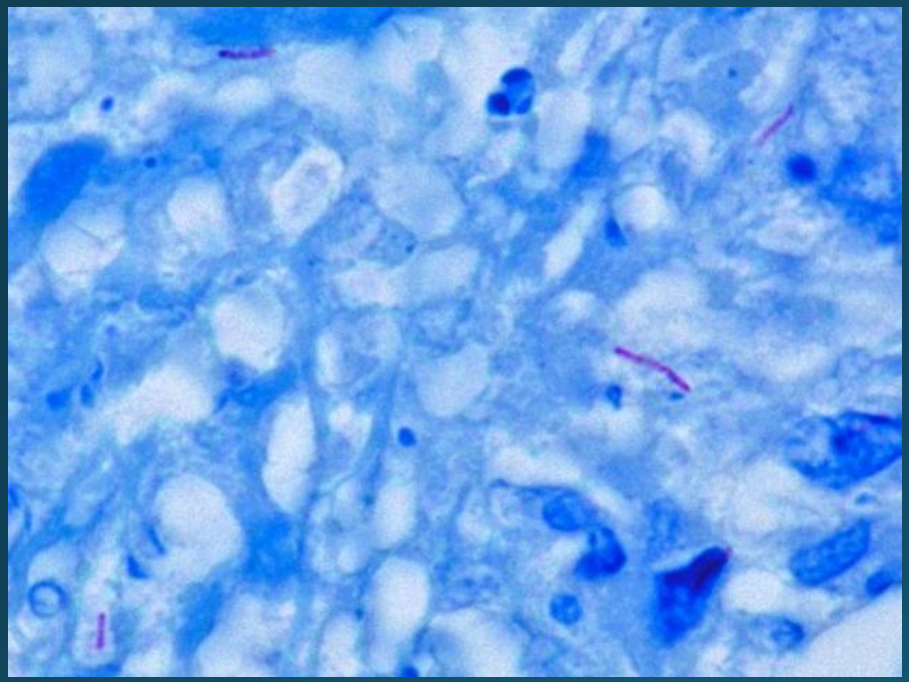
TUBERCULOSIS

2020



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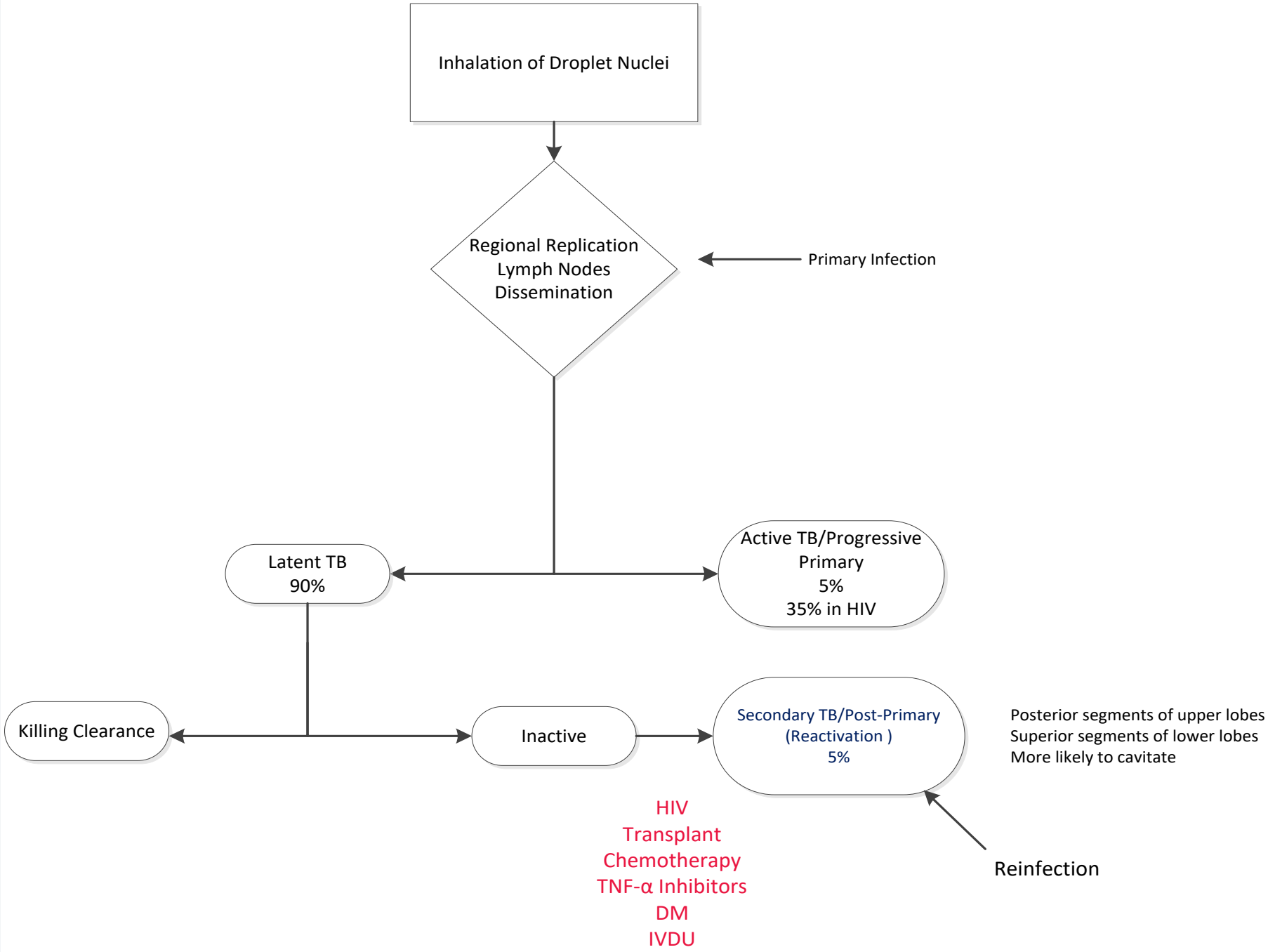
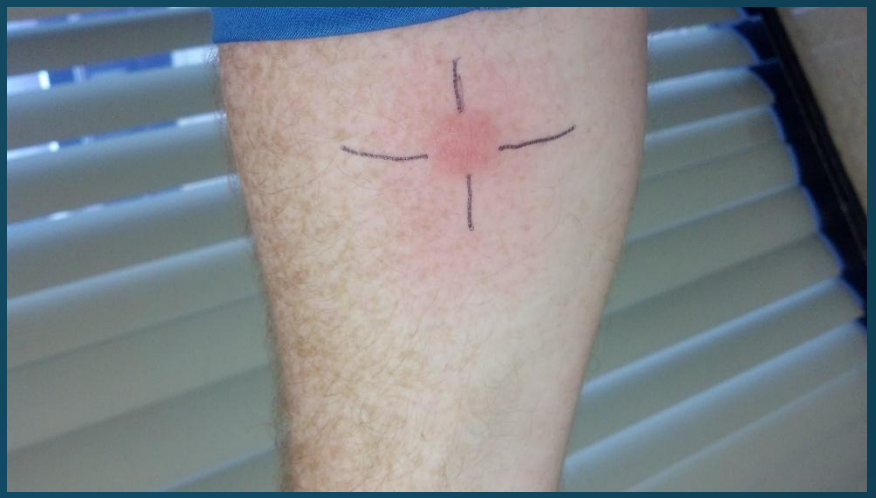
Global Picture

- 2018Statistics (WHO TB Report)
  - 10 million incident cases
  - 1.3 million deaths
    - #1 Infectious cause of death
  - 8 countries account for 66% of new cases
    - India , Indonesia, China, Philippines, Pakistan, Nigeria, South Africa, Bangladesh
    - 44% from South-East Asia
  - 500,000 new cases of MDRTB
    - China, India, Russian Federation account for 50%
    - Only 1 in 3 treated
    - 56% Cure Rate
- Maricopa County
  - Incidence is slightly lower than the national average
  - Most newly diagnosed cases are in foreign born persons
- HIV and DM2 important drivers of disease


