THE CHEST X-RAY FOR THE NONRADIOLOGIST

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Outline

- Approach
- Basics/Emergencies
- Lungs/Patterns
- Heart/Mediastinum
- Everything Else

*Everything today will assume an outpatient setting with PA & Lateral views and no prior imaging (or normal prior imaging)*
APPROACH
Technical Factors

- Honestly, it’s probably fine
- Missed anatomy
- Correct patient/film
LAMBS

- Life Support
- Air Spaces
- Mediastinum/Heart
- Bones
- Surrounding Areas

*Just needs to be systematic*
“Tubes, lines and pneumothoraces”

BASICS/EMERGENCIES
Pneumothorax

- Thin white line
- Tend to be apical in upright films
- +/- Lung markings
- Don’t confuse with a skin fold
Pneumothorax vs Skin Fold
Pneumomediastinum

- Air in mediastinum usually also tracks into the neck
- Need to find the source of the air
- Asthma is the most common etiology
- Perforated airway, esophagus
Pneumoperitoneum

- Air outlines underside of the diaphragm
- Often expected (post op, peritoneal dialysis, etc.)
- When unexpected, often a sign of bowel perforation
Pleural Effusion

- “Blunting” of the costophrenic angle
- Broad estimate of size
- Numerous causes
Emphysema

- Lungs too “black”
- Fewer vessels
- Hyperinflated
  - Flat diaphragm
  - AP diameter
  - Retrosternal clear space
  - Bullae
- Upper lobe
Broken Hardware

- Often discovered incidentally
- May be months or even years since last imaging
- Port catheters, pacemakers most common
Opacification

- Only 3 patterns make the lungs whiter:
  - Replacing the alveolar air with fluid
  - Resorption of the alveolar air
  - Filling of the interstitial spaces
Alveolar Flooding

- Fluid in the alveolar spaces.
- Fluffy, cloud-like
- Air bronchograms
- DDx:
  - Blood (various)
  - Pus (pneumonia)
  - Water (edema)
  - Cells (rare tumors)
Atelectasis

- Air distal to an airway obstruction is absorbed by the body
- Homogeneous
- Signs of volume loss
- DDx:
  - Tumor/Compression
  - Mucus plug
  - Foreign Body
  - Bronchopneumonia
“Atelectasis vs Pneumonia”
Interstitial Pattern

- Excess lines
- Kerley B’s peripheral
- DDx:
  - Int. pneumonia
  - Int. edema
  - Chronic fibrosis (but abnormal lines)
Solitary Pulmonary Nodule

- Key is seeing it

- Workup is fairly constant:
  - Old films
  - Calcification
  - CT (6, 12, 24)

- Occasionally: repeat in 6 weeks if it could be pneumonia
HEART/MEDIASTINUM
Edema Spectrum

- Large vascular volume
- Pulmonary vascular engorgement
- Interstitial edema
- Alveolar edema
Cardiac Contour Abnormalities

- Aneurysms
- Chamber enlargement
- Pericardial cysts
- Pericardial effusion
- Adjacent mass or adenopathy
PA Enlargement

- PA sits below and lateral to the aorta
- Many causes of PA hypertension
- Right and left main PAs usually enlarged as well
- May look similar to adenopathy
Hilar Adenopathy

- Try to distinguish from PAs
- Often have mediastinal adenopathy as well
- DDx:
  - Lymphoma/Ca
  - Sarcoid
  - Reactive/infectious
- Calcified nodes are ok (old histo)
Is it in the hilum?

- Hilum Overlay
  - If you can still see the hilar vessels through it, it’s outside the hilum

- Opposite is called a “silhouette sign”

- Same trick works anywhere air and soft tissue come together.
Mediastinal Masses

- Come in all shapes and sizes
- Classic differentials, BUT...
  - Different methods to divide the mediastinum
  - Don’t always know where it started
  - Always think about adjacent compartments & lung
EVERYWHERE ELSE
Bone Abnormalities

- Just like bones everywhere else
  - Arthritis/DJD
  - Primary tumors
  - Mets
  - Fractures
  - Dislocations
  - Direct invasion

- Easy to overlook
Diaphragm Disorders

- Hernias
  - Congenital or HH
- Eventration
- Trauma
- Paralyzed phrenic nerve
Chest Wall

- Easy to miss
- Asymmetry helps
- May disrupt the ribs
- DDx large, but main goal of CXR is detection
Questions?

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- Surrounding Areas

- *Just needs to be systematic

- Free PDFs with additional information and practice questions: chestradiology.com

Thank you so much for inviting me!

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