Nursing Care and Management of Respiratory System Diseases

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Infant ,Child, and Adolescents Health Care.

3rd Grad

5th –6TH weeks

27 /2 /2024 – 3/3/2024

Nursing care and management of respiratory system diseases.

Objectives:

In the end of this chapter student will be able to:

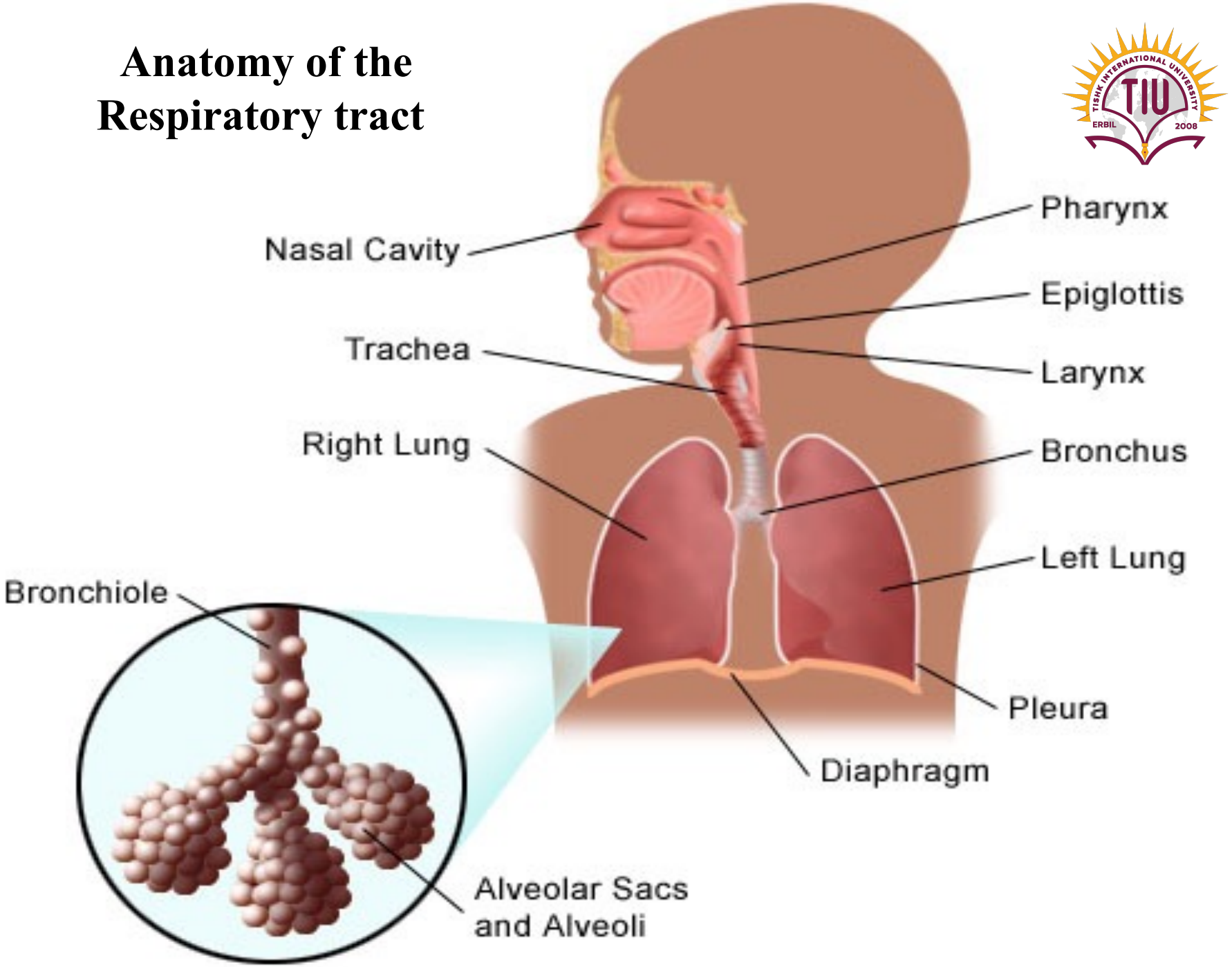
- Identify the factors leading to upper and lower respiratory tract infections in children.
- Assessment of respiratory diseases in children (Common Cold, Croup Tonsillitis, Bronchitis, Bronchiolitis, Pneumonia, Asthma, Inhalation of foreign body **).**
- Planning nursing intervention for children with respiratory diseases**.**

The child with health problems interferes with respiration:

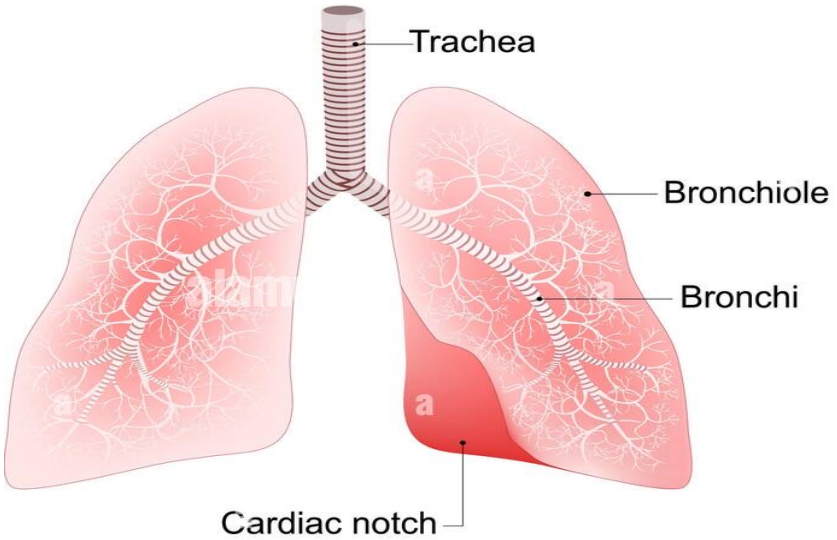
Outline

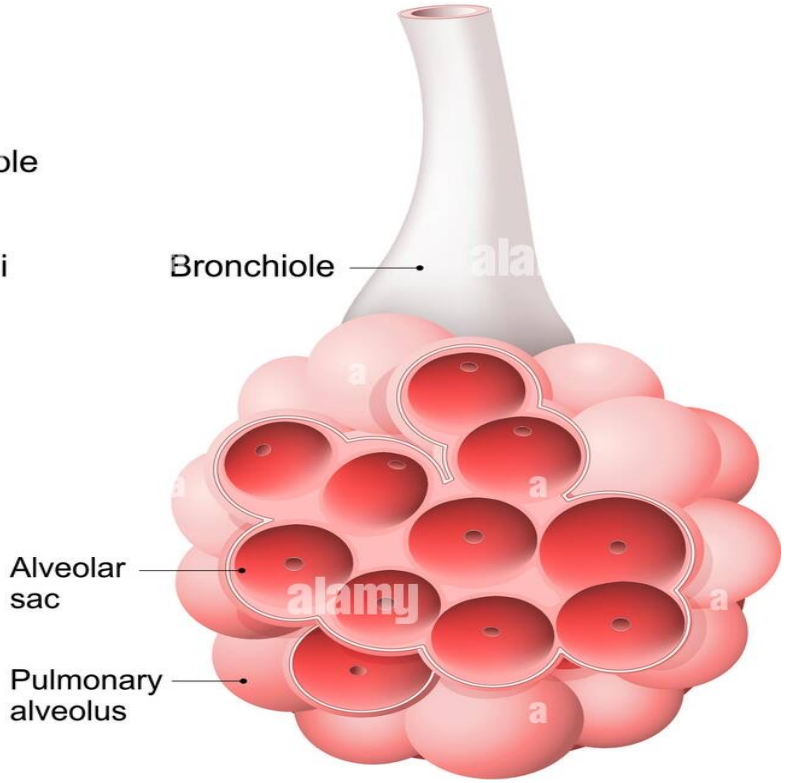
- **Anatomy and Children Airway criteria**
- **Respiratory assessment**
- **Risk factors for respiratory tract infections**
- Common Cold
- Croup
- Tonsillitis
- Bronchitis
- Bronchiolitis
- Pneumonia
- Asthma
- Inhalation of foreign body

Anatomy of the Respiratory tract



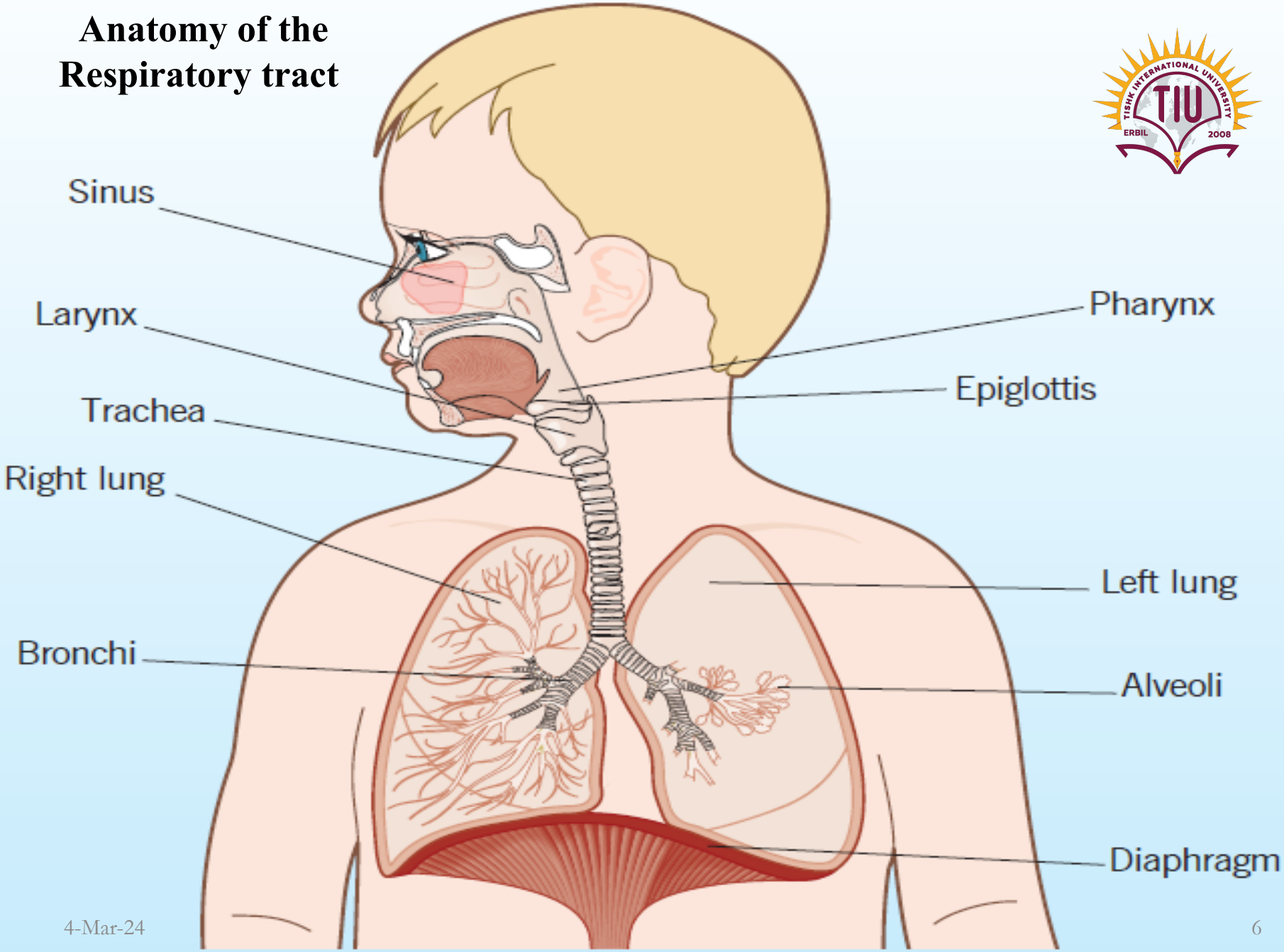
Lungs





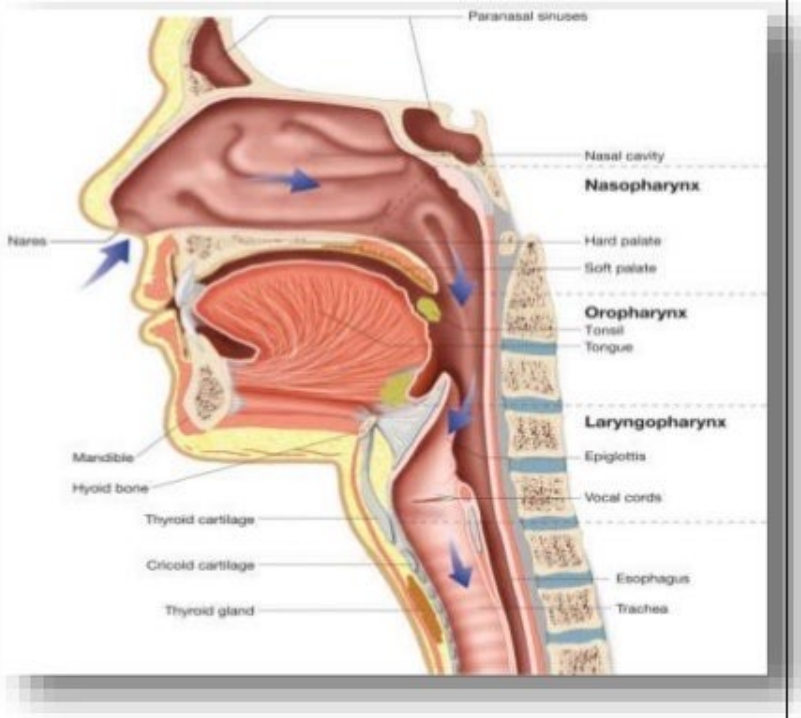
Alveoli

Anatomy of the Respiratory tract



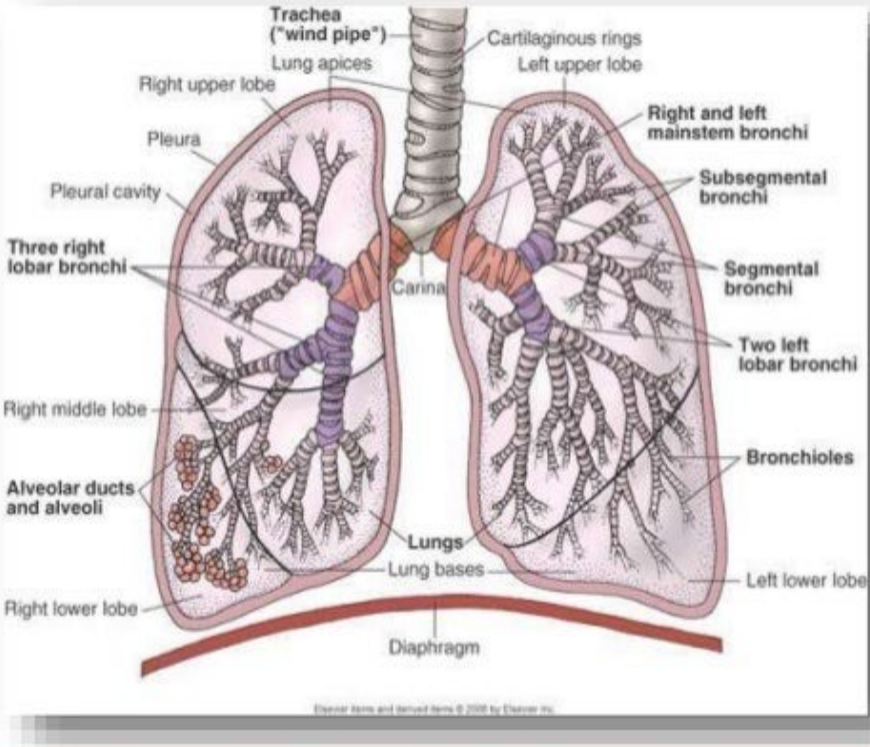
Upper Airway

- The upper airway consists of: nose, oral cavity, pharynx, and larynx
- Function of upper airway:
  - To warm the air
  - To humidify the air
  - To filter the air
  - Speech and smell



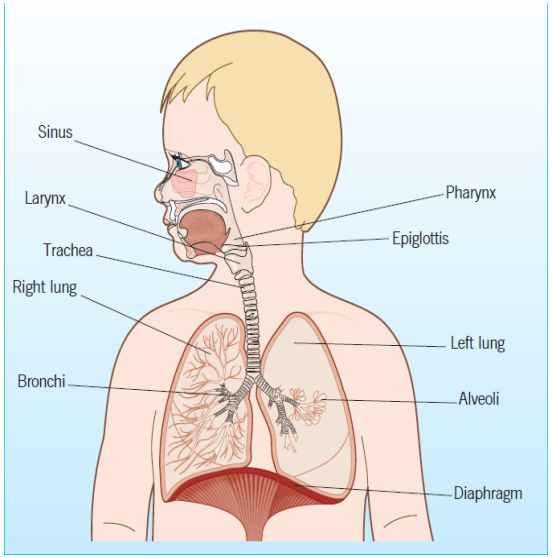
Lower Airway

- The lower airway consists of: trachea, bronchi, bronchioles, and alveoli
- Function of lower airway:
  - Ventilation (to and fro movement of gas)
  - Gas exchange (CO2 & O2 exchanged b/n pulmonary capillaries and alveoli)



Diaphragm separates chest cavity from abdominal cavity; regulates pressure within chest cavity

Children Airway criteria



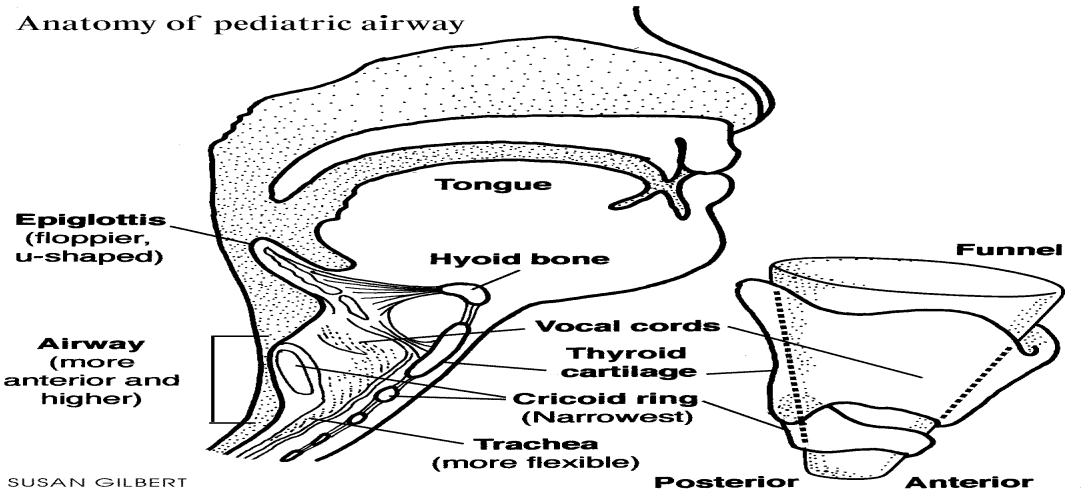
1. Paediatric airway is smaller.
2. Relatively larger tongue and smaller oral cavity.
3. Infants have a relatively larger occiput .
4. Infants are nose breathers.
5. Trachea is more cartilaginous and soft
6. Larynx is higher and more anterior.
7. The trachea is short
8. Diaphragmatic breathing

Pediatric Airway Considerations
Children Airway criteria

1. Paediatric airway is smaller

- In the small airway, there is greater **risk of airway obstruction** from small **foreign bodies**.

