PEDIATRIC AIRWAY

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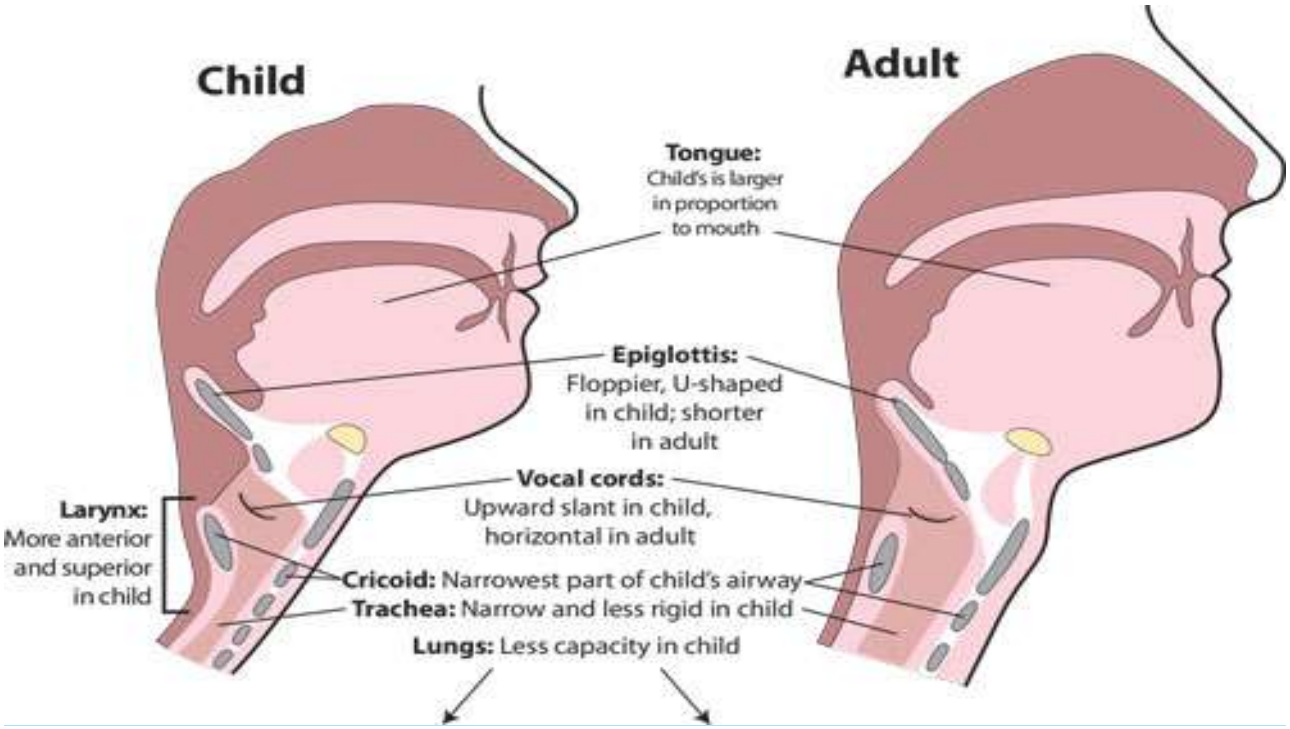
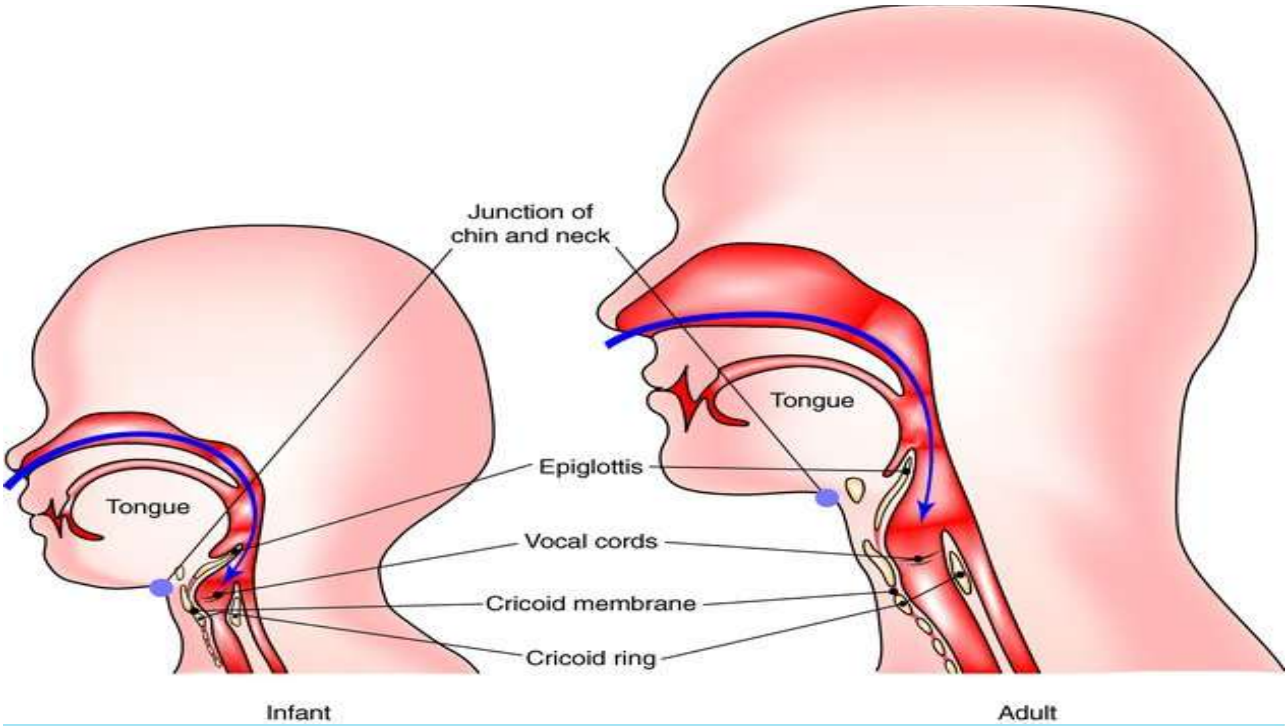
HOW ARE CHILDREN DIFFERENT?

