Introduction to Radiology For TB Nurses

Megan Devine, MD
Medical Consultant
Heartland National TB Center

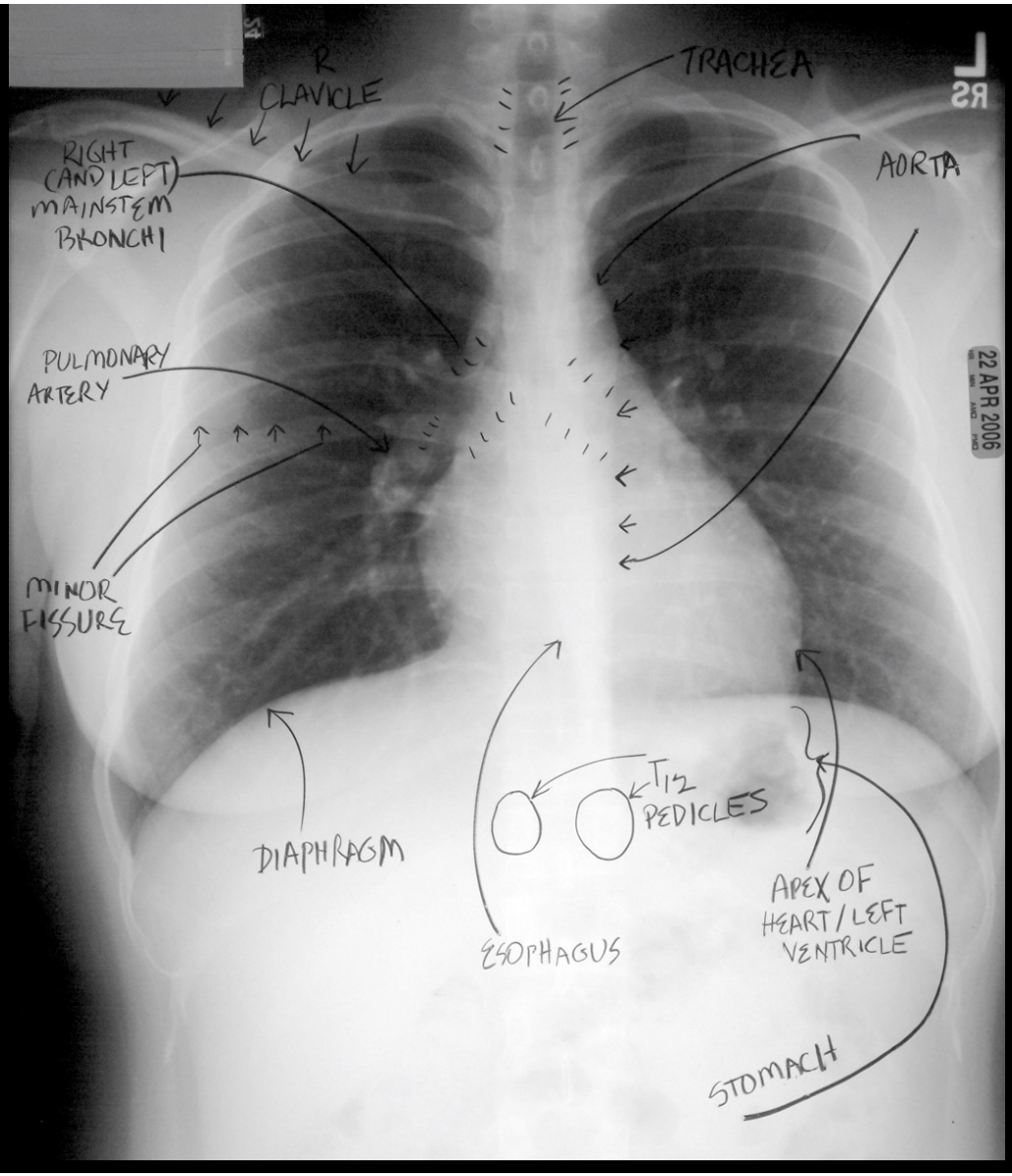
Associate Professor
Internal Medicine/Pulmonary Medicine/Critical Care
University of Texas Health Science Center at Tyler

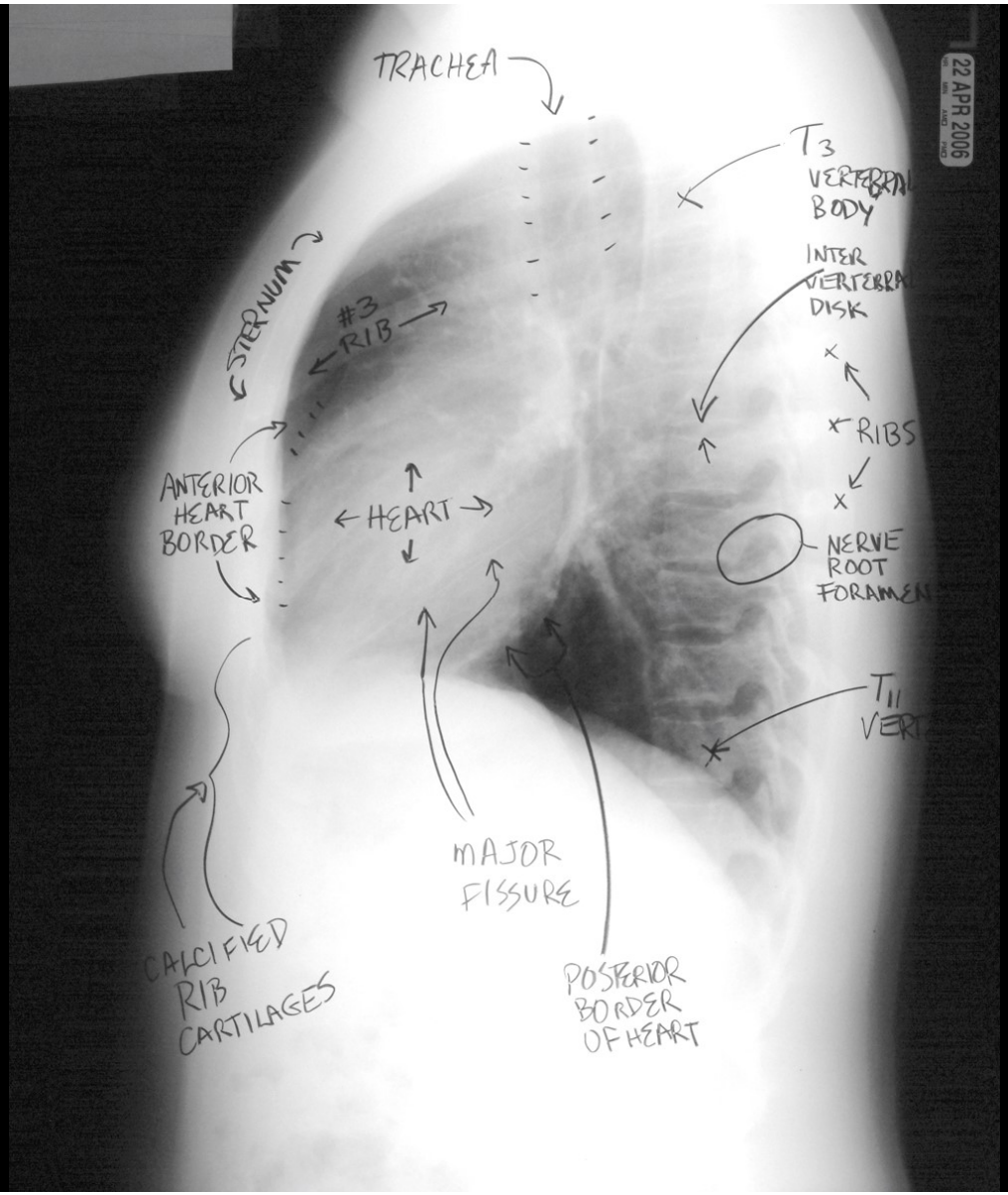
Chest Radiology in TB

- X-Rays penetrate air, absorbed by fluids/solids
- Chest radiographs show us shadows of organs and structures in the chest
- Interpretation of a chest radiograph is pattern recognition that requires clinical correlation for true diagnosis
- To know what “abnormal” looks like, you have to know what “normal” looks like

