

# Pediatric Chest Emergencies

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**TRAUMA & EMERGENCY RADIOLOGY**

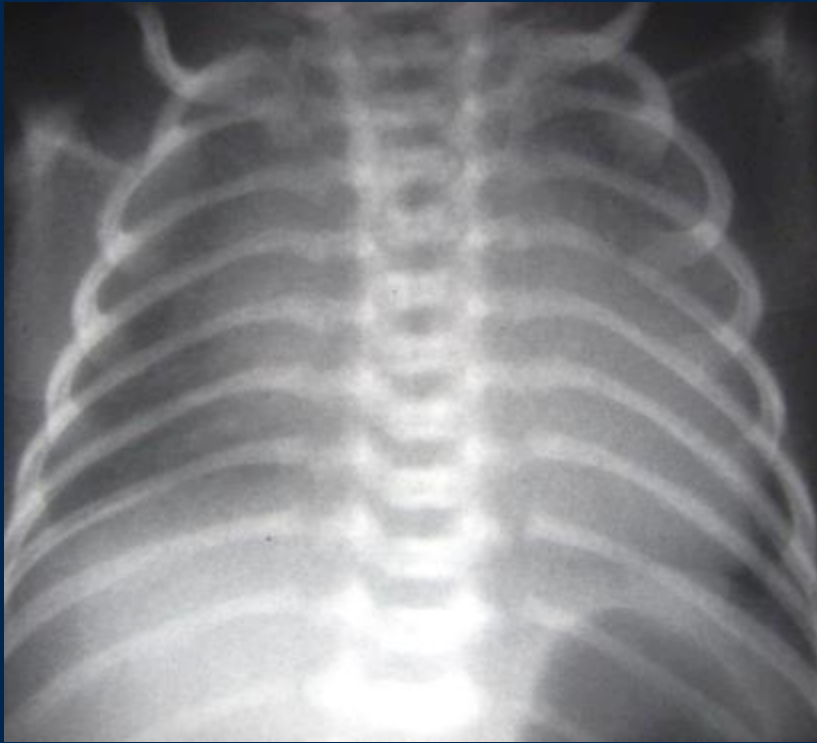


# Not Little Adults

- Positioning challenging
  - Rotation can mimic or hide pathology
- Airway dynamics more evident
  - Airways small and easily obstructed



# Good Radiographs Are Essential



- Upright images
- Straight
- Good inspiration



# Hyperinflated Lungs

- **Airway obstruction**
  - Central (rare)
  - Diffuse peripheral
    - Infections
    - Asthma
    - Cystic fibrosis



# Viral Respiratory Infections

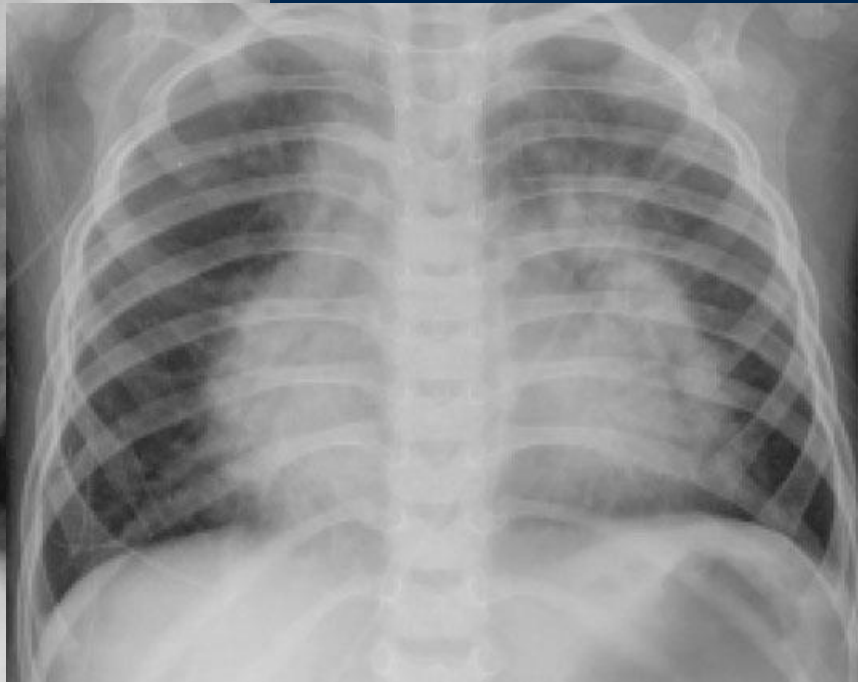
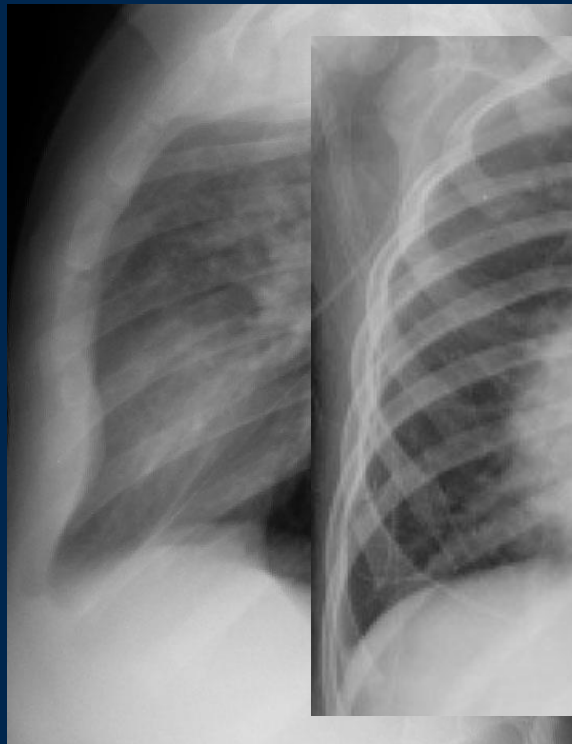
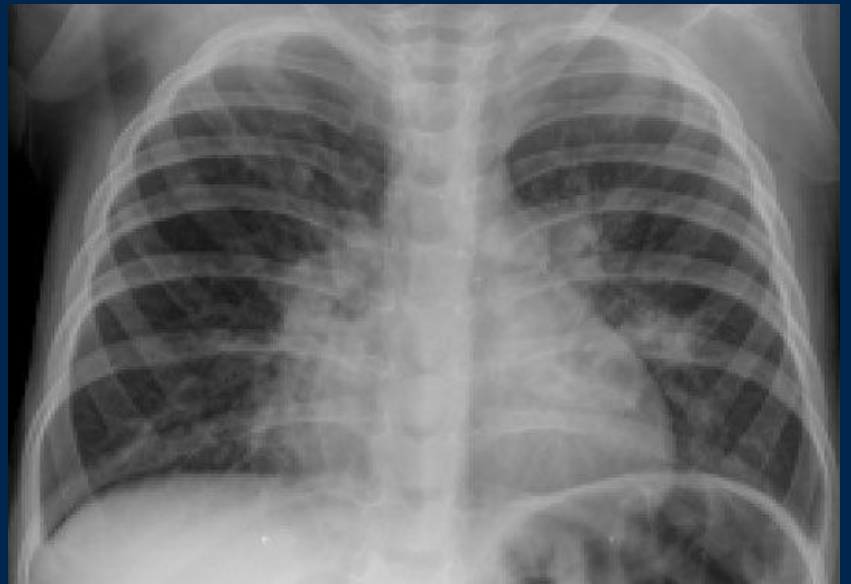
- Primarily tracheobronchial
- Wheezing – air trapping
- Rales/crackles common
- Central peribronchial opacities (bilateral)

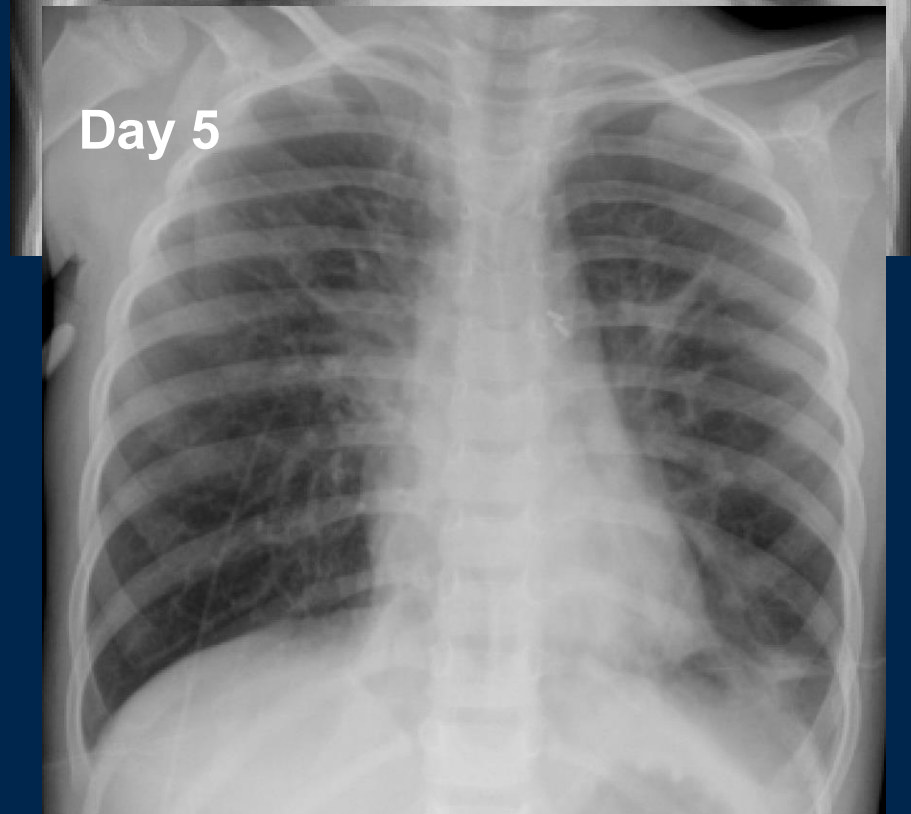
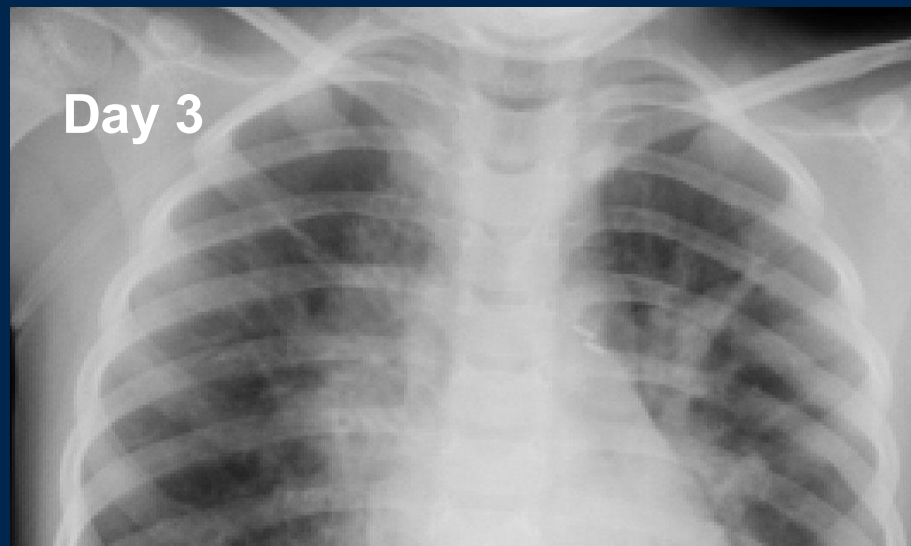
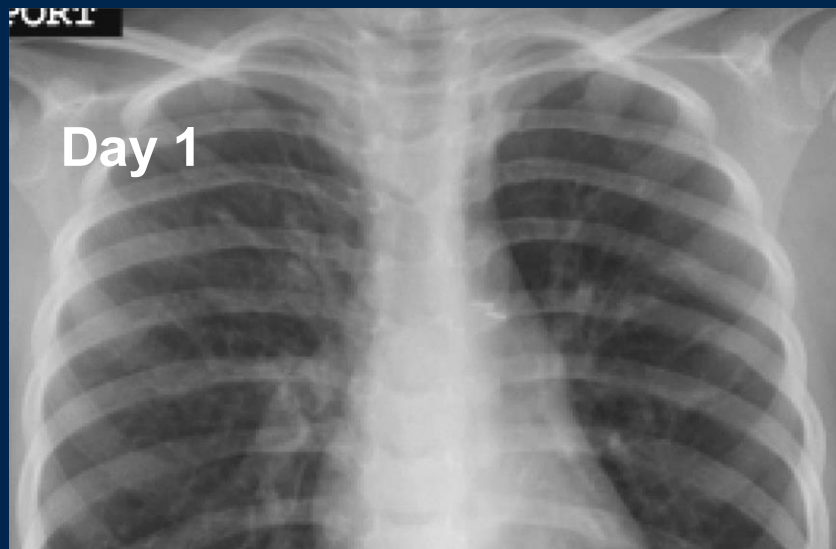
# Respiratory Syncytial Virus