- Narrower airways- they are more easily obstructed by oedema, blood foreign bodies and external compression. Even mild narrowing can lead to rapid increases in airway resistance and subsequent work of breathing.
- Larger tongue and adenoids - increased risk of obstruction, along with increased difficulty of laryngoscopy and visualising the vocal cords.
- The soft structures of the pediatric upper airway are also more prone to injury from multiple attempts at intubation.

HOW ARE CHILDREN DIFFERENT?

- Higher anterior larynx.
- Shorter trachea. Chest x-ray is required to confirm ETT position
- Increased metabolic requirements and reduced functional residual capacity lead to rapid desaturation
- Longer floppy epiglottis
- a straight blade laryngoscope may be preferred for intubation





MECHANISMS OF AIRWAY OBSTRUCTION

- Direct trauma to the airway or surrounding structures. This may include:
  - Maxillo-facial / laryngeal / tracheal injury or compression due to anterior neck haematoma
  - Burn-associated oedema of mouth, pharynx, larynx.
- Contamination of the airway due to material - for example with vomitus / blood / teeth or other foreign bodies
- Loss of pharygeal tone - due to head injury or intoxication with drugs/alcohol

AIRWAY ASSESSMENT

you should assess the upper airway and the anterior neck looking for signs of airway obstruction.

SIGNS OF AIRWAY OBSTRUCTION

- Respiratory distress which may be characterised by:
  - An increase in respiratory rate
  - Paradoxical movement of the chest and abdomen
  - Use of accessory muscles with sternal, intercostal and subcostal recession
- Intrathoracic obstruction (of trachea or bronchi) may present with wheeze or prolonged expiration
- Extrathoracic obstruction may present with:
  - stridor / hoarseness or voice change (laryngeal or upper tracheal injury),
  - gurgling (contamination of the oro-pharynx) or
  - snoring (loss of pharyngeal tone due to reduced level of consciousness leading to occlusion of airway)

LOOK FOR!

- Cyanosis / Low SpO_2
- Visible swelling of the tongue, pharynx or neck
- External signs of injury to face, mouth, mandible or neck
- Non specific effects on other organ systems - tachycardia / decreased conscious state / restlessness

