula.



Class 4

Soft palate is not visible at all.

Rapid assessment of Airway the 1 2 3 rule

- ▶ 1.Movement of TMJ– 1 finger
- ▶ 2.Extent of mouth opening–2 fingers
- ▶ 3.Size of mandibular space– 3 fingers

LEMON airway assessment method

LEMONS

- Look Externally
- Evaluate 3-3-2
- Mallampati Score
- Obstruction
- Neck Mobility
- Scene and Situation



Direct laryngoscopy and fibreoptic bronchoscopy

Grade I – Visualization of entire laryngeal aperture.

Grade II – Visualization of only posterior commissure of laryngeal aperture.

Grade III – Visualization of only epiglottis.

Grade IV – Visualization of just the soft palate.

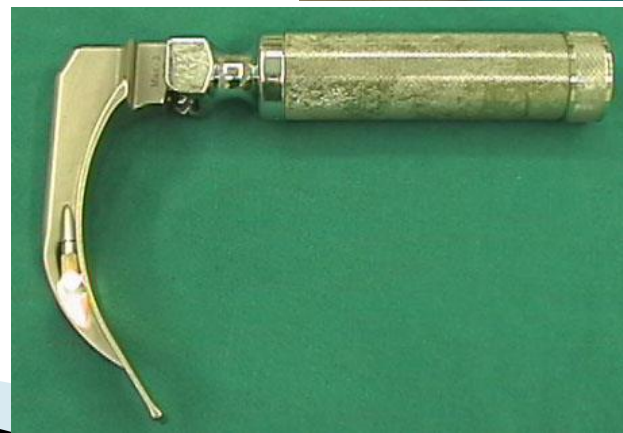
Grade III and IV predict difficult intubation.



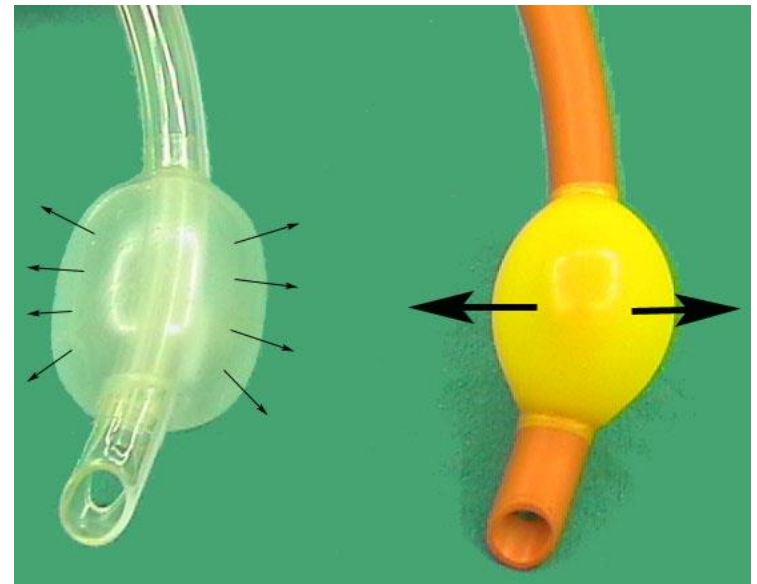
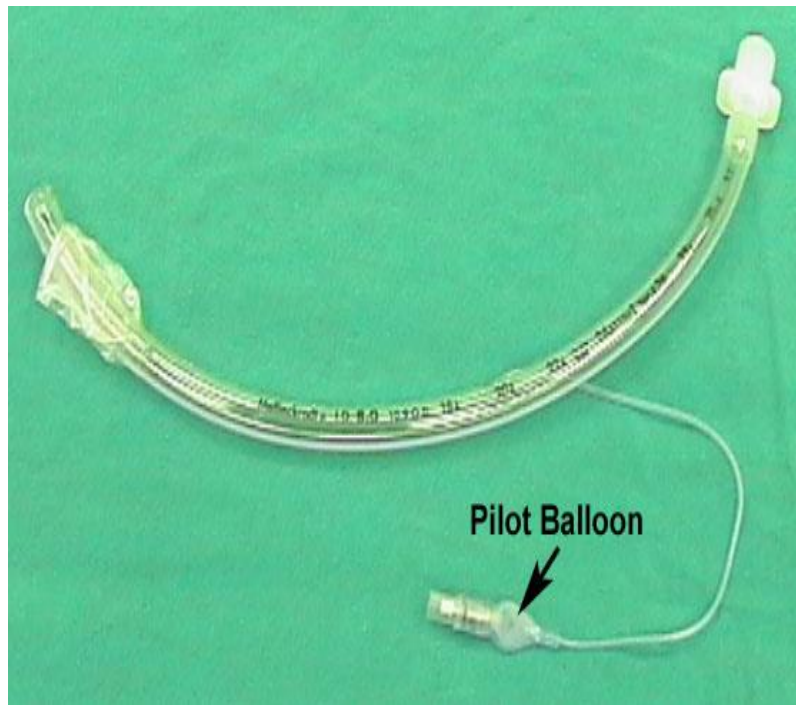


