Acute Respiratory Distress in the Pediatric Patient

For Truckee Fire District

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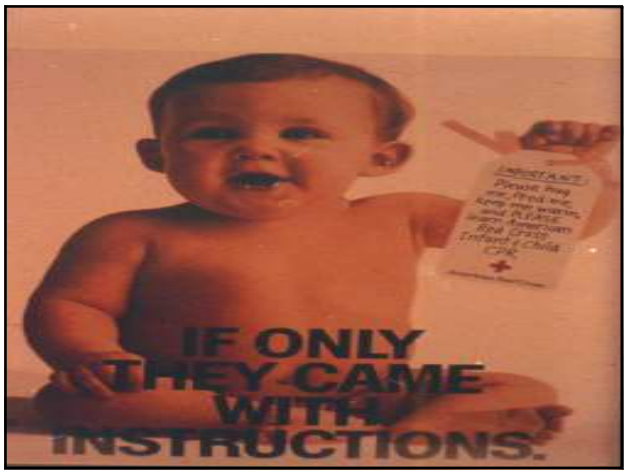

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Respiratory Emergencies

Objectives

- Anatomic considerations
- Physiological considerations
- Recognition
- Treatment

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To Breathe – to Breathe

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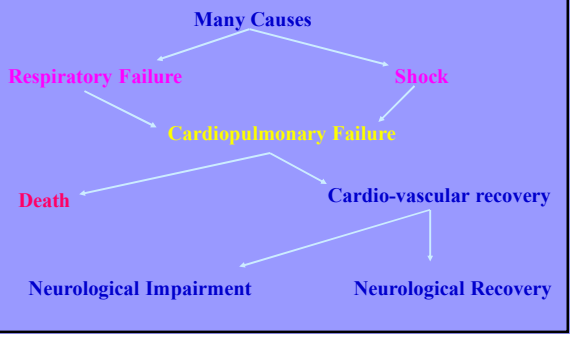
Mechanisms of Cardiopulmonary Failure



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Respiratory Failure

- Clinical state characterized by inadequate elimination of CO_2 and/or inadequate oxygenation of the blood

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Respiratory Failure is a process, not an Event

- The goal is to ***prevent*** cardiac arrest, not to treat it!
  - Respiratory dysfunction proceed from covert compensated dysfunction and proceeds to overt uncompensated dysfunction (cardiopulmonary failure)
  - Interventions in compensated state are the safes and most successful
  - Distinctions between distress and failure are artificial

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Respiratory Failure

- Compensated - adequate gas exchange
  - increased effort or work of breathing
    - tachycardia, tachypnea, retractions
- Decompensated - inadequate gas exchange

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Unique Features of the Pediatric Airway

- Obligate nose breathers
- Large tongue
- Larynx is anterior and higher
- Smaller & shorter tracheas
- Smallest diameter of trachea is at the cricoid ring (below the cords)
- Chest wall of infants is relatively weak and unstable

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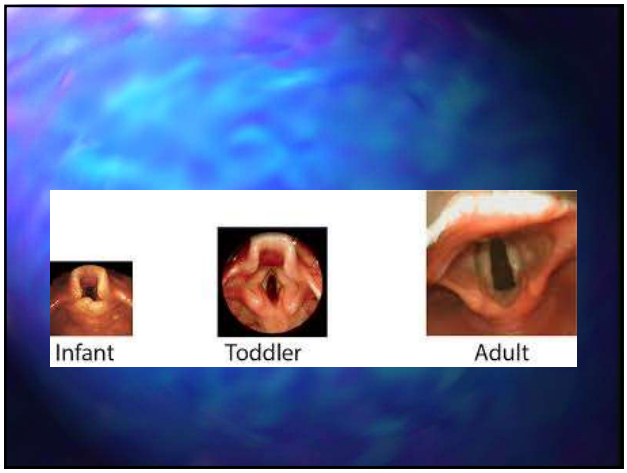

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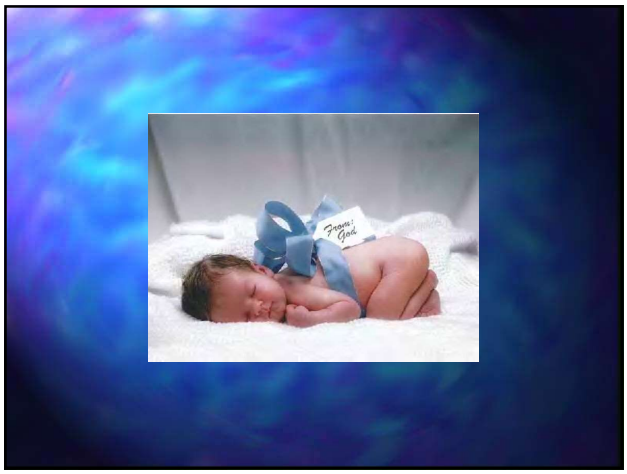