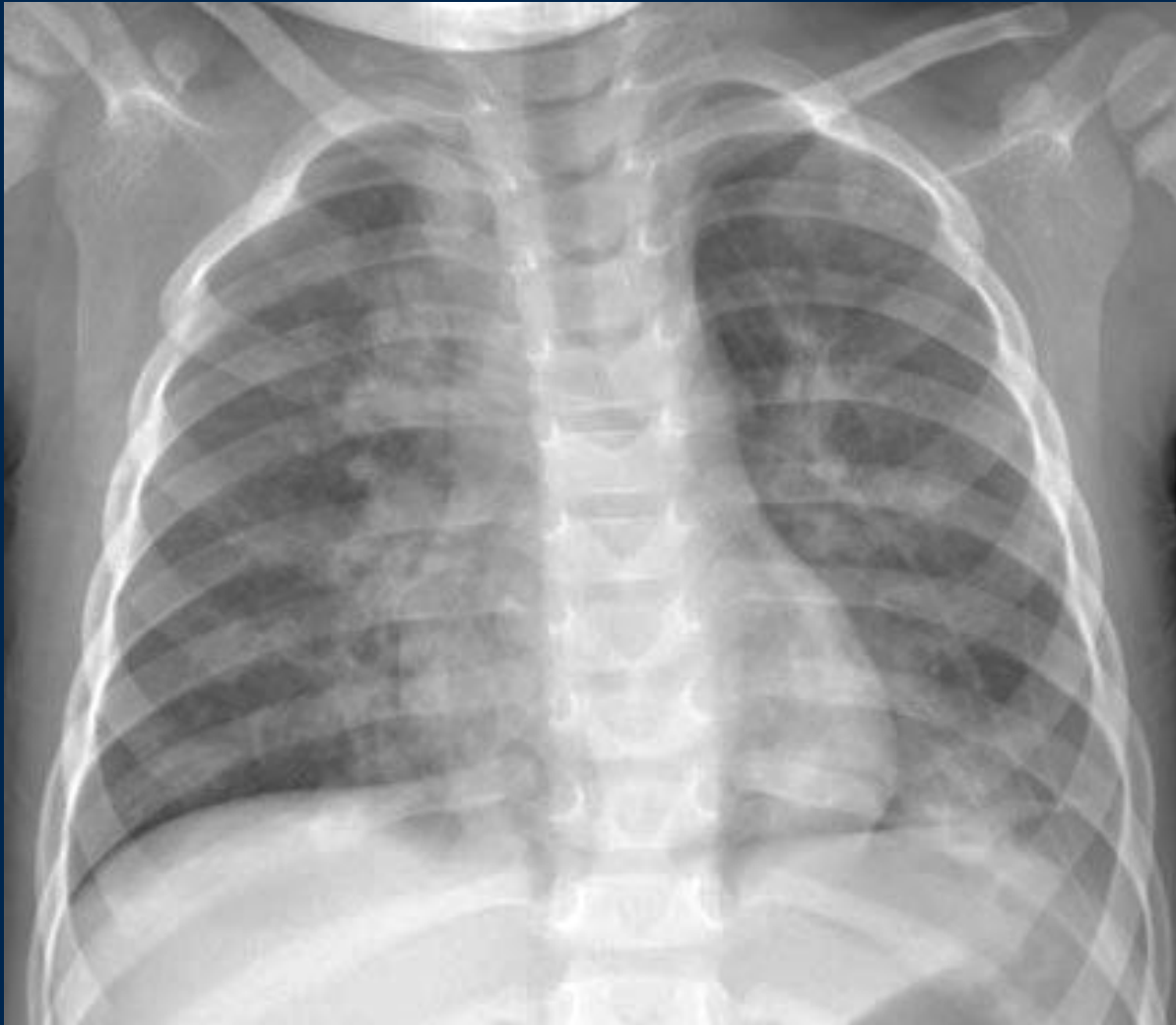
- Most common virus in children hospitalized for CAP in U.S.
- More common in children < 5 years







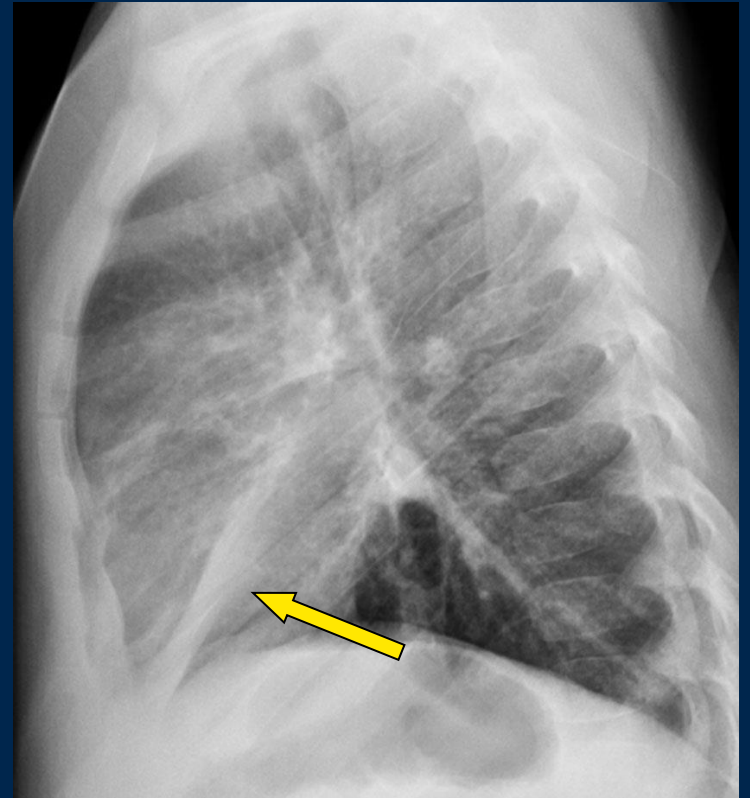
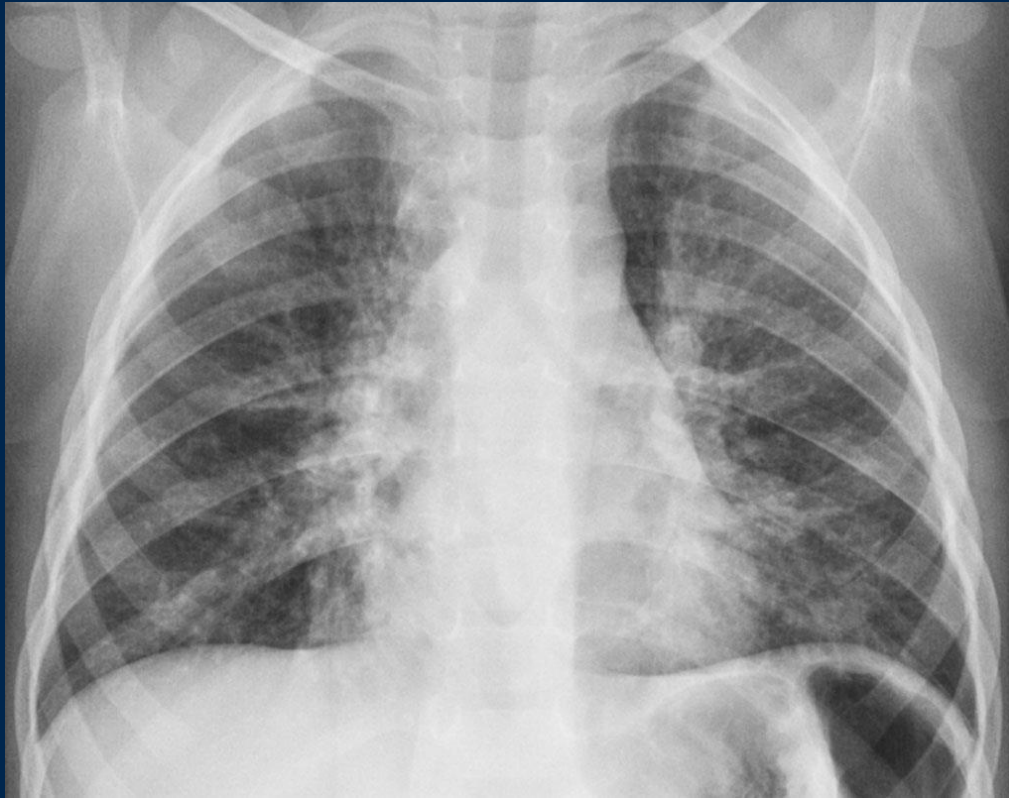




