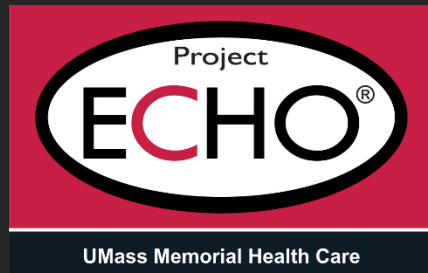


TB or Not TB Ruling Out TB Disease

John Bernardo

Session 9
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Objectives

- Consider abnormal chest xrays and next steps in TB disease evaluation
- Assess abnormal xrays in special populations
 - Children, persons with HIV
- Describe history and physical examination to rule out disease
- Consider when to refer a patient with an abnormal chest xray

Conflicts: None

Latent TB Infection

Defined: *A state of persistent bacterial viability, immune control, and no evidence of clinically manifested active tuberculosis.*

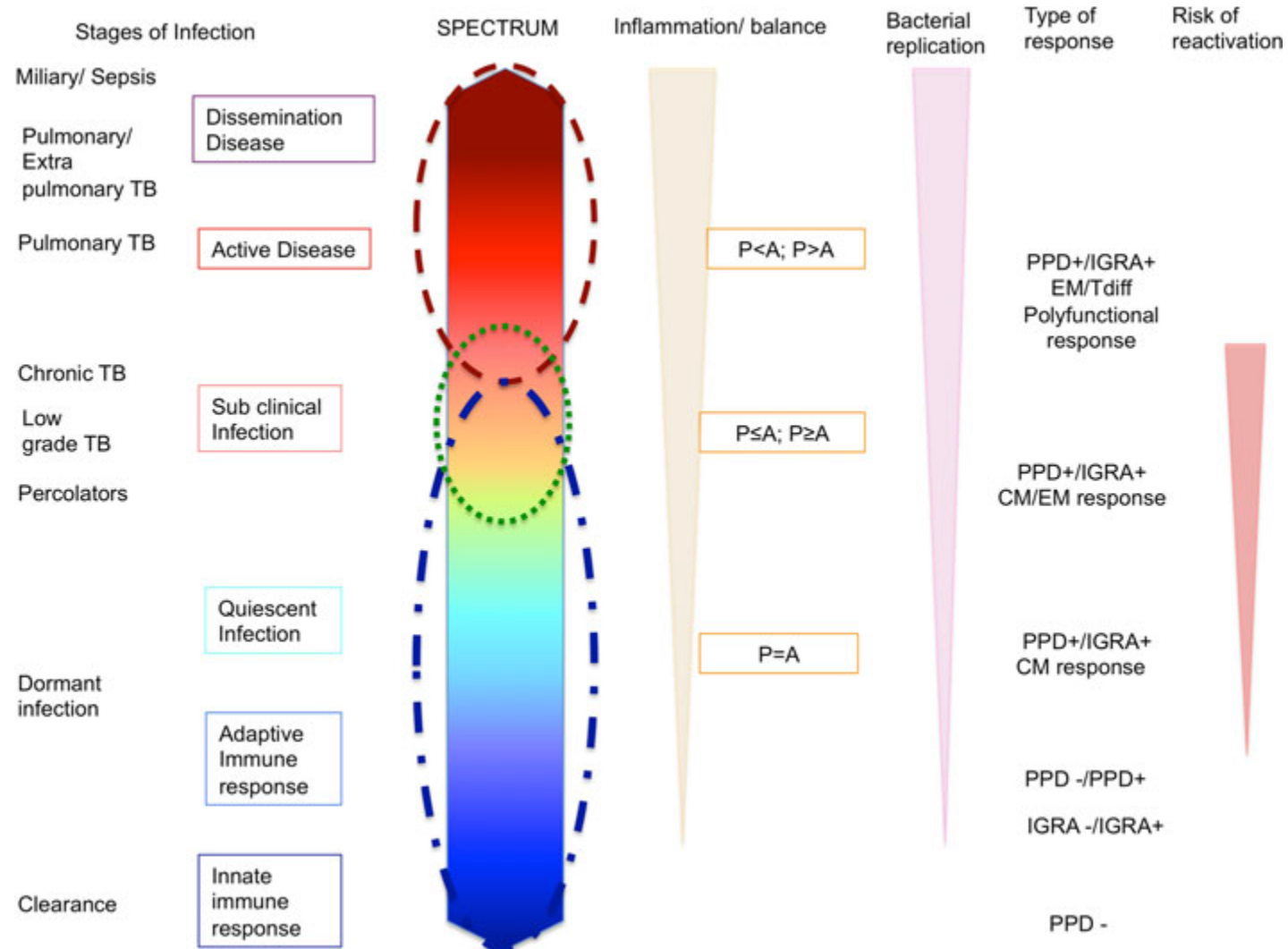
Latency of TB Infection

Classic interpretation: A binary process with either truly latent *M. tuberculosis* infection or active tuberculosis disease

- recently challenged as oversimplification

Getahun, et al NEJM 28:127, 2015

Outcome of TB Infection



LTBI is a Clinical Diagnosis

- Positive Test for TB infection
 - TST or IGRA
- Absence of symptoms
- “Negative” physical examination
- “Negative” chest radiograph

Most Tuberculosis in Massachusetts Results from Reactivation of Latent Infection