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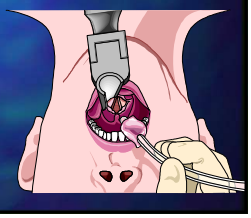
The Trachea of a Young Infant

- Cords may be difficult to visualize during laryngoscopy
- Right mainstem intubation and accidental extubation are common



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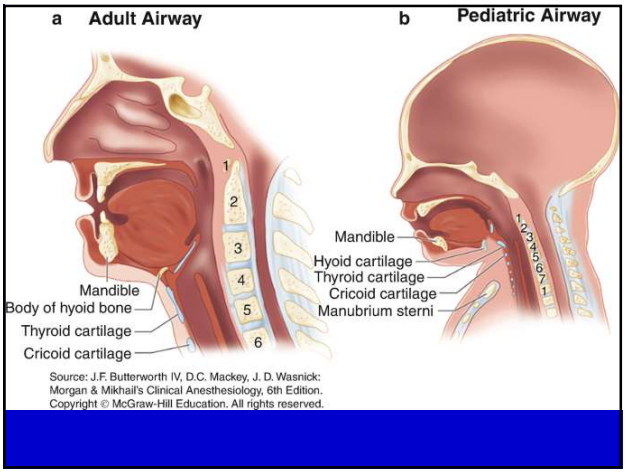

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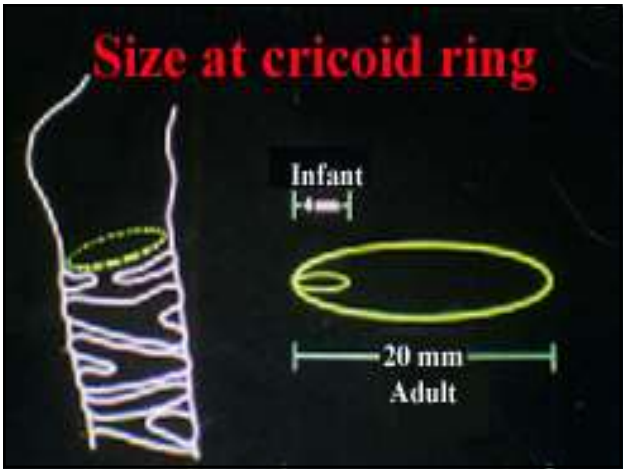

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Immunological Immaturity

- Increased susceptibility to respiratory infections
  - Croup
  - Epiglottitis
  - Bronchiolitis
- All of which are seen almost exclusively in children

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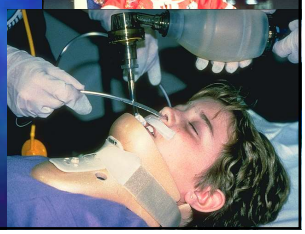
Developmental Immaturity

- Leads to increased susceptibility to foreign body aspiration
- Early placement of NG/OG tubes!



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Upper Airway Illnesses

- Croup
- Epiglottitis
- Foreign body obstruction

What are the two classic signs of upper airway obstruction?

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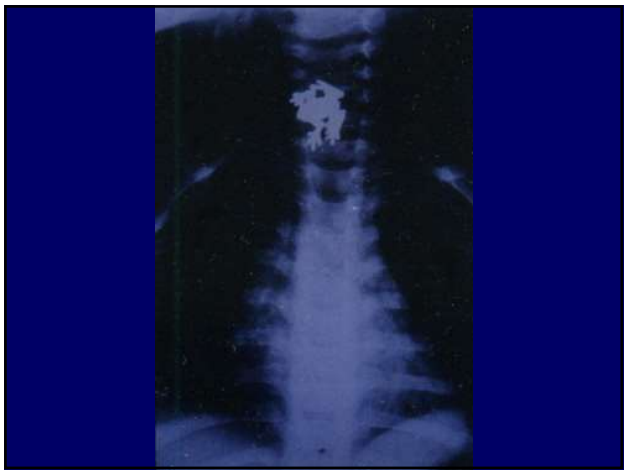