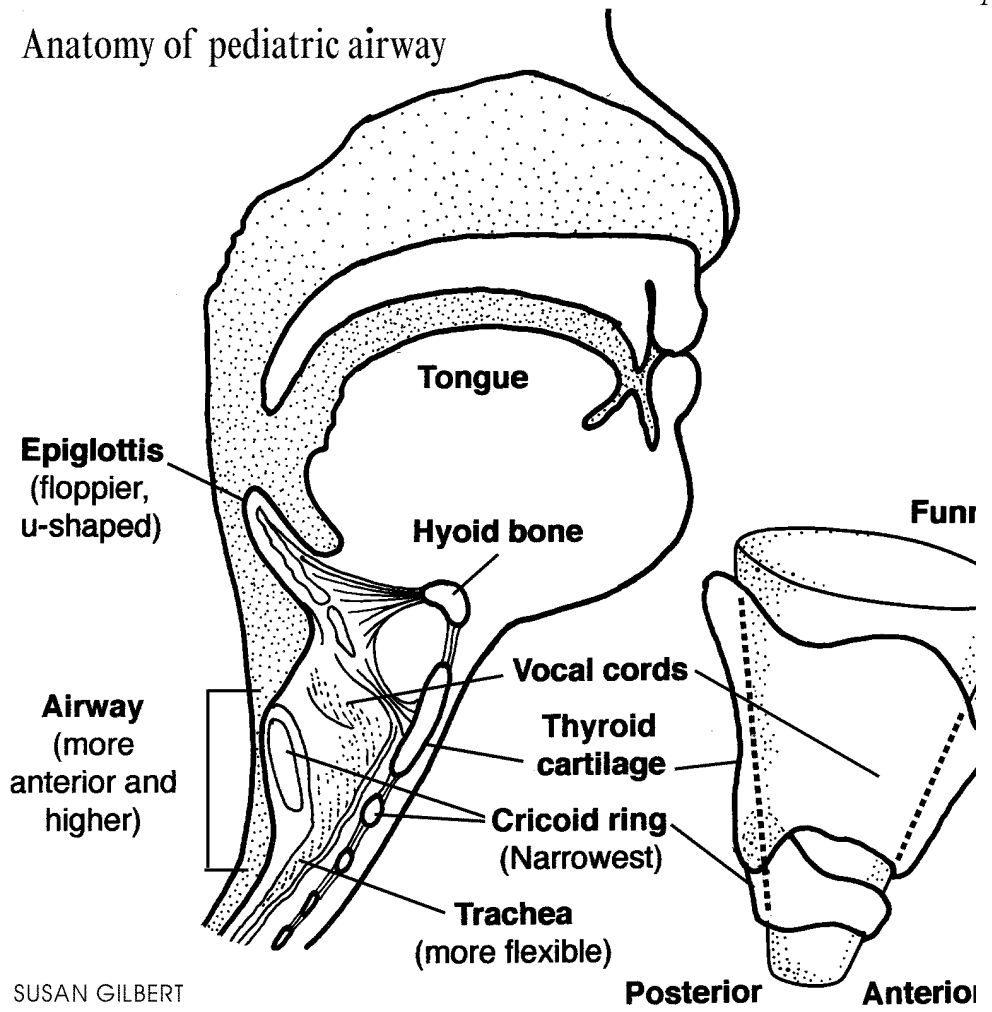
- Small amounts of **swelling** of the smaller paediatric airway, will result in a relatively greater reduction in airway diameter than would occur in the larger airway of the adult.

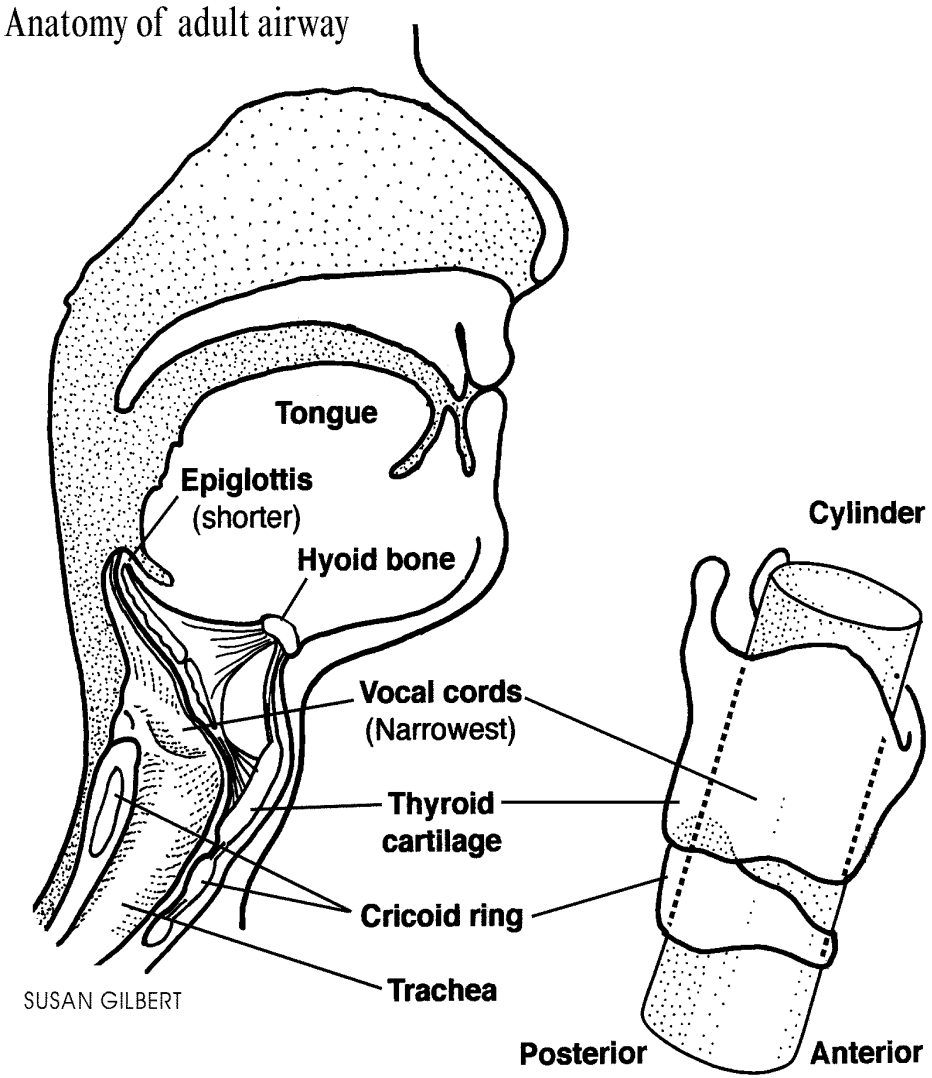


2. Relatively larger tongue and smaller oral cavity

- The relatively larger tongue and smaller oral cavity means that, in the child, the tongue is more likely to **obstruct the airway** than in the adult.
- This makes it essential that there is correct **positioning** of the head jaw to open the airway.

Cont: Pediatric Airway Considerations



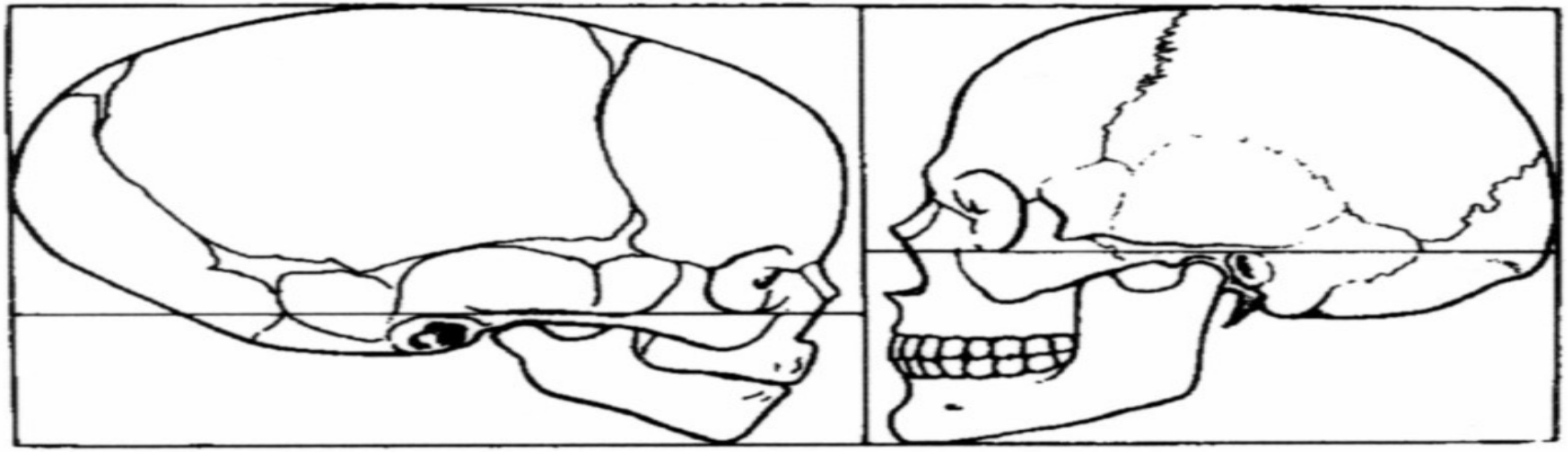


- **Cont: Pediatric Airway Considerations**

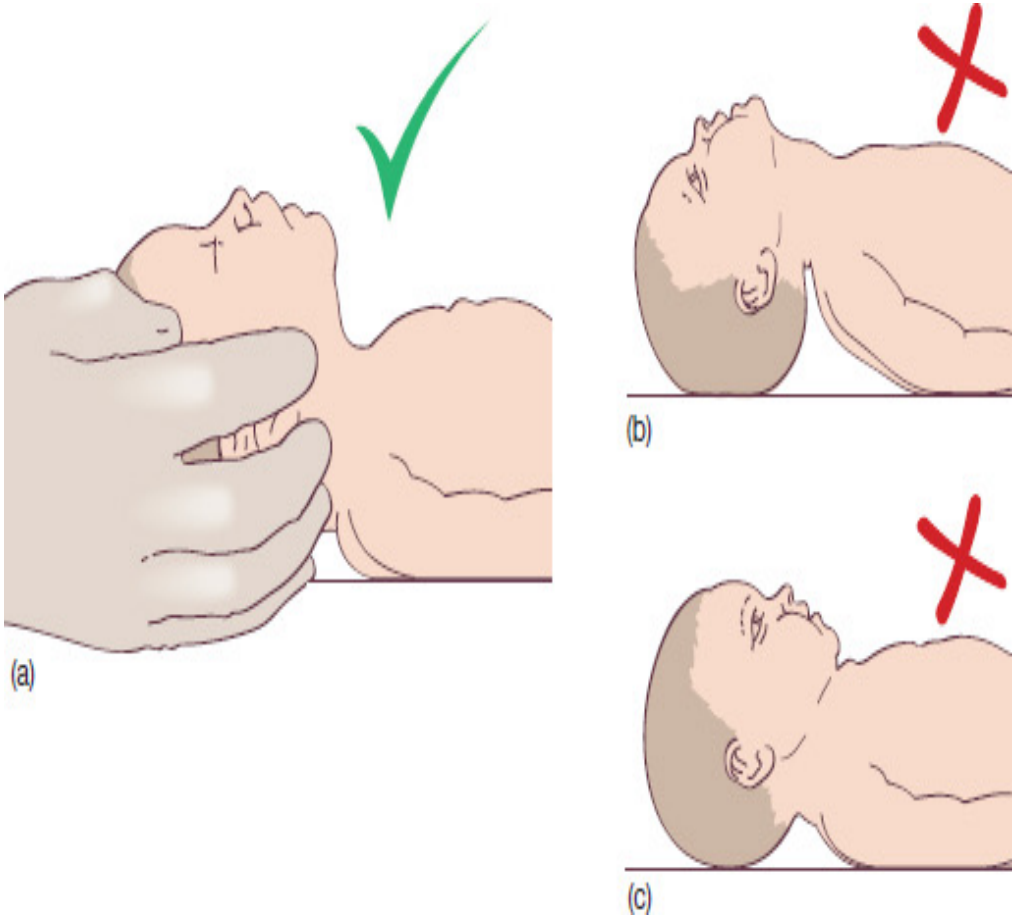
3. Infants have a relatively larger occiput

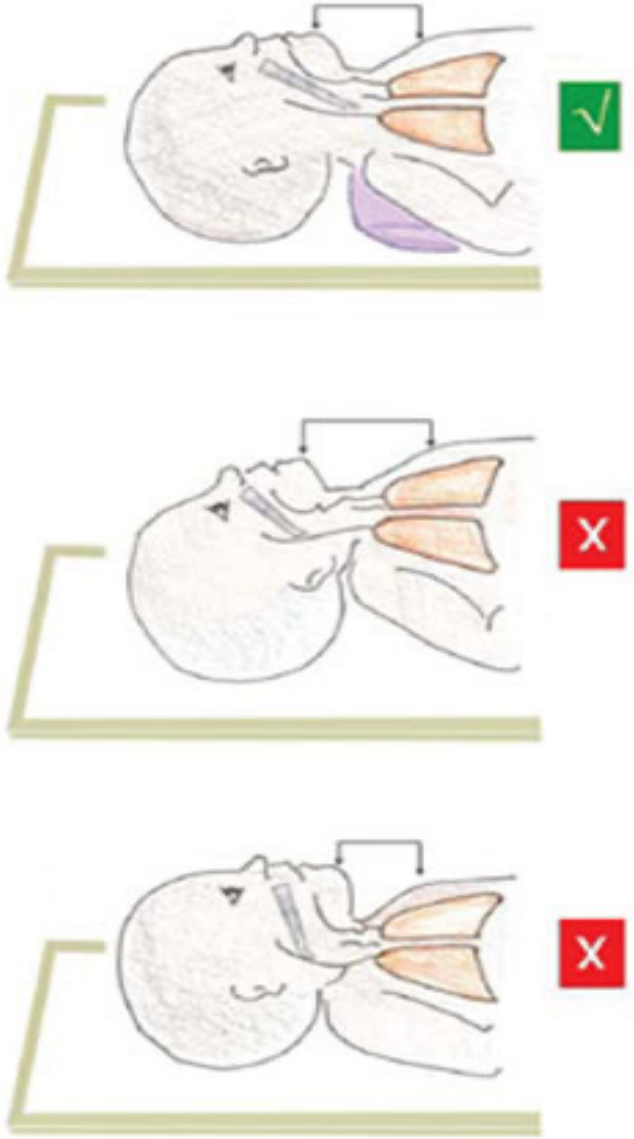
- The large occiput of the infant **flexes the head forward** when he/ she is placed prone on a flat surface.
- This is important in airway-opening manoeuvres and cervical spine immobilization.