- *Little evidence to support significant local transmission*

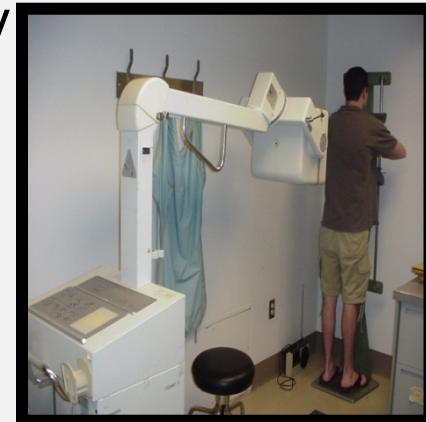
CDC Genotyping Network

Rule Out TB

- History (personal)
 - TB risks?
 - Epidemiology; medical risk factors
 - Symptoms
 - Specific to system involved
 - e.g., cough (pulmonary), chest pain (pericardial), neck swelling, ...
and/or
 - Nonspecific (*constitutional*)
 - e.g., fever, weight loss, night sweats, fatigue, ...
 - May be absent - *up to 25%*
- Physical examination
 - Findings specific to system involved; constitutional
- Chest radiograph
- Laboratory studies

Chest Radiograph

- Time: minutes to hours
- Sensitivity: excellent
 - But there are exceptions: e.g., immunosuppression/HIV)
 - Single view adequate in most settings (but children <11 - get 2 views)
- Specificity: poor
 - *Classic*: apical/poster upper lobe; superior segment lower lobe airspace disease
 - Up to 1/3 of pulmonary TB – *non-classic* radiograph
- Advantage: inexpensive screening of potentially *active* pulmonary cases
- Disadvantages: cost, radiation ?
 - Requires *skilled interpretation*



