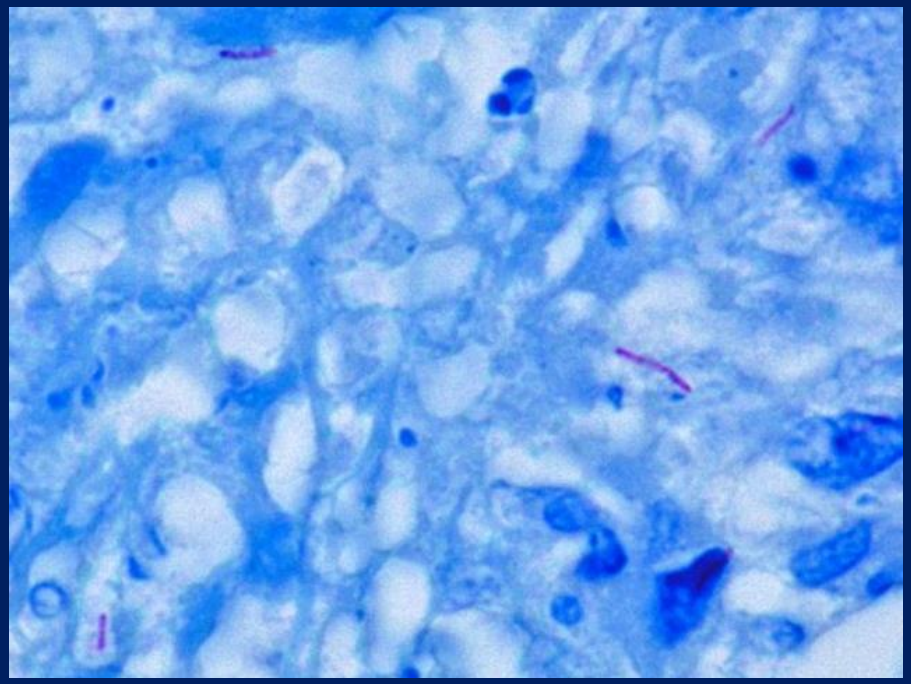
TUBERCULOSIS

2019



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Global Picture

- 2017 Statistics (WHO TB Report)
  - 10.4 million incident cases
  - 1.3 million deaths
    - Remains a top 10 killer
  - 5 countries account for 56% of new cases
    - India , Indonesia, China, Phillipines, Pakistan
  - 490,000 new cases of MDRTB
    - China, India, Russian Federation account for 47%
- Maricopa County
  - Incidence is slightly lower than the national average
  - Increase in number of MDRTB cases