## **Bronchial Infections**

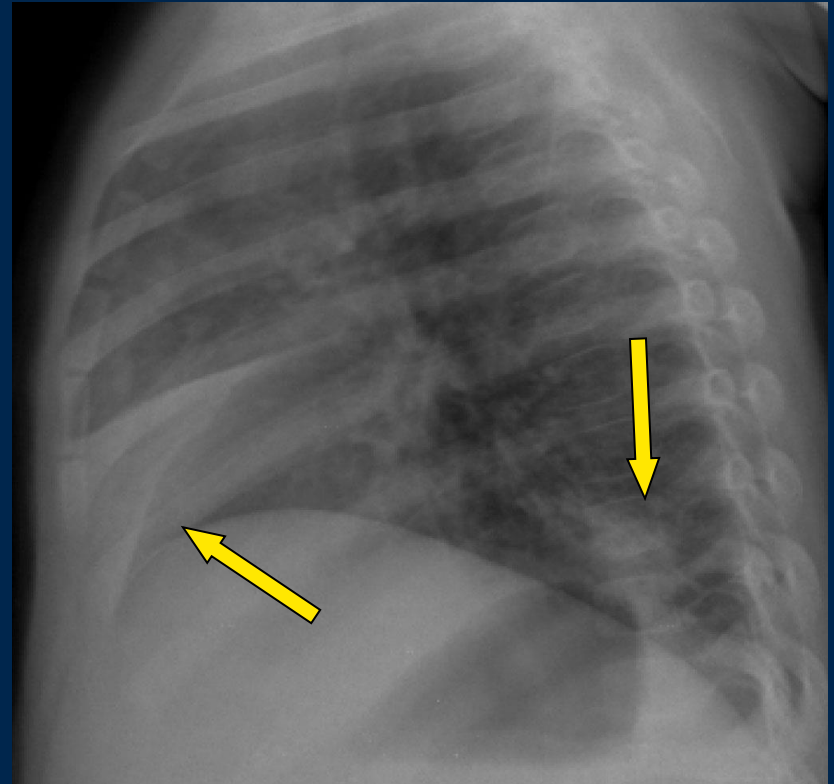
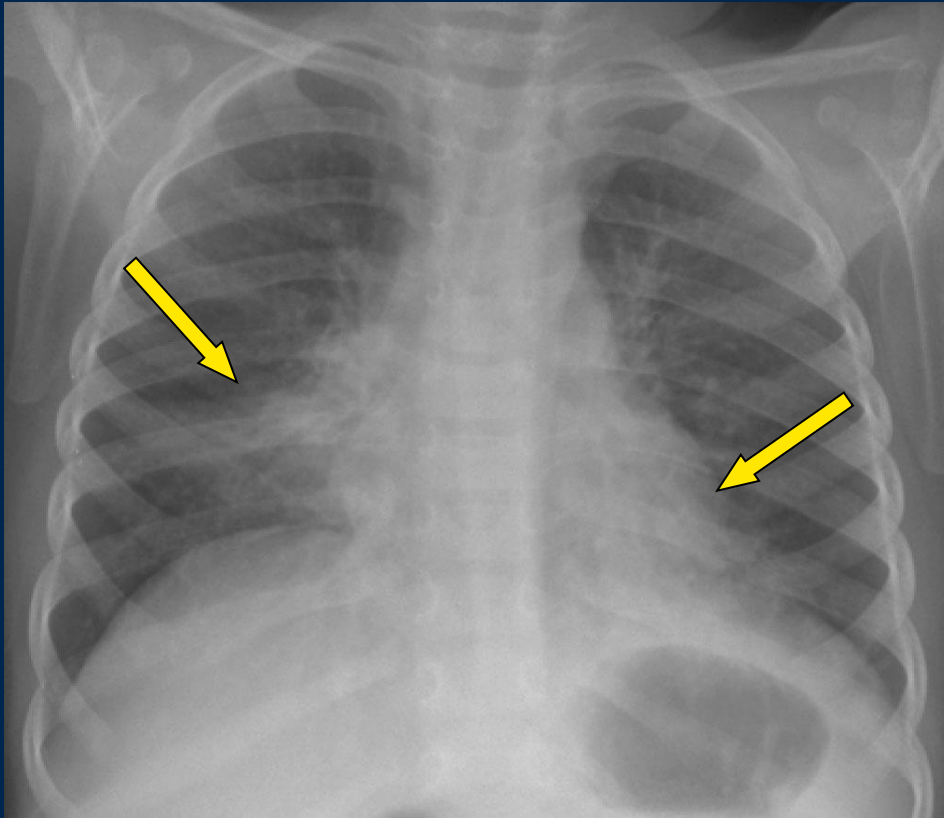
**Viral**  
**Pertussis**  
**Chlamydia**  
**Mycoplasma**

# Atelectasis is very common



# Viral Infection with Atelectasis

Multifocal linear or wedge shaped opacities



# Pneumonia – Opacity in “Clean” Lung



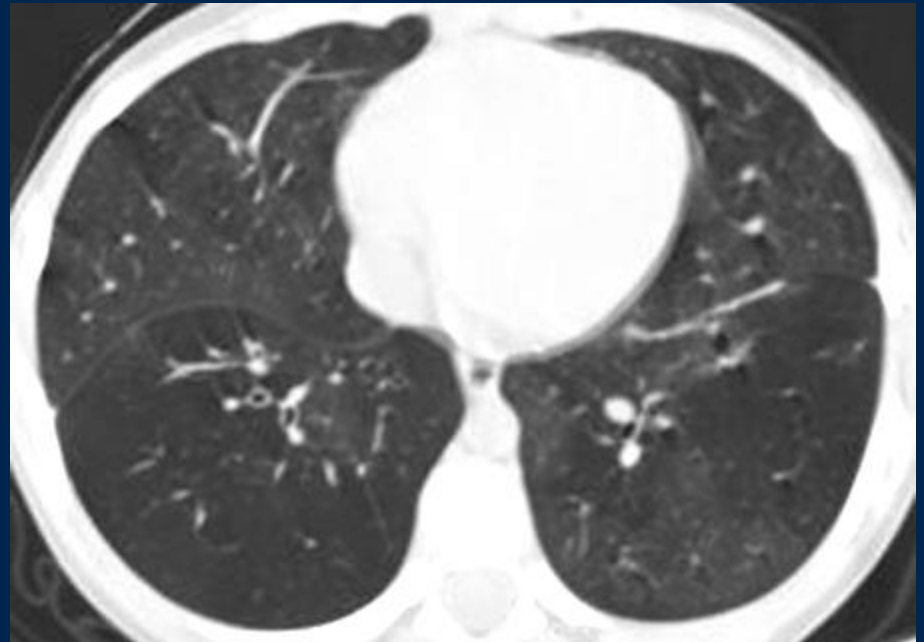
# RSV infection





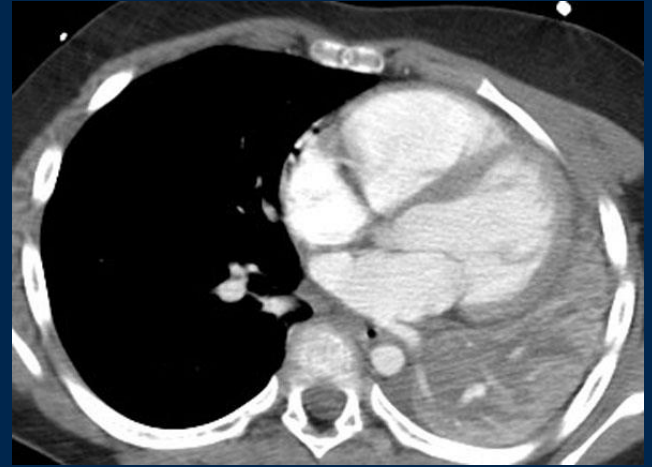
# Bronchiolitis Obliterans

- Chronic air-trapping
- Few XR findings



CT: Mosaic attenuation  
Hyperinflation/oligemia





Severe atelectasis with  
bronchiolitis obliterans

# Vaping Associated Lung Injury (EVALI)

Teenager with respiratory distress



- CT findings:
  - Ground glass opacities
  - Subpleural sparing
  - Consolidation



Amjad MA, et.al., Int J Environ Res Public Health, 2025, 22:792.