Fig. A comparison of face-braincase proportions in the child and adult. The

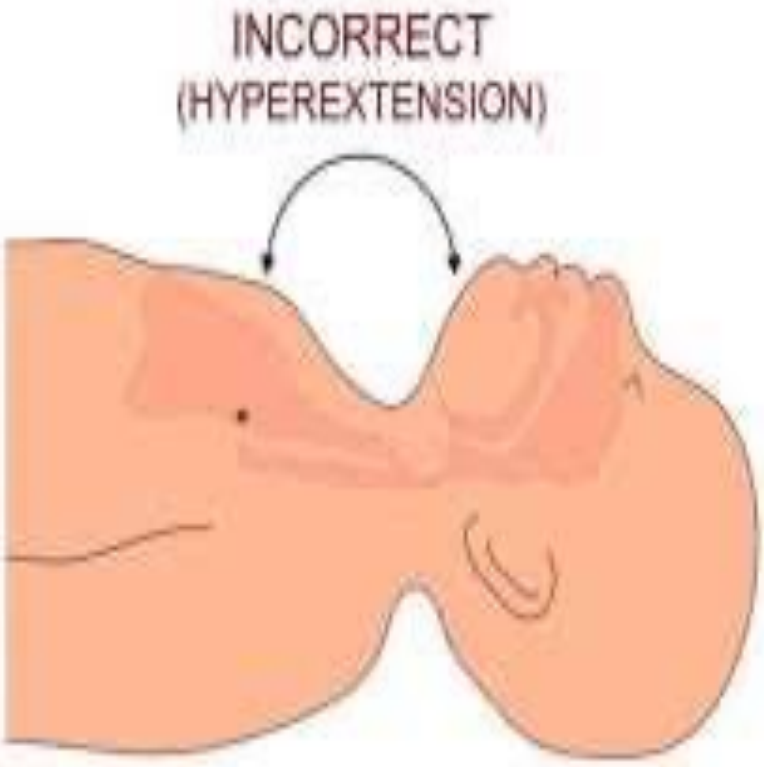


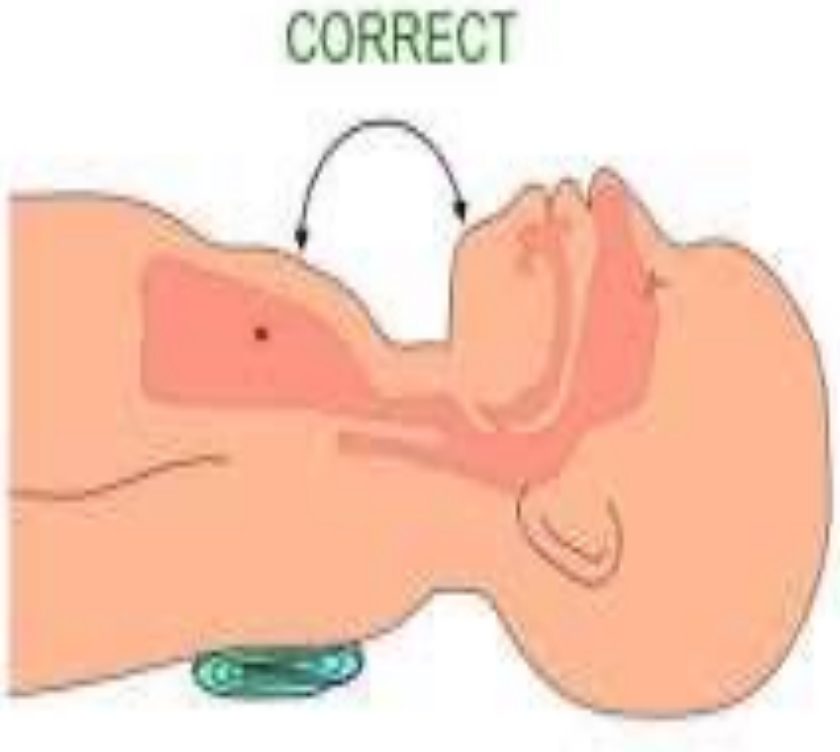
Cont: Pediatric Airway Considerations

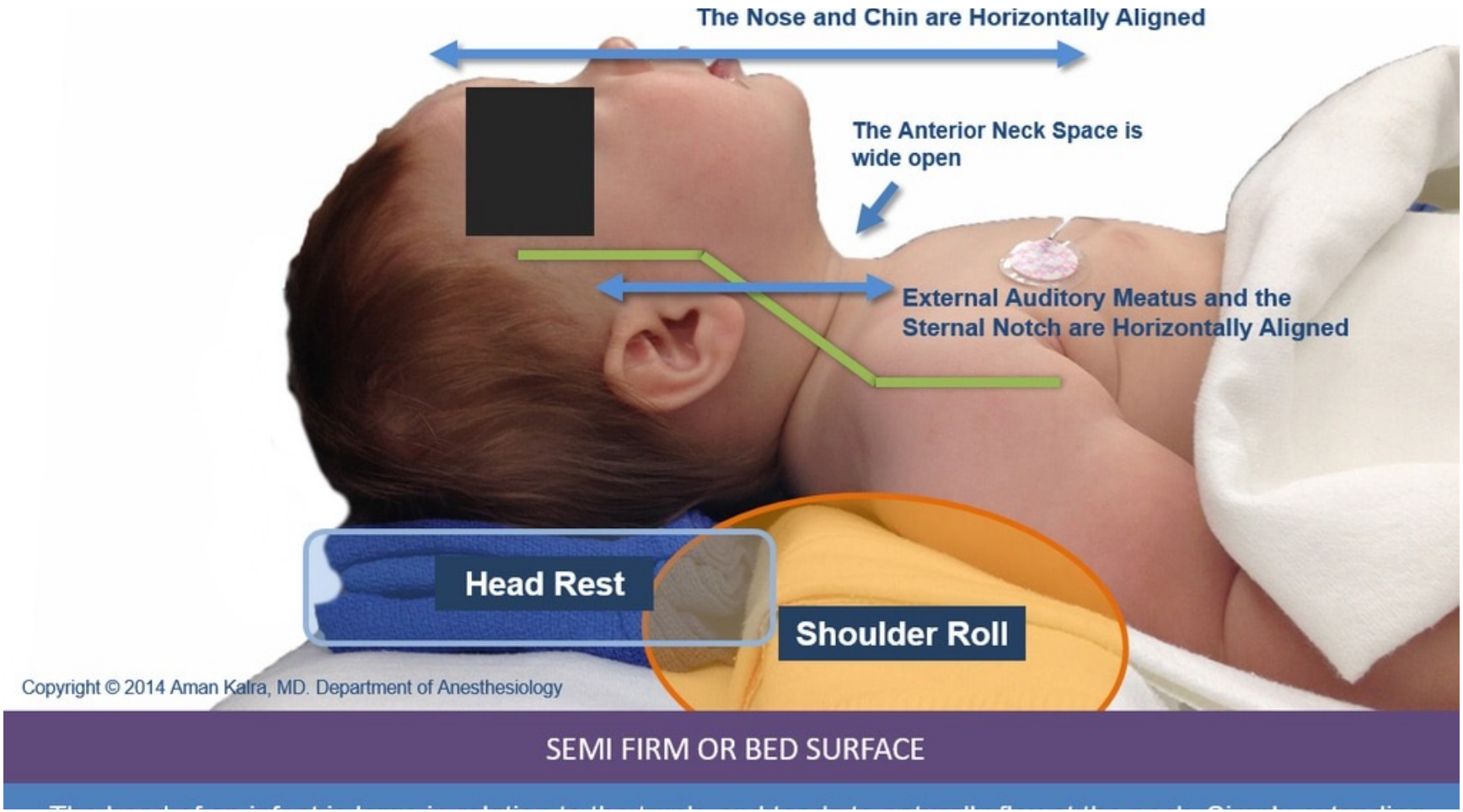


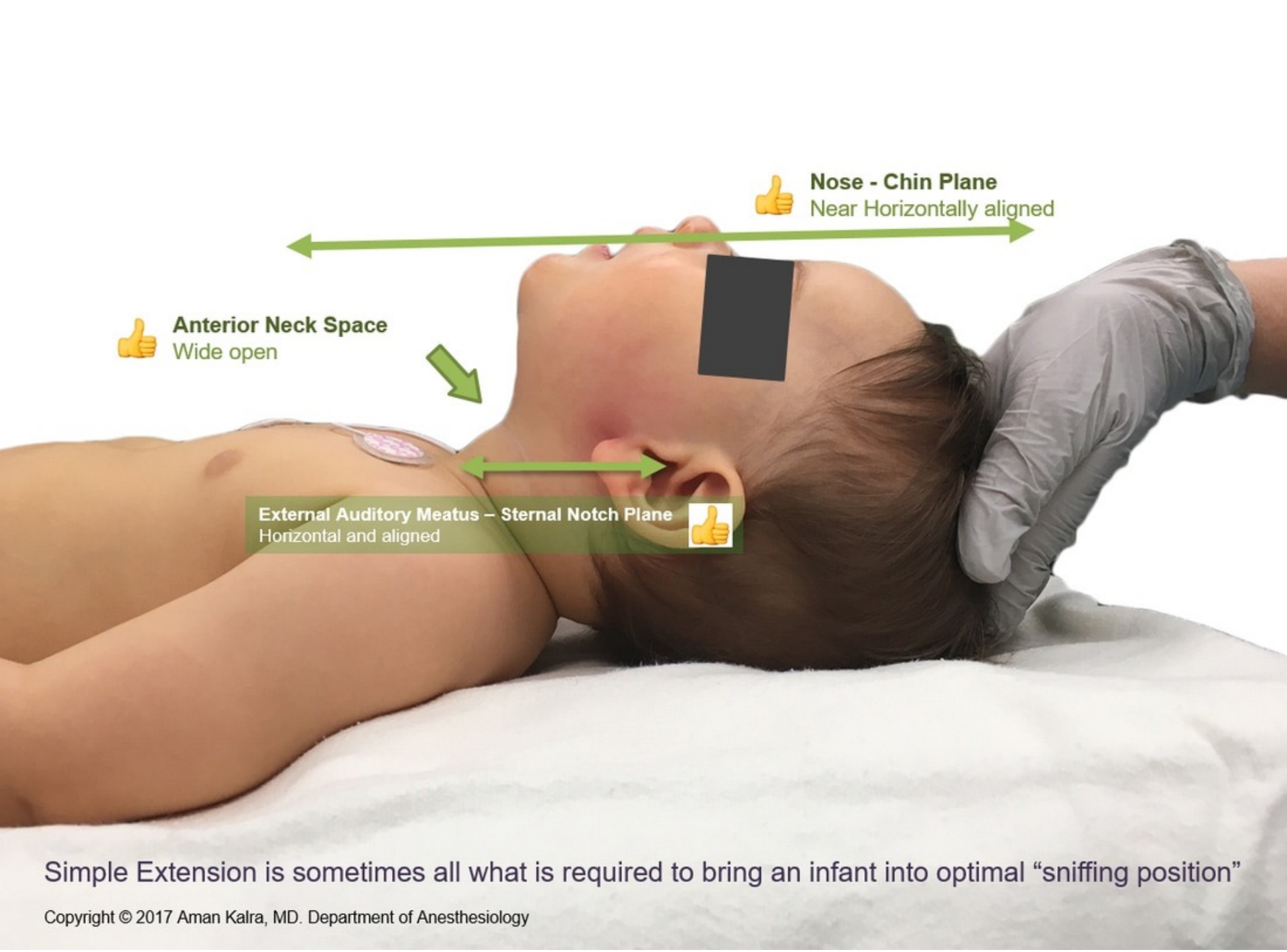


Correct neutral position of head for successful airway management


INCORRECT
(HYPEREXTENSION)

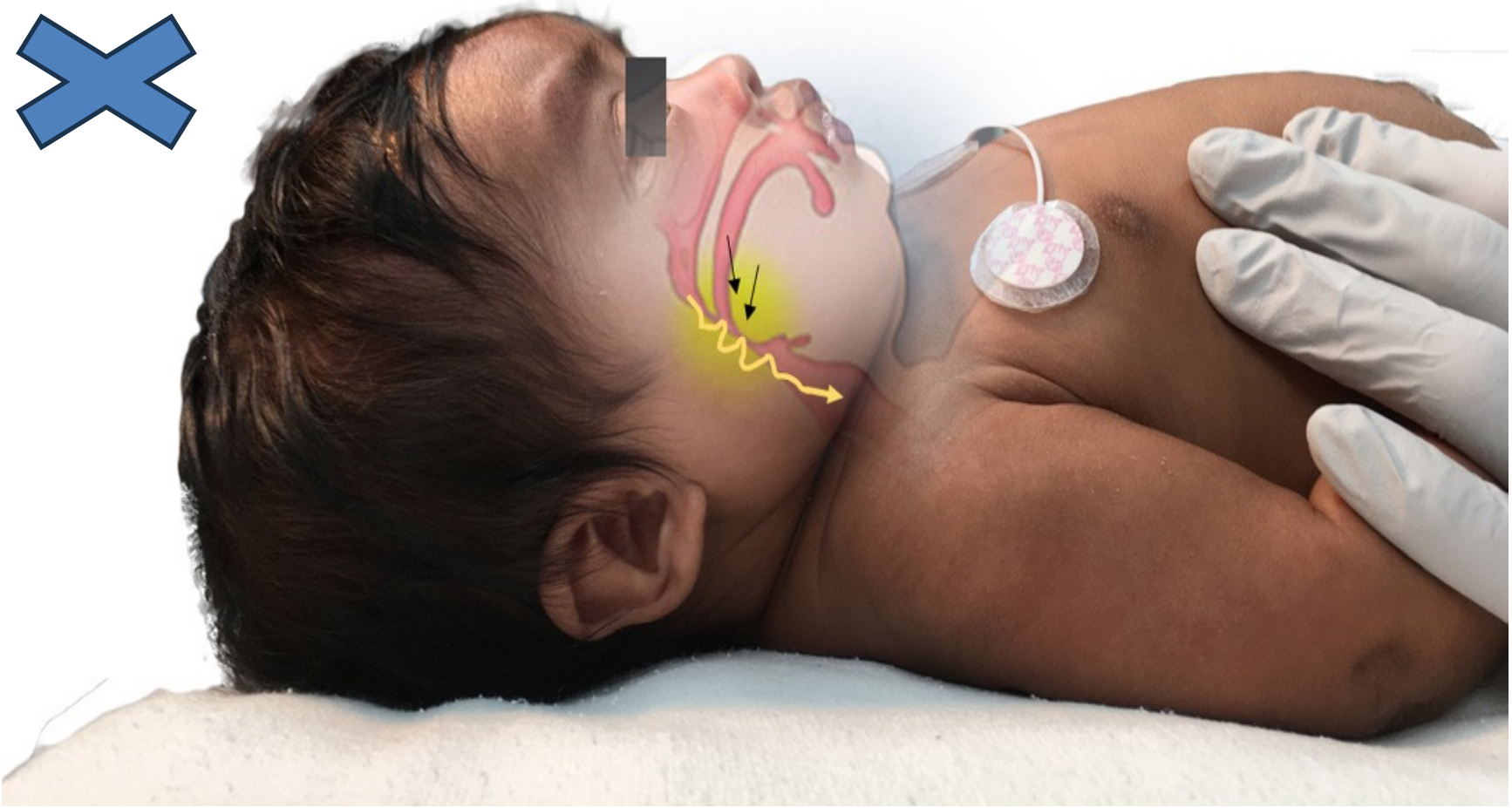

CORRECT

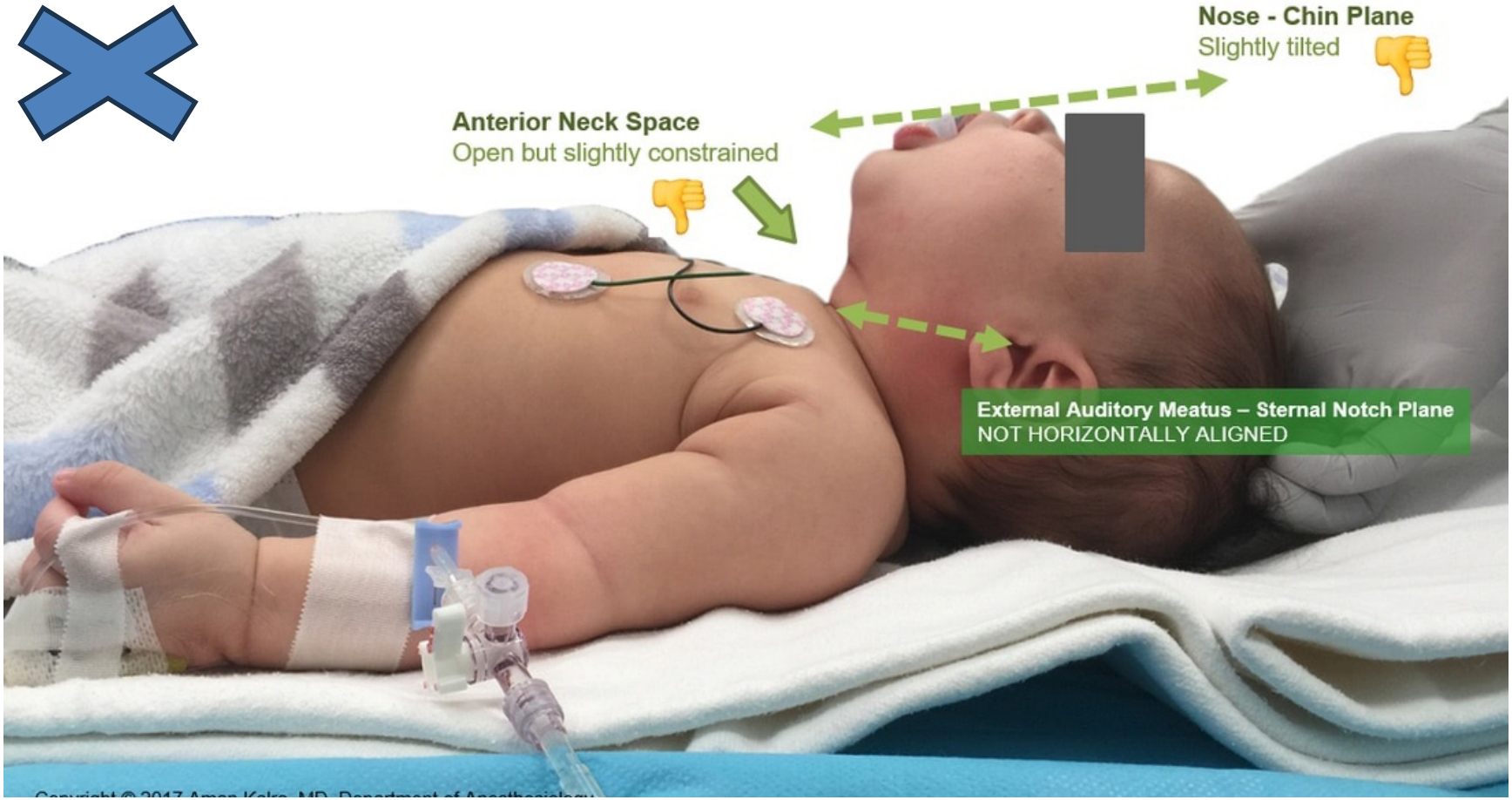

The Nose and Chin are Horizontally Aligned
The Anterior Neck Space is wide open
External Auditory Meatus and the Sternal Notch are Horizontally Aligned
Head Rest
Shoulder Roll
Copyright © 2014 Aman Kalra, MD. Department of Anesthesiology
SEMI FIRM OR BED SURFACE



Simple Extension is sometimes all what is required to bring an infant into optimal “sniffing position”

like during general anesthesia, the relatively large tongue falls back against the posterior pharyngeal wall and contributes to airway turbulence and upper airway obstruction




Nose - Chin Plane
Slightly tilted
Anterior Neck Space
Open but slightly constrained
External Auditory Meatus – Sternal Notch Plane
NOT HORIZONTALLY ALIGNED

Cont: Pediatric Airway Considerations

4. Infants are nose breathers.

- In the first 4-6 months of age infants breathe exclusively through the nose, And will experience respiratory distress if the nose is blocked.
- Care must be taken to ensure that the nares are patent in cases of infant trauma.

Cont: Pediatric Airway Considerations

5. Trachea is more cartilaginous and soft

- The cartilaginous nature of the paediatric airway makes **it more subject to collapse and obstruction** than the adult airway if the child is not positioned appropriately.

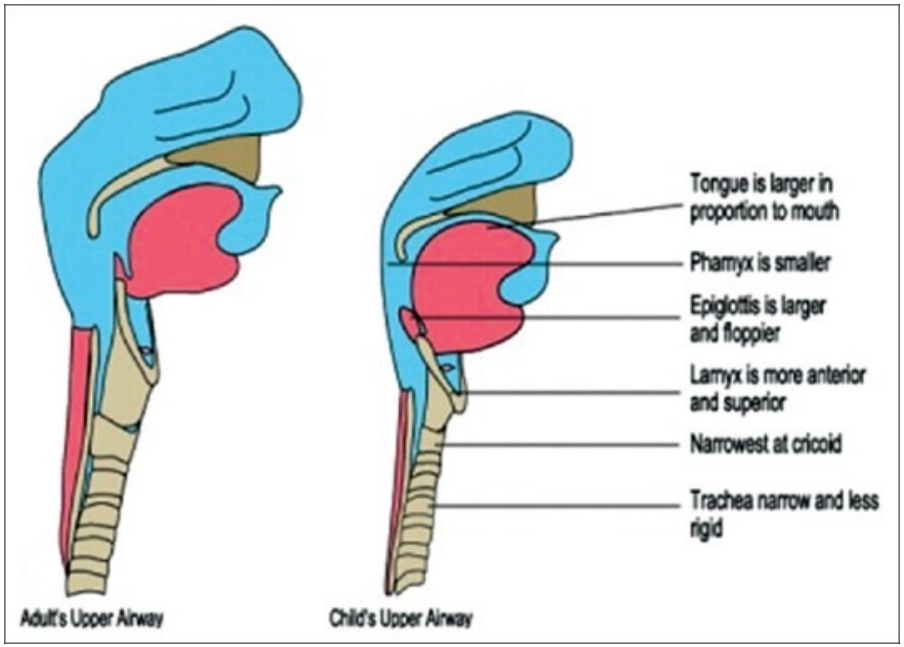
- The **tonsils** in toddlers and young children may be enlarged, contributing to airway obstruction and making nasal passage of an endotracheal tube difficult.