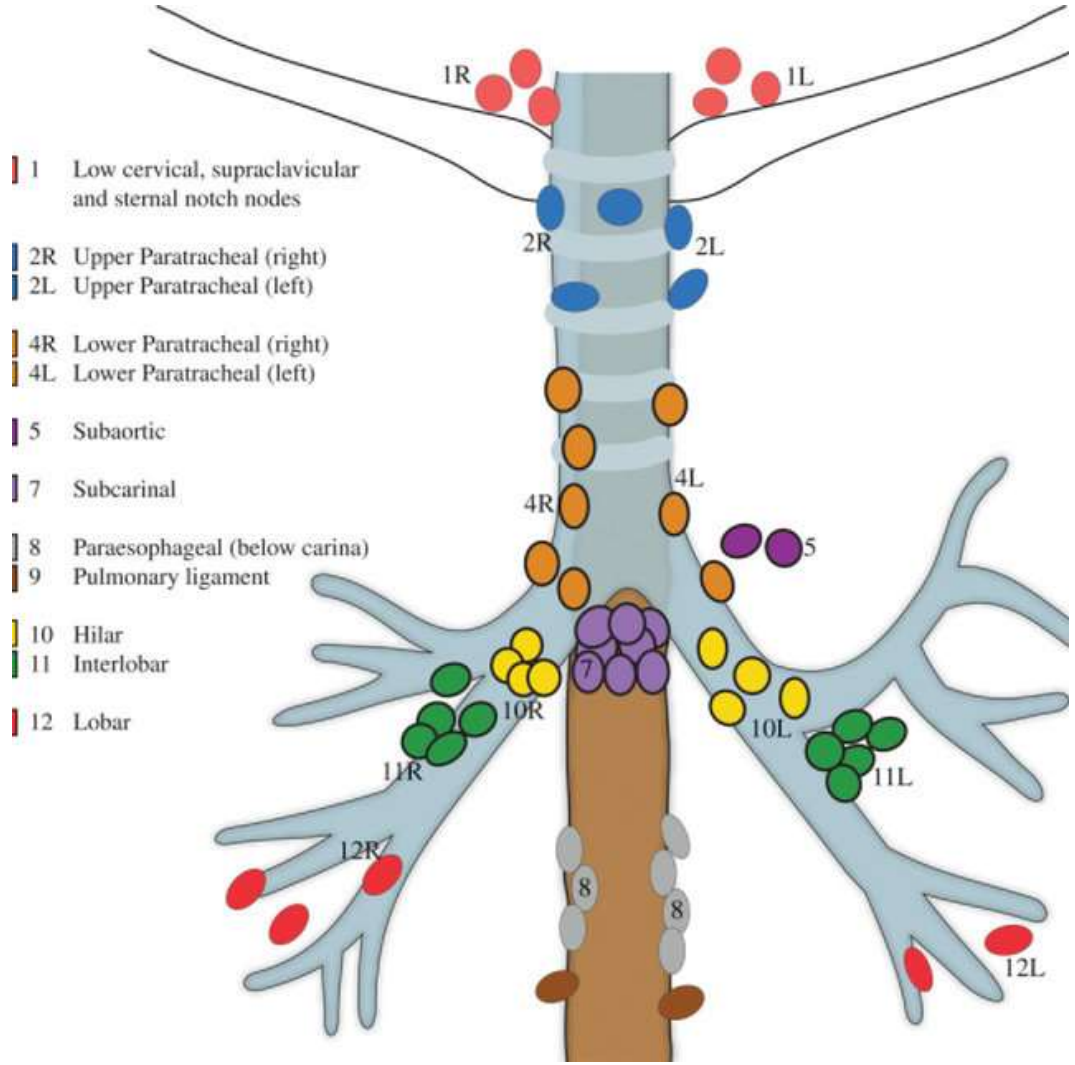
Chest Radiology Basics

- Dark/black = Air
- Dense White = Calcium (Bone Density)
- White = Water Density (Everything else)
  - Water
  - Blood
  - Fat
  - Tissue
  - Pus


R CLAVICLE
TRACHEA
RIGHT (AND LEFT) MAINSTEM BRONCHI
AORTA
PULMONARY ARTERY
MINOR FISSURE
DIAPHRAGM
T12 PEDICLES
ESOPHAGUS
APEX OF HEART / LEFT VENTRICLE
STOMACH
22 APR 2006


TRACHEA
22 APR 2006
T3 VERTEBRAL BODY
INTER VERTEBRAL DISK
RIBS
NERVE ROOT FORAMEN
T11 VERT
#3 RIB
STERNUM
ANTERIOR HEART BORDER
HEART
MAJOR FISSURE
CALCIFIED RIB CARTILAGES
POSTERIOR BORDER OF HEART