A 'conquered' disease returns

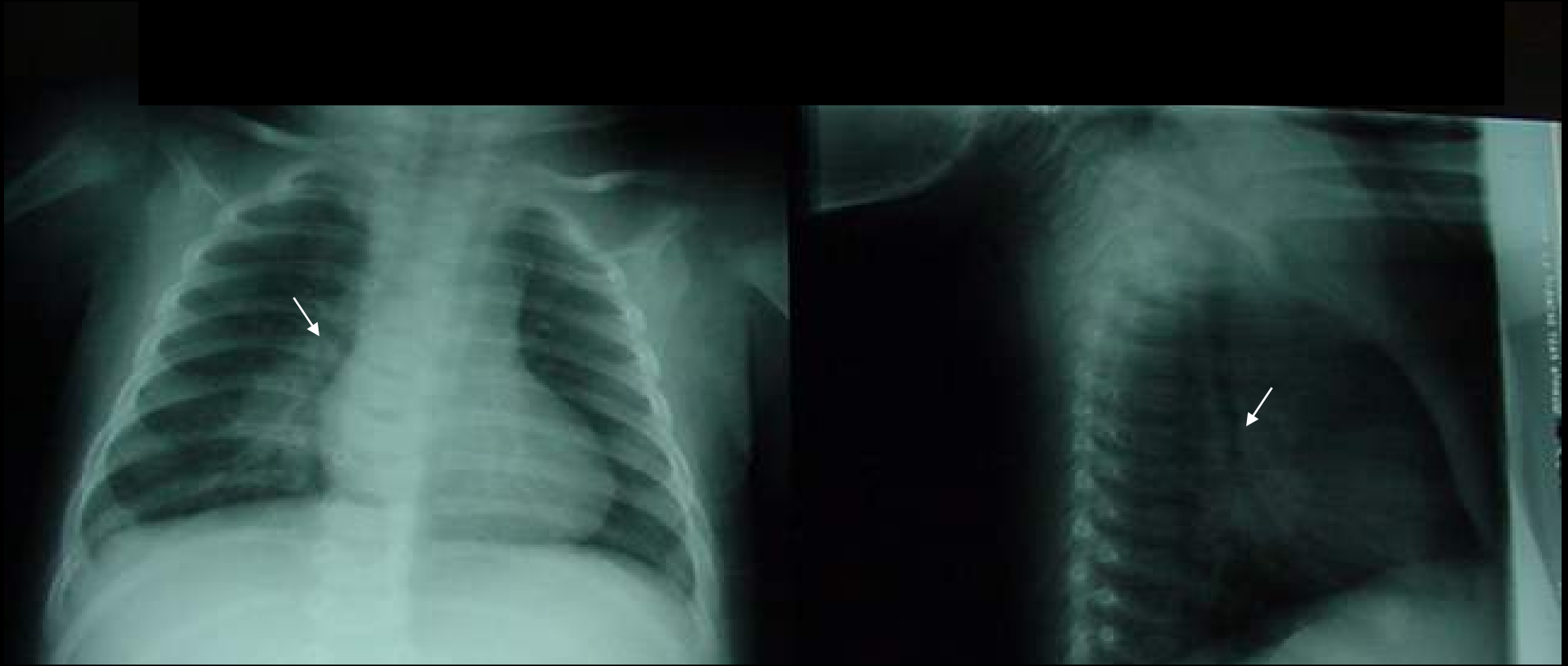
Dreaded in the 19th century, TB plagues new victims today



Normal Chest x-ray



Primary TB in a Child



Primary TB, 7 y/o



Classic “Adult-Type” TB



“Adult-Type” TB

Se:1
Im:1



C1704
W2258

TB Chest Radiography in Primary Care

- Many primary care providers do not read their own radiographs
 - Reliance placed on written reports
- Radiologist often is unaware of clinical situation
 - Example: Indication: “positive QuantiFeron”
- Terminology
 - Report may mis-state “TB Disease” as “TB Infection”
- Recommendation
 - Be specific with indication when placing order: e.g., cough, fever x 3 weeks, pos Tuberculin Skin Test. R/O TB
 - Communicate with radiologist