TB INFECTION

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 an chest xray

Case #1 continued…

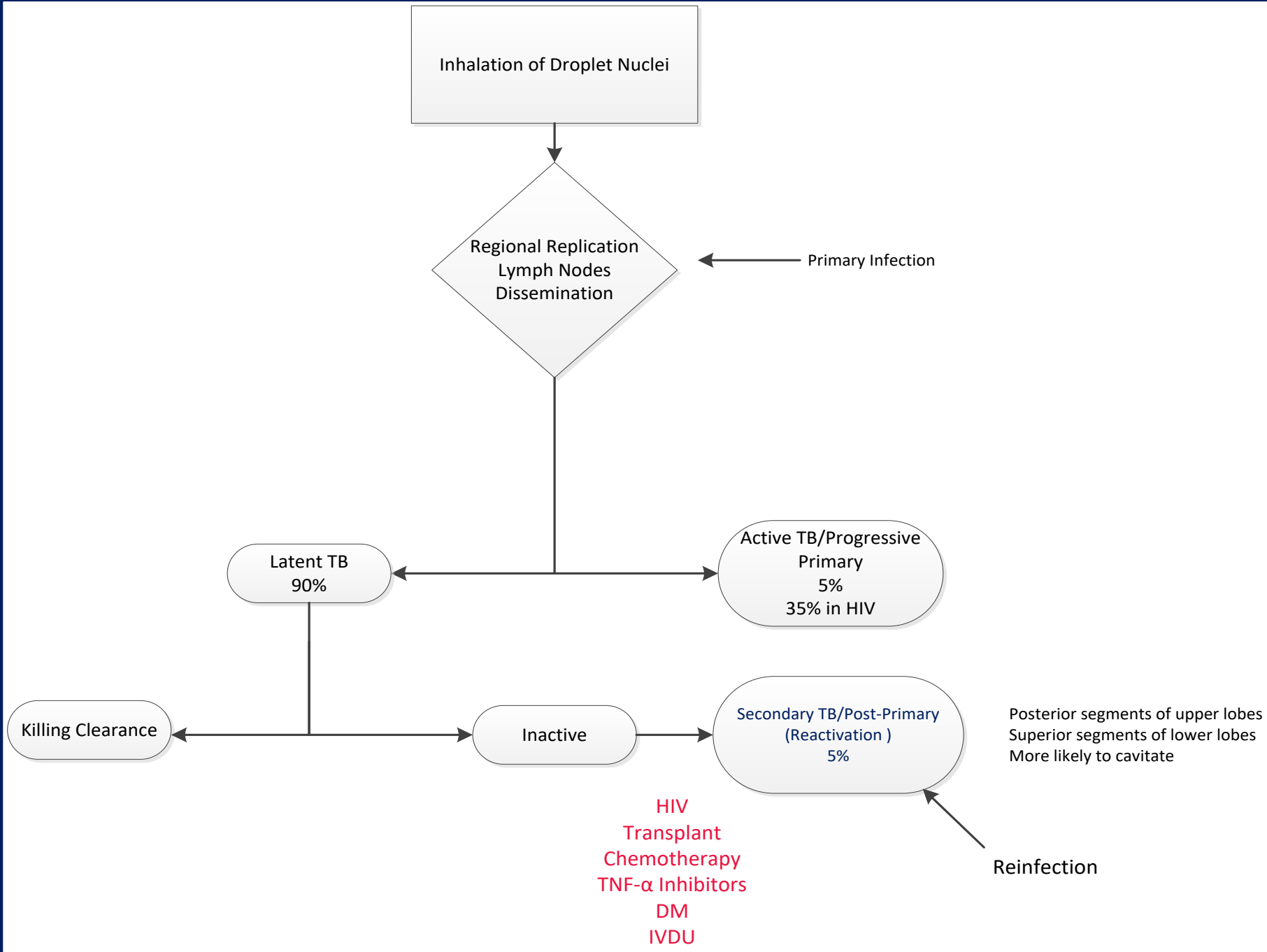
- Based on your interpretation of the radiographs which of the following would be the most appropriate next step?

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. Of the following options which would be appropriate treatment options?

A. Isoniazid + Rifampin x 8 weeks
B. Moxifloxacin x 6 months
C. Isoniazid + Rifapentine once weekly x 12 weeks
D. Rifampin daily x 4 months
E. Isoniazid daily x 9 months