INTUBATION EQUIPMENTS

1) Laryngoscope : handle and blade



2) Endotracheal tube : Red rubber / PVC Cuffed / uncuffed

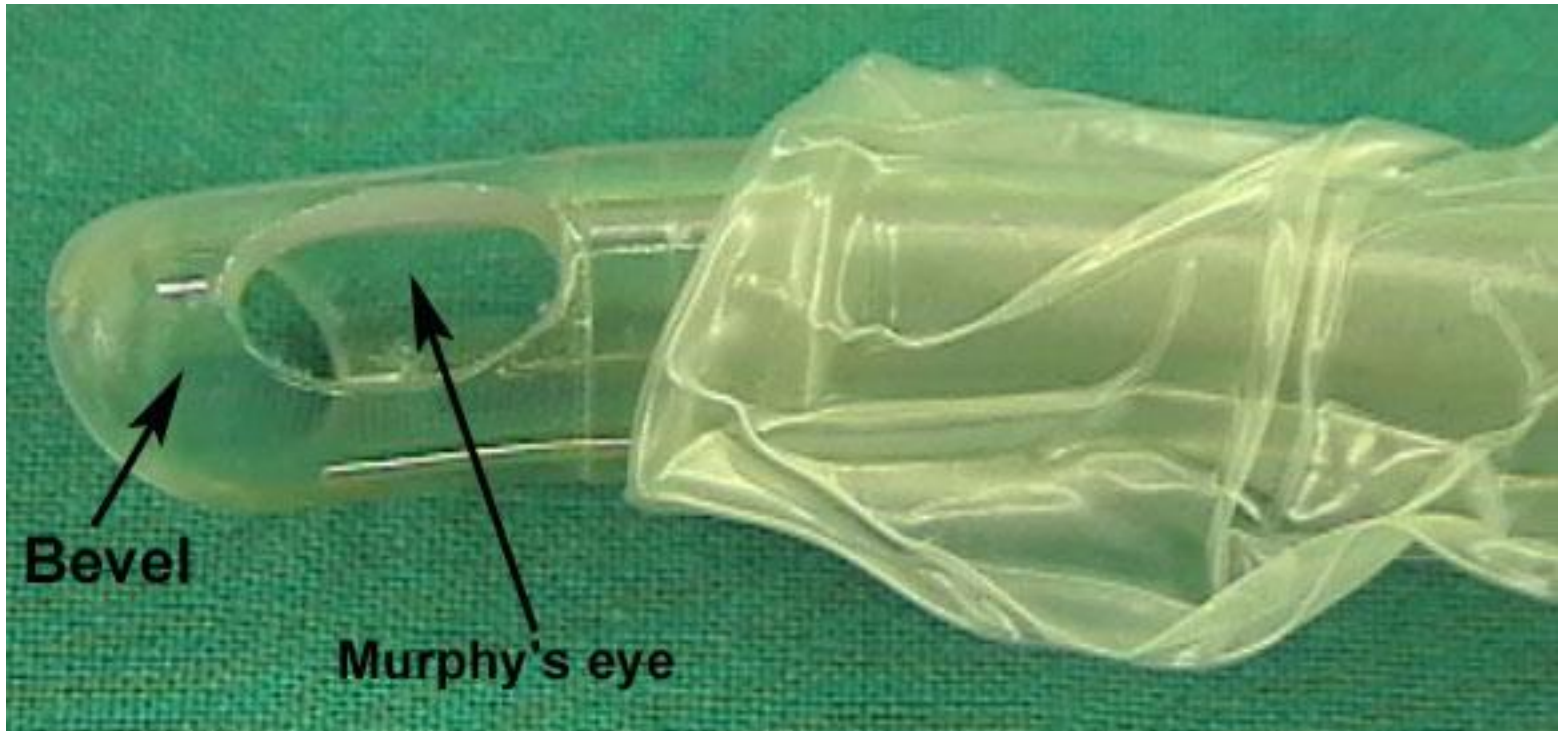


High volume

Low volume

Low pressure cuff High pressure cuff

ET Tube : Bevel : Murphy's eye