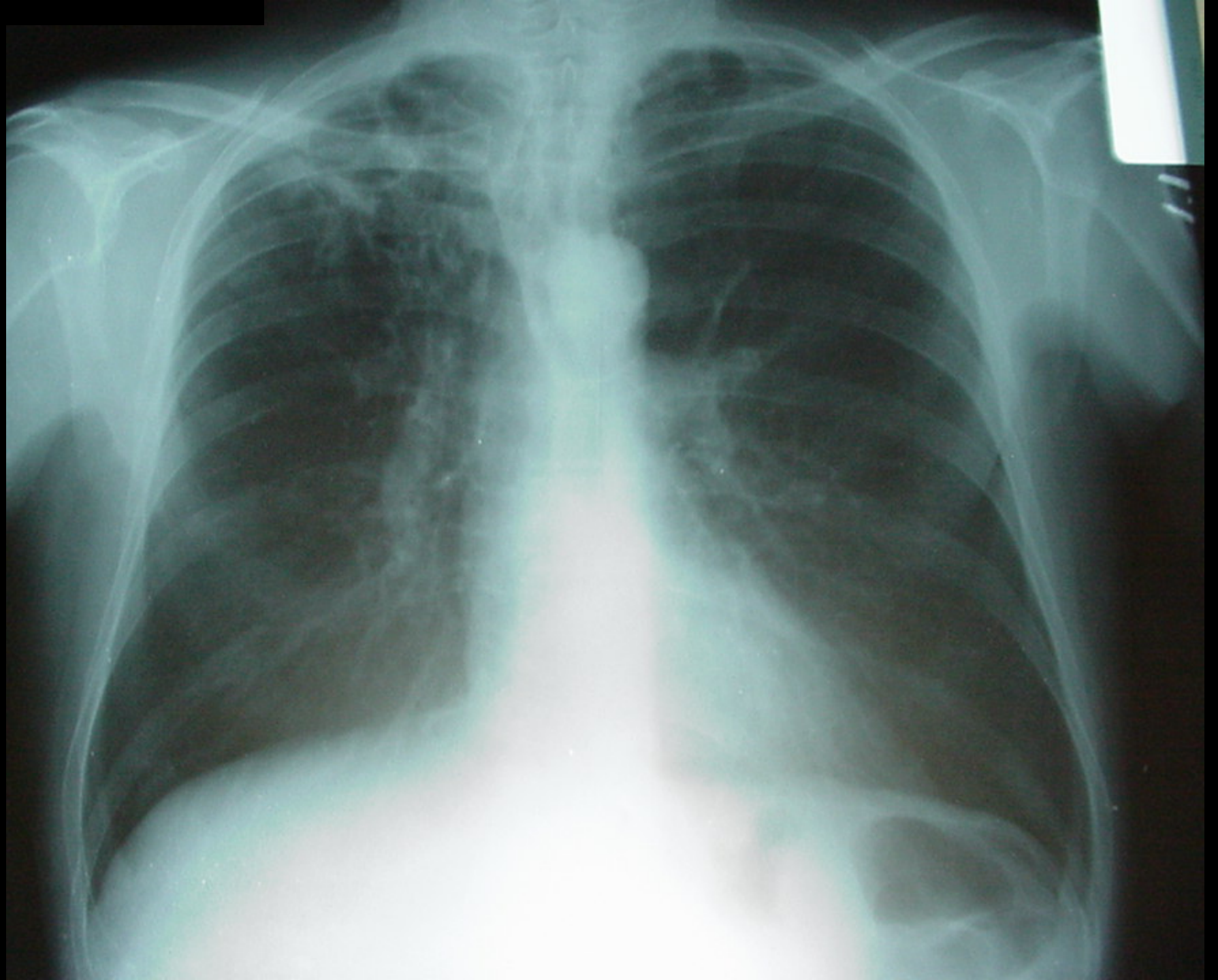
CXR - Some Special Situations

- Healthy adults
 - Single view (PA) adequate
- Children
 - 2 views (PA and Lateral) if < 11 y/o
- Immune Compromise (includes HIV)
 - Obtain 2 views (PA and Lateral)
 - Radiograph may be normal (esp with low CD4)
- CT scan?
 - Provides greater overall resolution
 - Ask: *Will this change my management?*
- A radiograph (or CT) cannot determine disease etiology or activity!

Communicate with Radiologist!

Scarring?