Inhalation of Droplet Nuclei
Regional Replication
Lymph Nodes
Dissemination
Primary Infection
Latent TB
90%
Active TB/Progressive Primary
5%
35% in HIV
Killing Clearance
Inactive
Secondary TB/Post-Primary
(Reactivation)
5%
Posterior segments of upper lobes
Superior segments of lower lobes
More likely to cavitate
HIV
Transplant
Chemotherapy
TNF-α Inhibitors
DM
IVDU
Reinfection

TST INTERPRETATION



- Read at 47-72hours
- Measured in mm induration
- ≥ 5 mm
  - HIV +
  - Transplant
  - TNF- α antagonists
  - Prednisone ≥ 15 mg/day ≥ 1 month
- ≥ 10 mm
  - Recent immigration (5yrs) from high prevalence countries
  - Clinical conditions (Silicosis, CRI, DM)
  - IVDU
  - Mycobacterial Laboratory Personnel
- ≥ 15 mm
  - Anyone
- http://www.tstin3d.com/en/calc.html

Primary Diagnostic Tools

- Immunologic
  - TST
  - IGRA (Quantiferon/T-Spot)
- Radiographic
  - Chest X-Ray
  - CT scan
- PCR
  - Xpert MTB/Rif
  - NAAT
- Microscopy
  - AFB staining
- Culture

Treatment of Latent Tuberculosis

- Preferred Regimens
  - Three months weekly Rifapentine + Isoniazid
    - Directly observed therapy preferred
  - Four months daily Rifampin
    - Drug interactions
    - HIV negative
  - Three months daily Isoniazid + Rifampin
- Alternative Regimens
  - 6 months INH
    - Preferred over 9 months
  - 9 months INH

MMWR February 14, 2020

TREATMENT FOR ACTIVE TB

- RIPE
  - Rifampin
  - Isoniazid (INH)
    - B6
  - Pyrazinamide (PZA)
  - Ethambutol (EMB)

- Induction Phase
  - 8 weeks (40 doses)

- Continuation Phase
  - Typically INH + B6 + Rifampin
  - Duration 6,9, 12 months

SECOND LINE AGENTS

Used in cases of resistance and intolerance

- GROUP A
  - LEVOFLOXACIN /MOXIFLOXACIN
  - LINEZOLID
  - BEDAQUILINE
- GROUP B
  - CLOFAZIMINE
  - CYCLOSERINE
  - TERYZIDONE
- GROUP C
  - Ethambutol
  - Delamanid
  - Pyrazinamide
  - Imipenem / Meropenem
  - Amikacin
  - Ethionamide
  - Para-aminosalicylic acid (PAS)