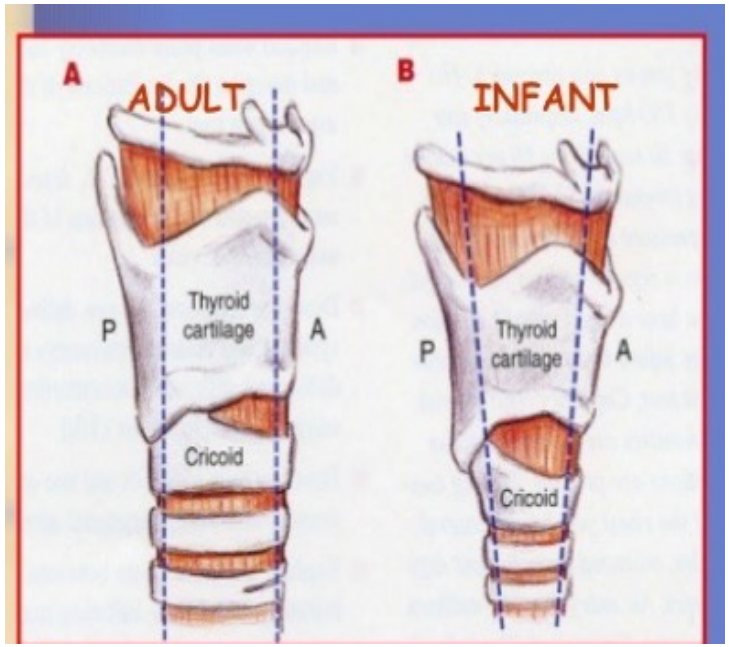
Cont: Pediatric Airway Considerations

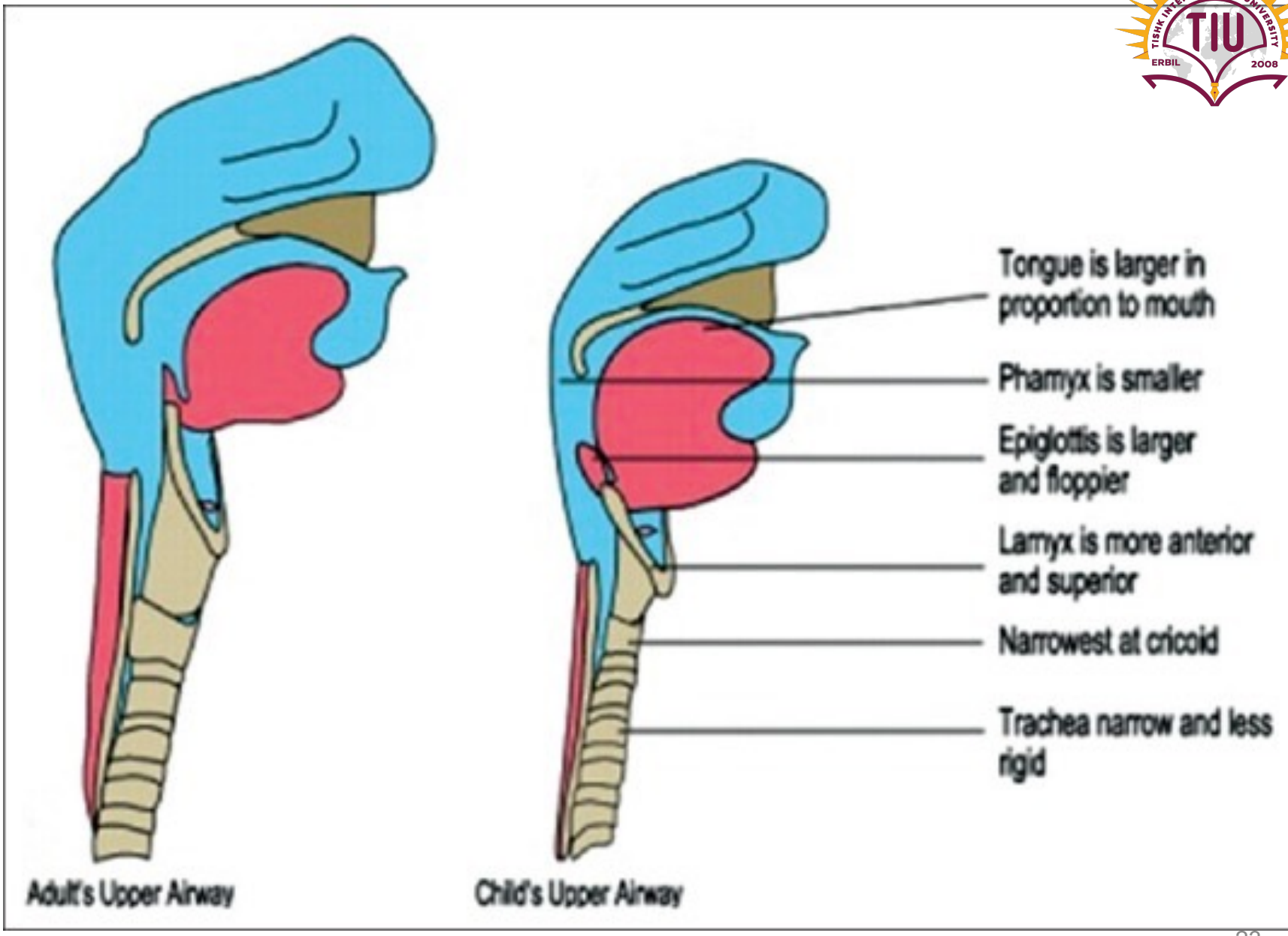
6. Larynx is higher and more anterior.

- The larynx sits at the level of the 2nd - 3rd cervical vertebrae in the young child, compared with the **6th -7th** cervical vertebrae in the adult.

- The positioning of the larynx makes its visualization in the pediatric airway more difficult than in the adult.

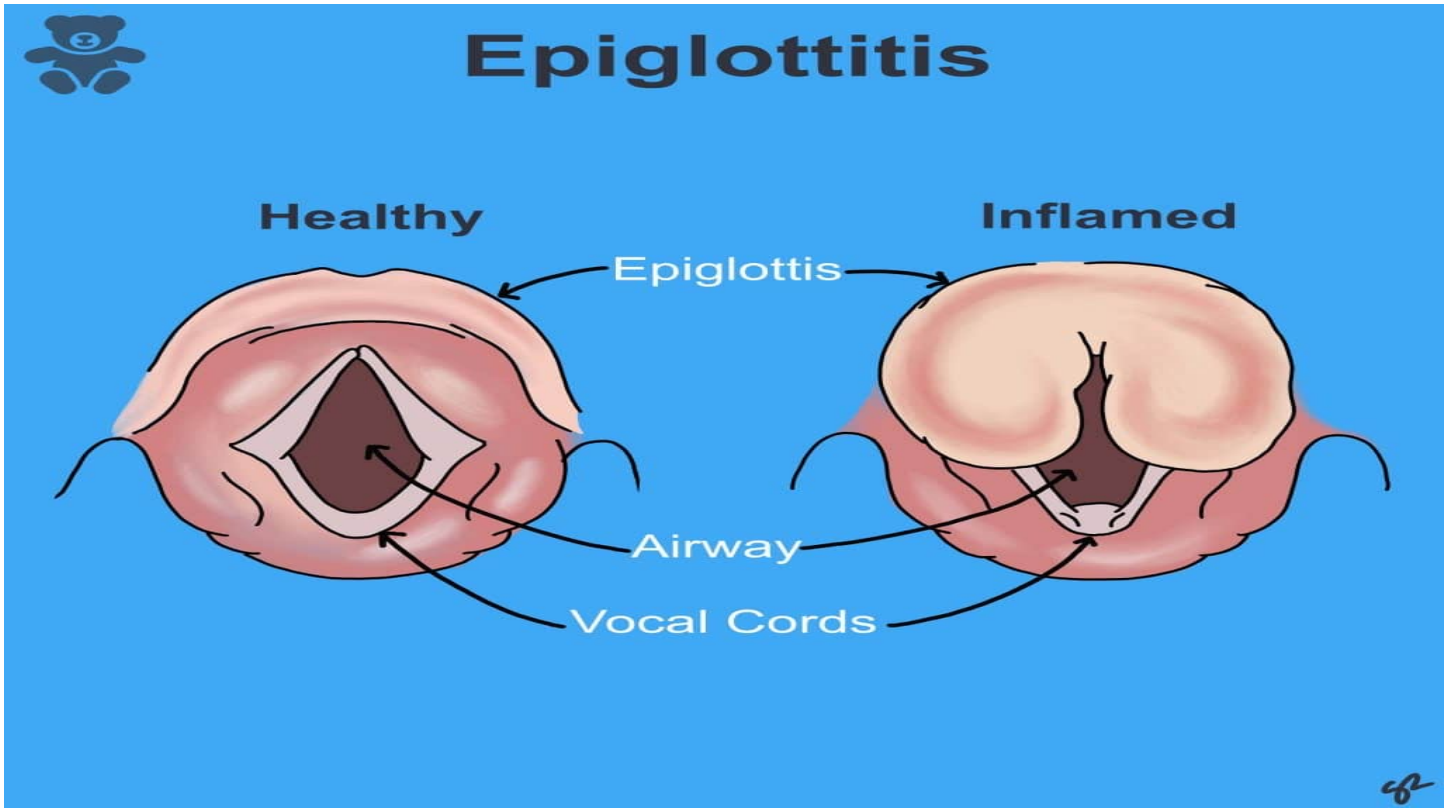




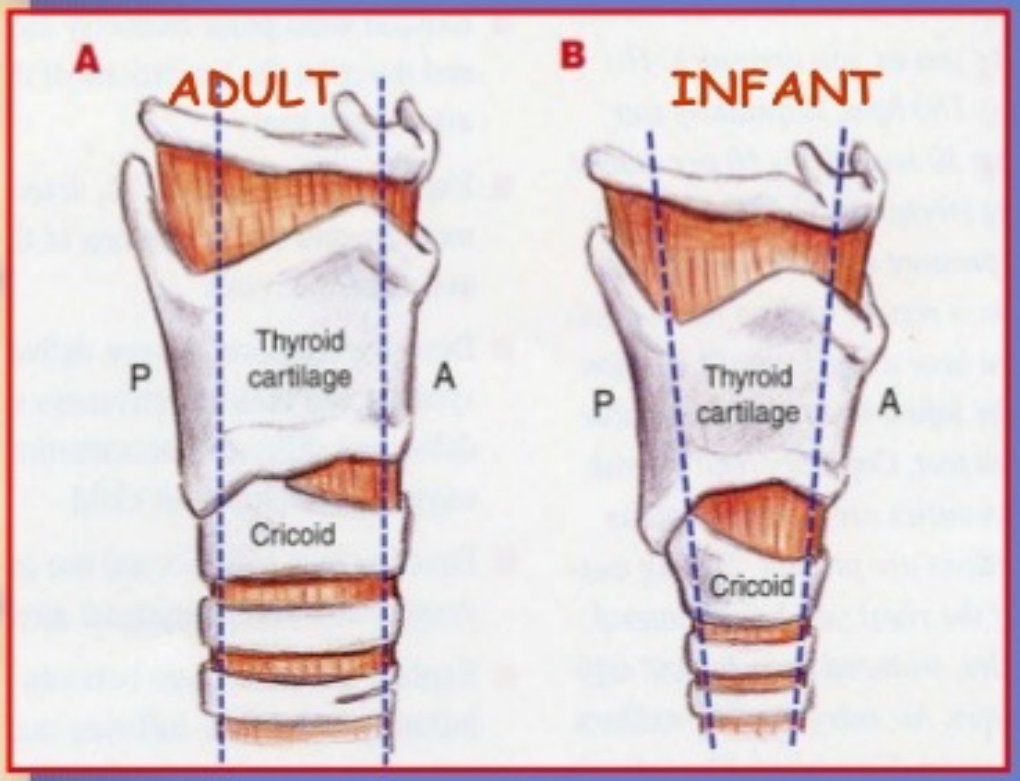

Tongue is larger in proportion to mouth
Pharnyx is smaller
Epiglottis is larger and floppier
Larnyx is more anterior and superior
Narrowest at cricoid
Trachea narrow and less rigid
Adult's Upper Airway
Child's Upper Airway

7. Shape of the epiglottis

- The epiglottis of the young child is horseshoe-shaped and projects posteriorly at 45^{o}.
- This makes the technique of tracheal intubation more difficult.



Funneled shape larynx



- narrowest part of infant's larynx is the undeveloped cricoid cartilage, whereas in the adult it is the glottis opening (vocal cord)
- Tight fitting ETT may cause edema and trouble upon extubation
- Uncuffed ETT preferred for patients < 8 years old
- Fully developed cricoid cartilage occurs at 10-12 years of age

Image from: http://www.hadassah.org.il/NR/rdonlyres/59B531BD-EECC-4FOE-9E81-14B9B29D139B1945/AirwayManagement.ppt

8. The trachea is short

- The pediatric trachea is comparatively shorter than that of the adult, which increases the risk of dislodgement of the endotracheal tube.

9. Breathing

- Ribs positioned more horizontally
- The ribs of the infant are positioned more horizontally than those of the adult.
- This means that with inspiration the ribs only **move up**, and **not up-and-out**, like the adult rib cage. This limits **the capacity to increase tidal volumes**.

Adult chest x-ray showing arched rib

- Neonate chest x-ray showing flattened ribs

10. Thin chest wall

Upper and lower respiratory noises can be referred to other areas of the chest when auscultating, making it **difficult to localize adventitious** sounds

11. Diaphragmatic breathing

In infancy, the diaphragm is the most significant respiratory muscle. The greater compliance of the chest wall in infants and young children also explains the significant intercostal retraction that occurs in children when the airway is obstructed, or there is a decrease in lung compliance.

12.Respiratory rate varies with age

- Young children have significantly higher metabolic rates than adults, and therefore have a higher oxygen demand, which in turn results in higher respiratory rates.

Respiratory rate according to age

Age in years	Respiratory rate per minute	Consider as rapid (respiration/minute)
Newborn	30–50	>60
Infant (<1 year)	20–30	>50
Toddler (one to three years)	20–30	>40
Child (from four years of age)	15–20	>30

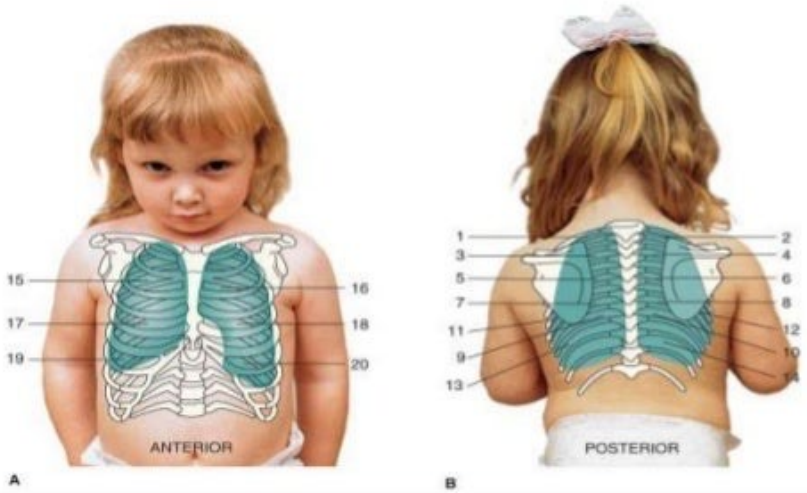
Assessment

- **Observation**
  - Level of Consciousness, Activity; Awareness of Environment (Recognizes Parents?)
  - Skin Color: Pink, Pale, Mottled?

Child with Mild Cyanosis

Respiratory Assessment (p. 122 [new], 138 [old])

- Auscultation
  - Listen comparing one areas to the other
    - Equality of breath sounds
    - Diminished
    - Poor air exchange
  - Abnormal breath sounds
    - Fine crackles
    - Wheezes (sibilant rhonchi)
    - Rhonchi (sonorous, coarse crackles)
    - Stridor
  - Cough



* Prolonged inspiratory phase = upper airway obstruction (croup, foreign body)
* Prolonged expiratory phase = lower airway obstruction (asthma)

CONT: Assessment

- **Respiratory Rate and breathing sound**

–***Grunting*:** Audible at end of **expiration**

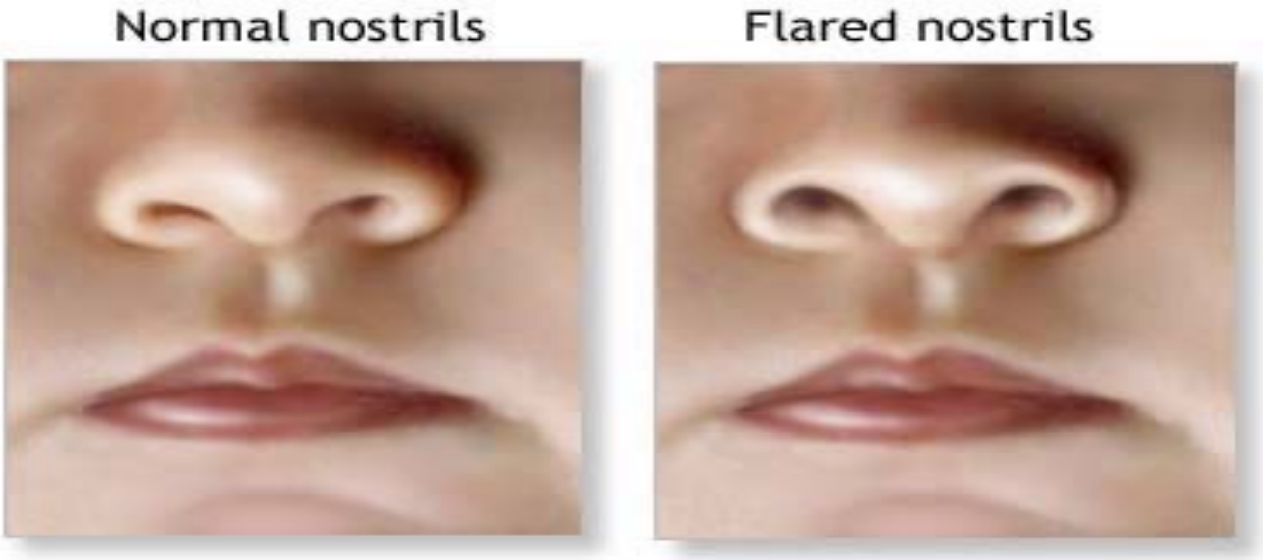
–***Stridor*:** produced by an obstruction of the trachea or larynx**.**

–**Wheezes:** Musical Sound Related to Turbulent عاصفAirflow in Constricted Airway (Asthma) .

–**Crackles, crepitations, or Rales**: are caused by explosive opening of small airway s related to Fluid in Airway (Pneumonia).

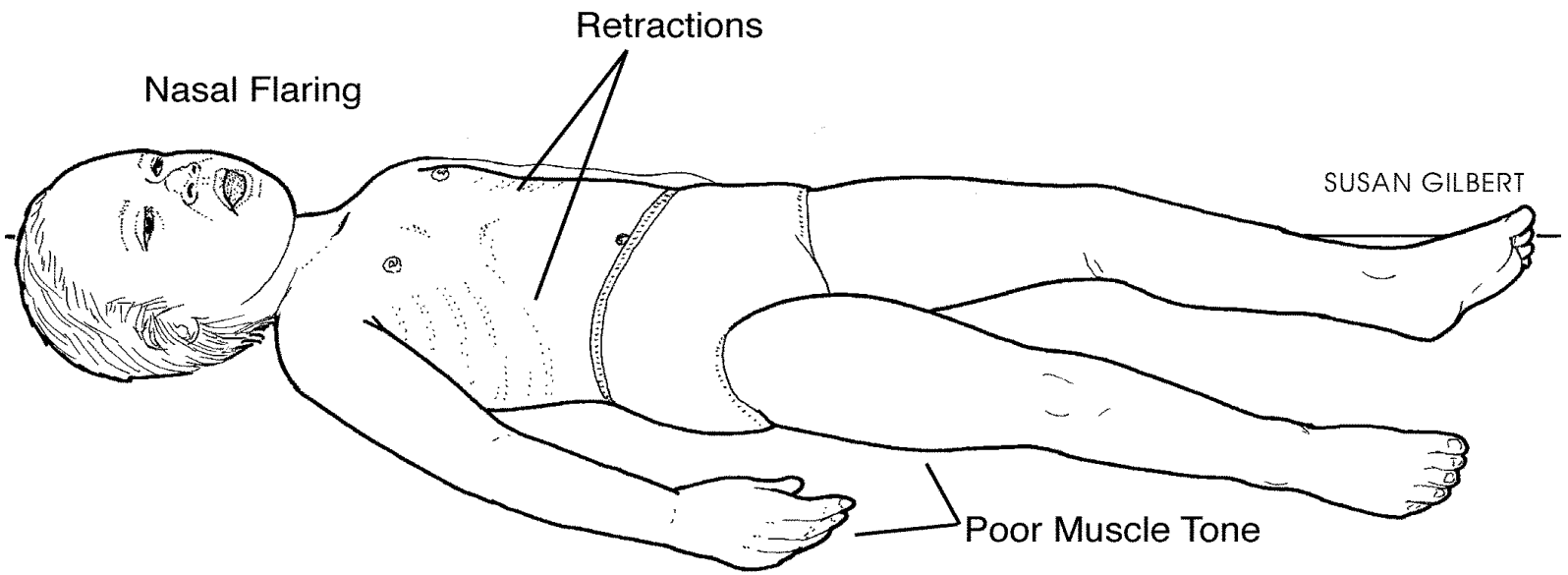
CONT: Assessment

- ***Nasal Flaring***: nostrils flare in attempt to increase airway diameter.