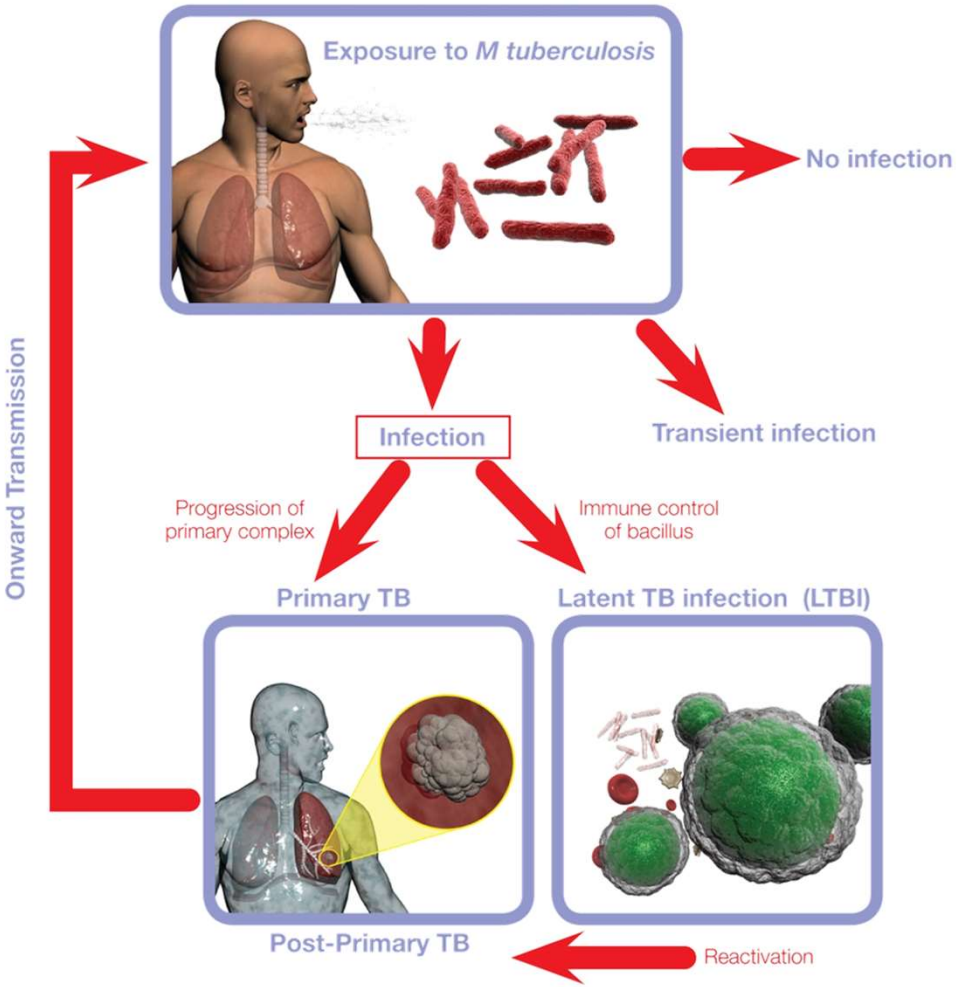
Lymph nodes in the chest



Normal CXR Child

Role of CT in the Diagnosis of TB

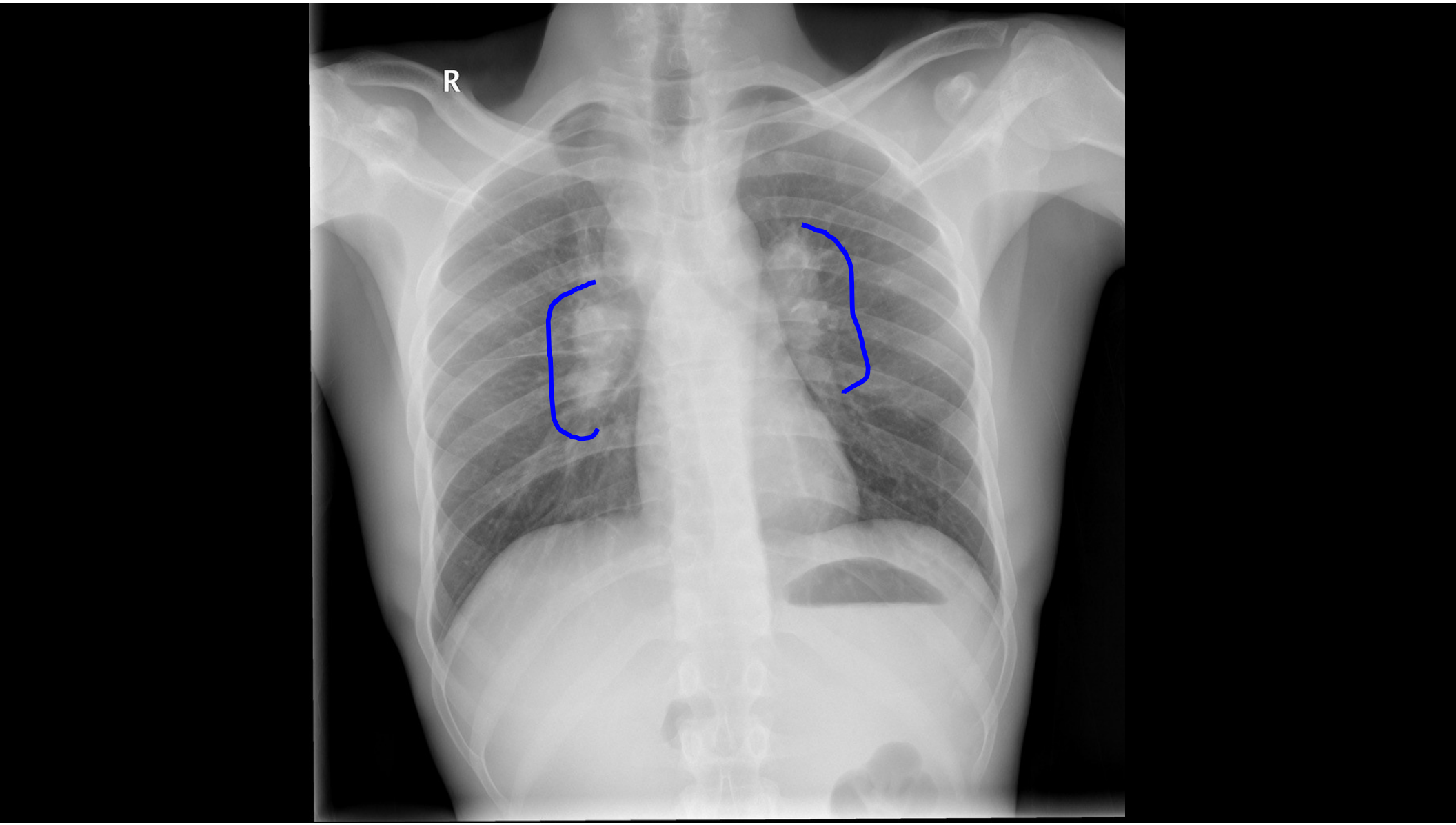
- CT is not the primary radiologic diagnostic test for TB (CT is overused in the US)
- Usually don't need CT for cavitary consolidation
- If TB is a possible diagnosis, sputum for AFB should be obtained prior to CT
- In most instances, CT should be reserved for patients in whom the diagnosis is unclear


Exposure to *M tuberculosis*
No infection
Infection
Transient infection
Progression of primary complex
Immune control of bacillus
Primary TB
Latent TB infection (LTBI)
Onward Transmission
Post-Primary TB
Reactivation

Cellestis

Primary Tuberculosis

- Most commonly in children and immune compromised patients
- Opacities are seen the in middle and lower lungs; commonly unilateral, bilateral 15%
- Hilar or paratracheal lymphadenopathy with or without infiltrates is characteristic.
- Lymph node enlargement may cause bronchial compression
- Pleural effusion (25% can occur in primary disease)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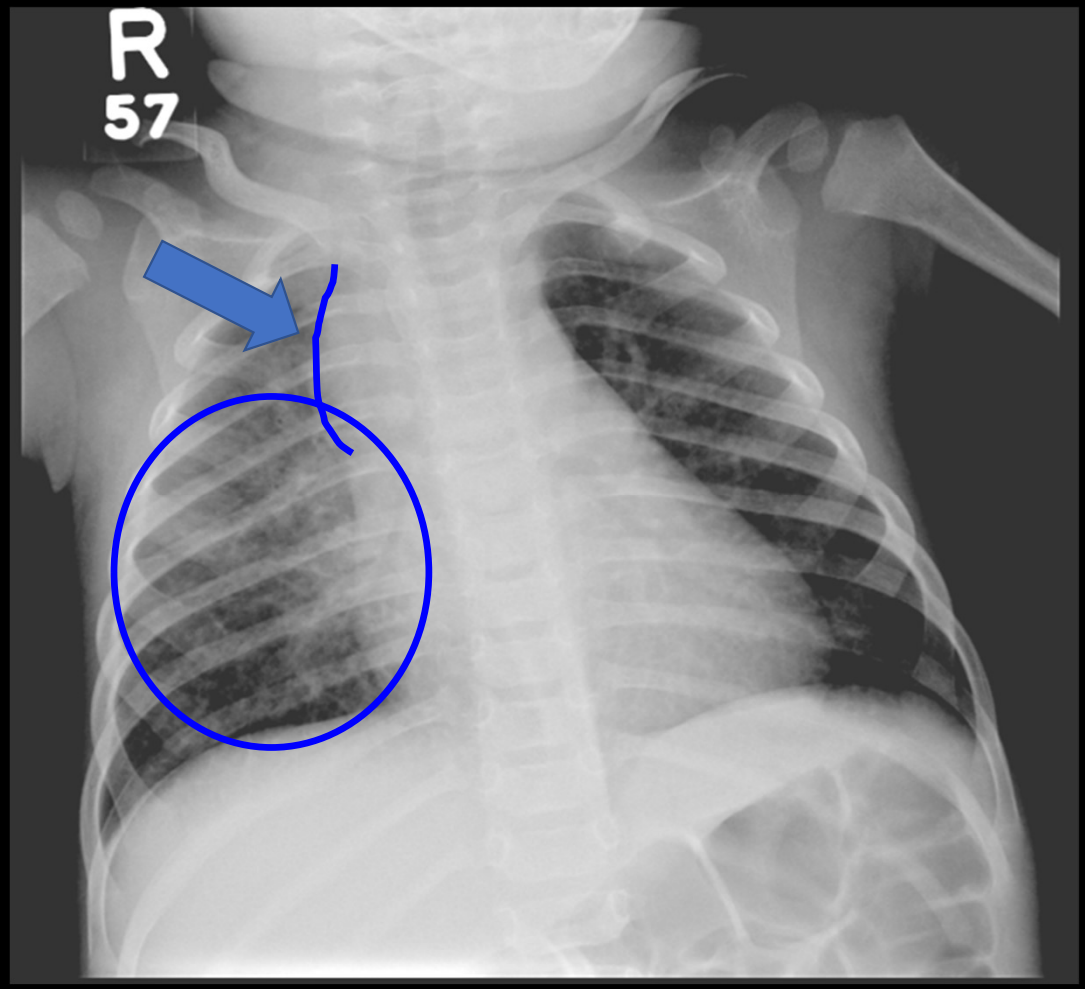
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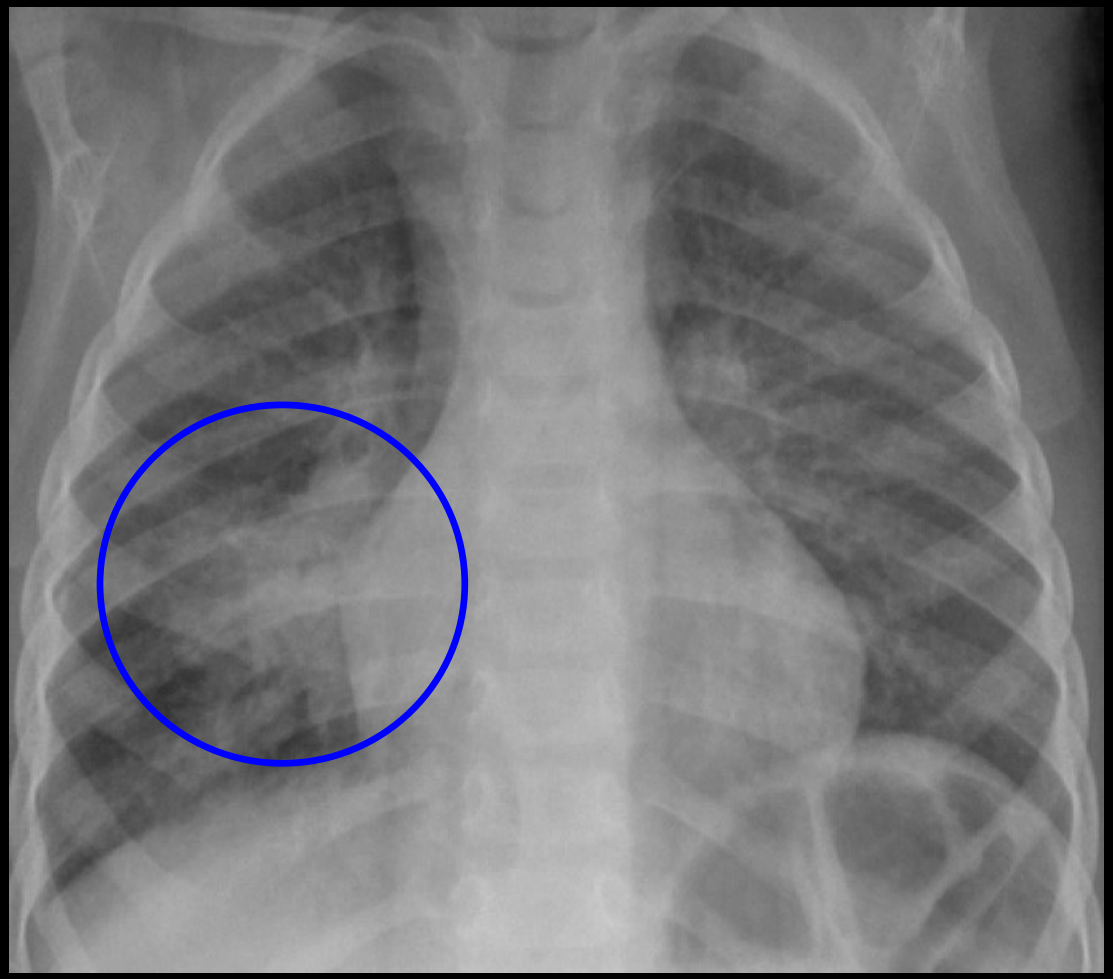