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

ACTIVE TB INFECTION

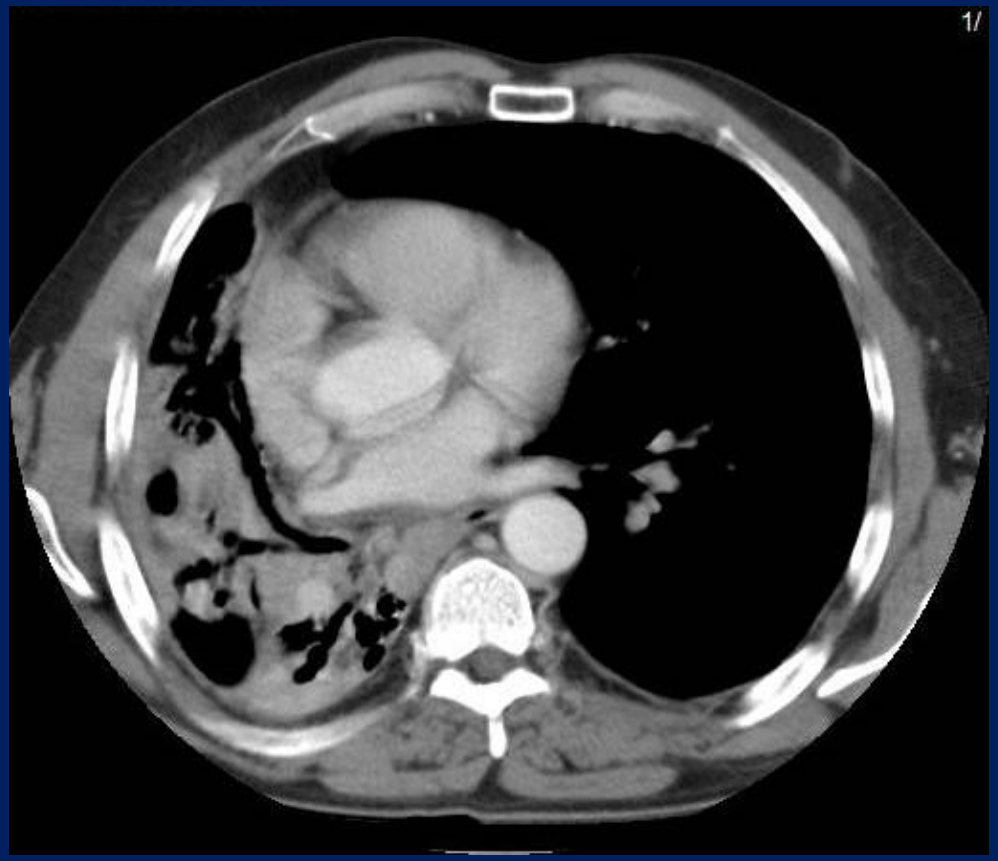
Case #2

- 60 yo male was referred to TB clinic as a suspect case of active disease. He is HIV negative (why is this important?). The referring facility reports that he has a positive TST of 18 mm. A Quantiferon® was done and found to be positive(Why was the Quantiferon® done in light of a positive TST?). Pt reports 20 lbs weight loss in the last 8 weeks, productive cough, increasingly blood tinged sputum and night sweats.

- Which of the following would be appropriate tests to request? (multiple choices may be correct)
  A. Cocci serologies
  B. Hemoglobin A1C
  C. Procalcitonin
  D. CMP
  E. Sputum sample for AFB

Case 2 continued..

- Prior to scheduling the patient you were able to review available imaging studies. This is what you see…



Case 2 continued…

- From an infection prevention viewpoint which of these choices is the most appropriate intervention when the patient arrives? (multiple choices may be correct..)

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

Case #2 continued…

- The clinic 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 susceptible.

- 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

Diagnostic Tools

- Immunologic
  - TST
  - IGRA (Quantiferon/T-Spot)
- Radiographic
  - Chest X-Ray
  - CT scan
- PCR
  - Xpert MTB/Rif
  - NAAT
- HPLC
- Microscopy
  - AFB staining
- Culture
- Urinary LAM
  - Lipoarabinomannan Antigen
    - A lipopolysaccharide present in mycobacterial cell walls
  - Present in urine in cases of active disease

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

- GROUP A
  - LEVOFLOXACIN (Lfx)/MOXIFLOXACIN (Mfx)
  - LINEZOLID (Lzd)
  - BEDAQUILINE (Bdq)
- GROUP B
  - CLOFAZIMINE (Cfz)
  - CYCLOSERINE (Cs)
  - TERYZIDONE (Trd)
- GROUP C
  - Ethambutol (E/EMB)
  - Delamanid (Dlm)
  - Pyrazinamide (PZA/Z)
  - Imipenem (Ipm-Cln)/ Meropenem (Mpm)
  - Amikacin (Am)
  - Ethionamide (Eto)
  - 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

THANKS!