CONT: Assessment

- ***Retractions***: chest wall is drawn inward during inspiration due to flexible (cartilage) airway.



Cont: Assessment

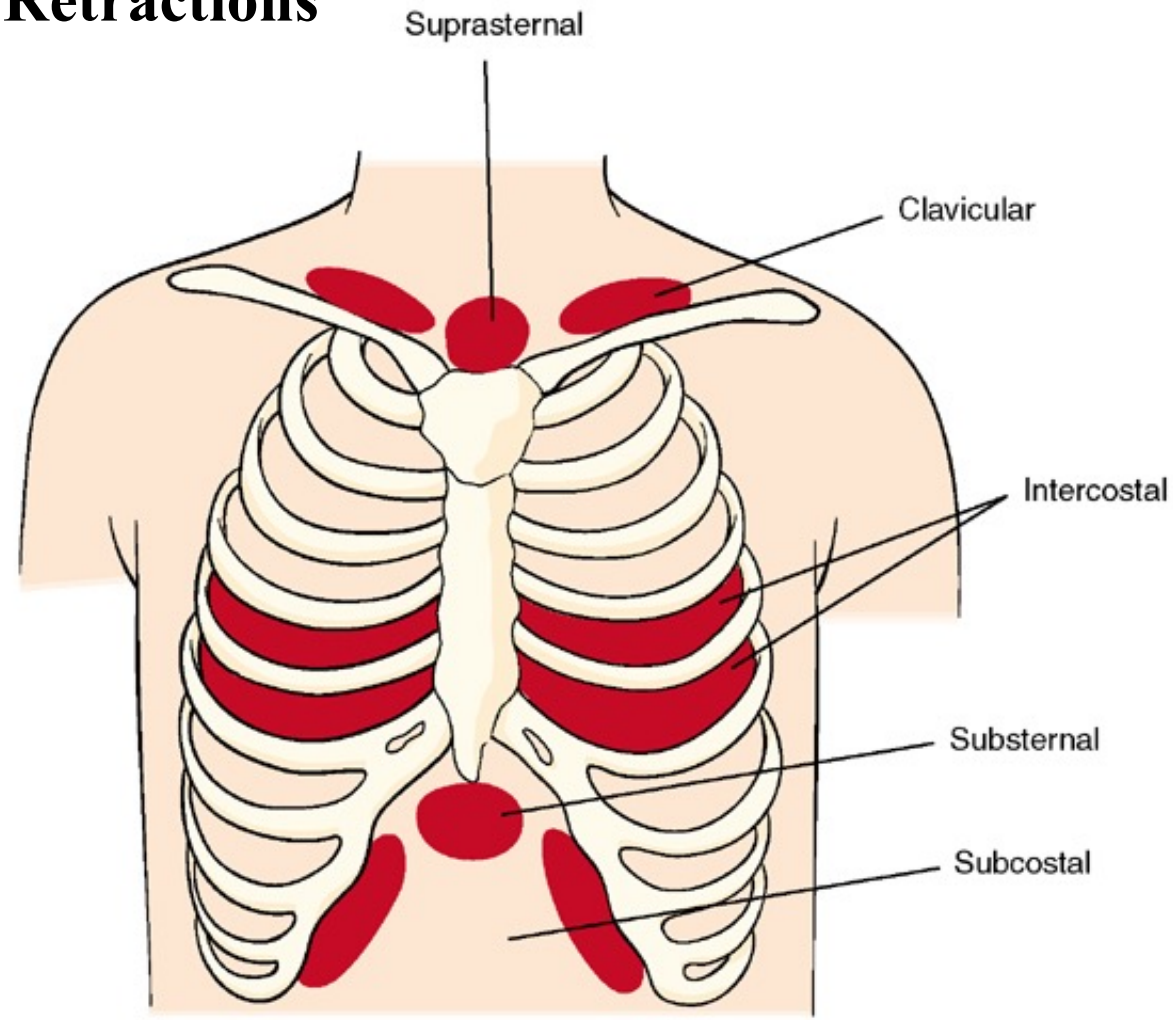
Chest retraction (Chest indrawing)

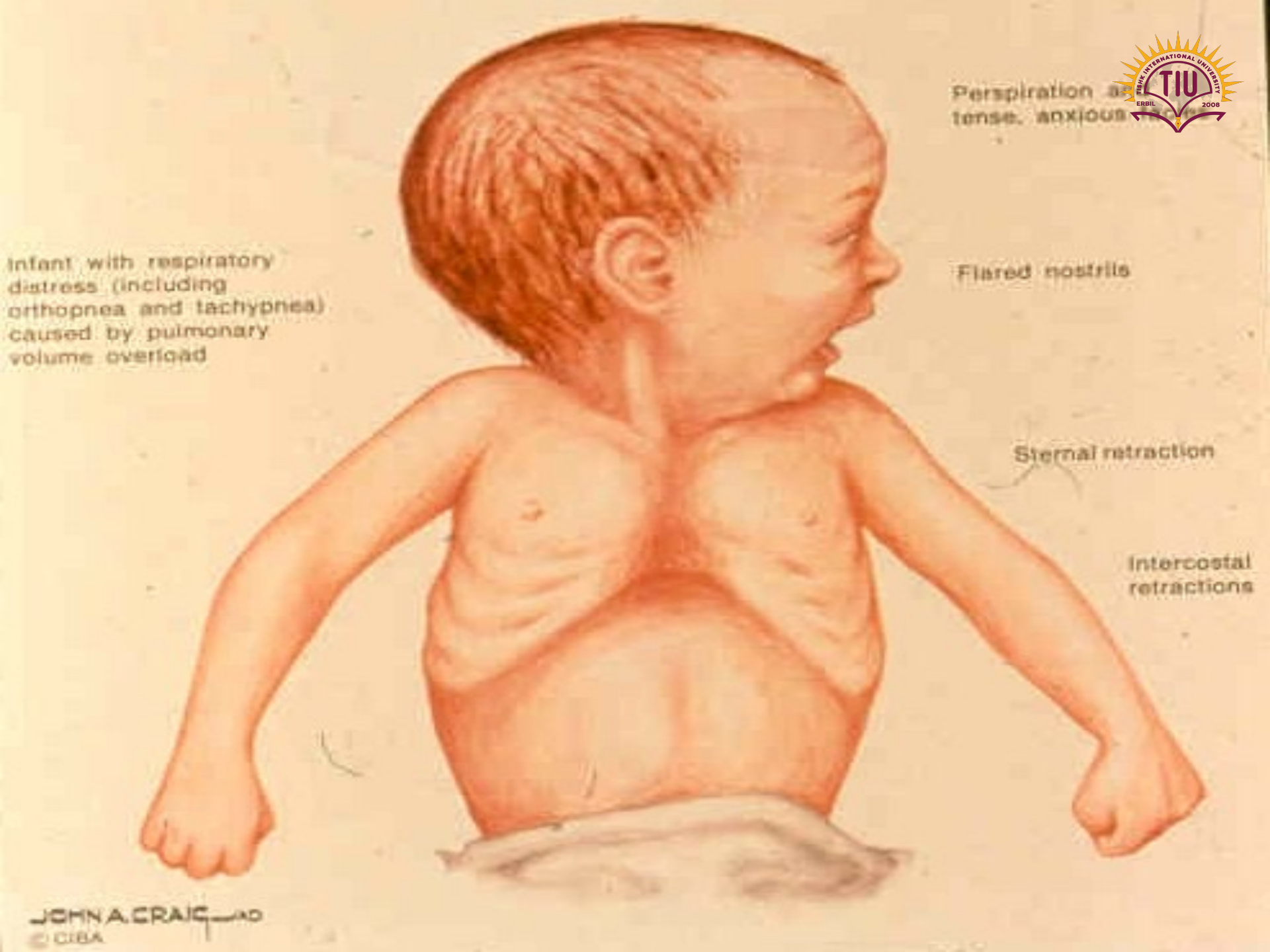
It is trying to get more air into lungs, but the lack of air pressure causes the skin and soft tissue in the chest wall to sink in.

Chest retraction. It's easy to spot in babies and small children because their chests are softer and haven't fully grown yet.

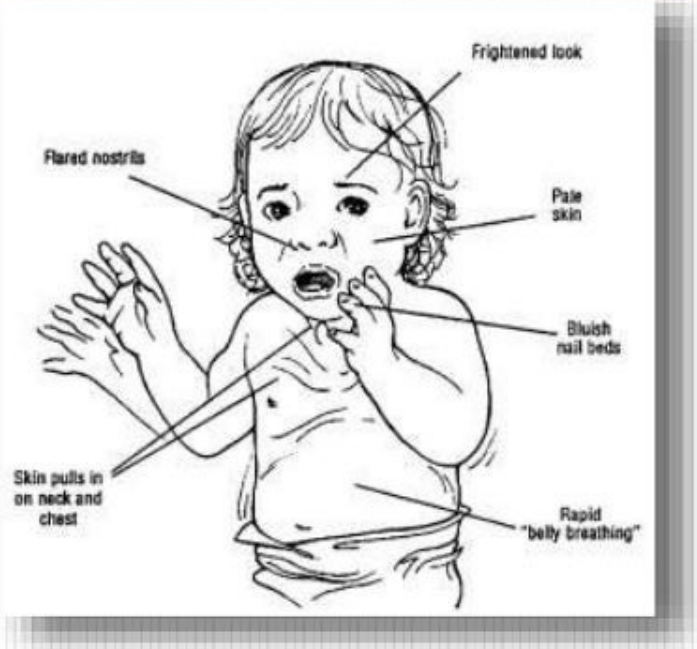
Cont: Assessment

Location of Retractions




Perspiration and tense, anxious
Flared nostrils
Infant with respiratory distress (including orthopnea and tachypnea) caused by pulmonary volume overload
Sternal retraction
Intercostal retractions
JOHN A. CRAIG, M.D.
© CIBA

Respiratory Distress



Cont: Assessment

- High fever
- Thick green, yellow secretions
- Grunting respirations
- Crackles, diminished breath sounds
- Cough and cyanosis
- X-ray

Respiratory Nursing Diagnoses

- Impaired gas exchange
- Ineffective breathing pattern
- Ineffective airway clearance
- Risk for aspiration
- Risk for imbalanced fluid volume
- Risk for ineffective tissue perfusion
- Anxiety
- Fatigue
- Activity intolerance
- Imbalanced nutrition: less than body requirements
- Delayed growth/development
- Deficient knowledge

Risk factors for respiratory tract infections

1. Absence of breastfeeding.
2. Age below 12 weeks at presentation.
3. Chronic lung disease..
4. Congenital heart disease.
5. Gastroesophageal reflux disease.
6. Neuromuscular disorders: associated with depressed consciousness.
7. Older siblings in the nursery or school.
8. Passive smoking, especially maternal.
9. Congenital or acquired immune deficiencies.

Disorder of Upper respiratory tract

Common Cold, Flu
(Acute Nasopharngitis)

- It is most frequent infectious disease in children .
- Toddlers have an average of 10 to 12 colds a year.
- School age children and adolescents have a many as 4 to 5 yearly.
- The incubation period is typically 2-3 days.
- Most occur in the winter months.

Common Cold

Causes

- Rhinovirus, influenza viruses, adenovirus, .

- Children are exposed to common colds at school from sick children .
- Children who have low immune system.

Assessment of common cold

- Nasal congestion.
- A watery rhinitis .
- The mucous membrane of the nose becomes edematous and inflamed.
- Difficulty breathing due to edema congestion.
- Draining pharyngeal secretions may lead to cough.
- Cervical lymph nodes may be swollen and palpable.

Assessment of common cold

- Infants will develop fever
- secondary symptoms (vomiting and diarrhea).
- Older children will not develop as high fever .

Therapeutic Management of common cold

- There is no specific treatment for a common cold.
- Antibiotics are not effective unless a secondary bacterial invasion has occurred.
- If children have fever, it should be controlled by antipyretic drugs .
- If infants have nasals congestion, saline nose drops or nasal spray may be use to liquefy nasal secretion and help them drain.

Croup Syndromes

Croup Syndromes: is a general term applied to a symptom complex characterized by **hoarseness, a resonant cough** described as **“barking” or “brassy” (croupy**), varying degrees of inspiratory stridor, and varying degrees of respiratory distress resulting from swelling or obstruction in the region of the larynx.

Acute infections of the larynx are important in infants and small children because the small diameter of the airway in infants and children places them at risk for significant narrowing with inflammation.

CROUP SYNDROMES

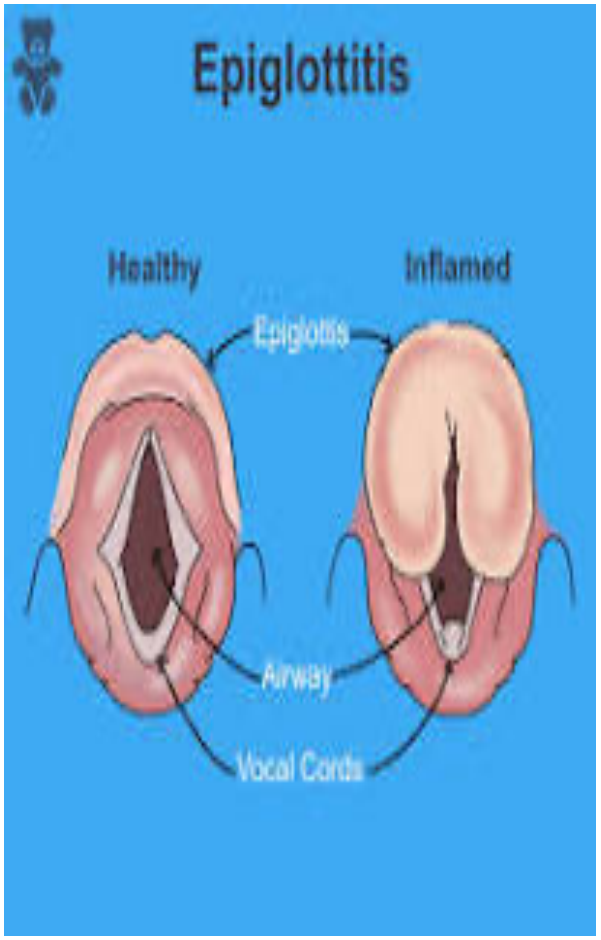
Croup syndromes can affect the **larynx, trachea, and bronchi**.

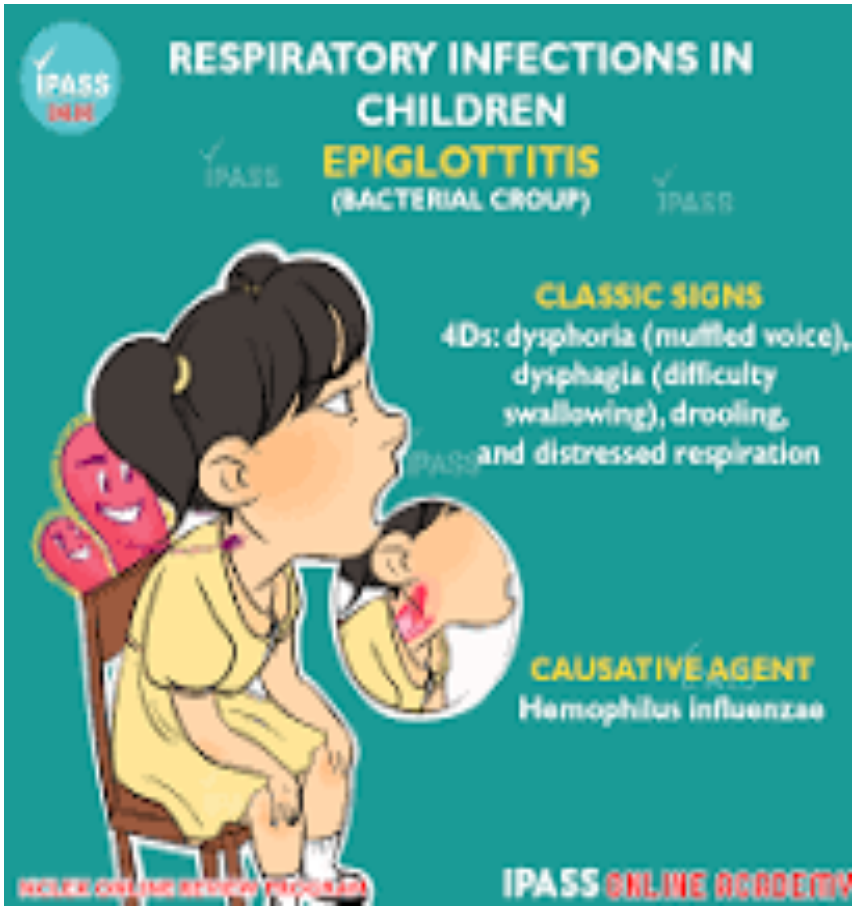
However, laryngeal involvement often dominates the clinical picture because of the severe effects on the voice and breathing.

Croup syndromes are described according to the primary anatomic area affected (i.e., **Epiglottitis , Laryngitis, Laryngotracheobronchitis [LTB], And Tracheitis**).