Depth of endotracheal tube : Midtrachea or below vocal cord ~ 2 cms

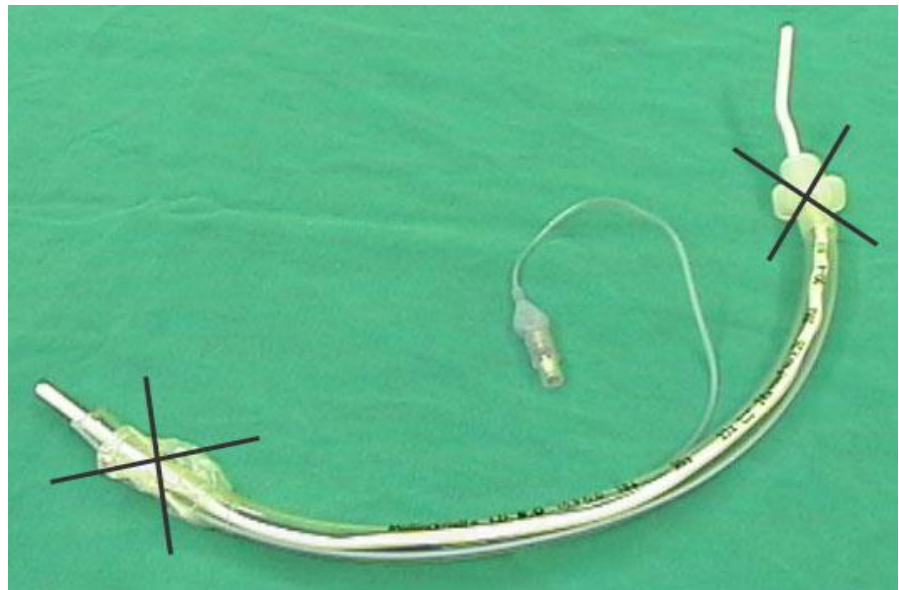
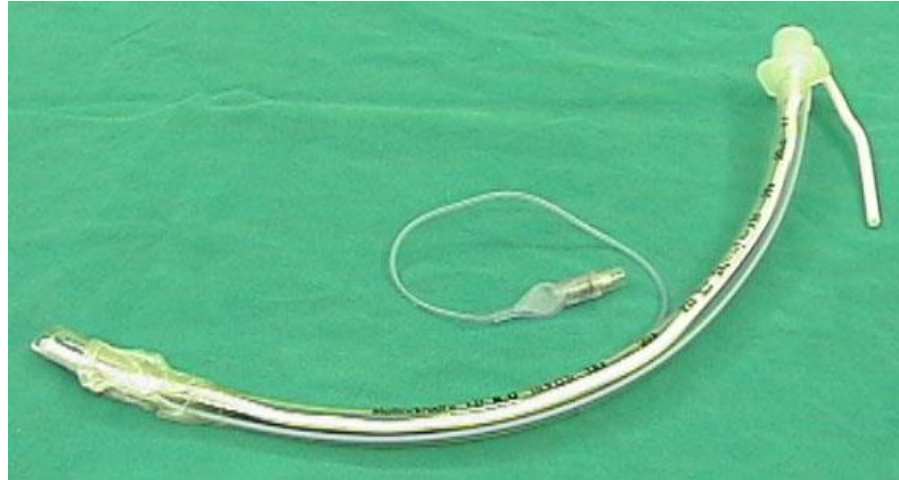
- Adult → Male = 23 cms ,Female = 21 cms
- Children

Oral endotracheal tube = $(\text{Age}/2) + 12$
(cm)