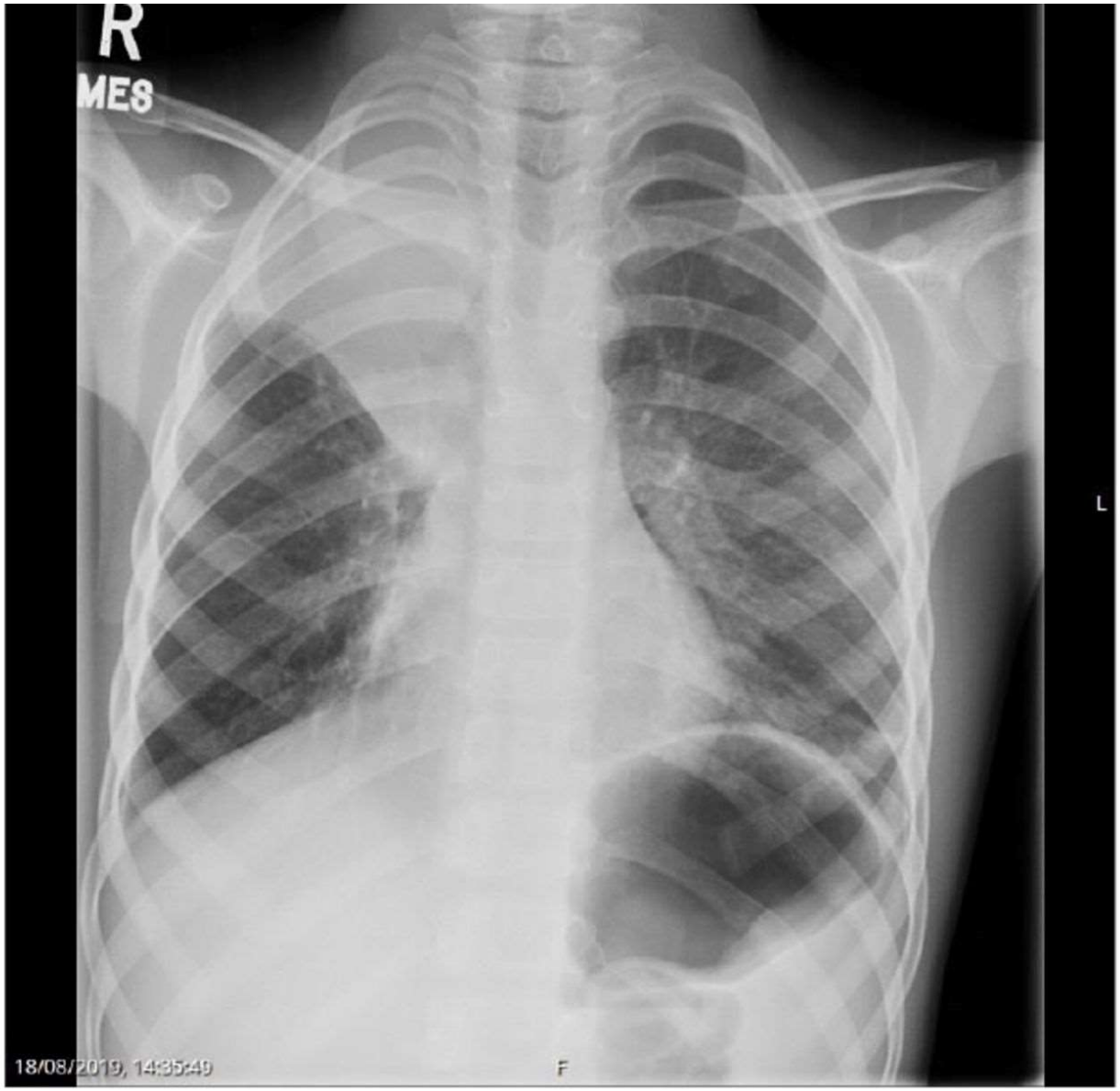
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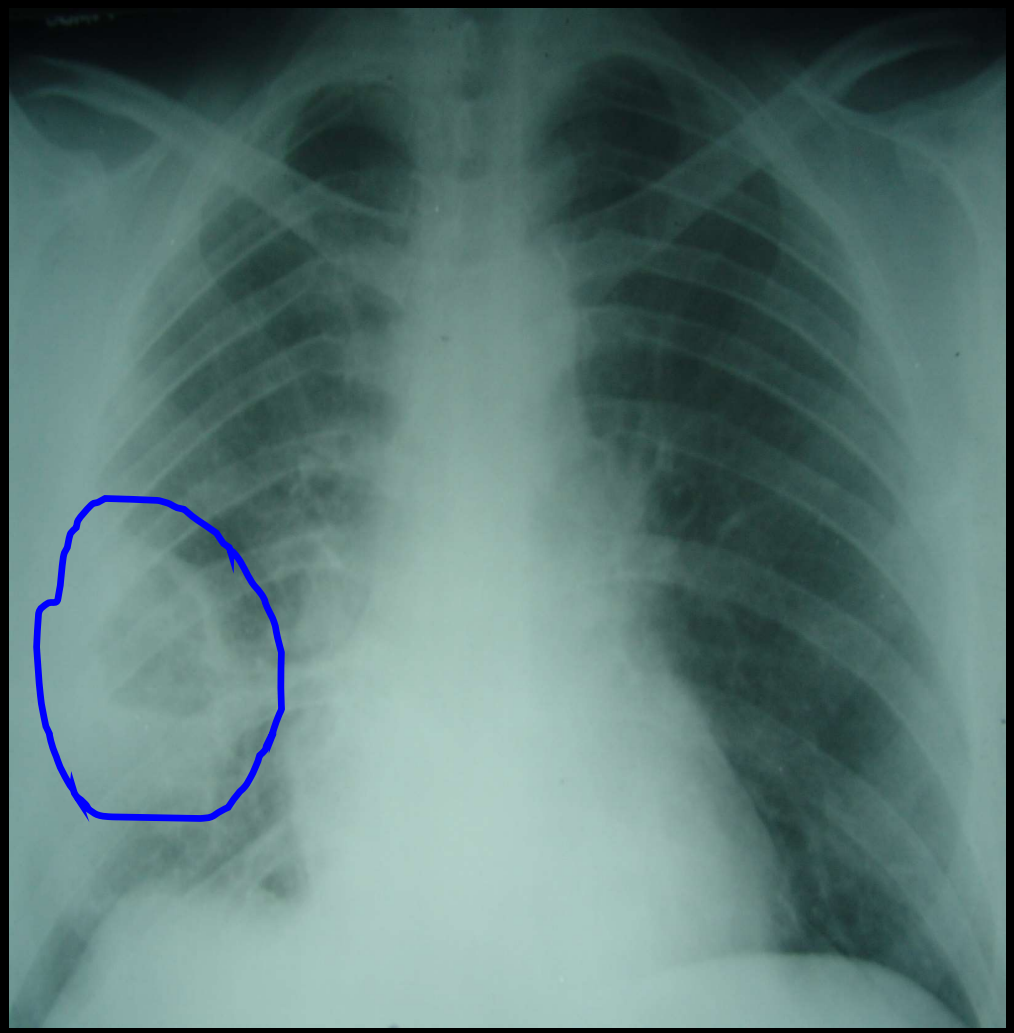
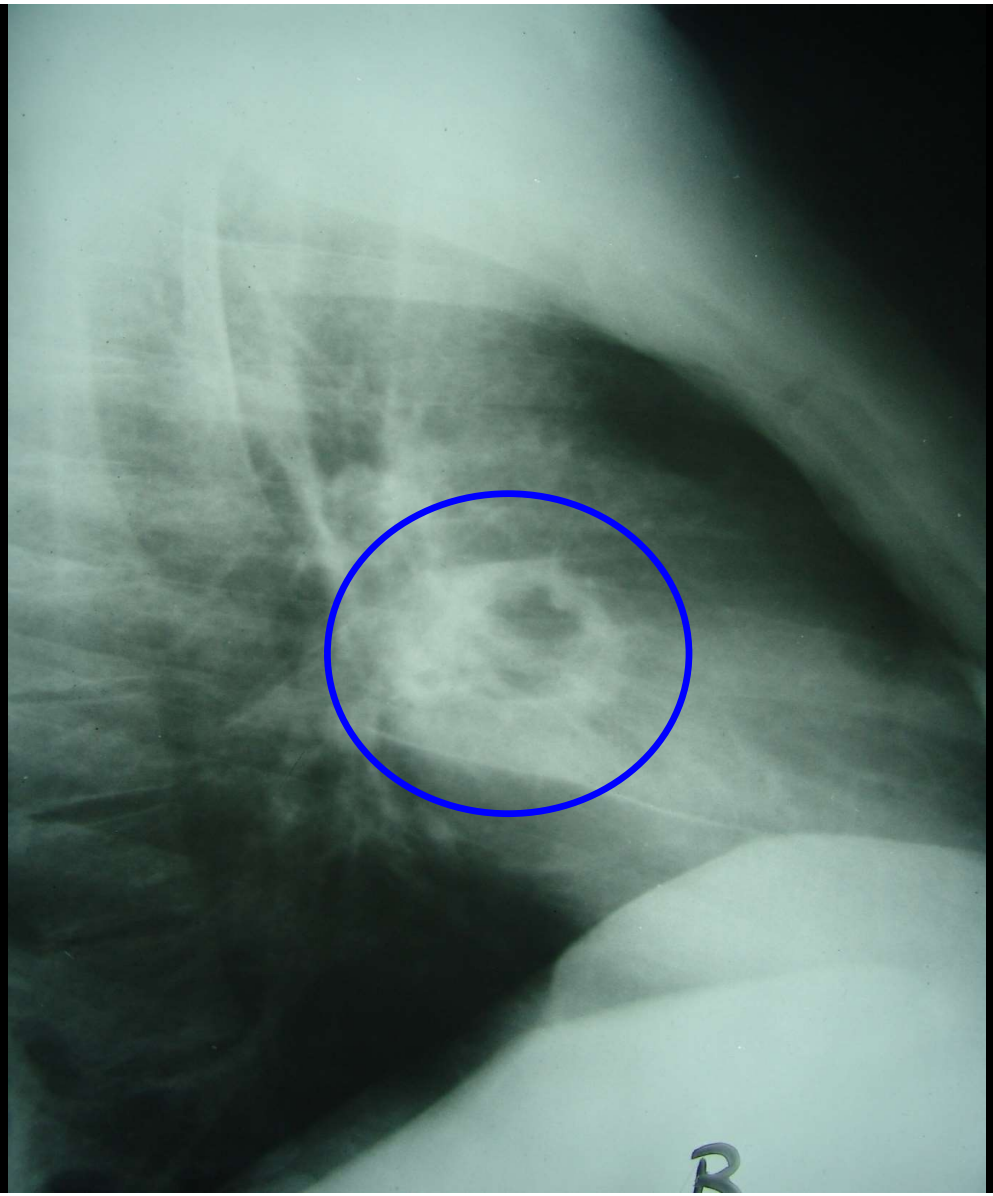
Carestream Health R&D Hps