CROUP SYNDROMES

epiglottitis





CROUP SYNDROMES

- In general, **LTB** occurs in very young children, and **epiglottitis** is more common in older children, and epiglottitis is more common in older children. The initial symptoms of all four conditions include:
- Acute spasmodic croup and LTB are the most common disorders, but epiglottitis and bacterial tracheitis are more serious

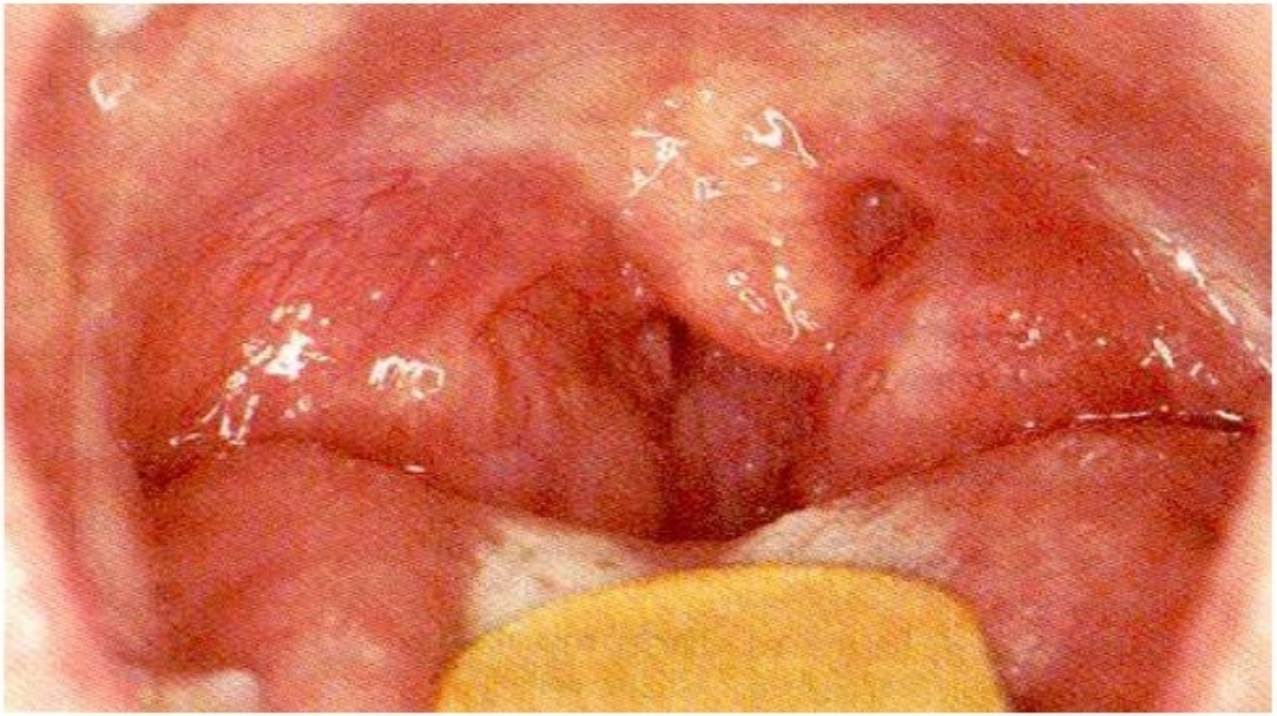
- Pyrexia
- Drooling
- Inability to swallow
- Stridor
- Characteristic tripod position
- Cough rare

Can progress from presentation to death within hours

- **Nursing Care Management of** Epiglottitis

- Focuses on adequacy of respiratory functioning and severity of illness.
- Attach a cardiore-spiratory monitor and pulse oximeter.
- Have the child in an area where continuous visual monitoring is possible to detect changes in severity of respiratory distress.
- Assess vital signs, including temperature.
- Pay particular attention to any progressive changes in the child's respiratory effort that may signal the need for intubation.
- Exhaustion can diminish the intensity of retractions and stridor.
- As the child uses remaining energy reserves to maintain ventilation, breath sounds may actually diminish.
- Responsiveness decreases as hypoxemia increases.

Tonsillitis



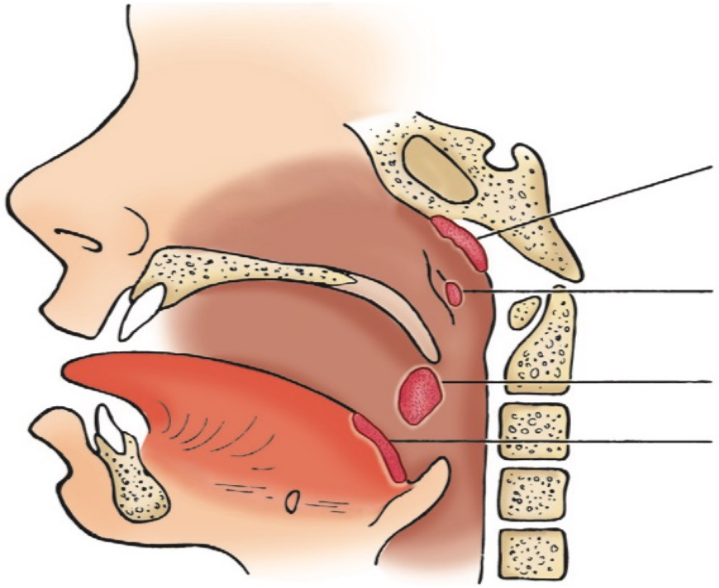
"Kissing tonsils" occur when the tonsils are so enlarged they touch each other.

Tonsillitis

The tonsils are masses of **lymphoid tissue** located in the pharyngeal cavity.

They filter and protect the respiratory and alimentary tracts from invasion by pathogenic organisms and play a role in antibody formation.

Children generally have much larger tonsils than adolescents or adults, because young children are especially susceptible to URIs.



Etiology OF Tonsilitis

Tonsillitis often occurs with pharyngitis. Because of the abundant lymphoid tissue and the frequency of URIs, tonsillitis is a common cause of illness in young children.

The causative agent may be **viral or bacterial.**

- **Clinical Manifestations of Tonsilitis**
- The manifestations of tonsillitis are caused by inflammation.
- As the platine tonsils enlarge from edema, they may meet in the midline (kissing tonsils), obstructing the passage of air or food.
- The child has difficulty swallowing and breathing.
- When enlargement of the adenoids occurs, the space behind the posterior nares becomes blocked, making it difficult or impossible for air to pass from the nose to the throat.
- As a result, the child breathes through the mouth.

Therapeutic Management of tonsilitis

- Throat cultures for antibiotic treatment. It is important to differentiate between viral and streptococcal infection in febrile exudative tonsillitis. Because most infections are of viral origin, early rapid tests can eliminate unnecessary antibiotic administration.

- **Tonsillectomy** is the surgical removal of the palatine tonsils. Absolute indications for a tonsillectomy are recurrent peritonsillar abscess, airway obstruction, tonsillitis resulting in febrile convulsions, and tonsils requiring tissue pathology .

Contraindications to either tonsillectomy adenoidectomy are:

- **(1) Cleft palate because the tonsils help minimize escape of air during speech,**
- **(2) Acute infections at the time of surgery because locally inflamed tissues increase the risk of bleeding,**
- **(3) Uncontrolled systemic diseases**
- **(4) Poor anesthetic risk.**

Nursing Care Management of tonsillectomy

- providing comfort and minimizing activities or interventions that precipitate bleeding.
- Patients with sleep-disordered breathing require close monitoring of airway and breathing postoperatively.
- A soft to liquid diet is preferred.
- A cool-mist vaporizer keeps the mucous membranes moist during periods of mouth breathing.
- Warm salt-water gargles, throat lozenges, and analgesic–antipyretic drugs such as acetaminophen are used to promote comfort.
- Often opioids are needed to reduce pain for the child to drink.

- **Cont: Nursing Care Management of tonsillectomy**
- Psychologic preparation
- Until they are fully awake, the child is placed on his or her abdomen or side to facilitate drainage of secretions.
- Routine suctioning is avoided, but when performed, it is done carefully to avoid trauma to the oropharynx.
- When alert, the child may prefer sitting up.
- The child is discouraged from coughing frequently, clearing the throat, blowing the nose, and any other activity that may aggravate the operative site.
- An ice collar may provide relief, but many children find it bothersome and refuse to use it.
- Most children experience moderate pain after a T&A and need pain medication regularly for at least the first few days.

Cont: Nursing Care Management of tonsillectomy

- Analgesics may be given rectally or intravenously to avoid the oral route.
- An antiemetic such as ondansetron (Zofran) may be administered postoperatively if nausea or vomiting is present.
- Food and fluids are restricted until the child is fully alert and there are no signs of hemorrhage.
- Cool water, crushed ice, flavored ice pops, or diluted fruit juice may be given, but fluids with a red or brown color are avoided to distinguish fresh or old blood in emesis from the ingested liquid.
- Citrus juice may cause discomfort and is usually poorly tolerated.

Cont: Nursing Care Management of tonsillectomy

- Soft foods, particularly gelatin, cooked fruits, sherbet, soup, and mashed potatoes, are started on the first or second postoperative day or as the child tolerates feeding.
- Milk, ice cream, and pudding are usually not offered because milk products coat the mouth and throat and may cause the child to clear the throat, which can initiate bleeding.

Disorder of the lower respiratory tract

It is infection by a pathogenic agent of trachea, bronchi, bronchioles and lung tissues

Bronchitis

Acute bronchitis, inflammation of the **trachea and bronchi**, rarely occurs in childhood as an isolated problem.

It may be preceded by a common cold or influenza.

Bronchitis occurs most commonly in the winter months.

It is one of the more common illness affecting **preschool and school** children.

The classic symptom of bronchitis:

Is a dry, hacking cough that increases in severity at night. The cough may or may not be productive.

The child may swallow sputum and vomit as a result.

The chest and ribs may be sore because of the deep and frequent coughing.

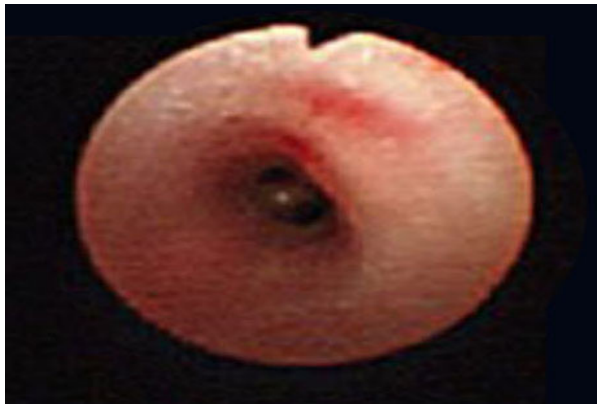
Over several days breath sounds may become coarse with fine crackles, and some scattered high-pitched wheezing may be heard.

Treatment is palliative unless a secondary bacterial infection occurs that needs antibiotic therapy.

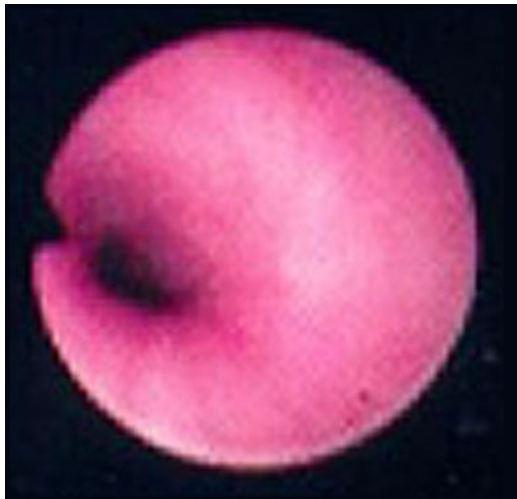
Causes of **Bronchitis:**

- Viruses or bacteria (streptococci) and lasting several days or weeks.

- Normal Airway



Bronchitis Airway



Therapeutic Management of Bronchitis:

The aims of the therapy to reduce the symptoms of illness, reducing fever and maintaining adequate hydration.

1. **Antibiotic:** if considered to be bacterial is commonly treated with an antibiotic .
2. **Bronchodilators:** Inhalers for wheezing (Bronchodilators) may be used like Ventolin, (Salbutamol) or aminophyllin, is commonly used for shortness of breath due to bronchospasm.
3. **Expectorants** like solvodin.
4. Cough syrups to suppress the cough.

Nursing Management OF Bronchitis

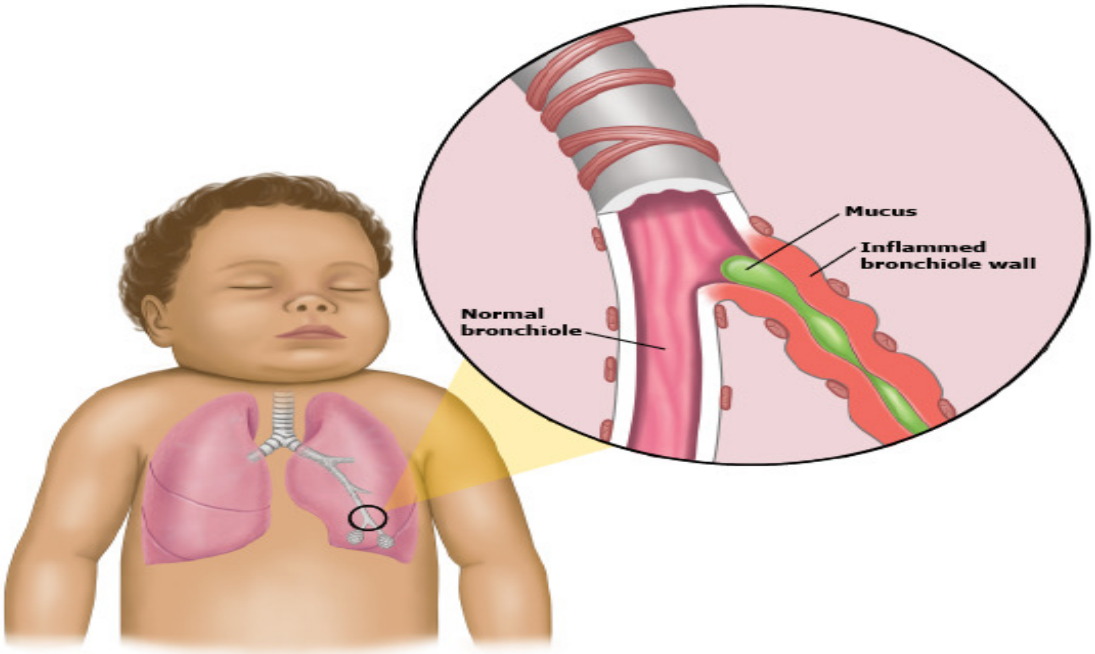
Nursing management includes supporting respiratory function through: rest, humidification, hydration, and symptomatic treatment.

Home care should emphasize the self-limiting nature of the disorder.

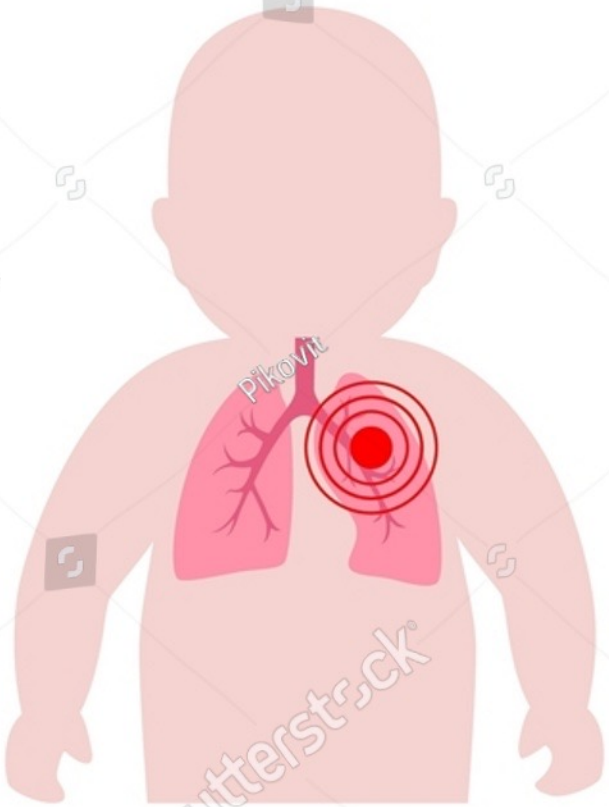
Advise parents who smoke that quitting or not smoking in the child's presence may benefit the child.

Bronchiolitis

- Bronchiolitis is a lower respiratory tract illness that occurs when a viral or bacterial organism causes inflammation and obstruction of the bronchioles.
- **Is** acute obstruction and inflammation of the bronchioles, the smallest air passages of the lungs.



BRONCHIOLITIS



Swollen airway

Etiology And Pathophysiology

Respiratory syncytial virus (RSV) is the most common cause of bronchiolitis, but **adenovirus, parainfluenza virus, and human metapneumovirus** may also be responsible.

Ri**sk factors** for severe RSV infection include:

Immunosuppression.

Very low birth weight.

Lung disease.

Severe neuromuscular disease.

Complicated congenital heart defects.

Bronchiolitis and Respiratory Syncytial Virus

It is a leading cause of hospitalization during the first year of life .

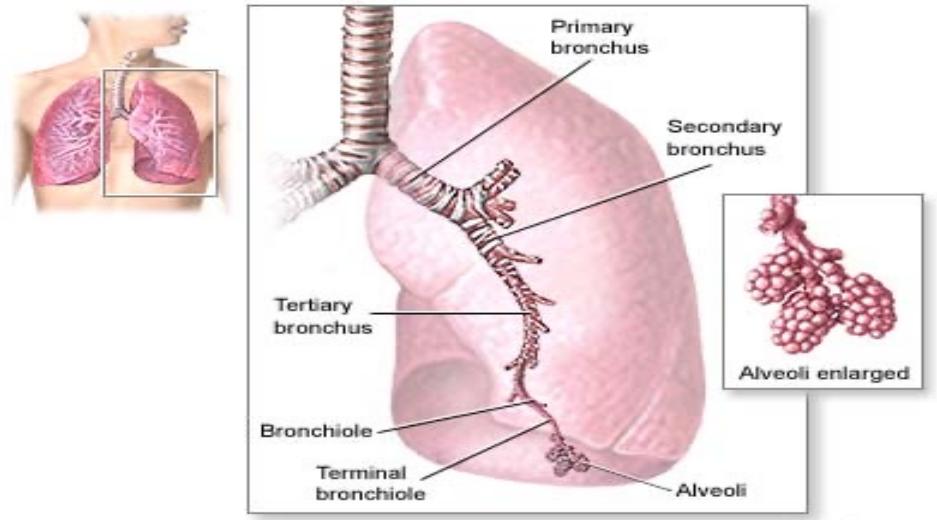
Infants who develop bronchiolitis have an increased risk for recurrent wheezing during the first year of life.

Incidence : is highest in the winter and spring months.

Causative agents of Bronchiolitis

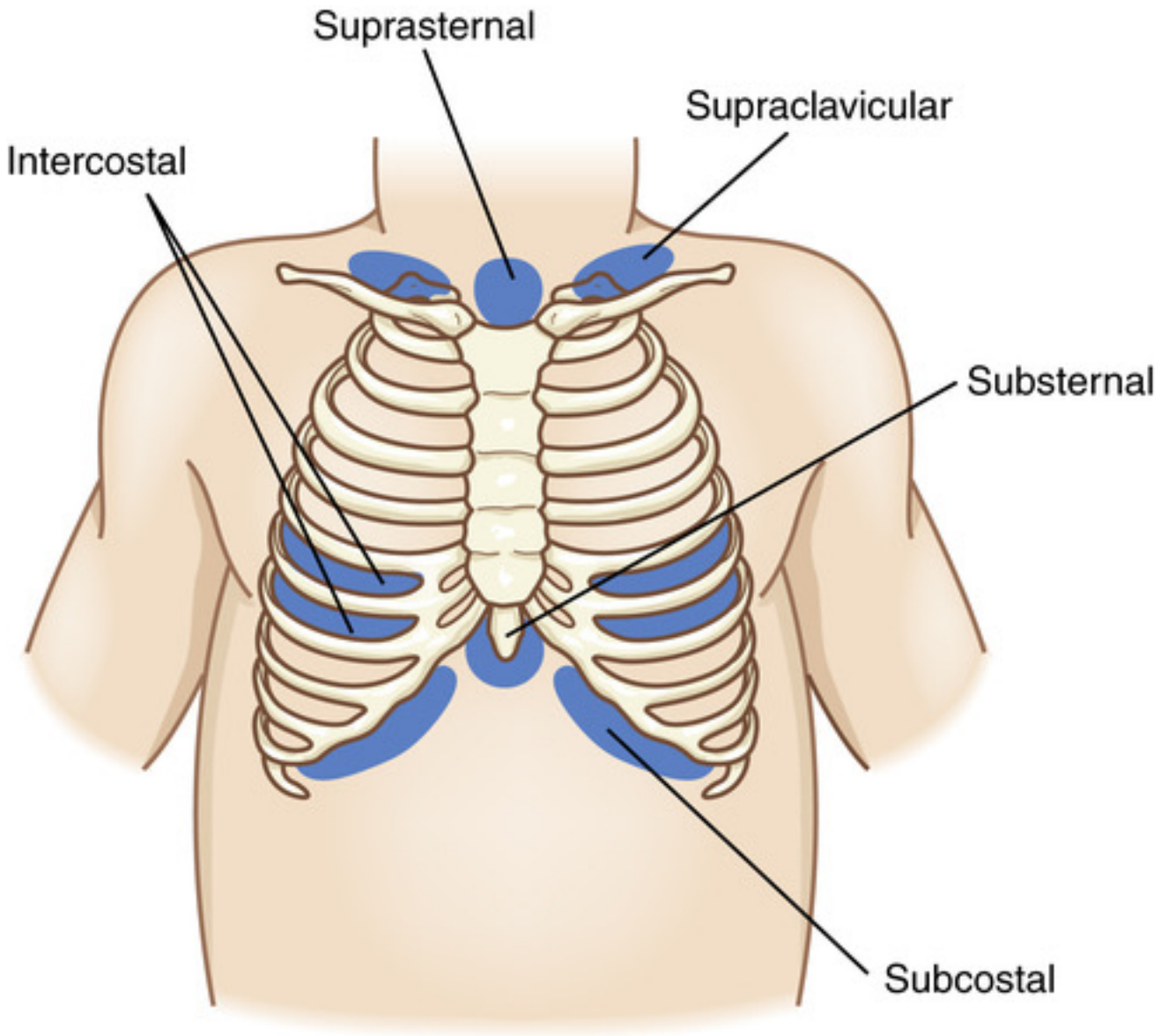
1- **Respiratory Syncytial Virus (RSV).**

RSV affects almost all infants and young children in the first three years of life, with a peak incidence of hospitalized patients at two to six months of age.