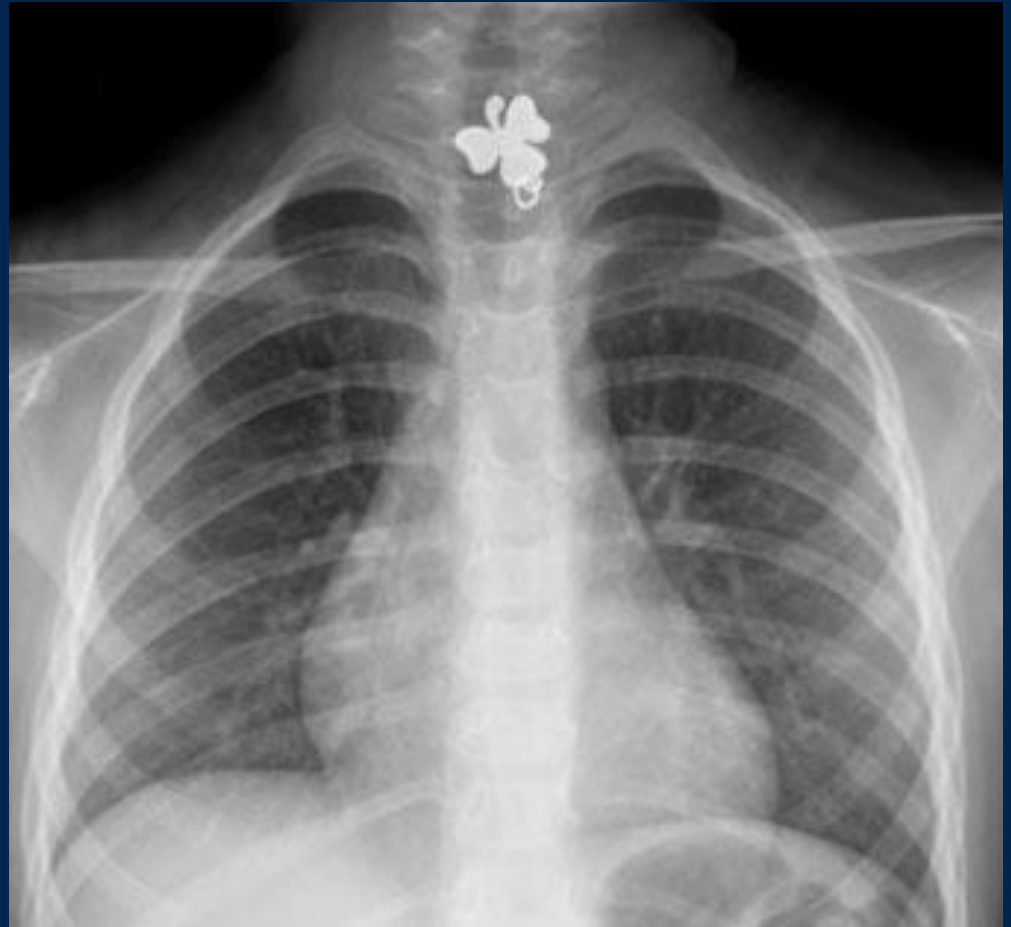
Courtesy of Daniel Ocazonez MD

# Aspiration Pneumonia

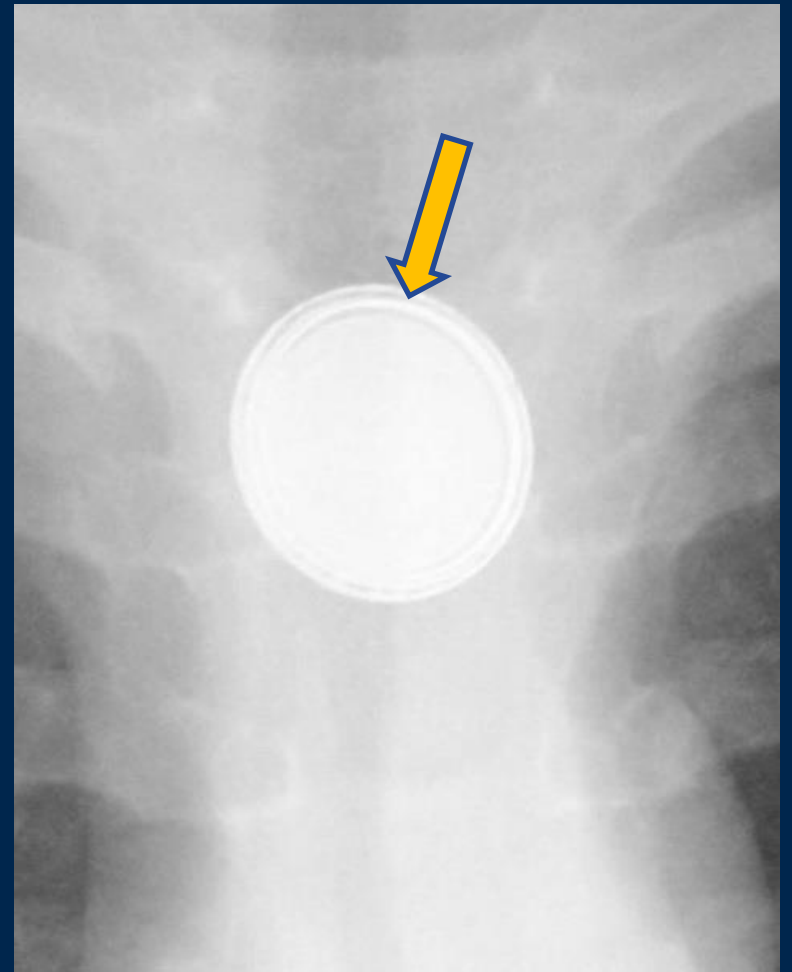
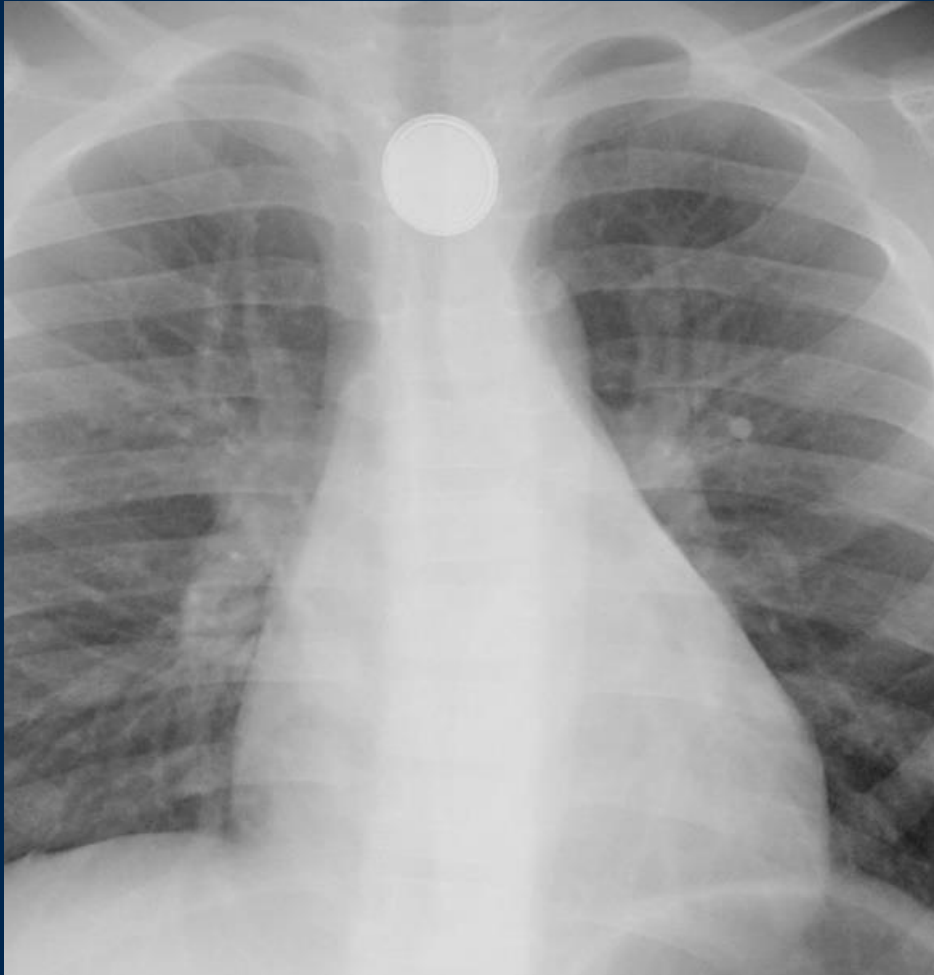
- **Hydrocarbon ingestion**
  - Acute intense chemical pneumonitis
  - Bibasilar, medial
  - Severe
- **Lipoid pneumonia**
  - Aspiration of mineral oil given for constipation



# Foreign Bodies







## **Disc Battery in Esophagus**

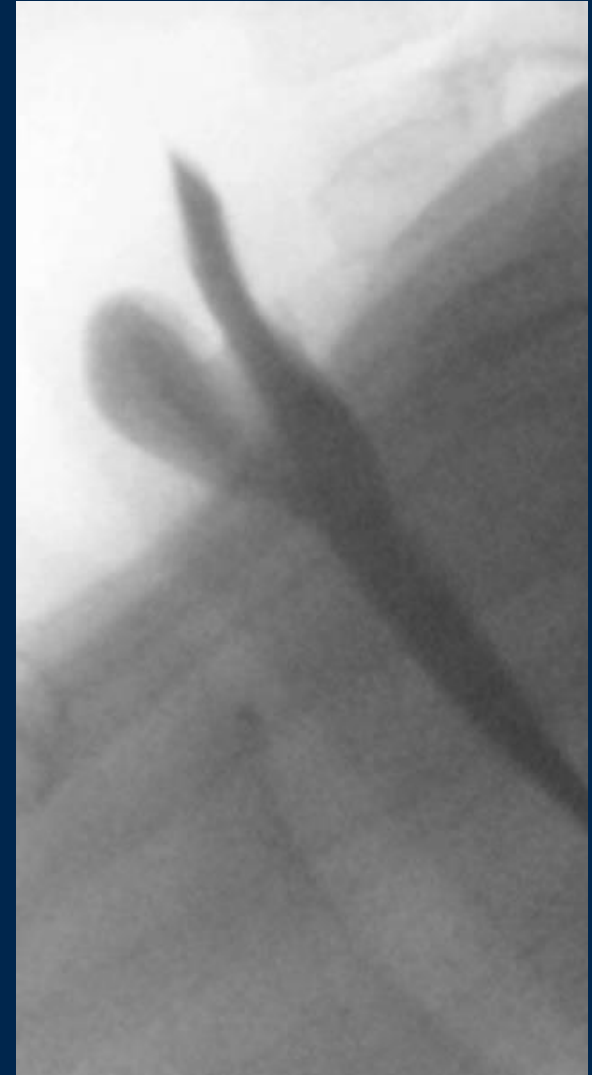
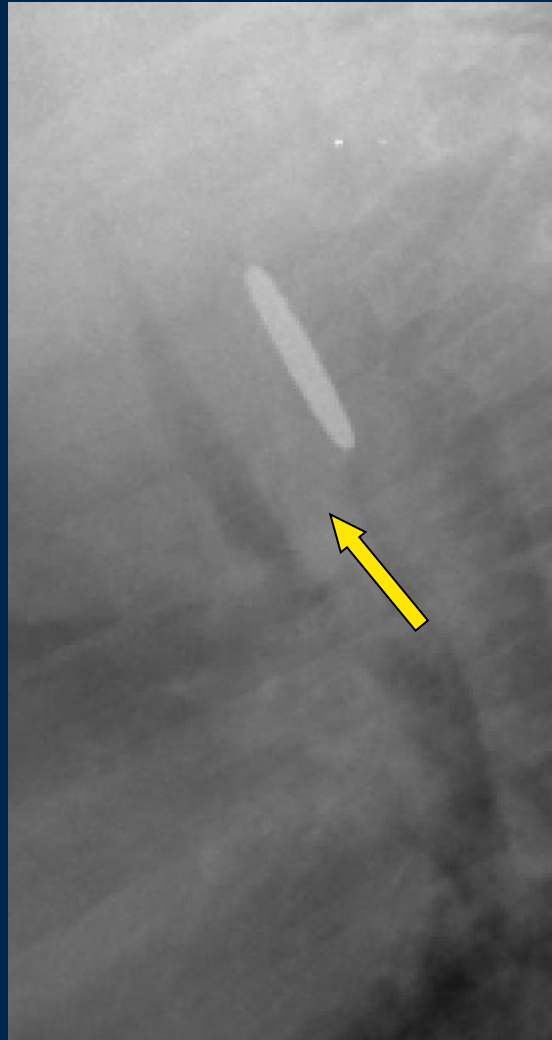
**Remove sooner rather than later**