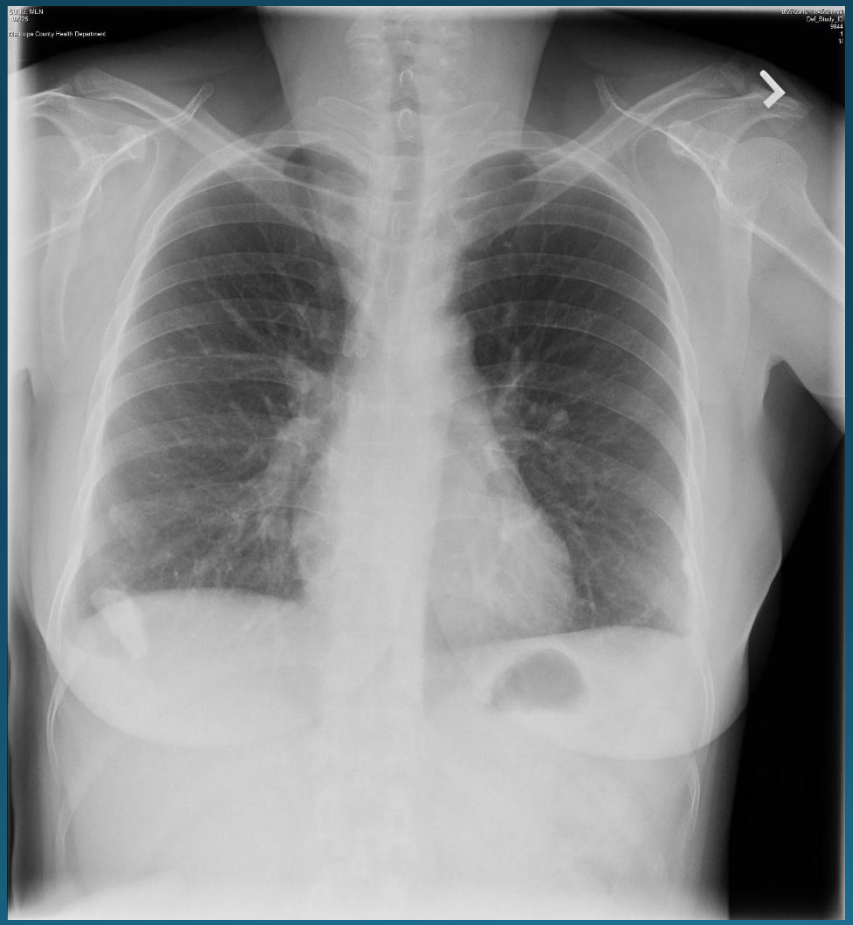
Infection Control Considerations

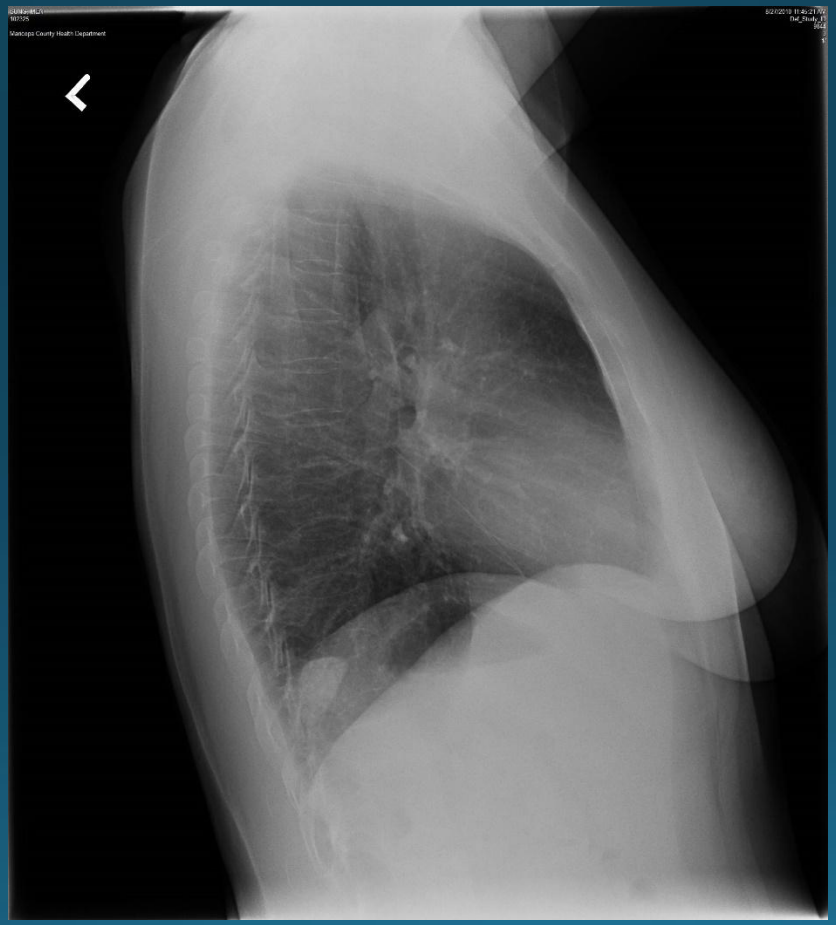
- Respiratory isolation for suspected cases
  - If in doubt isolate
- Personnel respiratory protection
  - N95
  - PAPR (Purified Air Purifying Respirator)
- Surgical mask on patient
- Clearing Patient
  - 3 AFB negative smears
    - 8 hours apart
    - BAL specimen counts for one
  - Alternative diagnosis

CASE #1

- 43 yo female is referred to your TB clinic after a recent pre-employment evaluation . She was found to have a positive interferon gamma release assay. The patient is originally from Thailand and has been in Arizona for 5 years. The patient denies weight loss, fever, night sweats. Pt has dry nonproductive cough x 4 weeks.