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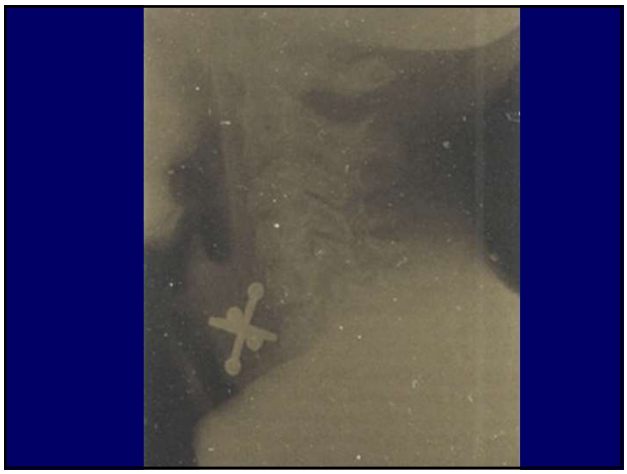

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> 90% of pediatric deaths due to foreign body aspiration occur in children < 5 years of age

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Suspect foreign body aspiration in the afebrile child with a sudden onset of respiratory distress

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Acute Upper Airway Obstruction

Good Air Exchange

- Forceful cough
- Wheezing

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Acute Upper Airway Obstruction

Poor Air Exchange

- Weak, ineffective cough
- High pitched breath sounds
- Cyanosis

Treat as a complete airway obstruction

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Complete Upper Airway Obstruction

Symptoms

- Unable to speak, cough or breath
- Clutches neck (universal sign of distress)
- Cyanosis

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WE don't do blind finger sweeps on infants or children!

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Croup

- Viral infection causing edema of the cords and adjacent trachea and subglottic tissues
- Accounts for approximately 90% of infectious upper airway problems in children
- Occurs more commonly in winter months
- Found most commonly between the ages of 6 months and 3 years

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Clinical Syndrome

- URI symptoms for several days
- low grade fever
- hoarseness

Progressing to

respiratory distress
stridor
barking "seal like" cough

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Treatment for Croup

- Cool, humidified air
- Racemic Epinephrine
  - 0.5 cc in 3cc of saline NPPB
    - (5mg of epi 1:1000)
  - Administer with supplemental O_2
- Steroids
  - Decadron 0.5-.6mg/kg IM or PO

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Epiglottitis

- A life threatening bacterial infection causing inflammation and edema of the epiglottis and the adjacent structures above the larynx
- Relatively uncommon - accounts for only 5-10% of pediatric upper airway infections
- Children 3-7 y/o most commonly affected

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Epiglottitis

Onset is Abrupt

- Fever, often up to 105^0, is generally the first sign and is present in almost every case
- Sore throat is present in only 50% of cases
- Difficulty swallowing may lead to drooling and refusal to take fluids
- Postural preferences may be noted
- STRIDOR may be a prominent sign, but COUGH is not characteristic
- Children tend to be quiet and anxious

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Epiglottitis

- Avoid agitation; allow child to maintain a position of comfort
- Administer blow-by O_2 (if tolerated)
- Prepare emergency airway equipment
- Alert the OR

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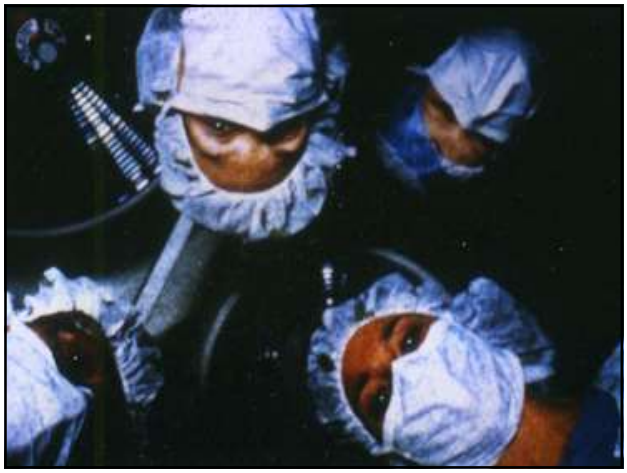

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EPIGLOTITIS

Treatment

- If the child loses consciousness, becomes apneic, or develops persistent central cyanosis despite administration of 100% O_2, positive pressure ventilation is required
- Procedures like IV placement are not a priority!