Assessment of Bronchiolitis

- ✓ Children have 1 - 2 days of an upper respiratory tract infection than suddenly begin to have nasal flaring .
- ✓ In a typical case, an infant develops :
- ✓ **cough, wheeze, and shortness of breath over one or two days.**
- ✓ **Intercostals and subcostal retraction on inspiration and increase respiratory rate .**
- ✓ **Mild fever**
- ✓ Infants develop tachycardia and cyanosis from hypoxia.
- ✓ Chest X-ray is useful for diagnosis.


Suprasternal
Supraclavicular
Intercostal
Substernal
Subcostal

Intercostal Retractions

One of the most important physical findings to be able to recognize in a newborn is the presence of retractions. **Sepsis, pulmonary pathology, cardiac disease, metabolic disorders, polycythemia, cold stress.** It is a sign of a newborn in distress. In this photo, taken during inspiration, the shadows between the ribs can be clearly seen.

Retractions may or may not occur in combination with other signs of distress: nasal flaring, grunting, and tachypnea

Subcostal Retractions

This infant demonstrates subcostal retractions. Here the shadow is seen at the lower margin of the rib cage only.

Therapeutic Management of Bronchiolitis

Therapy is principally **supportive.**

- ✓ Frequent small feeds are encouraged to maintain **hydration**

  I.V fluid may be given for the 1 to 2 days of illness.
- ✓ **Semi- fowlers poison** to facilitate breathing.
- ✓ Humidified and adequate **Oxygenation therapy** .
- ✓ **Chest percussion** to mobilize secretions
- ✓ **Suction of the nasopharynx** is often performed to maintain a clear airway.
- ✓ **Monitoring vital signs** and blood gas levels and ventilatory.
- ✓ **Nebulizer bronchodilators** and steroids may be used.
- ✓ **Antibiotics** are often given in case of a bacterial infection

  complicating bronchiolitis but have no effect on the underlying viral infection.

Prognosis and prevention of Bronchiolitis

- **Handwashing between** touching patients will limit the spread of bronchiolitis in the healthcare .

The recovery of pulmonary epithelial cells occurs three to four days after the onset of bronchiolitis, but cilia do not regenerate for approximately two weeks. This explains the prolonged cough and wheeze and it is helpful to let parents know this during discharge .

Prognosis and prevention of Bronchiolitis

- Mortality remains as high as 0.5-1.5 per cent in hospitalized patients, increasing to 3-4 per cent in those with underlying cardiac or pulmonary disease, namely premature infants

Pneumonia.

Pneumonia accounts for **15%** of all deaths of children under 5 years old, killing an estimated 922 000 children in 2015.

Pneumonia.

Community-acquired pneumonia (CAP) is defined as a pneumonia acquired by a healthy child outside the hospital; it usually presents with cough and fever.

Pneumonia.

Streptococcus pneumonia is the most common bacteria seen in children under five years old, while ***Mycoplasma pneumoniae*** *and* ***Chlamydophilia pneumoniae*** *are more common in* children over five years of age.

Pneumonia.

Clinical presentation

presents with :

fever,

cyanosis

tachypnoea,

cough,

decreased breath sounds and crackles

(abnormal discontinuous bubbling noises heard on chest auscultation during inspiration) .

Pneumonia.

Clinical presentation

Bacterial pneumonia is more likely in children older than three years of age

with a temperature higher than 38.5° C.

Viral pneumonia, is more common in infants and young children, with wheeze, low-grade pyrexia (<38.5° C), hyperinflation and chest wall retraction.

Management of pneumonia

Children who are well can be managed at **home** and their parents advised on measures for fever

management, adequate fluid administration, antibiotics

and worsening needs reassessment .

Cont: Management of pneumonia

The children's nurse plays an important role in addressing parents' **anxieties** and may be able to offer reassurance when a child is **discharged home** after an initial assessment, along with a plan of what features to look out for if the child deteriorates.

Management of pneumonia . cont

In the hospital setting a child may need:

supplemental oxygen,

intravenous fluids ,

and other supportive measures.

antibiotics

A chest X-ray is done to prove or confirm the clinical suspicion of pneumonia but may not be able to differentiate between a bacterial and viral etiology.

Management of pneumonia cont.

•Children with CAP admitted to hospital are generally treated with antibiotics.

•**Amoxicillin** is the preferred antibiotic in children under five years of age because *Streptococcus pneumoniae is the common pathogen in this age group.*

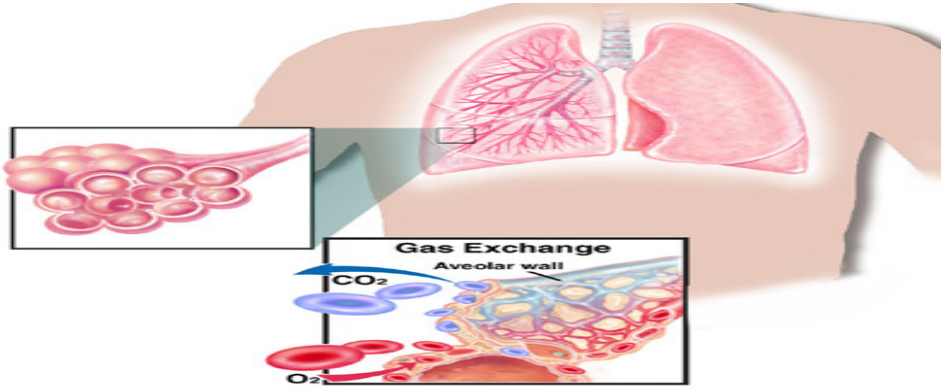
•For children older than five years of age, **erythromycin** or **azithromycin** is preferred because ***Mycoplasma pneumoniae*** *is more* common in this age group .

• A course of antibiotics for CAP of seven to ten days is advisable.

Asthma

Asthma

Asthma is a chronic condition that has periods of quiescence and exacerbation. It involves inflammation of the airways and airway reactivity causing a contraction of the bronchioles; this is called Bronchospasm (Dixon *et al 2009).*



- **Asthma**
- Third leading cause of hospitalization among children younger than 15 years.
- Its occur initially before age 5 years.
- Child at early age, may diagnose as frequent occurrences of bronchiolitis rather than asthma.

Risk Factors of asthma

- Family history of eczema and hay fever , atopic disease;
- a positive skin test for allergies
- Air pollution

- **Sever broncho constriction can be induce by:**
- Cold air
- Irritating odors (smoke)
- Inhalation of a known allergen.
- Air pollutants such as cigarette smoke.
- Inhalation antigens such as pollens, molds, or house dust.
- Foods also may cause allergic.

Organic Compounds

Dishwashing liquid,

Detergent,

Nitrogen Dioxide

Dust mite

Weather dusty &cold

Dust

Cockroaches

Pet epithelial cells;

Grass pollen

Aggravating Stimuli

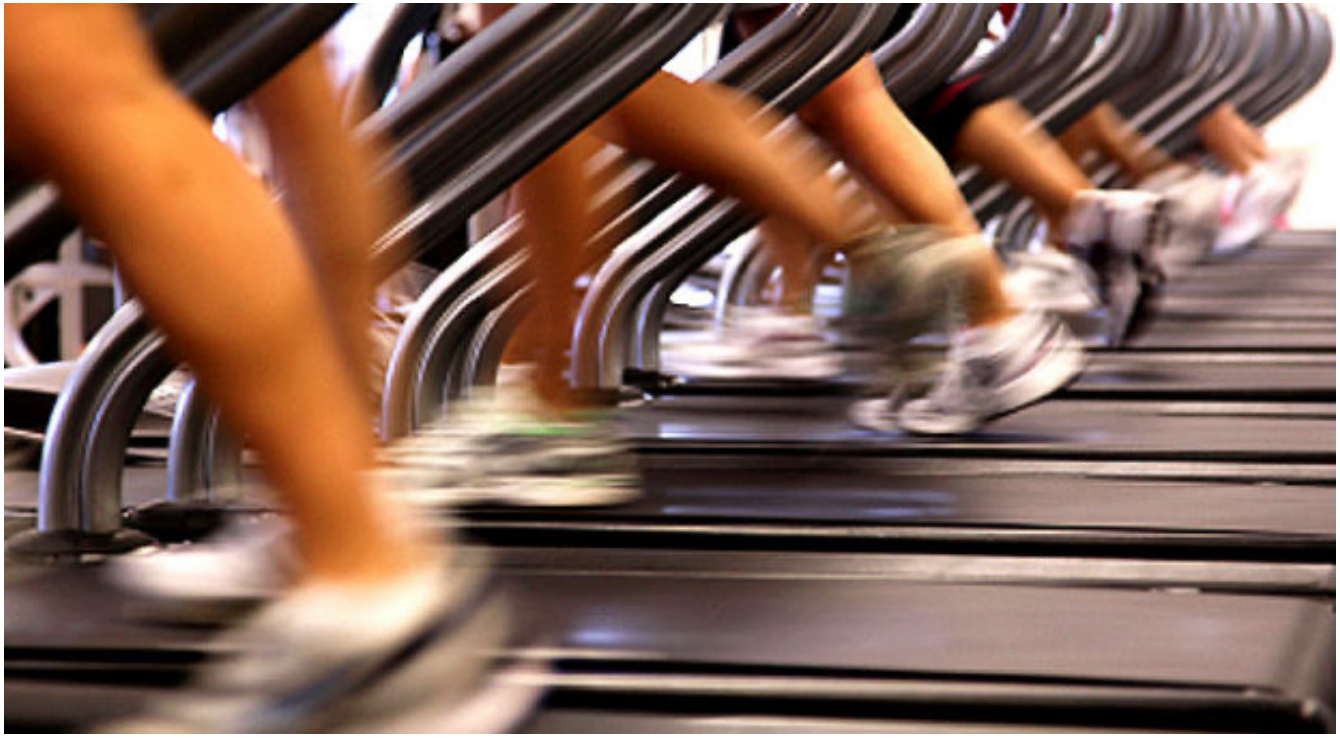
Molds

Pollution

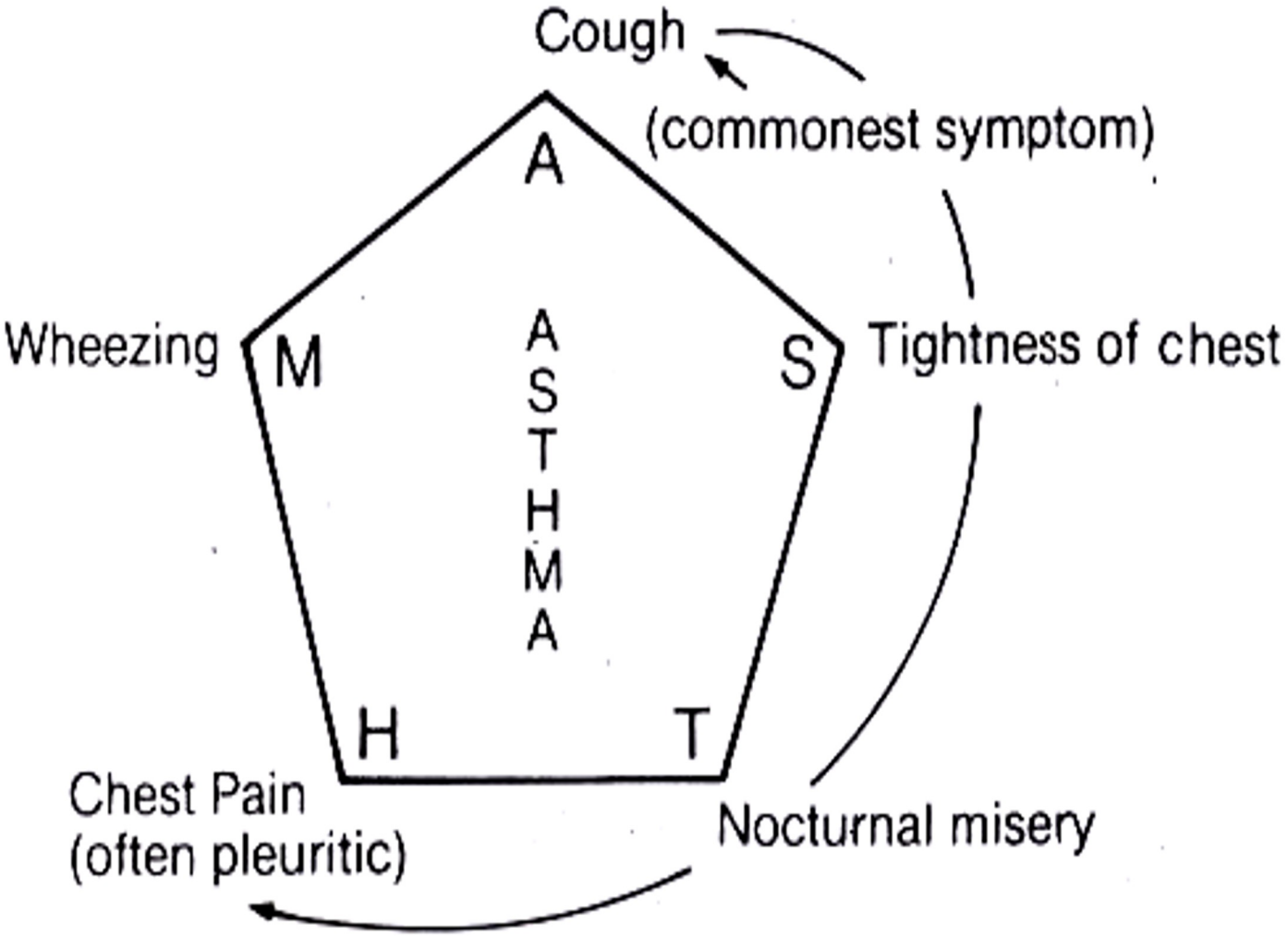
Fuel

Infections

Exercise



Common symptoms of asthma include:



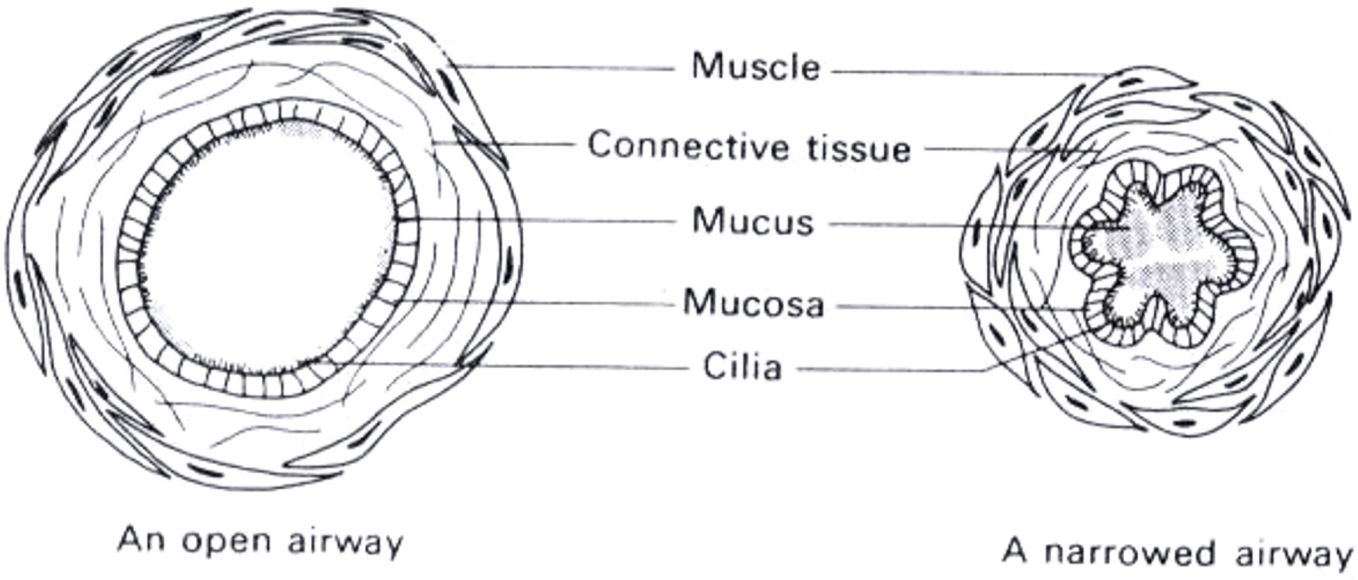
- **Signs of an Asthmatic Episode(Attack) include:**

1. Tachypnoea.
2. Use of accessory muscles (seen as nasal flare, head
3. bobbing, shoulder fixing, abdominal breathing and
4. in-drawing of the musculature of the thoracic cage).
5. Continuous, high-pitched musical-like wheeze because of airway turbulence.
6. Normally a troublesome cough.
7. Also, there may be emotional distress and panic, including restlessness and breathlessness.
8. Verbal and cognitively aware children might complain of a tight chest, and children may become uncommunicative.