- What is the best next step?
  A. Masking the patient
  B. Initiate treatment for latent infection
  C. Obtain cocci serologies
  D. No further workup for TB is needed
  E. Obtain a chest xray




Maricopa County Health Department

Case #1 continued…

- Based on your interpretation of the radiographs which of the following would be the most appropriate next step?

A. Mask the patient
B. Initiate treatment for latent infection
C. Obtain cocci serologies
D. Initiate treatment for active infection
E. Collect sputum samples for AFB

Case #1 continued….

- You have decided that the patient should be treated for latent TB infection. What regimen is preferred for this patient?

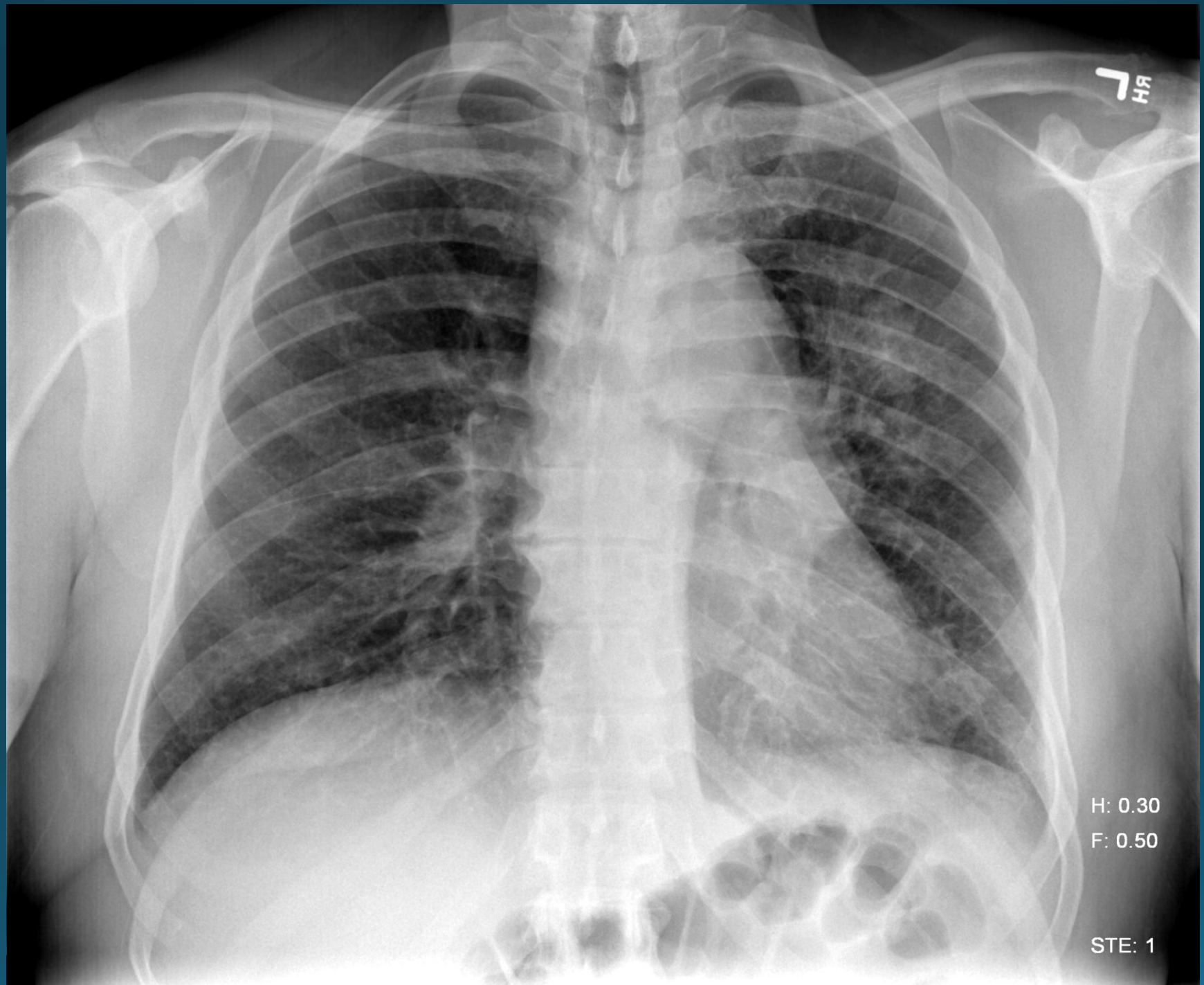
A. Once weekly INH + Rifampin x 12 weeks
B. Moxifloxacin x 6 months
C. Isoniazid + Rifapentine once weekly x 12 weeks
D. INH daily x 6 months
E. INH daily x 9 months