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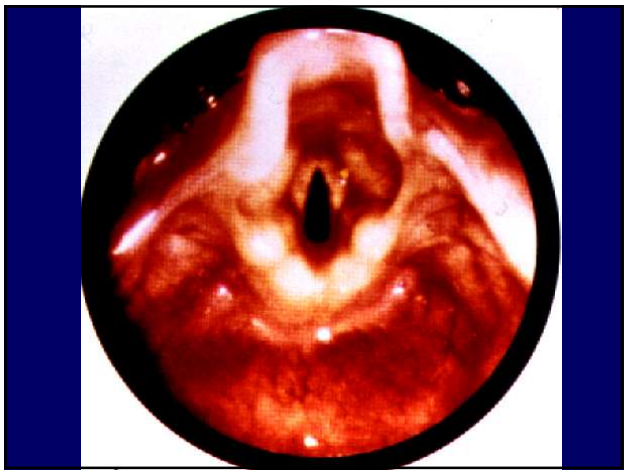

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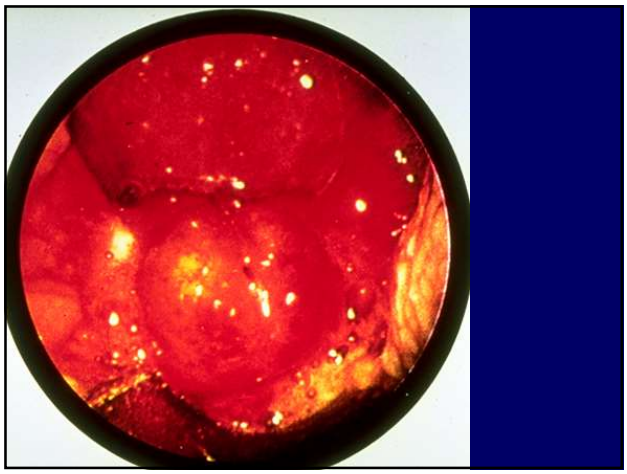

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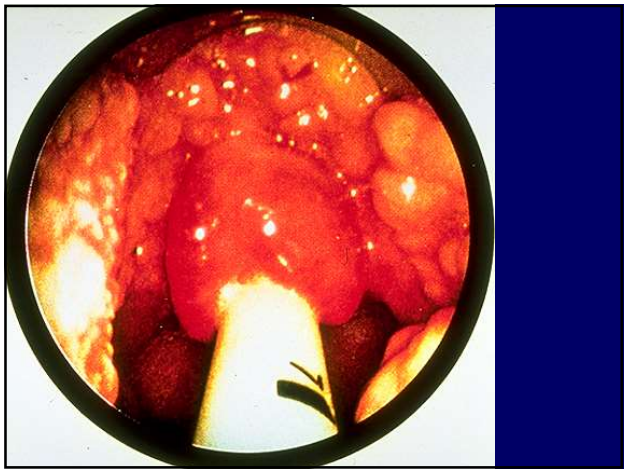

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Respiratory Assessment should be Rapid and Repeated

- Observation is most useful

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Major Errors in Initial Management are:

- Underestimation of distress
- Overzealous examination
- Lab studies that distress the child

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Failure to Improve?

- DOPE
  - Displaced
  - Obstructed
  - Pneumothorax
  - Equipment failure

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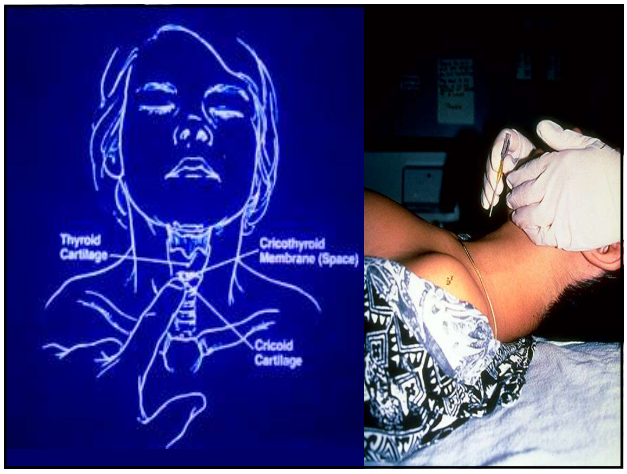

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Tracheostomies

Used to:

- Bypass an upper airway obstruction caused by birth defects or trauma
- provide long-term mechanical ventilatory support to offset breathing difficulties caused by certain diseases or injuries affecting the lungs or muscles
- aid in the removal of pulmonary secretions in patients unable to clear their airway due to neurological or neuromuscular diseases

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Tracheostomy Disasters

- Acute dislodgment
- Tube obstruction

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Single lumen tubes

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Double lumen tubes

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Obstruction and suctioning

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Suctioning fails

remove trach

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Infant obstructed trach

remove trach

bag patient

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Pediatric Intubation

- Broselow
  - Reference cards
  - Formulas
- Cuffs versus no cuffs
- Drugs (RSI)
- Stylet versus Bougie
- Secure your tube

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