



# ACUTE RESPIRATORY INFECTIONS IN CHILDREN

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## Introduction

- Upper and lower respiratory tract separated at base of epiglottis.
- Upper respiratory tract consists of airways from the nostrils to the vocal cords in the larynx, including the paranasal sinuses and the middle ear.
- The lower respiratory tract covers the continuation of the airways from the trachea and bronchi to the bronchioles and the alveoli.
- Three to six respiratory tract infections per year (2-3years).



## Introduction

- ❑ ARI responsible for 20% of childhood (< 5 years) deaths
  - – 90% from pneumonia
- ❑ ARI mortality highest in children
  - – HIV-infected
  - – Under 2 year of age
  - – Malnourished
  - – Weaned early
  - – Poorly educated parents
  - – Difficult access to healthcare
- ❑ Out- patient visits
  - – 20-60%
- ❑ Admissions
  - – 12-45%



## Factors influencing the incidence of respiratory tract infections

- Poor nutritional status
- Poor socio-economic status
- Parental smoking
- Parasitic infection
- Structural abnormalities
- Breastfeeding and early weaning
- Immunization
- HIV incidence
- Rainy and cold weather



## UPPER RESPIRATORY TRACT INFECTIONS

- RHINITIS (COMMON COLD OR CORYZA)
  - RHINOVIRUSES, ENTEROVIRUSES, CORONAVIRUSES
  
- Acute Tonsillopharyngitis
  
- EAR INFECTIONS (ACUTE OTITIS MEDIA)
  - VIRUSES, PNEUMOCOCCUS, GABHS, HEMOPHILUS INFLUENZA, MORAXELLA CATARRHALIS
  
- Sinusitis



## RHINITIS (COMMON COLD OR CORYZA)

### Caused by :

- Adenoviruses, Influenza, Rhinovirus, Parainfluenza virus, RSV etc.
- Rhinitis can also be due to allergy.

### Spreads by droplet infection.

### Clinical features :

- Fever, serous discharge, irritability.
- Cervical lymphadenopathy, Nasopharyngeal congestion causing nasal block & difficulty breathing.
- Eustachian tube block- serous otitis media



## RHINITIS (COMMON COLD OR CORYZA)

### Treatment

- ✓ Relieve Nasal congestion- use saline drops, avoid decongestants, antihistaminics are avoided in <6m age.
- ✓ Nonsedating agents (loratidine, cetirizine etc) may be used in allergic rhinitis.
- ✓ Antipyretics for fever.
- ✓ Antibiotics are used for secondary bacterial infection only if secretion are purulent, high fever or developing bronchopneumonia.



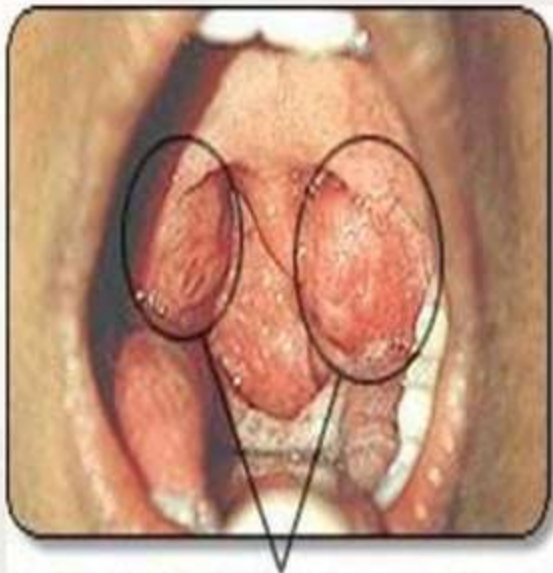
## Acute Tonsillopharyngitis

- ❑ Viral or bacterial infection of throat causing inflammation of the pharynx & tonsils.
  
- ❑ Causative agents:
  - Viral – Adenovirus, Influenza, Parainfluenza, Enterovirus, EBV etc
  - Other – Streptococci, Mycoplasma pneumonia, Candida
  
- ❑ Clinical Features:
  - Fever, Headache, Nausea, Sore throat
  - Refusal to feed in younger children
  - Pharyngo-tonsillar Congestion/Exudates.



## Acute Tonsillopharyngitis

- **Palatine tonsils**  
(Visible during oral examination)



**Enlarged & Inflamed Tonsils**



## Acute Tonsillopharyngitis

### ☐ Management

#### ▪ Medical

-- Rest, Liquid/soft diet, warm saline gargles, cool moist environment.

-- Antipyretics, Antibiotics (if bacterial)

#### ▪ Surgical

-- Tonsillectomy in chronic tonsillitis is controversial.

-- Advised for >5 to 6 episodes of tonsillitis/yr or tonsillar/peritonsillar abscess.