Case #2

- Mr. Posadasi is a 61 yo AA gentleman who is being admitted from the ED after presenting with a 3 week h/o shortness of breath, chest pressure, fevers, chills, night sweats and weight loss. He reports one loose stool today. He seen at an outside facility where he was given treatment for CAP as well as dexamethasone. His CTA at that time was thought to be consistent with an "atypical" pneumonia.
  - VS HR 77 RR 17 BP 165/76 SaO2 97% RA

Case #2

- As the admitting resident what are your next steps?
  - Pt placement
  - History
  - Testing
    - Labs
    - Imaging
  - Treatment
    - Antimicrobial coverage
    - Timing (STAT?, Today?…)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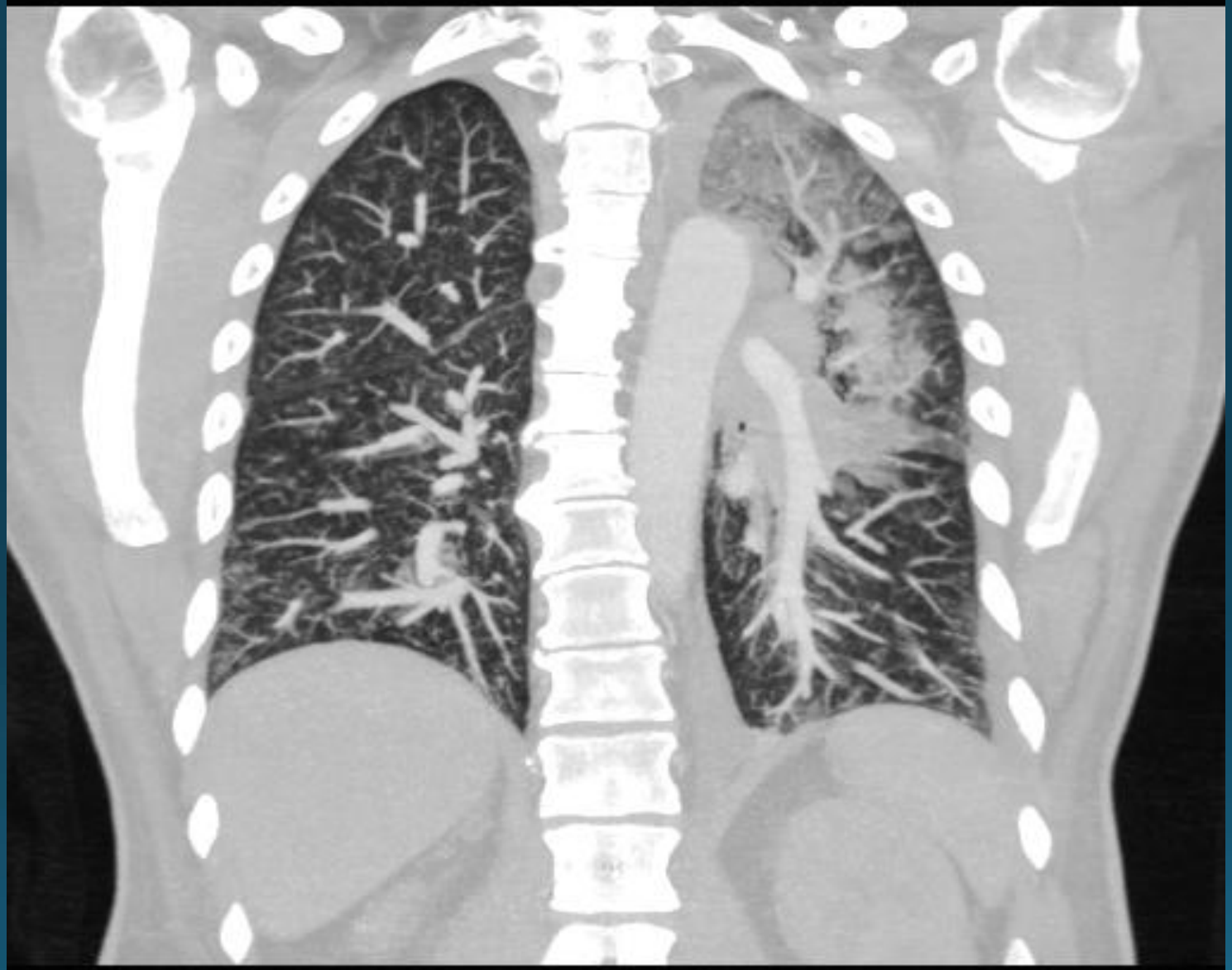