- 45 year old homeless man presented to clinic following POS TST
 - Hx: NIDDM, smokes 1ppd, mild EtOH use
 - Denied symptoms other than chronic am cough
 - Examination unremarkable
- CXR:
 - Indication: *Pos PPD*



Report: Right upper lobe
scarring, consistent with
prior TB Infection

Events:

- Back to Clinic: Obtained 3 sputum specimens
 - AFB smear and NAAT negative
 - Started Rifampin for treatment of LTBI/Class IV TB
- 4 weeks later
 - Sputum is growing *M* tuberculosis, INH resistant
- Called to Clinic for new sputum specimen
 - 6 weeks later: *M* tuberculosis; INH and Rif resistant (MDR)

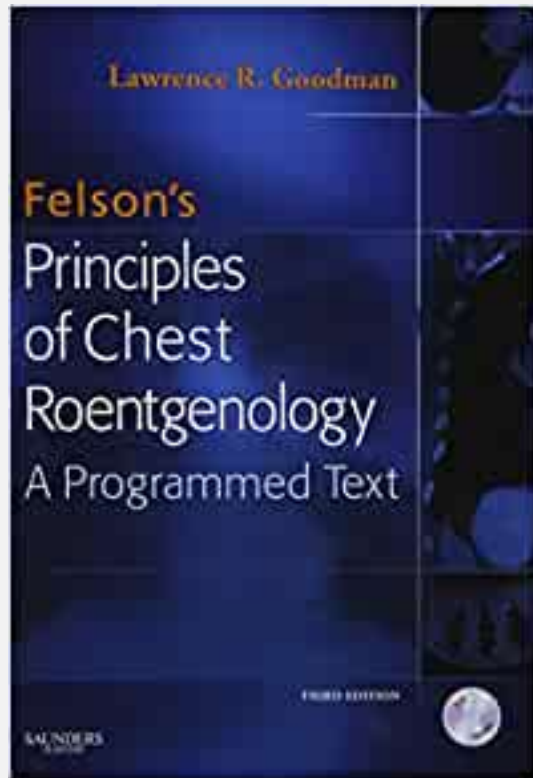
Abnormal CXR Expert Consultation?

- Yes – if complex medically
- Yes – if stability cannot be determined for a pleural or parenchymal lesion
- Yes – if findings merit further evaluation (e.g., nodule, mass)

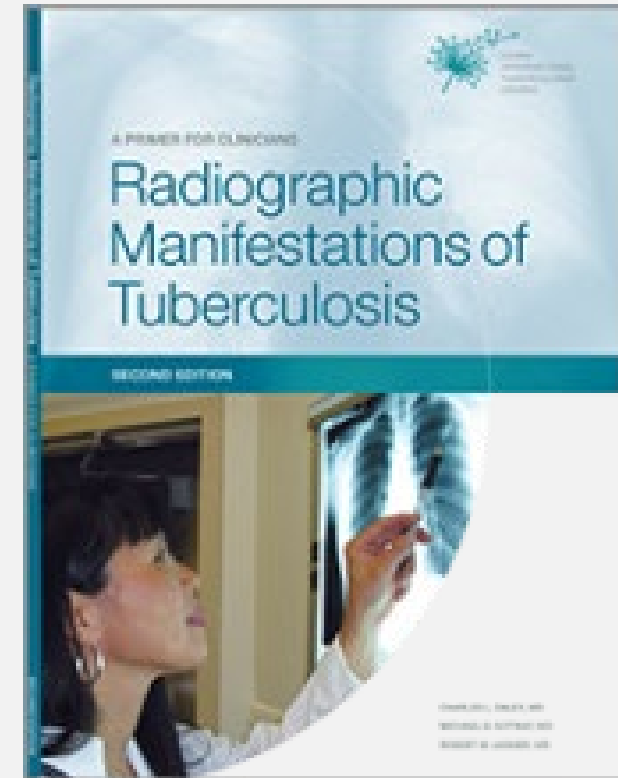
A few trigger terms: effusion (pleural, pericardial); lymphadenopathy; airspace disease/infiltrate/opacity; granuloma; nodule; mass; scar

For these and other uncertainties, discuss with Radiologist; consider referral to TB or Pulmonary specialist

Reading



Felson's Principles of Chest Roentgenology Text with CD-ROM
(Goodman, Felson's Principles of Chest Roentgenology)



[TB Radiology | Curry International Tuberculosis Center \(ucsf.edu\)](http://ucsf.edu)