Post Primary, Reactivation Tuberculosis

- Characterized by upper lobe predilection, cavitation and absence of lymphadenopathy.
- Cavitation is the hallmark; can also see parenchymal disease (consolidation), hematogenous dissemination (milliary), bronchogenic spread (tree-in-bud) and pleural disease.
- Fibrosis and calcification are seen after healing.

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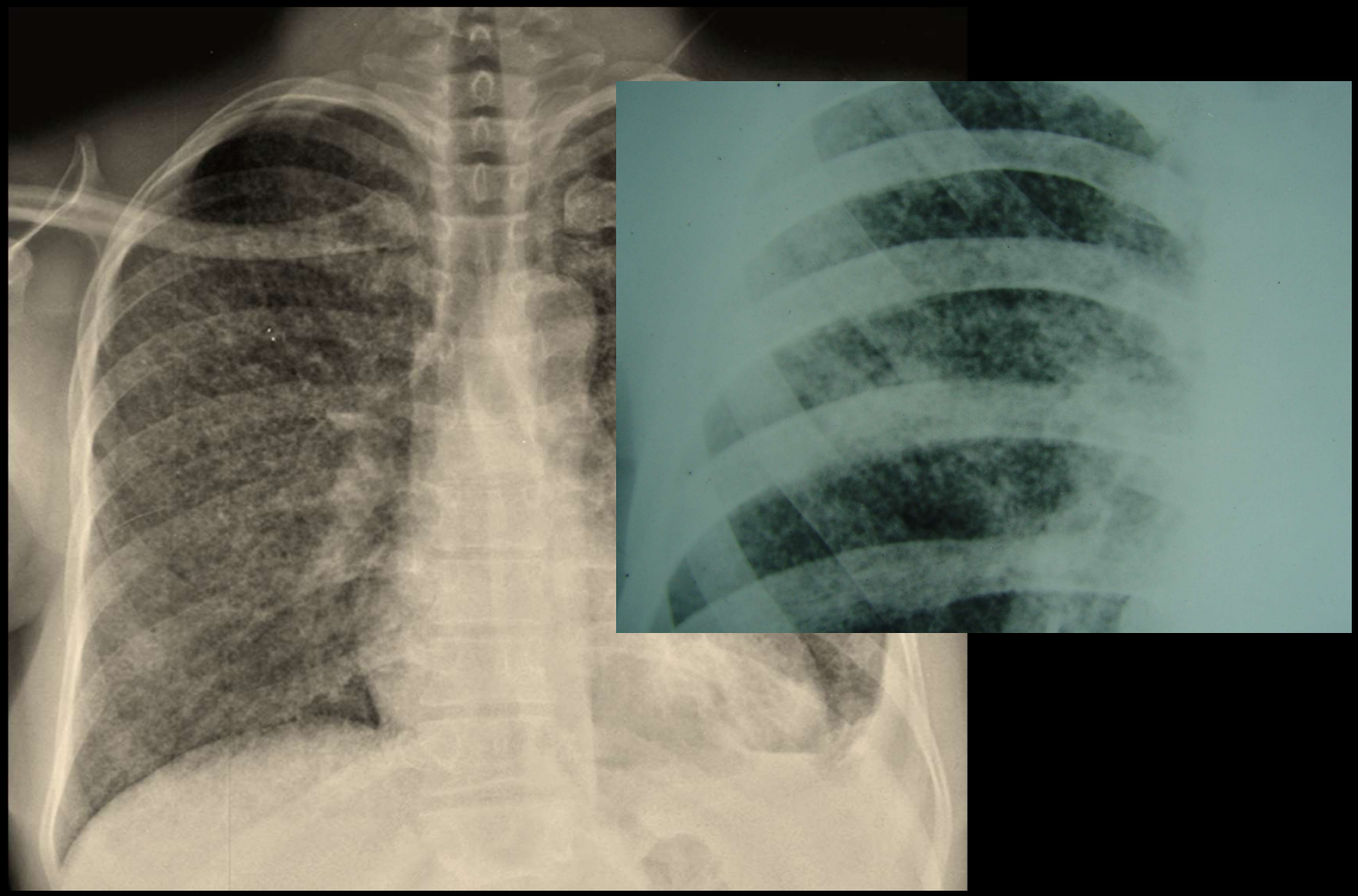
Millet Seeds