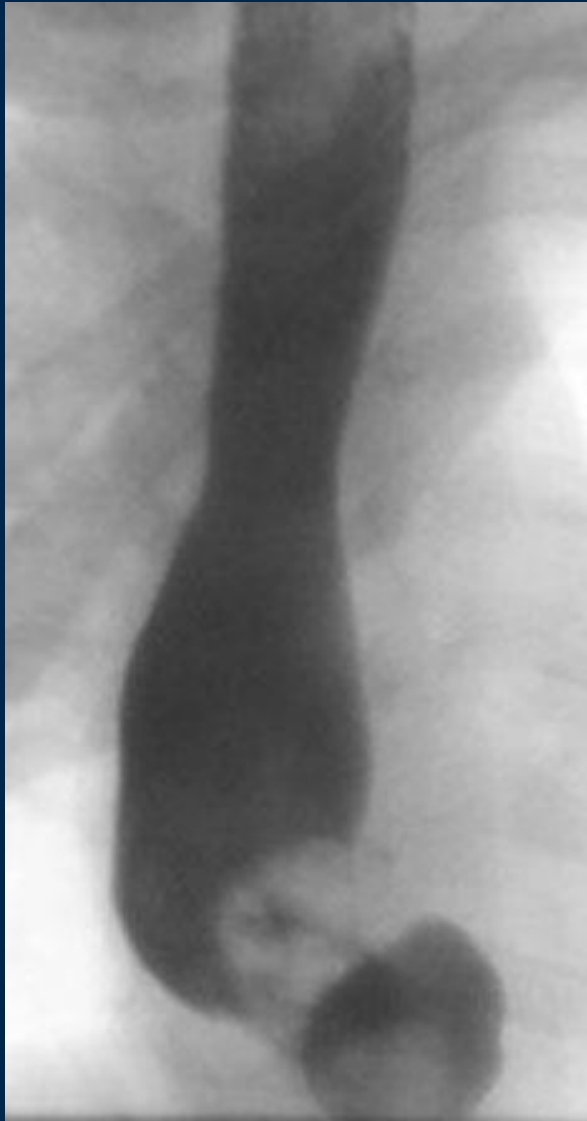


# Esophageal Foreign Bodies

- Risk of complications if chronic
- Look for periesophageal edema

# Penetrating ulcer after chronic FB





## **Chronic Plastic Foreign Body Causing Stricture and Pseudodiverticulum**

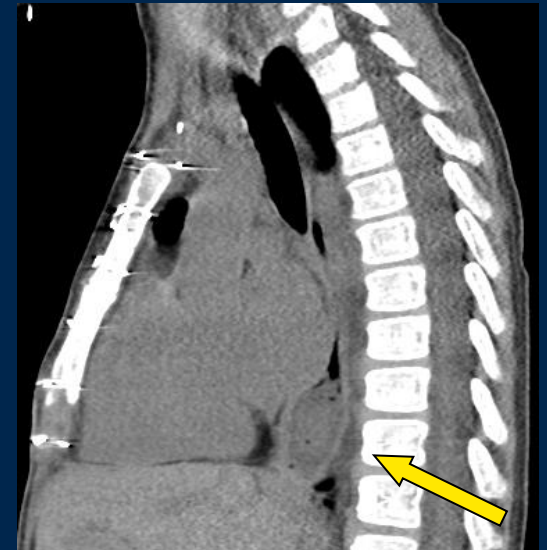
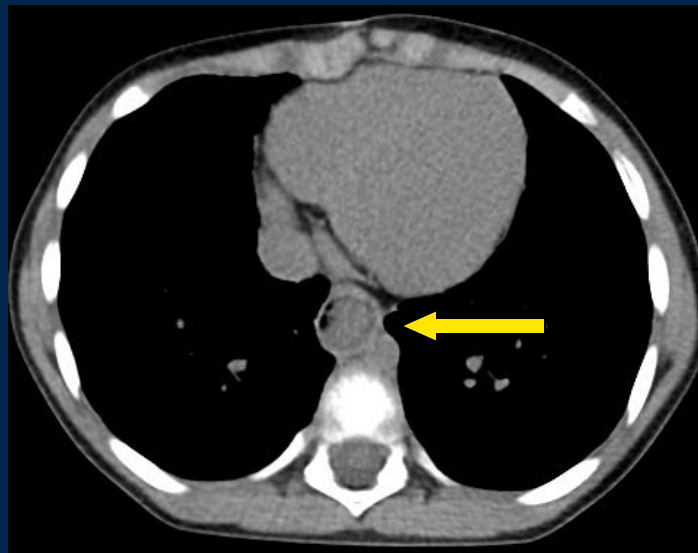
- Can develop bronchoesophageal fistula, mediastinitis

# Low Dose CT for Foreign Bodies



6 year old with vomiting for 3 days

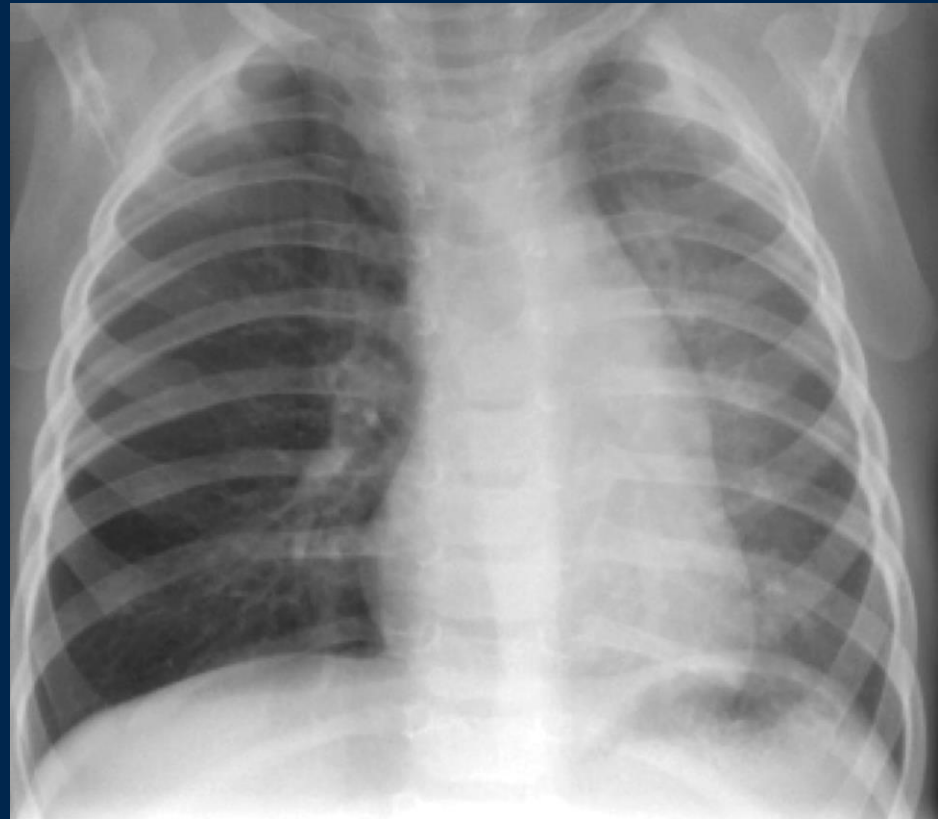
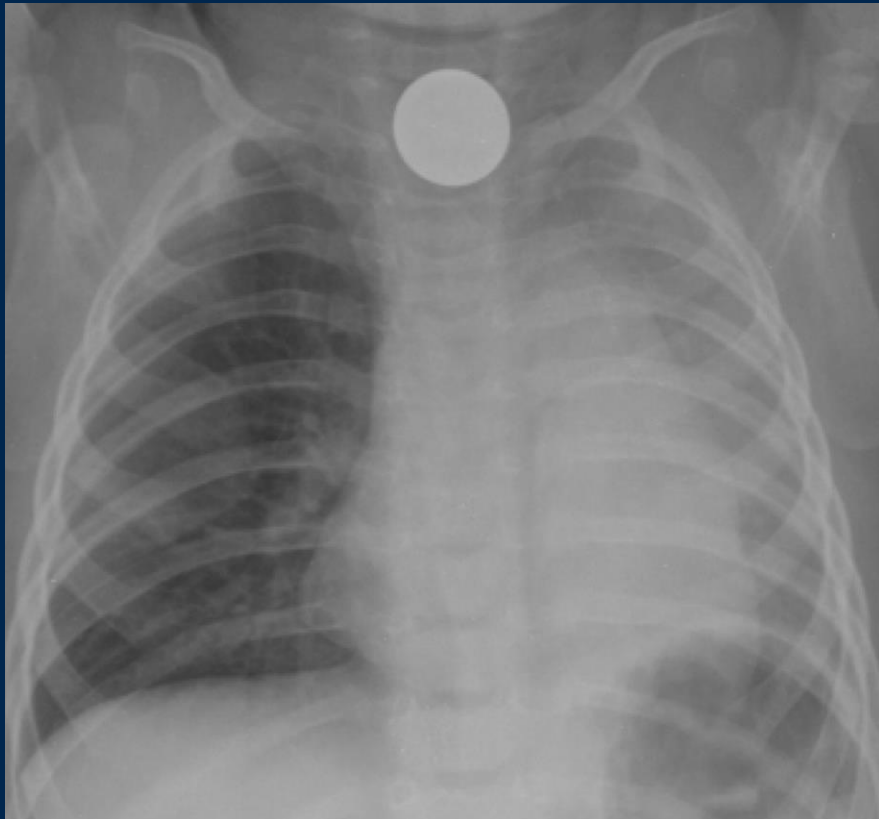
- Food impaction occult on xray
- Common in children with eosinophilic esophagitis