AIRWAY ASSESSMENT

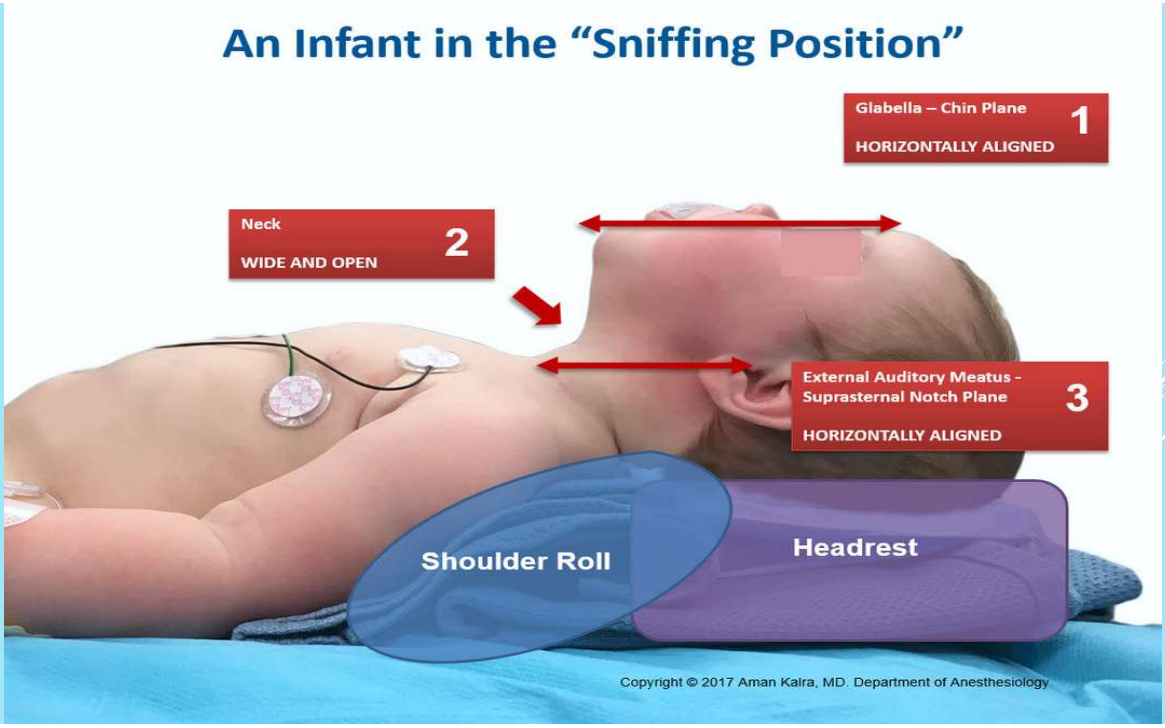
You should also examining the anterior neck.

- **T**racheal deviation - may be caused by a tension pneumothorax or a massive haemothorax (with tension)
- **W**ounds - blunt or penetrating wounds to the neck may directly injure the airway, or lead to swelling that will progressively obstruct it
- **E**mphysema (subcutaneous) - indicates a pneumothorax
- **V**enous distension - associated with obstructive shock secondary to a tension pneumothorax or cardiac tamponade

OPEN THE AIRWAY

in trauma, always use **jaw thrust**. (Not head tilt or chin lift) (Place fingers behind the angles of the mandible and push anteriorly (towards the tip of the nose)

An Infant in the "Sniffing Position"



IF AN OBSTRUCTION PERSISTS

- Optimise the head position, and reopen the airway using a jaw thrust.
- Rapidly examine the mouth with a laryngoscope.
- Remove any visible foreign body using Magill forceps or Yankauer sucker.
- If the airway is adequate during laryngoscopy but inadequate at other times, insert an oropharyngeal airway.

OROPHARNGEAL AIRWAY (OPA)

An airway of the right size reaches from the central incisors to the angle of the child's mandible

ORAL AIRWAY

- Child more than 8 years: As for an adult: concave side up; pass to the back of the hard palate, then rotate 180º to concave side down
- Only in unconscious children
- Use a tongue blade to facilitate insertion<8y
- •DO NOT INSERT AND ROTATE 180 degrees—this maneuver can tear the soft palate and cause bleeding

If the airway remains inadequate: consider tracheal intubation if the facilities are available to do this safely and quickly

PREPARATION FOR ENDOTRACHEAL INTUBATION

Pre-Oxygenate:

- Pre-oxygenate with T-piece and high flow oxygen
- Deliver positive airway pressure breaths and positive end-expiratory pressure
- Aspirate air from the stomach via a small bore gastric tube

PREPARATION FOR ENDOTRACHEAL INTUBATION

- **Laryngoscope:** Have 2 available; check they are working
- **Suction:**
  - Check it is working
  - Verify the suction device is a Yankauer, Check it is next to the child's head

PREPARATION FOR ENDOTRACHEAL INTUBATION

- **Drugs:** Drawn up and labeled:
  - Ketamine

    1-2mg/kg depending on the degree of physiologic un-wellness (**lower** dose in acute circulatory failure)
  - Rocuronium

    1.2-1.6mg/kg depending on the degree of physiologic unwellness
  - Saline flush 10 ml IV cannula + 3-way

Endotracheal intubation

- What size endotracheal tube
- Tube diameter should be the size of the child's 5th finger
- New born 3.5, 1 year 4.0, 2 years 4.5, >2 years 4.5 + age/4

Oral: Always use oral, never nasal, intubation in a child with a head injury (because of the risk of meningitis, or of entering the cranial cavity if an undiagnosed fracture of the skull base is present)

PREPARATION FOR ENDOTRACHEAL INTUBATION

- **Laryngoscopy**.
  - Hold laryngoscope in your left hand.
  - Be gentle.
  - Don't lever on the teeth.
  - Don't jam the lip between blade and teeth.
  - **Up to 1year: Straight blade**

It is recommended that only an experienced clinician should attempt to intubate a child - unless the procedure is immediately required to save a life.

THANK YOU