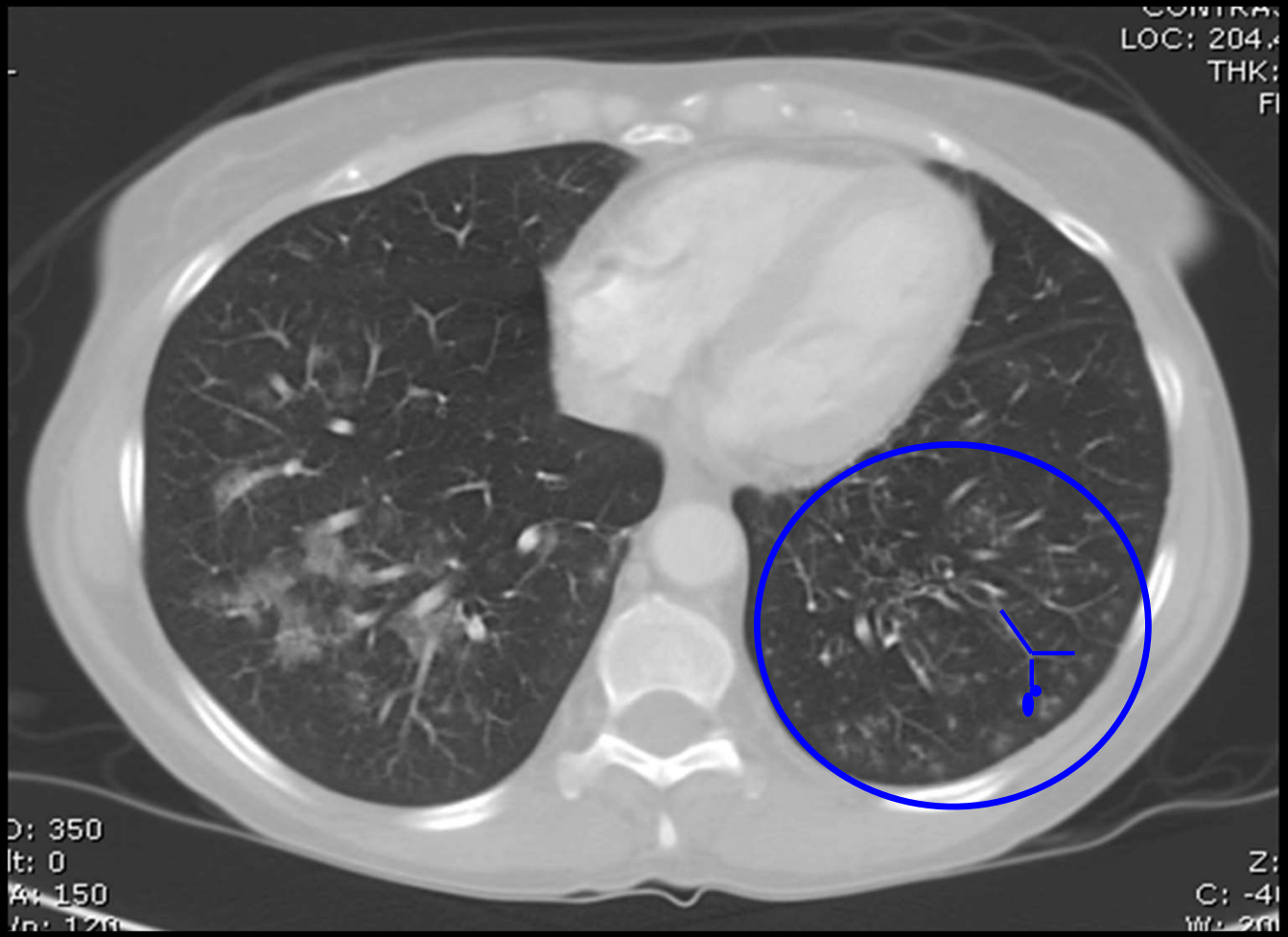
- Slender plant, 1-15 feet
- Seeds ~ 2-3 mm in diameter
- Africa and India