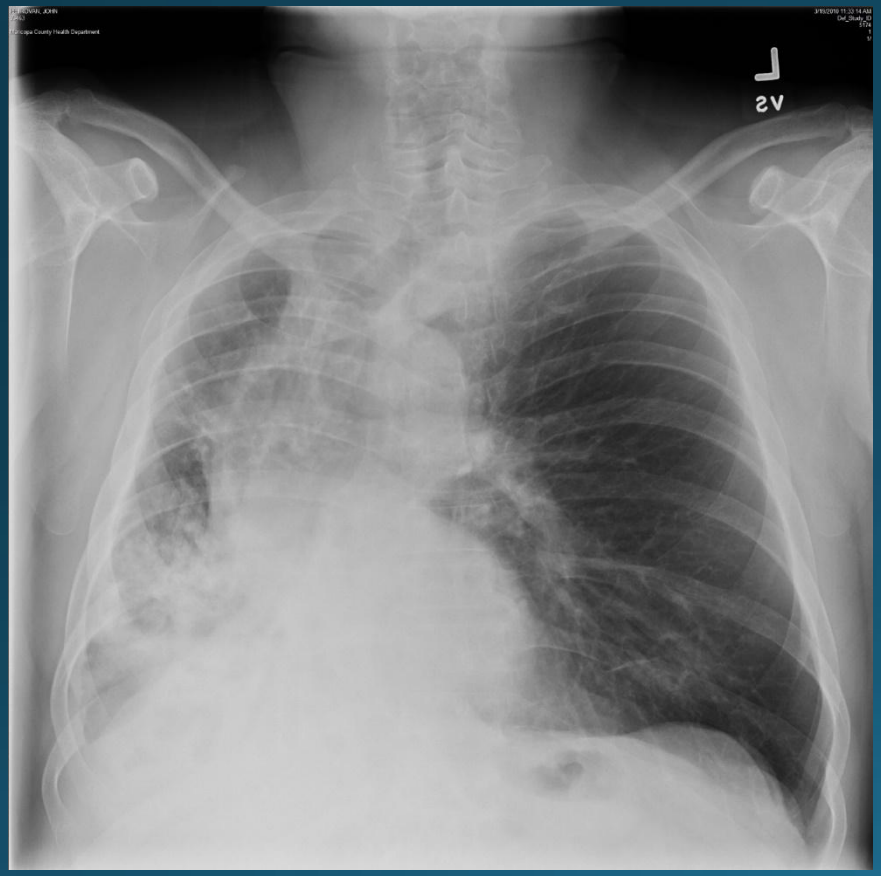
Case #3

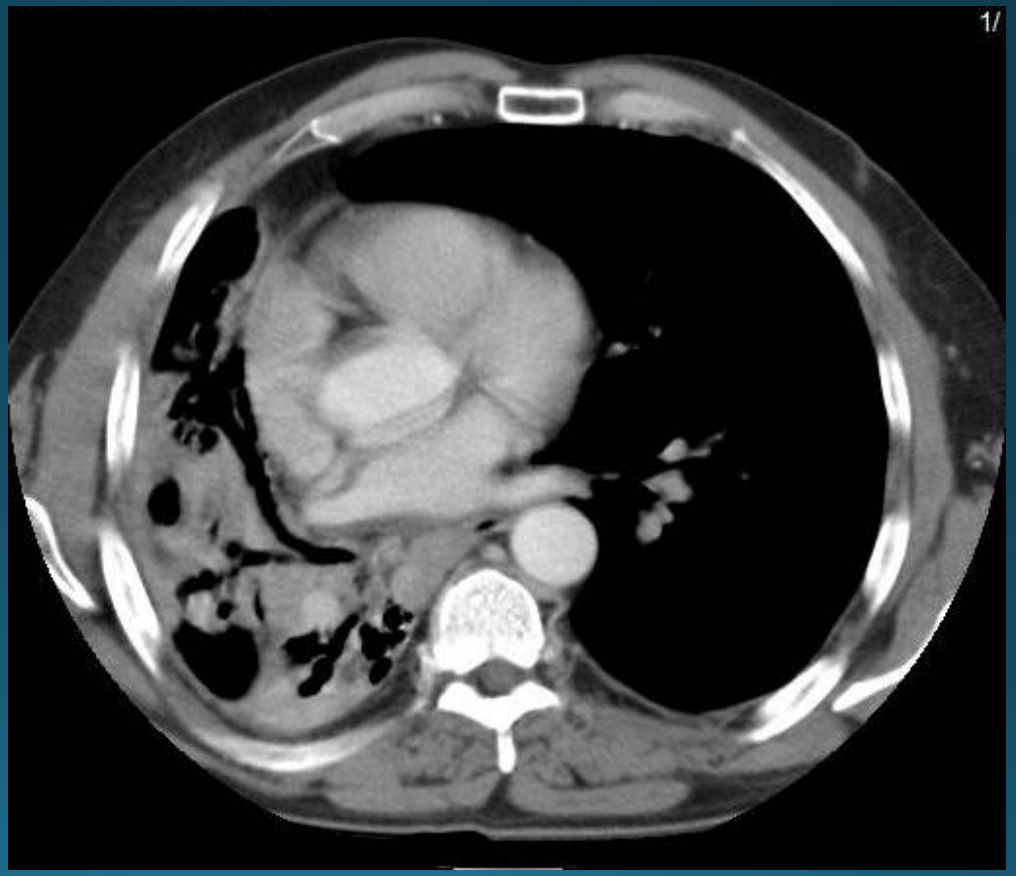
- 60 yo male was referred for admission as a suspect case of active TB disease. He is HIV negative. The referring facility reports that he has a positive TST of 18 mm. A Quantiferon® was also done and found to be positive. Pt reports 20 lbs weight loss in the last 8 weeks, productive cough and night sweats.

- Of the following which are appropriate tests to request?
  A. Cocci serologies
  B. Hemoglobin A1C
  C. Procalcitonin
  D. CMP
  E. Sputum sample for AFB

Case 3 continued..

- Upon the patient's arrival you were able to review available imaging studies. This is what you see…





Case #3 continued…

- From an infection prevention point of view, which are an appropriate intervention when the patient arrives?

A. Patient should be placed in contact isolation
B. Place a N95 respirator on the patient
C. Place patient in a reverse air flow room (negative air pressure)
D. Staff caring for patient to wear a PAPR/N95

Case #2 continued…

- The clinical micro staff report that the sputum collected are all positive for AFB (4+). A Genexpert was performed and the results indicate the presence of Mtb complex and Rifampicin susceptibility.

- What is the significance of the Genexpert results?

- When is TB therapy indicated?
  A. Now
  B. Wait for full susceptibilities
  C. Wait to see if it grows in culture. PCR detection does not indicate viable organisms

Case #2 continued….

- What is the most appropriate regimen to initiate for treatment?

A. Isoniazid + Rifampin
B. Isoniazid + Rifampin + Pyrazinamide + Ethambutol + B6
C. Isoniazid + Rifampin + Moxifloxacin
D. Moxifloxacin + Linezolid + Bedaquiline + Cycloserine

Case 2 continued….

- Based on available information what is the most reasonable duration for treatment?

A. 6 months
B. 9 months
C. 12 months
D. 18 months

THANKS!