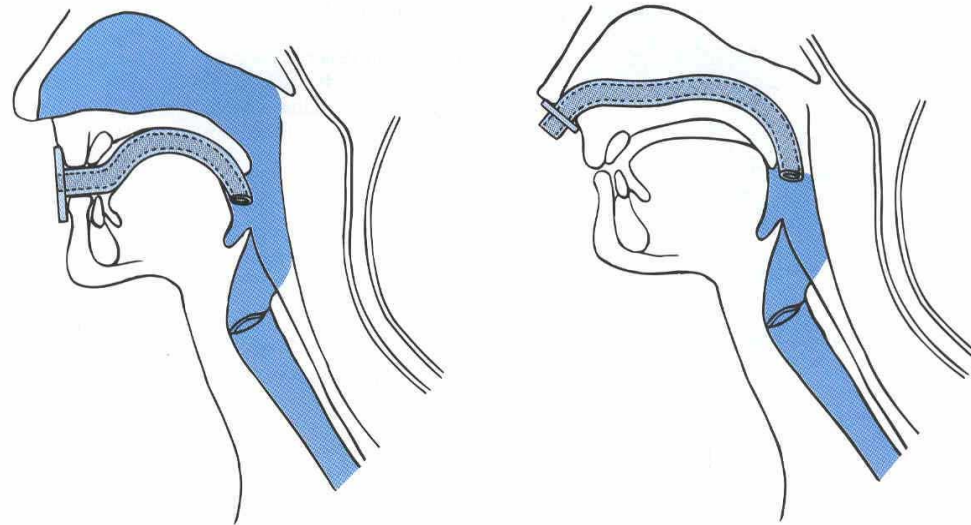
Nasal endotracheal tube = $(\text{Age}/2) + 15$
(cm)