Milliary TB



Tree in Bud……

http://www.jellosalad.com/pic/favorites/index.html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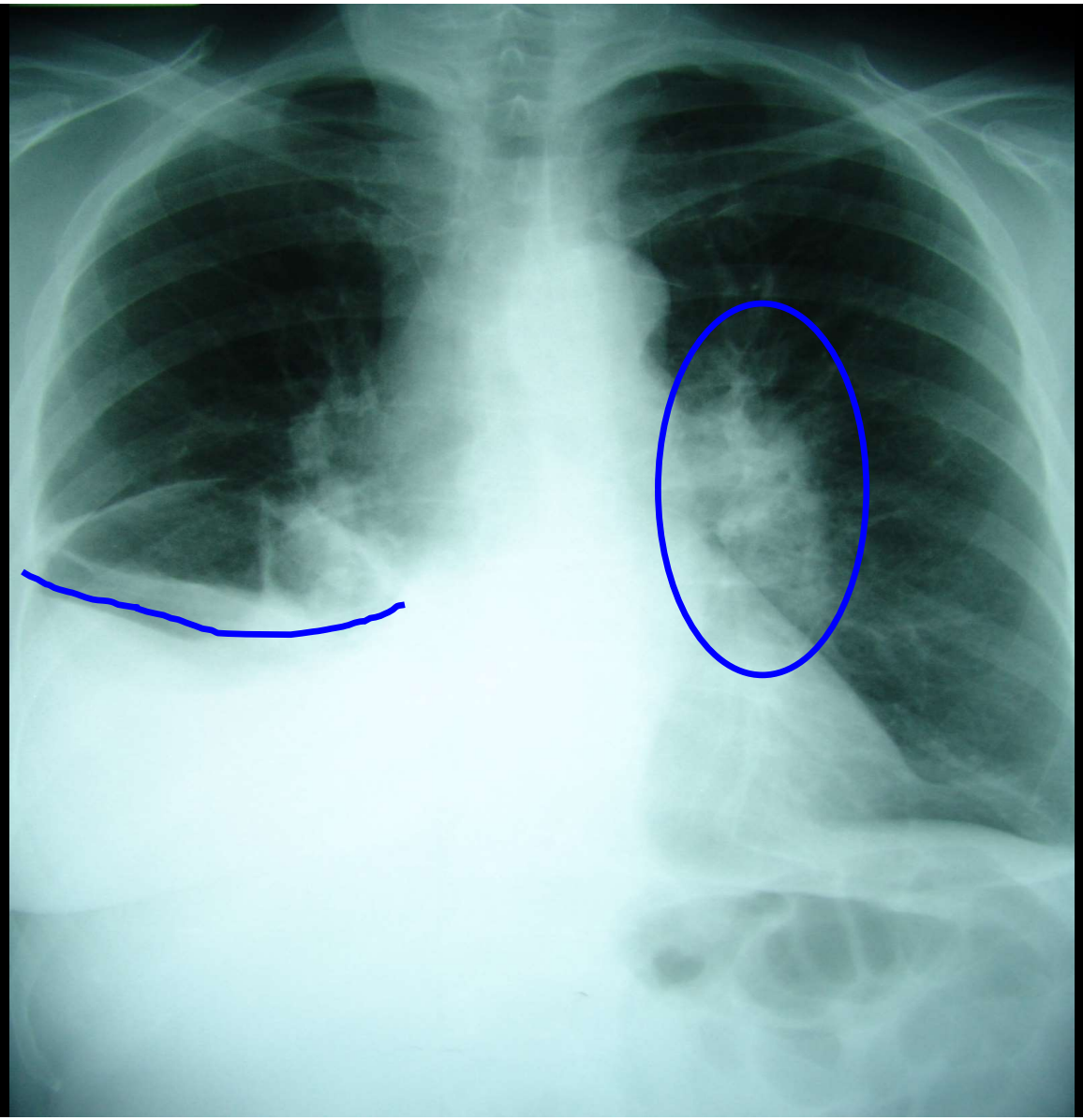
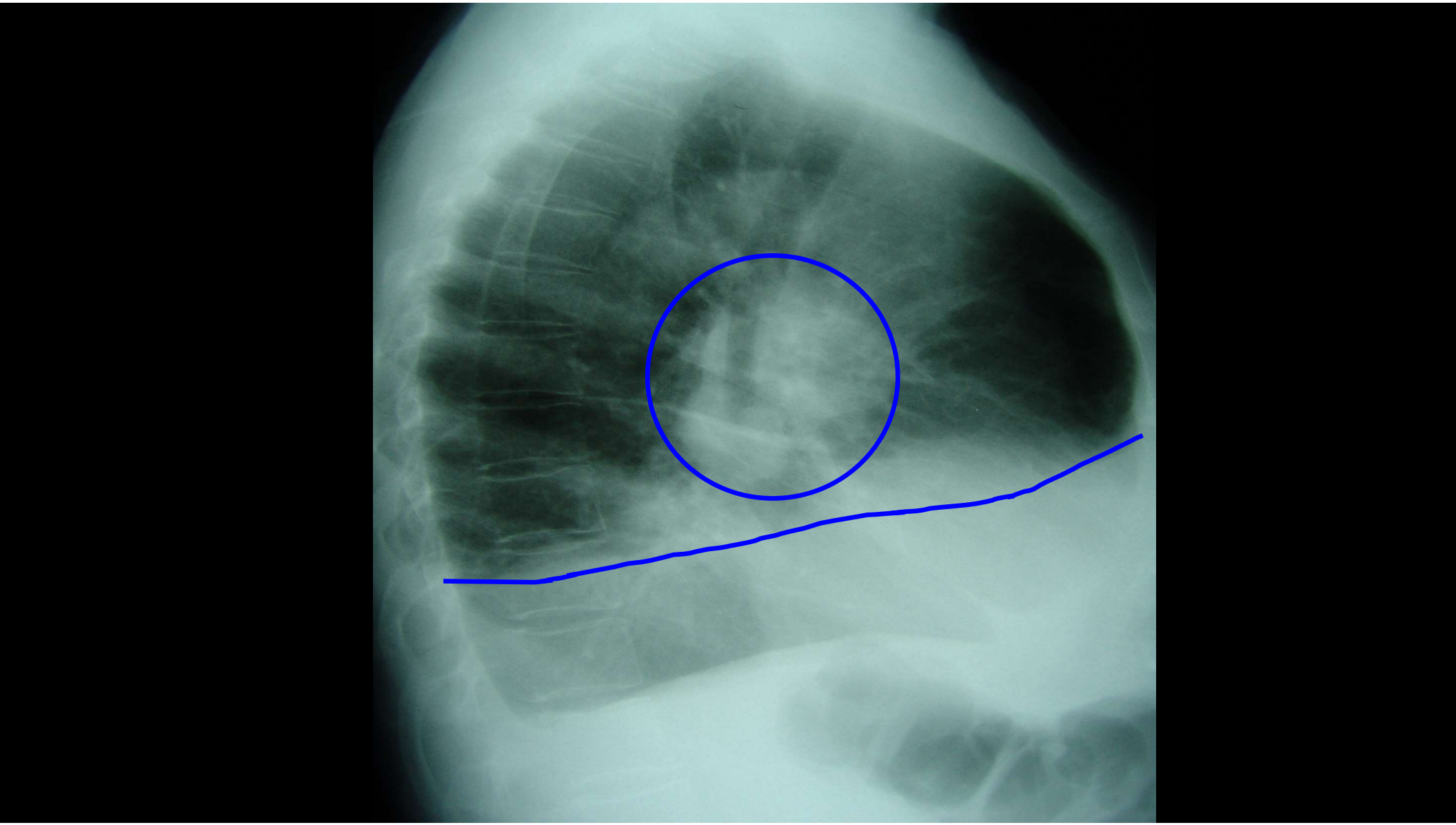
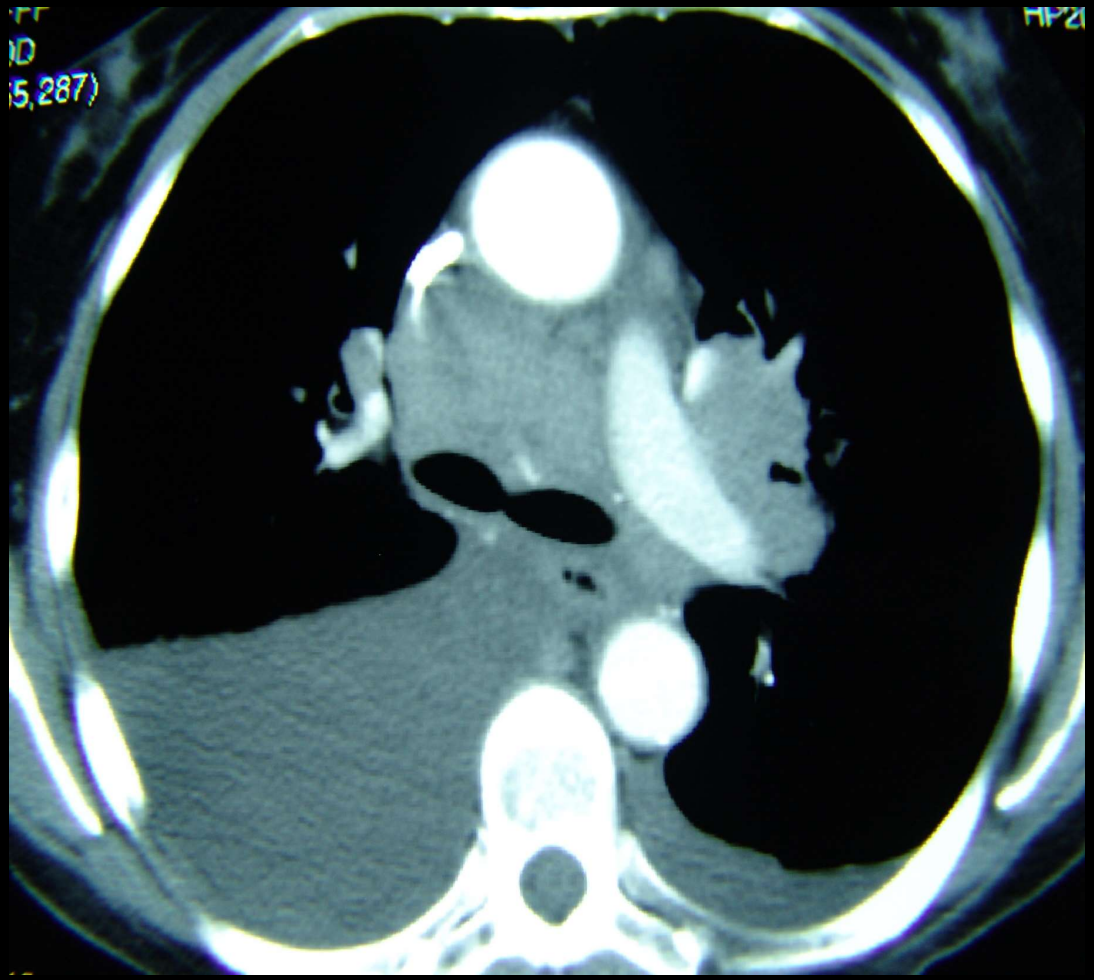
Pleural Effusions