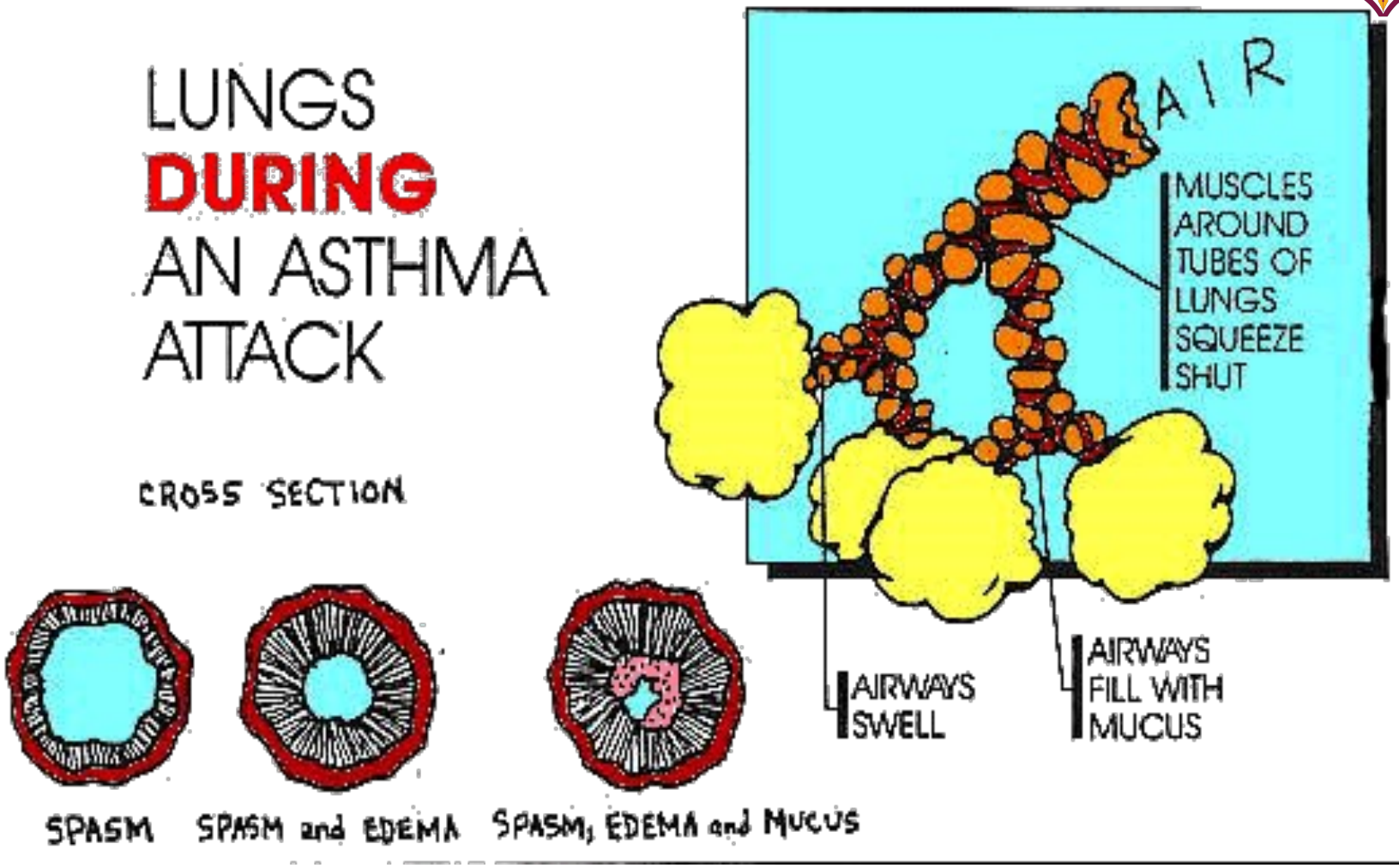
- Though symptoms may be very severe during an acute exacerbation, between attacks an asthmatic may show few or even no signs of the disease.

Mechanism of disease.

- Asthma primarily affects the small airways and involves three separate processes:
  1. **Bronchi -spasm.**
  2. **Inflammation of bronchial.**
  3. **Increase bronchial secretion**



Asthma Attack



Management

Relievers

are(short-acting beta2 (ß2) agonists). They provide relief from distressing symptoms of asthma during an acute attack.

ß2agonists are bronchodilators with a rapid onset of action,relaxing the smooth muscle of the bronchioles and relieving bronchospasm.

They are administered by a metered dose inhaler (MDIs). they are usually colour-coded blue.

albuterol,(Ventolin).

Preventers

these drugs reduce inflammation in the airways.

Preventers decrease the distressing symptoms of asthma, improve lung function and reduce airway reactivity to triggers.

preventers can be colour-coded red, brown, beige, pink or orange.

Example: medications include beclometasone and budesonide

Inhaled corticosteroids (ICS) Sometimes called

glucocorticoids, these are another anti-inflammatory therapy for the treatment of a child's asthma symptoms. They help to reduce inflammation in the airways.

- Prednisolone

Therapeutic management

- ✓ The most effective treatment for asthma is identifying triggers.

Therapy for child with asthma involves planning for the **three goals** of all allergy disorders:

- ✓ **Avoidance of the allergen** by environmental control.
- ✓ **Skin testing** and hypo sensitization to identified allergens
- ✓ **Relief of symptoms** by use of **pharmacologic agents**.

Spacer medication

About.com: pediatrics

Nebulizer

About.com: pediatrics

Foreign Bodies Inhalation
Foreign Body Aspiration

Foreign Body Inhalation

- Children, especially toddlers, tend to place objects in their mouths while exploring their environment. They are therefore at increased risk of inhaling foreign bodies, which may become lodged in the tracheobronchial system.

- **The most common aspirated substances are:**
- Nuts, popcorn, sunflower seeds, improperly chewed pieces of meat and small, smooth items such vegetables.
- Toy parts, Balloons are more likely to cause tracheal obstruction and asphyxiation.
- Safety pins, coins
- Dried foods may cause progressive obstruction as they absorb water.

FOREIGN BODIES

Or Everything else

Foreign Body Aspiration

- Is the inhalation of an object(solid or liquid food or non food) in to the respiratory tract.
- Aspiration most occur during feeding and reaching activities while crawling or during play time in children ages 6months to 4 years.
- Aspiration may occur in children of any age.

How common is it?

- Worldwide, 55% of children who have inhaled foreign bodies are between 1 and 3 years of age and
- 7-10% are under 1 year of age with a peak between the first and second birthdays.

Pathophysiology

Children are more prone to aspirate foreign

material for several reasons:

1- The lack of molar teeth in children decreases their ability to sufficiently chew food, leaving larger chunks to swallow.

2- children usually talk, laugh, and run while chewing also increases the chance that a sudden or large inspiration may occur with food in the mouth.

3- Children often examine even nonfood substances with their mouth.

- **Immobile infants** may aspirate foreign bodies because :
- They have less chewing capacity and higher respiratory rates, so any objects placed in their mouths are more likely to be aspirated than in older children.
- Some times siblings, who may put the wrong foods in the baby's mouth in an attempt to help feed them.

Foreign Body Aspiration pathophsiology

- Partial or complete airway obstruction can occur.
- The severity of obstruction depend on the size of the object or substance and it is location within respiratory tract.
- Object may migrate from higher to the lower location and may also move back up to the trachea, creating extreme respiratory difficulty.
- If oxygen depleted for extend time, brain damage may occur.

- In a child in an upright position, the **right-sided airways** are direct entries from the trachea**.**
- **The left main bronchus is smaller than the right main bronchus and is slightly angled.**
- **In a child in a supine position, material is more likely to enter the right main bronchus**.

Clinical Manifestations

Children may brought to hospital after sudden

episode of:

coughing or gagging , dyspnea , tachypnea , nasal flaring, and retraction,….

Anxious expression ,sit in a forward position with neck extended ,hypoxic ,behavior change and Irritable.

coughing choking , gagging ,dysphonia and wheezing may be brief or may persist for several hours if the object drops to below the trachea in to one of the main-stem bronchi.

Clinical Manifestations

In some cases the child become asymptomatic after coughing for 15-30 minutes.

If the FB drops into the lower air way and not removed, the child may present with chronic cough, persistent or recurrent pneumonia or lung abscess week later.

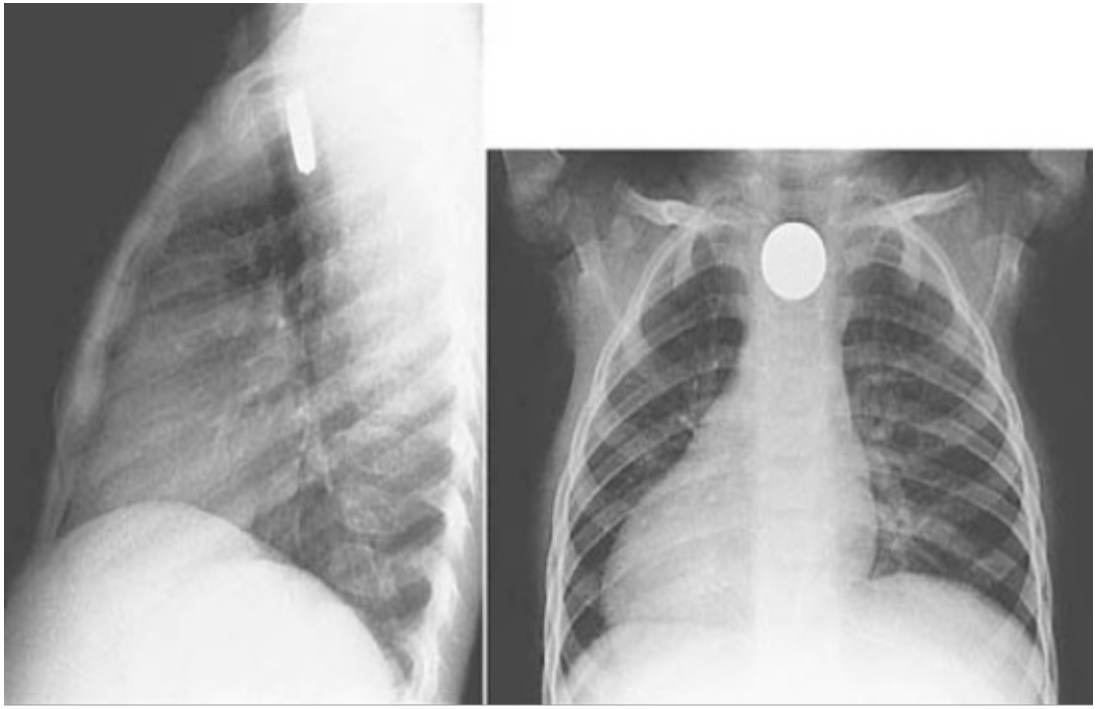
- The more difficult cases are those in which aspiration is not witnessed or is unrecognized and, therefore, is unsuspected.

Diagnosis

- ✓ **Imaging Studies**
- ✓ **Radiography**
- ✓ **Fluoroscopy**
- ✓ **CT scanning**
- ✓ **Bronchoscopy**

Aspirated foreign body (backing to an earring) lodged in the right main stem bronchus.

FOREIGN BODIES



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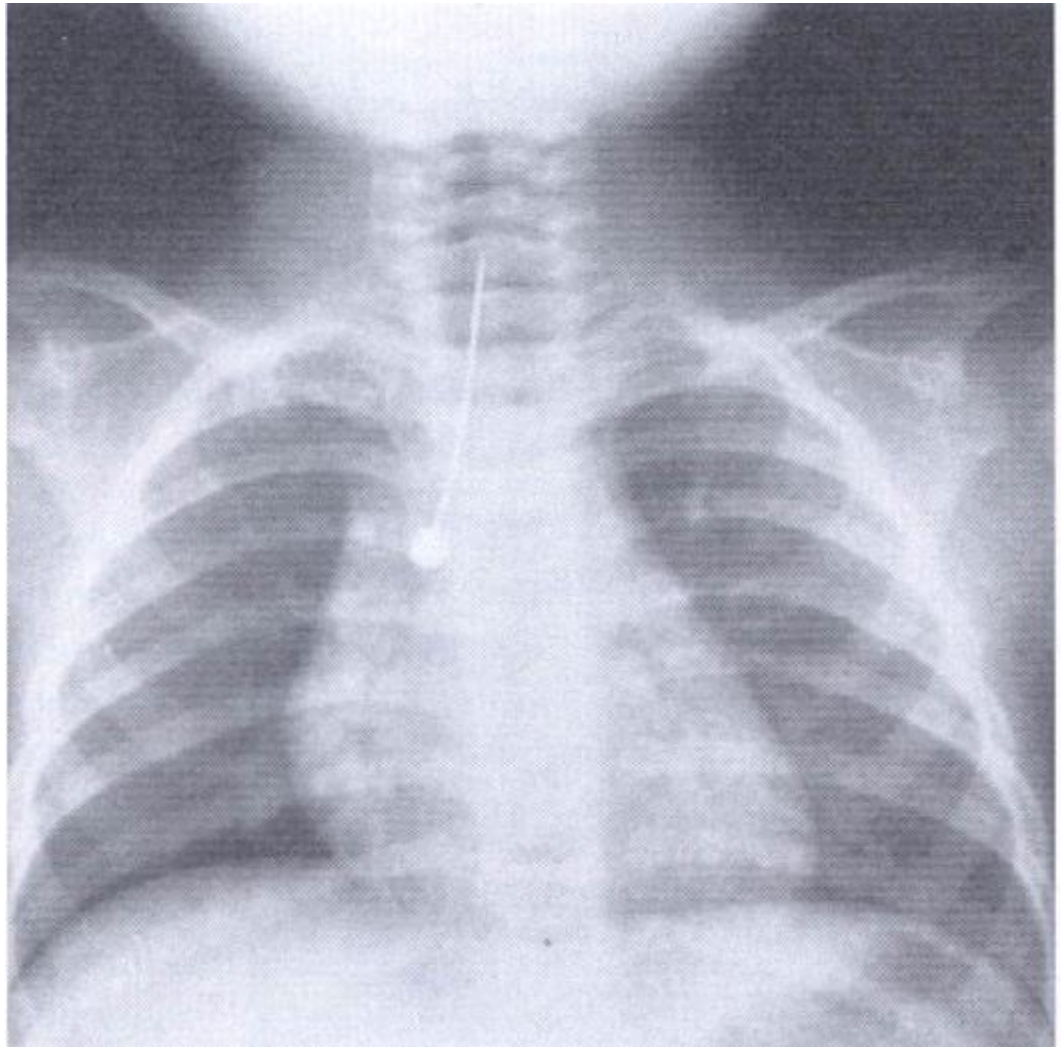

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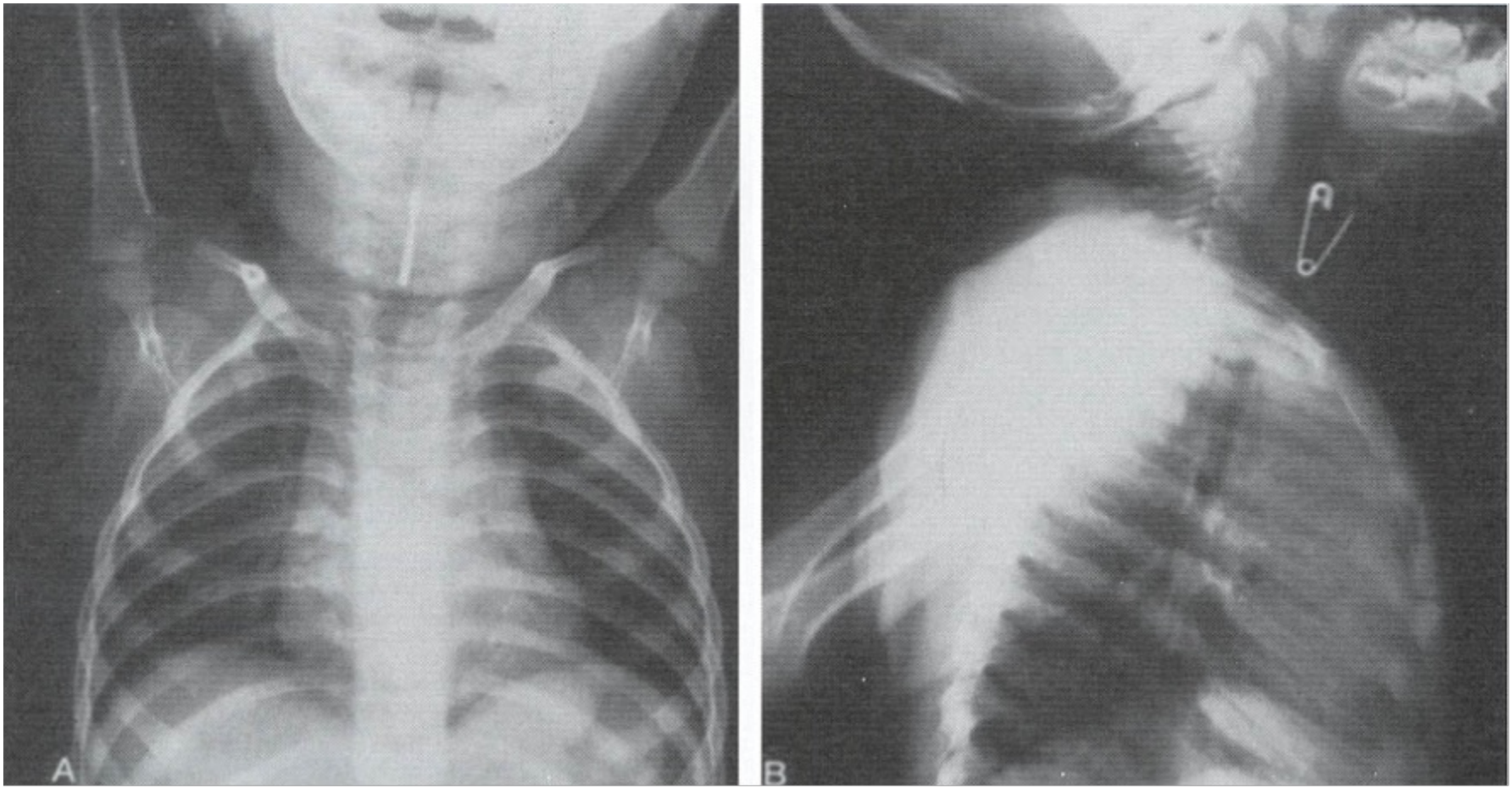

Collaborative care

1- identifying and treating life-theartining airway obstruction .

2- history taking.

3- physical examination

4- chest thrusts and back blows or the abdominal thrust is used to remove an object from an obstructed airway.

Heimlich maneuver

- If the child has respiratory distress and is unable to speak or cry, complete airway obstruction is probable, and the likelihood of morbidity or mortality is high. In those cases, a Heim**lich maneuver** may be performed.
- If the child is able to speak, the Heimlich maneuver is contraindicated because it might dislodge the material to an area where it could cause complete airway obstruction

Heimlich maneuver on Infant

Heimlich maneuver on Infant

Place the infant stomach-down across your forearm and give five quick, forceful blows on the infant's back with heel of your hand

Place two fingers in the middle of the infant's breastbone and give five quick downward thrusts

A.D.A.M.

Heimlich maneuver on conscious child

Place one fist just above the child's navel with the thumb side facing the abdomen

A.D.A.M.

Surgical Care

- Surgical therapy for an airway foreign body involves endoscopic removal, usually with a rigid bronchoscope.
- A pediatric surgeon or pediatric otolaryngologist usually performs the rigid bronchoscopy if necessary.

Inpatient Care

- Endoscopy must be performed by a physician skilled in pediatric airway procedures.
- Ideally, an anesthesiologist skilled in the treatment of children should also be present in the operating room.
- Once the foreign body has been removed and the patient is stable, the child may be discharged. This usually occurs the same day as the procedure.

Medication

- No medications are needed.
- If significant swelling is observed in the airway , a corticosteroid (eg, prednisolone, prednisone) may be administered.
- Unless airway secretions are infected, antibiotics are not helpful or necessary.

Prevention

- The best therapy is avoidance.
- Give parents information about age-appropriate foods and instructing the child to sit at the table until all chewing is complete.
- Talking while chewing should also be discouraged.

Prognosis

- Once the foreign material is removed, the prognosis is excellent. The sooner it is removed, the quicker and more complete the recovery.

Thanks