3) Other equipments

Stylet



4. Oropharyngeal / Nasopharyngeal Airway



5) Face mask and self inflating bag



6) Magill forcep



7. suction machine and catheter



Suction machine



Suction Catheter diff. Size

8) Syringe 10 ml for air

9) Lubricating jelly

10) Plaster for strapping endotracheal tube

11) Video laryngoscope

MONITORING SUCCESS OF ENDOTRACHEAL INTUBATION

- ▶ Stethoscope
- ▶ Endtidal – CO₂
- ▶ Pulse oximeter
- ▶ B/L Chest Expansion

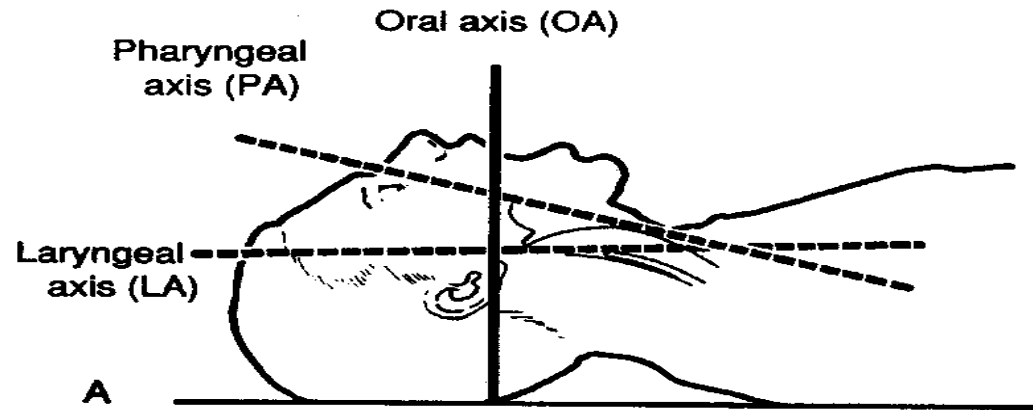


Do's And Don'ts in covid

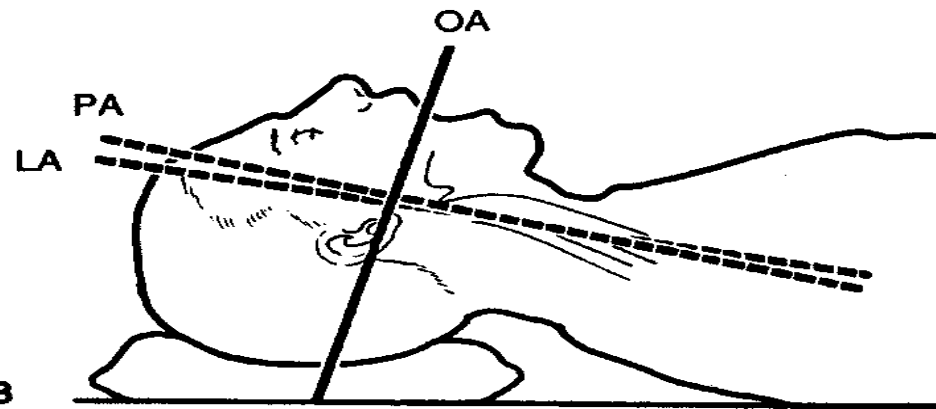
- ▶ RSI
- ▶ Close suctioning
- ▶ Abolition gag reflex
- ▶ Complete paralysis
- ▶ Extubation (mask over ET tube)
- ▶ Avoid BMV
- ▶ Avoid awake intubation
- ▶ Avoid open suctioning
- ▶ Avoid T-piece during weaning
- ▶ Avoid bucking (Antiemetic and Lidocaine)



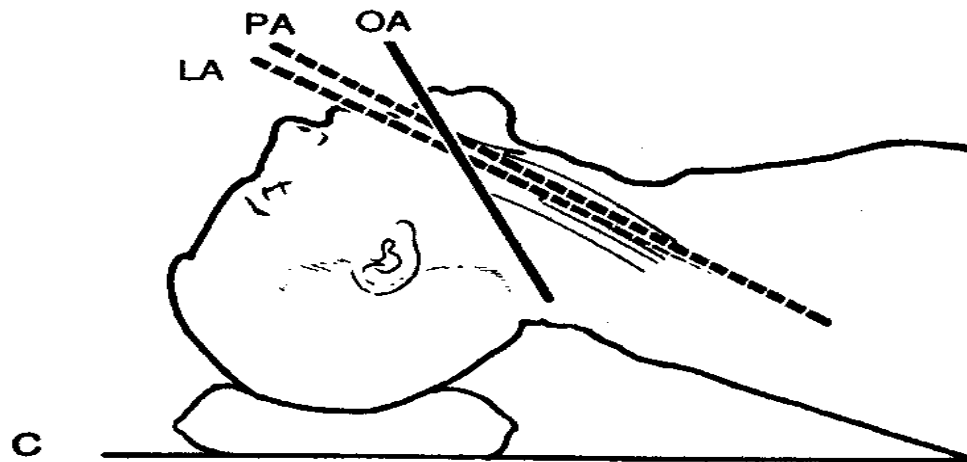
Sniffing position



A



B



C

Steps of oroendotracheal intubation



Steps of oroendotracheal intubation



Steps of oroendotracheal intubation





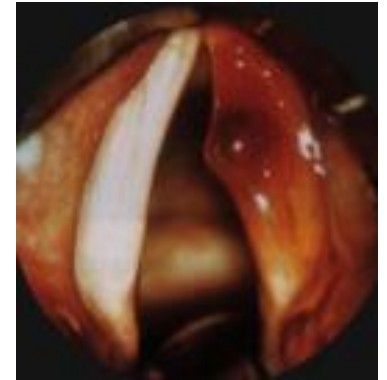
COMPLICATIONS OF ENDOTRACHEAL INTUBATION

1) During intubation

- : Trauma to lip, tongue or teeth
- : Hypertension and tachycardia or arrhythmia
- : Pulmonary aspiration
- : Laryngospasm
- : Bronchospasm

: Laryngeal edema

**: Arytenoid dislocation ->
hoarseness**



: Increased intracranial pressure

**: Spinal cord trauma in cervical
spine injury**

: Esophageal intubation

2) During remained intubation

- : Obstruction from kinking , secretion or overinflation of cuff .**
- : Accidental extubation or endobronchial intubation.**
- : Disconnection from breathing circuit**
- : Pulmonary aspiration.**
- : Lip or nasal ulcer in case with prolonged period of intubation**
- : Sinusitis or otitis in case with prolonged nasoendotracheal intubation.**

3) During extubation

- Laryngospasm**
 - Pulmonary aspiration**
 - Edema of upper airway**
- 

4) After extubation

- Sore throat
- Hoarseness
- Tracheal stenosis (Prolong intubation)
- Laryngeal granuloma





THANK U