## Acute Lower Respiratory Tract Infections

- Epiglottitis
- Laryngitis and Laryngotracheobronchitis (LTB)
- Pneumonia
- Bronchiolitis





## Acute epiglottitis

- Infection of the epiglottis, the aryepiglottic folds and arytenoid soft tissue
- Peak incidence :- 1 – 6 years
- Male affected more
- Bacterial Infection ( H. Influenzae type B )
- Concomitant bacteremia, pneumonia, otitis media, arthritis and other invasive infections caused by H. Influenzae type B may be present.



## Acute epiglottitis

### □ CLINICAL FEATURES

- High fever, sore throat, dyspnea, rapidly progressing respiratory obstruction
- Patient may become toxic, difficult swallowing, laboured breathing, drooling, hyperextended neck
- Tripod position (sitting upright and leaning forward)
- Cyanosis , coma
- Stridor is a late finding

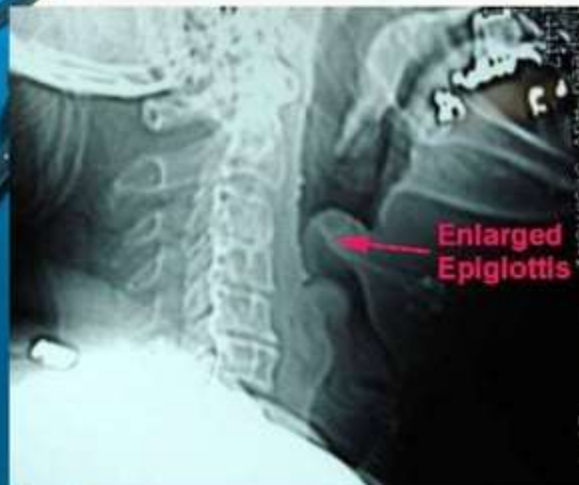


## Acute epiglottitis

### □ EXAMINATION

- DO NOT EXAMINE THE THROAT
- ASSESSMENT OF SEVERITY
  - DEGREE OF STRIDOR
  - RESP RATE
  - H.R
  - LEVEL OF CONSCIOUSNESS
  - PULSE OXIMETRY

## Acute epiglottitis



### ❑ DIAGNOSIS:

- “Cherry red” appearance of epiglottis on laryngoscopy
- Thumb sign on lateral neck radiograph



## Acute epiglottitis: Treatment

- Need to be managed in ICU, endotracheal intubation may be needed.
- Fluid and electrolyte support
- I.V AMPLICILLIN 100 mg/kg/day OR CEFTRIAZONE 100 mg/kg/day .
- OTHER OPTIONS
  - CEFUROXIME OR CEFOTAXIME
  - CHOLRAMPHENICOL
  - Treatment Duration :-7-10 DAYS
- Rifampicin prophylaxis to close contacts





## Acute LTB (Viral croup)

- Viral infection leading to mucosal inflammation of the glottic and subglottic regions
- Commonly due to influenza (type a), parainfluenza (1, 2, 3) and RSV.
- Age :- 6 months – 6 years



## Acute LTB (Viral croup)

### □ CLINICAL FEATURES

- Initial :- rhinorrhea, mild cough, fever
- Later (24-48 hours) :-
  - Barking cough
  - Hoarseness of voice
  - Noisy breathing (mainly on inspiration)
- Symptoms worsen at night and on lying down
- Children prefer to be held upright or sit in bed.



## Acute LTB (Viral croup)

### ❑ CLINICAL EXAMINATION

- Hoarse voice
- Normal to moderately inflammed pharynx
- Slightly increased resp rate with prolonged inspiration and inspiratory stridor

### ❑ DIAGNOSIS

- Mainly a clinical diagnosis
- Radiograph neck :- steeple sign (unreliable)

## Acute LTB (Viral croup)



[Steeple sign]



## Acute LTB (Viral croup)

### □ TREATMENT

- Moist or humidified air
- Steroids
  - Reduce the severity and duration / need for endotracheal intubation
  - Dexamethasone/Prednisolone
  - Nebulized budesonide
  - Nebulized adrenaline (epinephrine)



## Pneumonia

- ❑ Classified Anatomically as : Lobar or lobular pneumonia, bronchopneumonia, Interstitial pneumonia.
- ❑ Etiology :
  - **Viral-** RSV, Influenza, Parainfluenza, Adenovirus
  - **Bacterial- 0 - 2m** : Klebsiella, E.coli, Pneumococci, Staph.  
**3m-3yr** : Pneumococci, H.influenza, Staph.  
**>3yr** : Pneumococci & Staph.
  - **Atypical organisms-** Chlamydia, Mycoplasma, Pneumocystis jiroveci, histoplasmosis, coccidioidomycosis.
  - **Others-** Ascaris, Aspiration ( food, kerosene, oily nose drops etc).