Courtesy of Marla Sammers MD

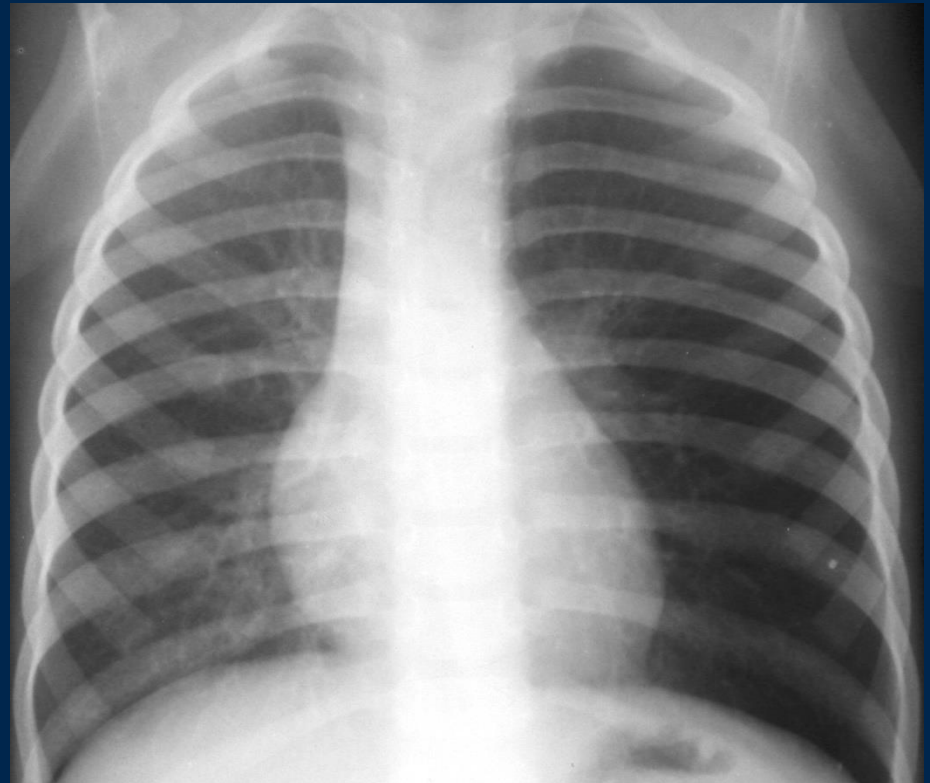
# Peanut in L bronchus

- Esophageal FBs don't cause major airway obstruction

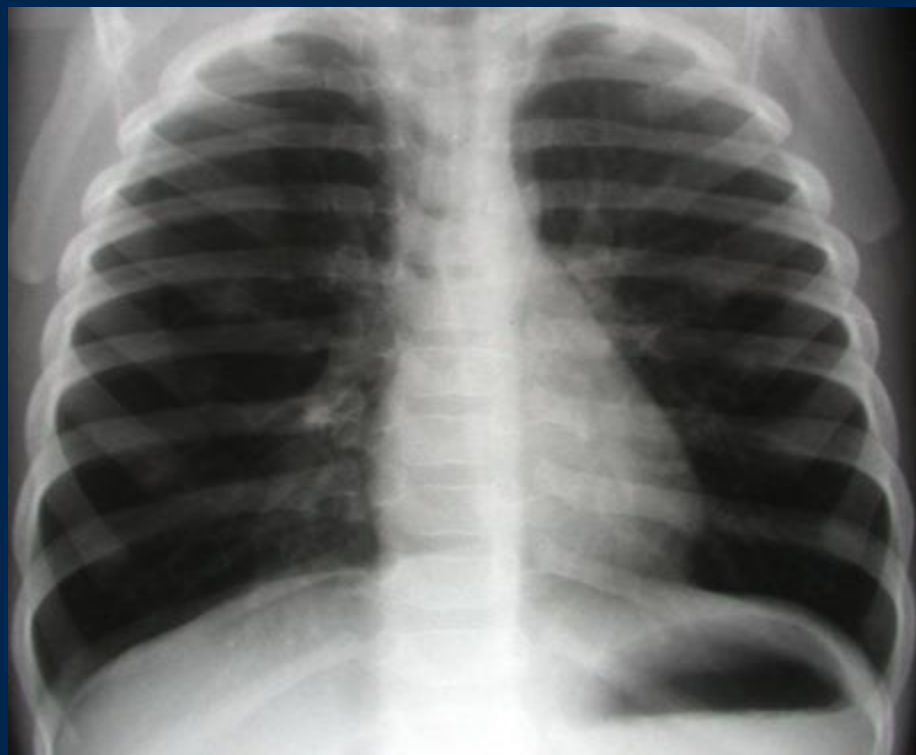
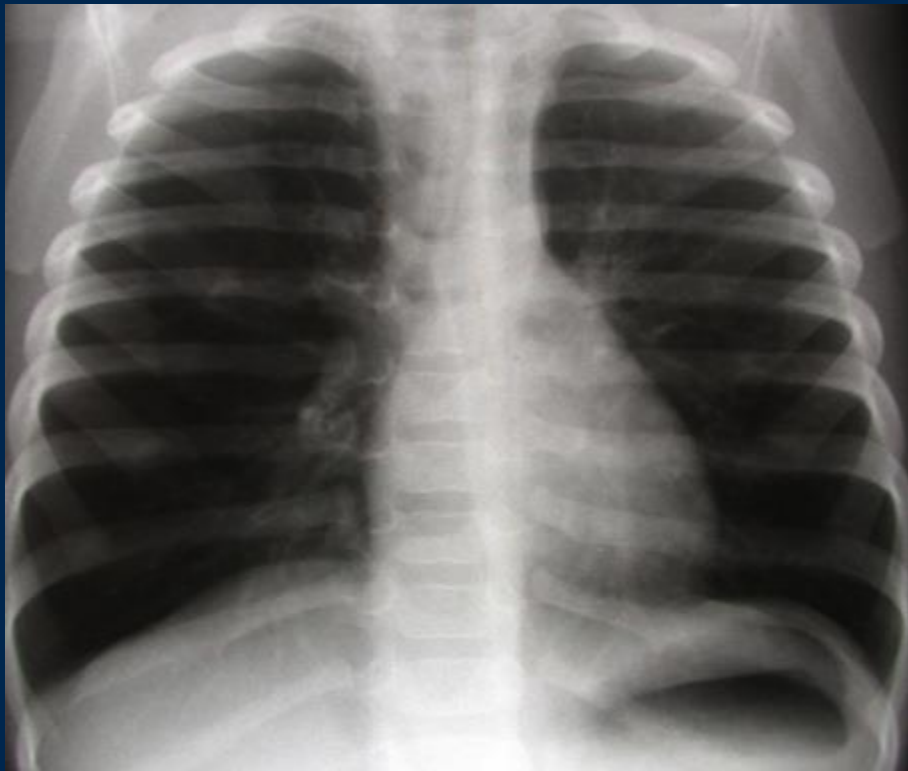


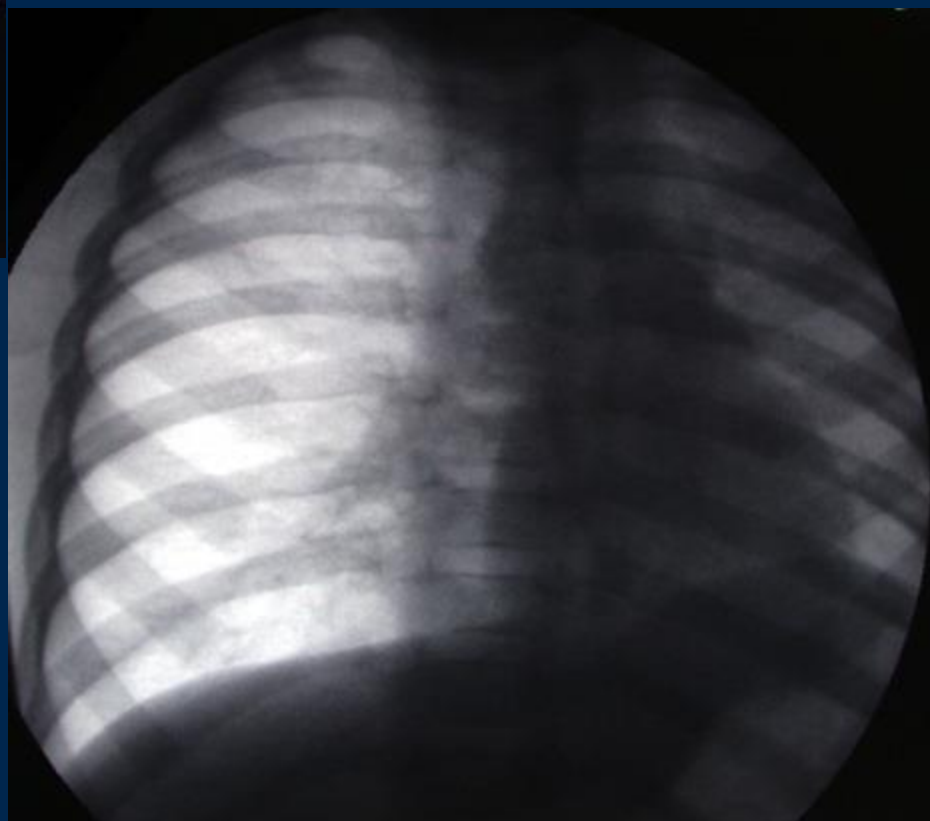
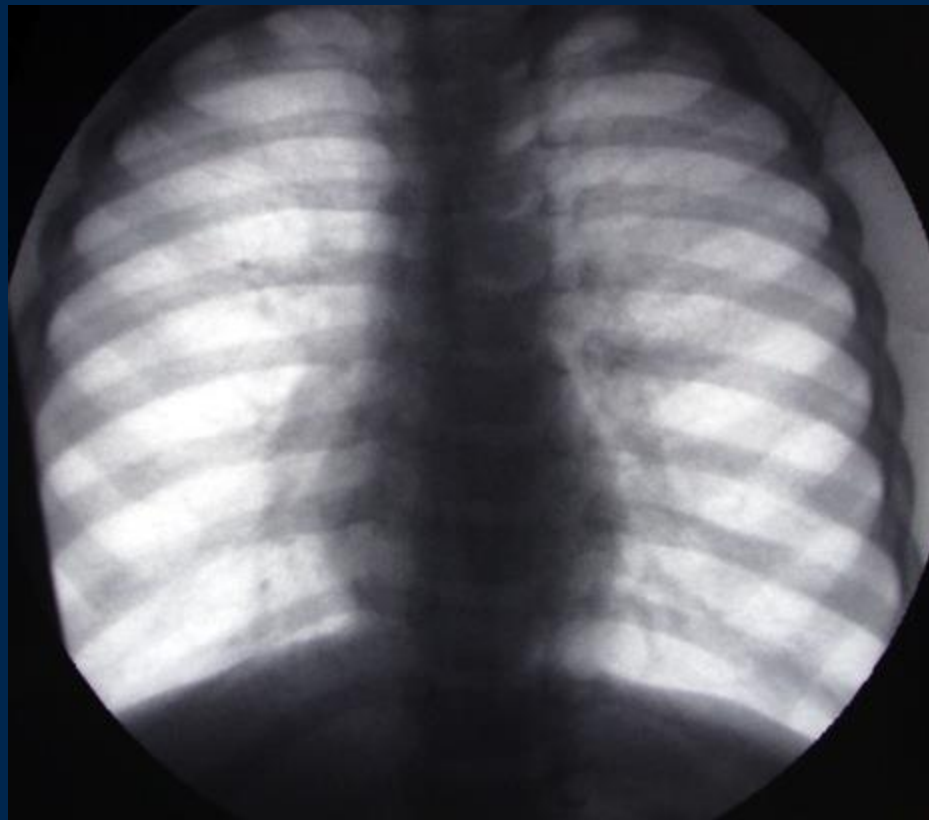
# Tracheobronchial Foreign Bodies