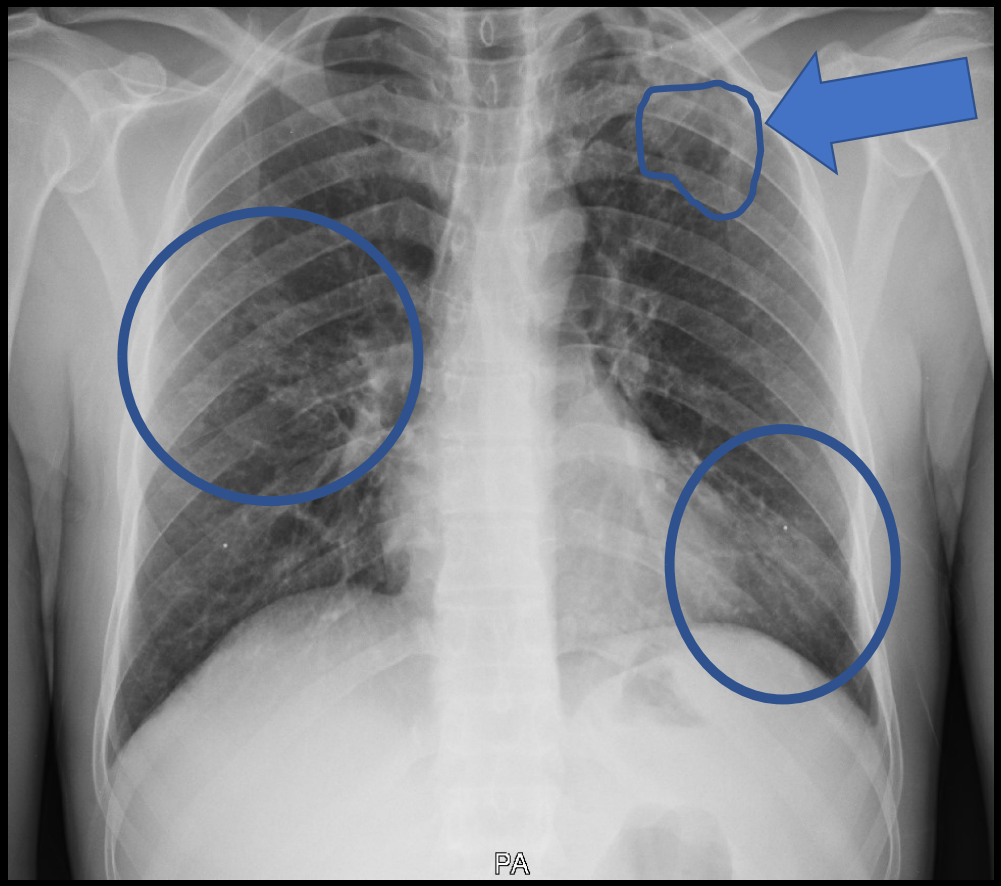
- Primary TB (25%)
- Hypersensitivity reaction to TB proteins
- Organisms uncommonly isolated from fluid
- May not be associated with obvious parenchymal disease on CXR







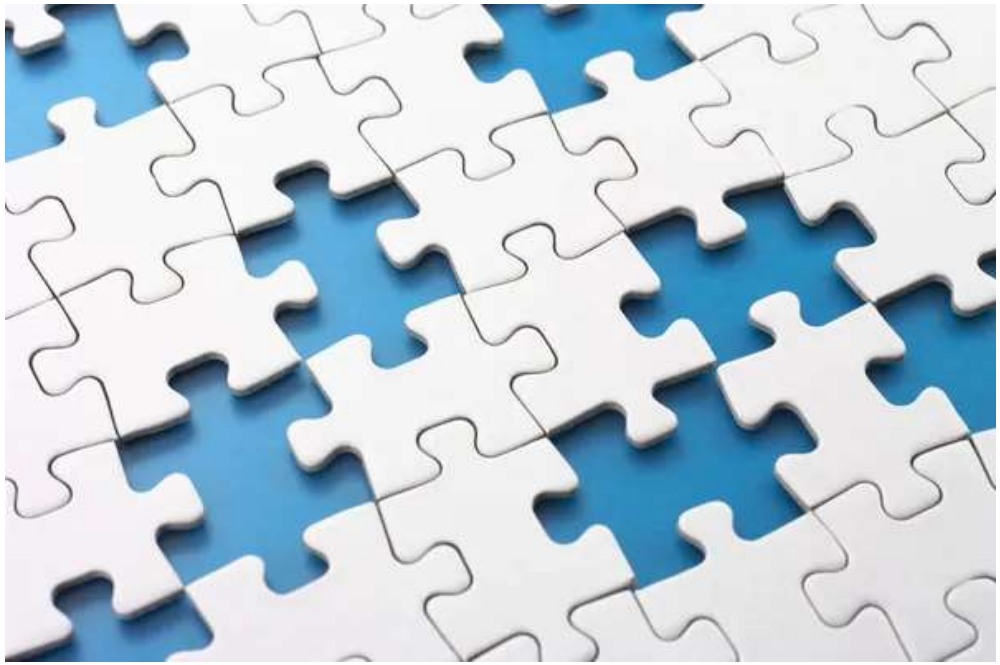
Back to our Eritrean family…

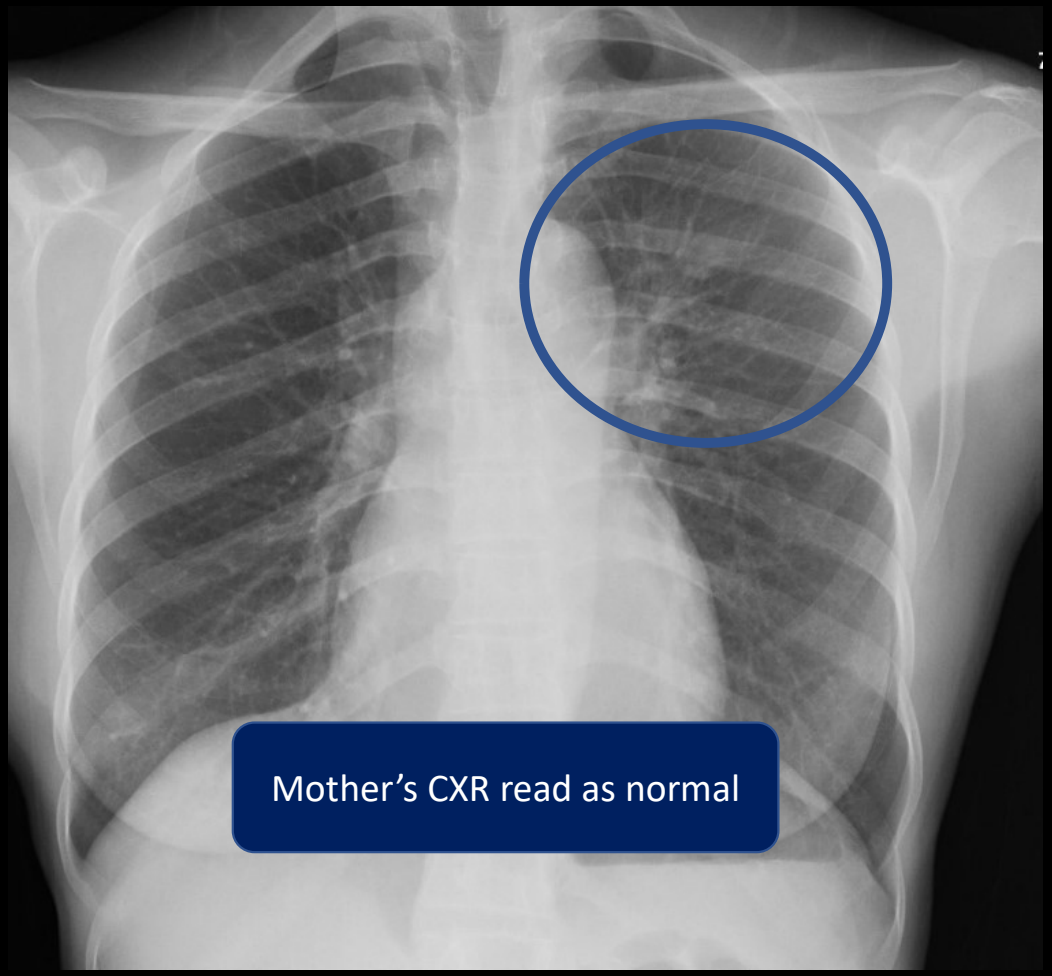


May 2019

37 year old African man
4 months of cough, weight loss, and poor energy

Chest xray is one piece of the TB puzzle





Sputum AFB smear and PCR +, culture + MTB

Chest Radiology in TB

- Interpretation of a chest radiograph is pattern recognition that requires clinical correlation for true diagnosis

Thank you

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