# Pneumonia

## WHO: Clinical Classification & Management

NO PNEUMONIA	COUGH NO TACHYPNEA	-HOME CARE -SOOTHE THE THROAT AND RELIEVE COUGH -ADVISE MOTHER WHEN TO RETURN -FOLLOWUP IN 5 DAYS IF NOT IMPROVING
PNEUMONIA	-COUGH -TACHYPNEA -NO RIB OR STERNAL RETRACTION -ABLE TO DRINK - NO CYANOSIS	-HOME CARE -ANTIBIOTICS FOR 5 DAYS -SOOTHE THE THROAT AND RELIEVE COUGH -ADVISE MOTHER WHEN TO RETURN -FOLLOWUP IN 2 DAYS
SEVERE PNEUMONIA	-COUGH -TACHYPNEA -RIB AND STERNAL RETRACTION -ABLE TO DRINK -NO CYANOSIS	-ADMIT IN HOSPITAL -GIVE RECOMMENDED ANTIBIOTICS -MANAGE AIRWAY -TREAT FEVER IF PRESENT
VERY SEVERE PNEUMONIA	-COUGH -TACHYPNOEA -CHEST WALL RETRACTION -UNABLE TO DRINK -CENTRAL CYANOSIS	-ADMIT IN HOSPITAL -GIVE RECOMMENDED ANTIBIOTICS -OXYGEN -MANAGE AIRWAY -TREAT FEVER IF PRESENT



## Danger Signs (IMCI)

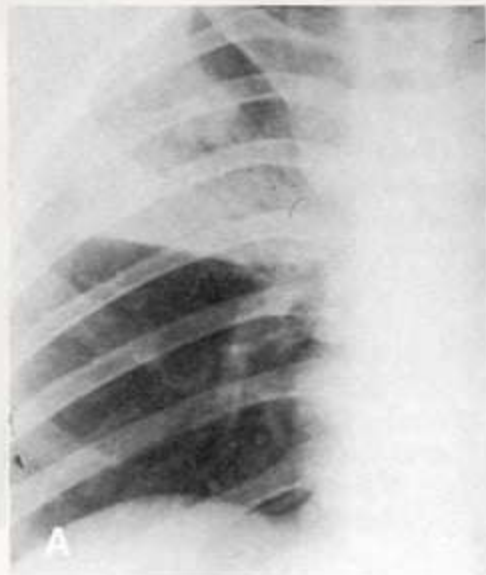
- ❑ High risk of death from respiratory illness
  - Younger than 2 months
  - Decreased level of consciousness
  - Stridor when calm
  - Severe malnutrition
  - Associated symptomatic HIV/AIDS



## Pneumonia: Radiology

### Bacterial

- Poorly demarcated alveolar opacities with air bronchograms
- Lobar or segmental opacification



## Pneumonia: Radiology

### **Viral**

- Perihilar streaking, interstitial changes,
- Air trapping



## Pneumonia : Radiology

### Clues to other specific organisms-

- Staphylococcus – areas of break-down
- Klebsiella, anaerobes, H. influenza or TB – cavitating or expansile pneumonia
- TB, S. aureus, H. influenza
  - pleural effusion and empyema



A blue stethoscope is positioned on the left side of the slide, partially overlapping a blue vertical bar. The background of the slide is a blurred image of a hospital hallway with white walls and doors.

## Pneumonia: Complications

- Empyema
- Lung abscess
- Pneumothorax
- Pneumatocele
- Pleural effusion
- Delayed resolution
- Respiratory failure
- Metastatic septic lesions
  - Meningitis
  - Otitis media
  - Sinusitis
  - Speticemia



## Pneumonia : Treatment

- Maintain Airway
- Oxygen
- Hydration
- Temperature control
- Chest drain :- for fluid or pus collection in chest (empyema)
- Antibiotics



## Bronchiolitis

- Common serious acute lower respiratory infection in infants.
- Caused by RSV predominantly; other organisms are influenza, parainfluenza, adenovirus, mycoplasma.
- Age - 1 to 6m ( can occur upto 2yrs )



## Bronchiolitis

### □ Pathogenesis-

- Inflammation of bronchiolar mucosa, edema, mucous plugging.
- Bronchiolar narrowing- increased airway resistance.
- Air trapping and hyperinflation
- Reduced ventilation, CO<sub>2</sub> retention, Resp acidosis, Hypoxemia.



## Bronchiolitis

### □ Clinical features-

- Few days following URTI child presents with tachypnea and respiratory distress.
- Dyspnea and Cyanosis may appear.
- Prolonged expiratory phase with crepts and rhonchi B/l.
- Hyperinflation : liver & spleen may be pushed down.
- X-ray : Hyperinflation & Infiltrates.



## Bronchiolitis : Treatment

- Mild cases can be cared for at home.
- Nursed with head & neck elevated to 30° to 40°
- Humidified O<sub>2</sub> for hypoxemia, keep O<sub>2</sub>sat >92%.
- Maintain Hydration : I.V Fluids.
- Nebulization : Adrenaline, 3% NS, Bronchodilators have been tried but efficacy not established.
- CPAP, Assisted ventilation may be needed.
- Antibiotics have no role.



**THANK YOU**





# Slide Title

## Product A

- Feature 1
- Feature 2
- Feature 3

## Product B

- Feature 1
- Feature 2
- Feature 3