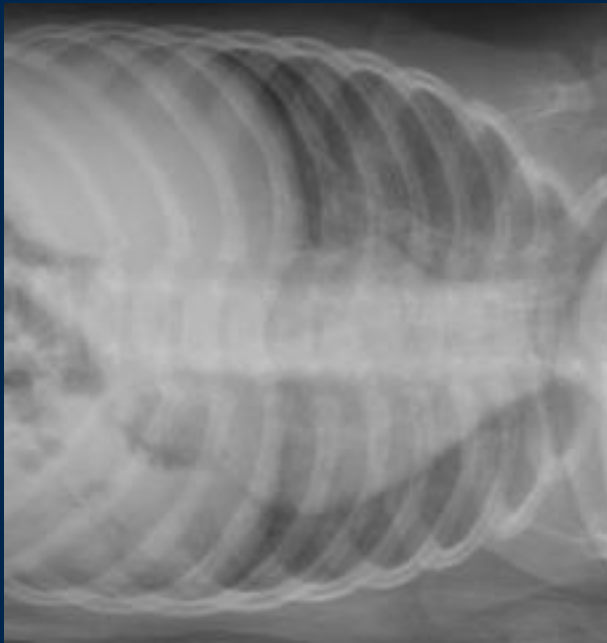
- Usually food, not radiopaque
  - Look for airway obstruction
- 
- Asymmetrical lung volume or density
  - Diminished pulmonary vascularity
  - Lack of volume change between inspiration and expiration
    - Fluoroscopy



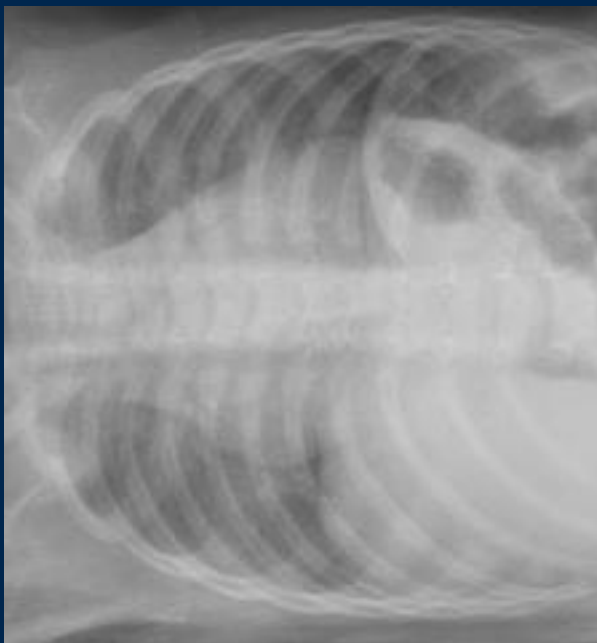






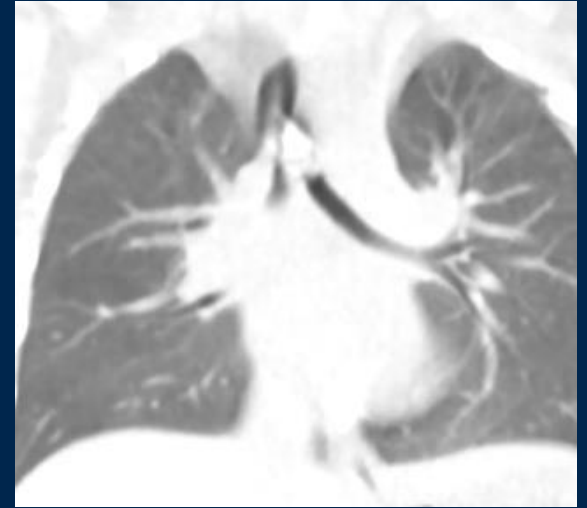


Decubitus views misleading,  
not recommended



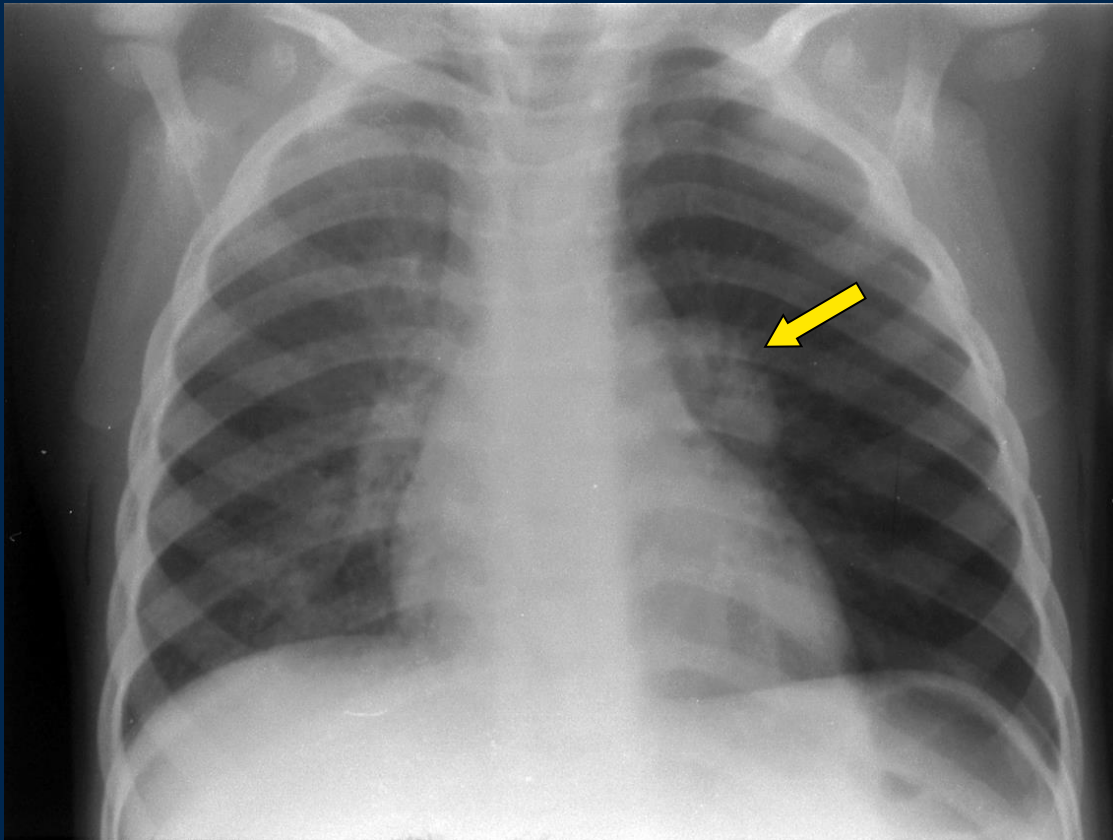
Normal

# 11 month old, choked on a rib



Courtesy of Marla Sammers MD

# Other Causes of Airway Obstruction



- Mucus plug
- BPD
- Vascular rings
- Congenital lung anomalies

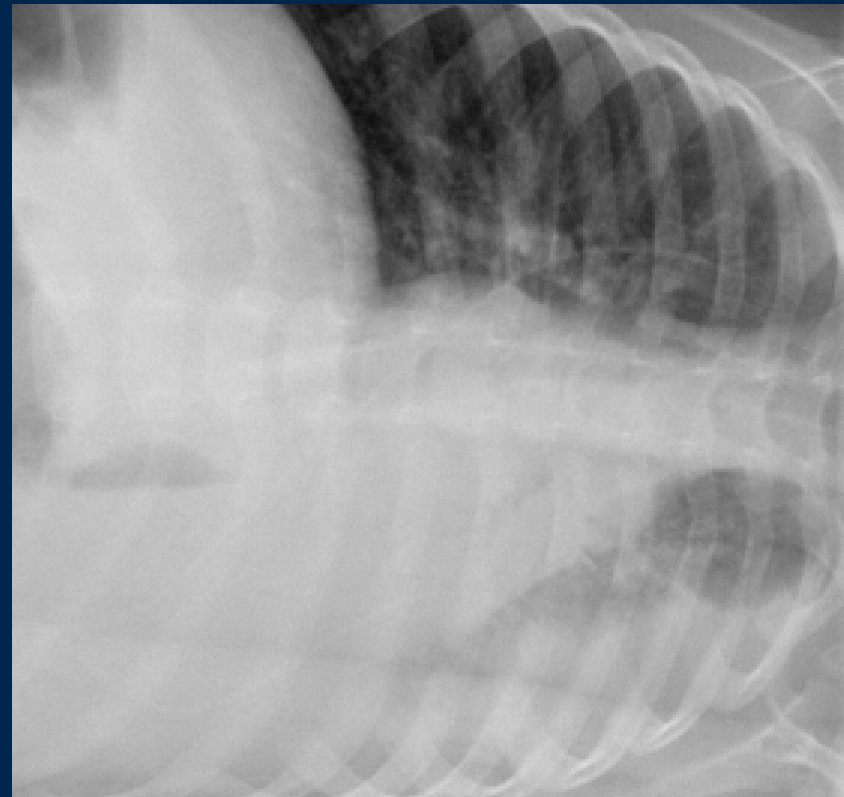
Bronchial compression by lymphadenopathy  
– Primary TB

# Empyema or Parapneumonic Pleural Effusion



- Almost never fatal in children
- Imaging guides management
- Radiographs and US often sufficient

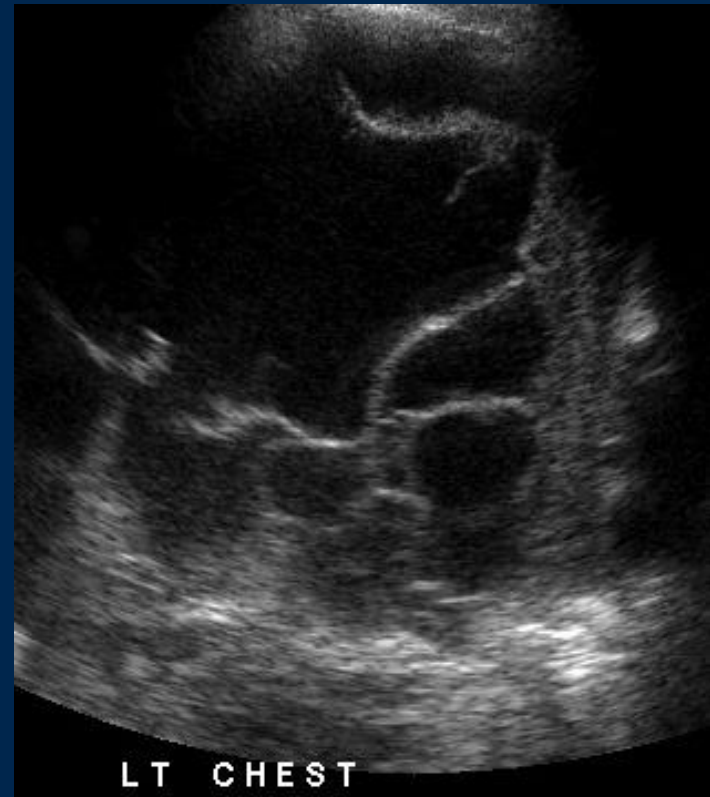
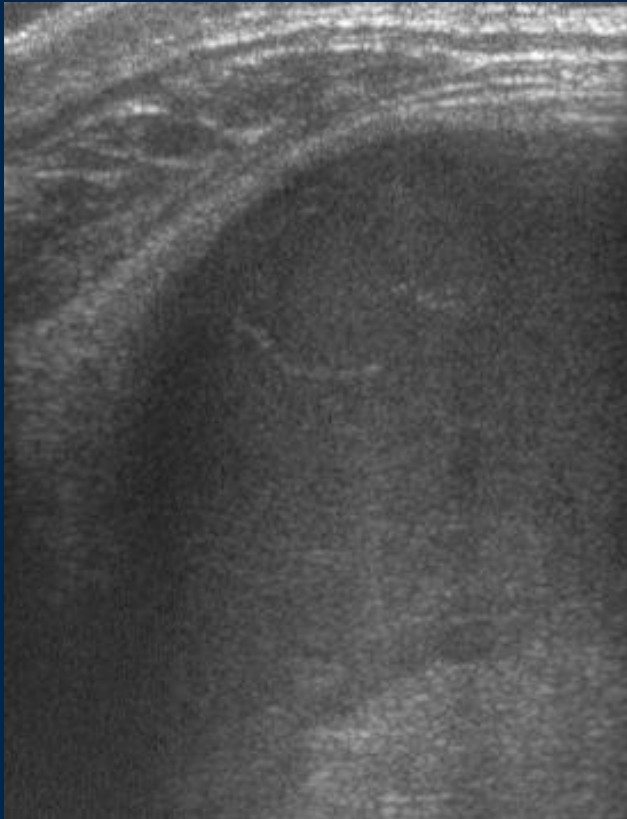


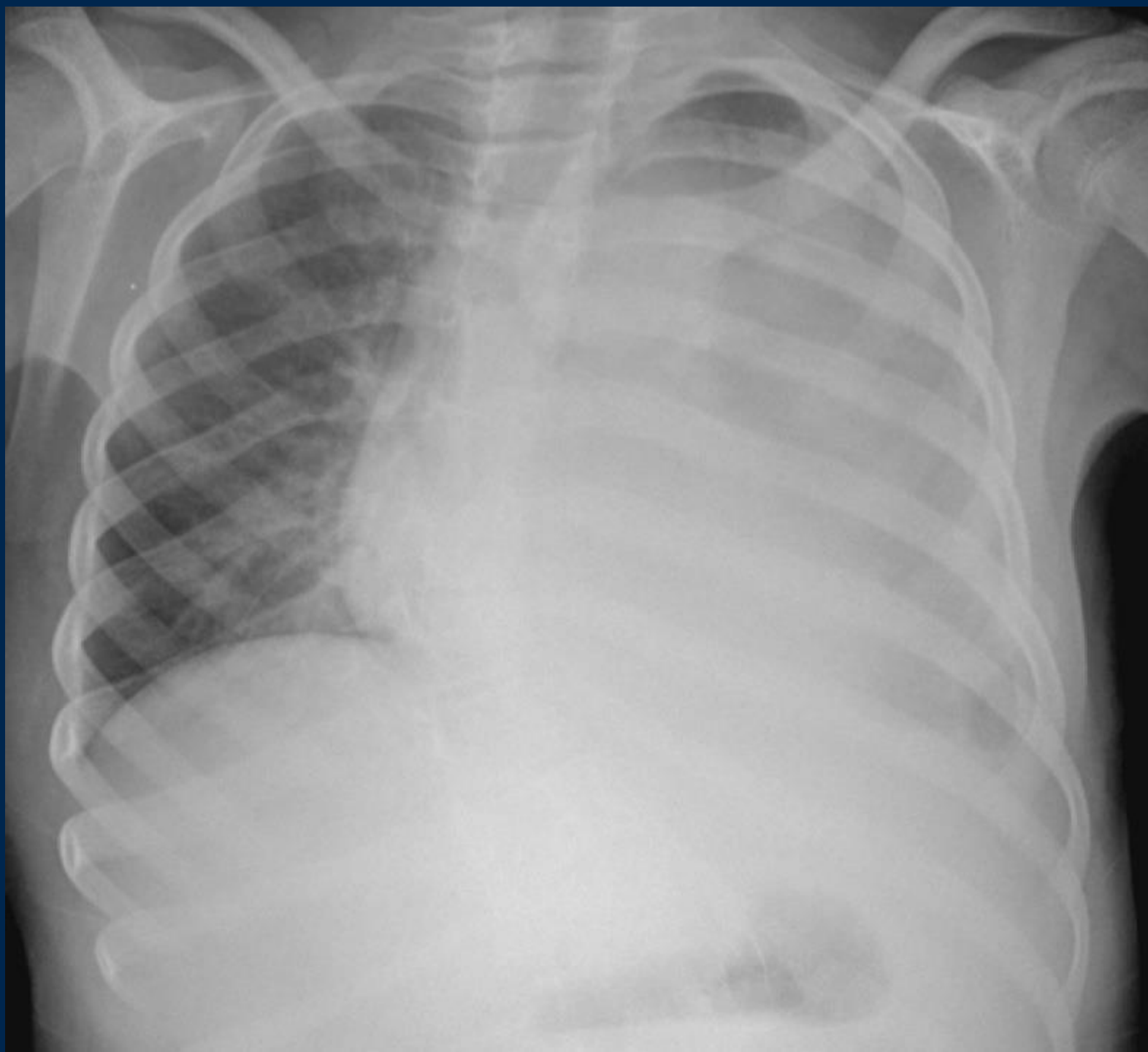


**Convex margins are highly correlated with loculation**

# Empyema

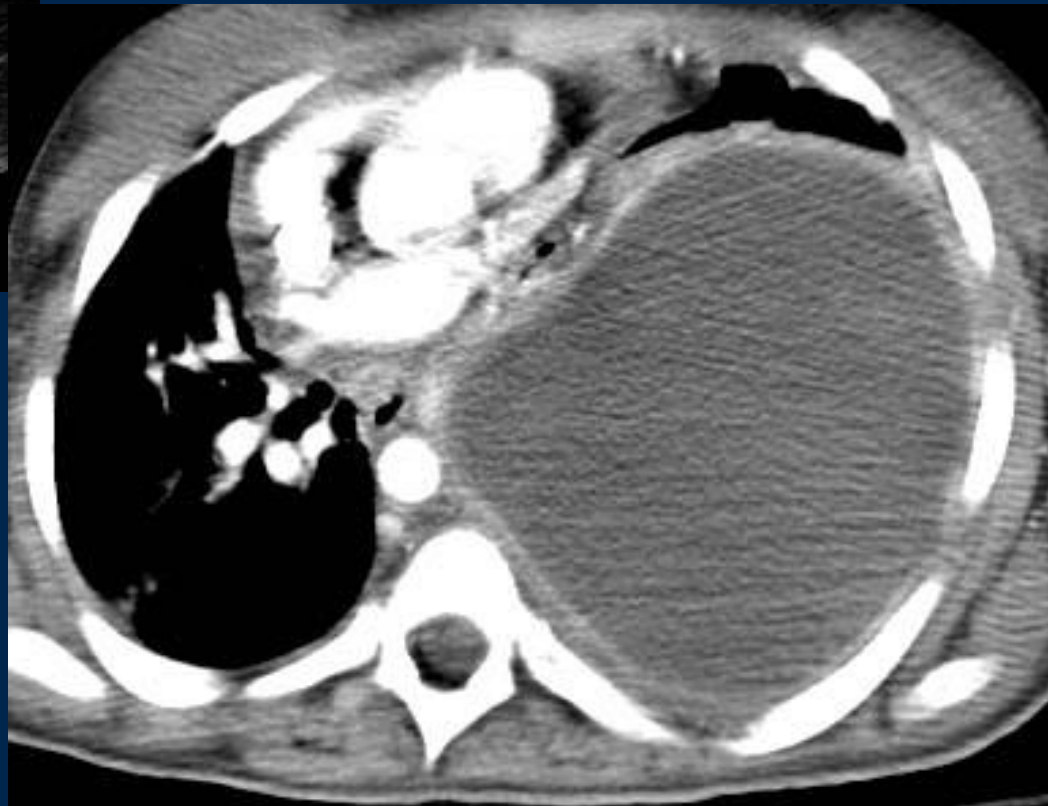
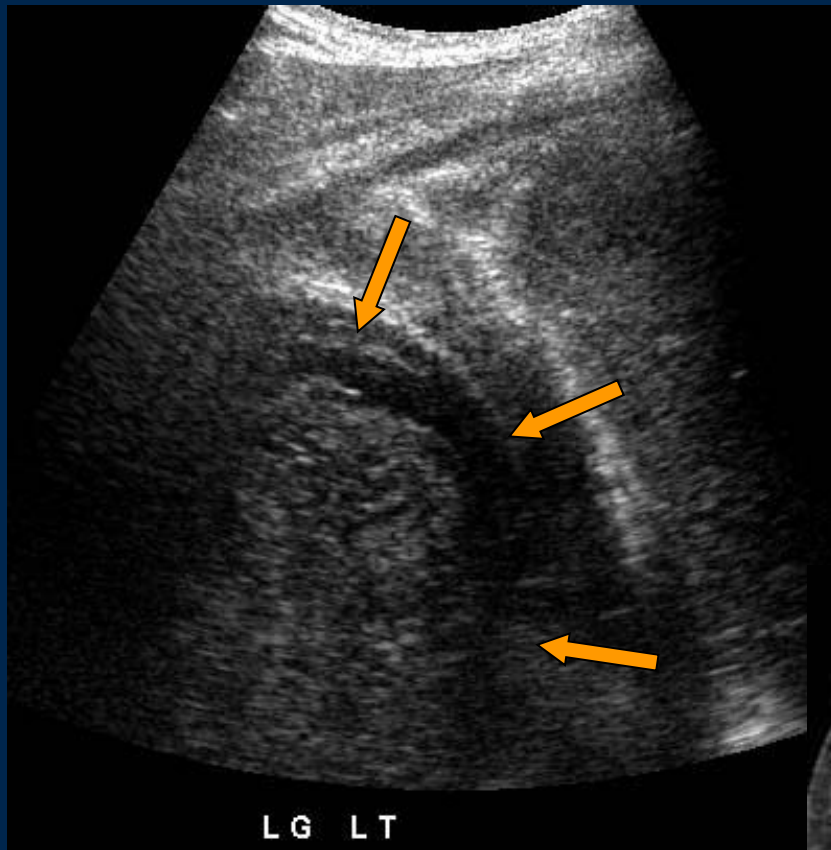
- US
  - Sector 3-8 mHz
  - Linear 7-10 mHz
- Loculations vs. Septations





# Lung Abscess

Important distinction because  
management differs



# Things to Remember

- Viral infections may cause opacities
  - Central, diffuse
- Atelectasis is common and can often be distinguished from pneumonia
- Obstructive emphysema caused by foreign bodies can be subtle – expiratory views valuable
- Low dose CT may be helpful for ingested/aspirated foreign bodies