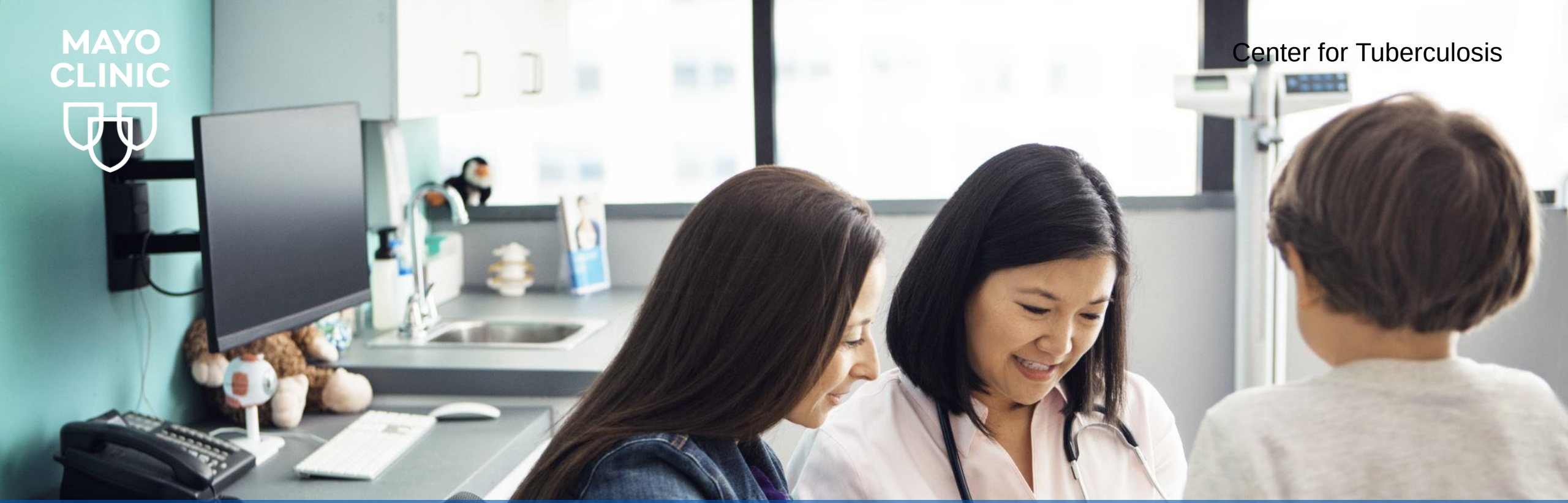


Center for Tuberculosis

Evaluation of Patients at Risk for Tuberculosis

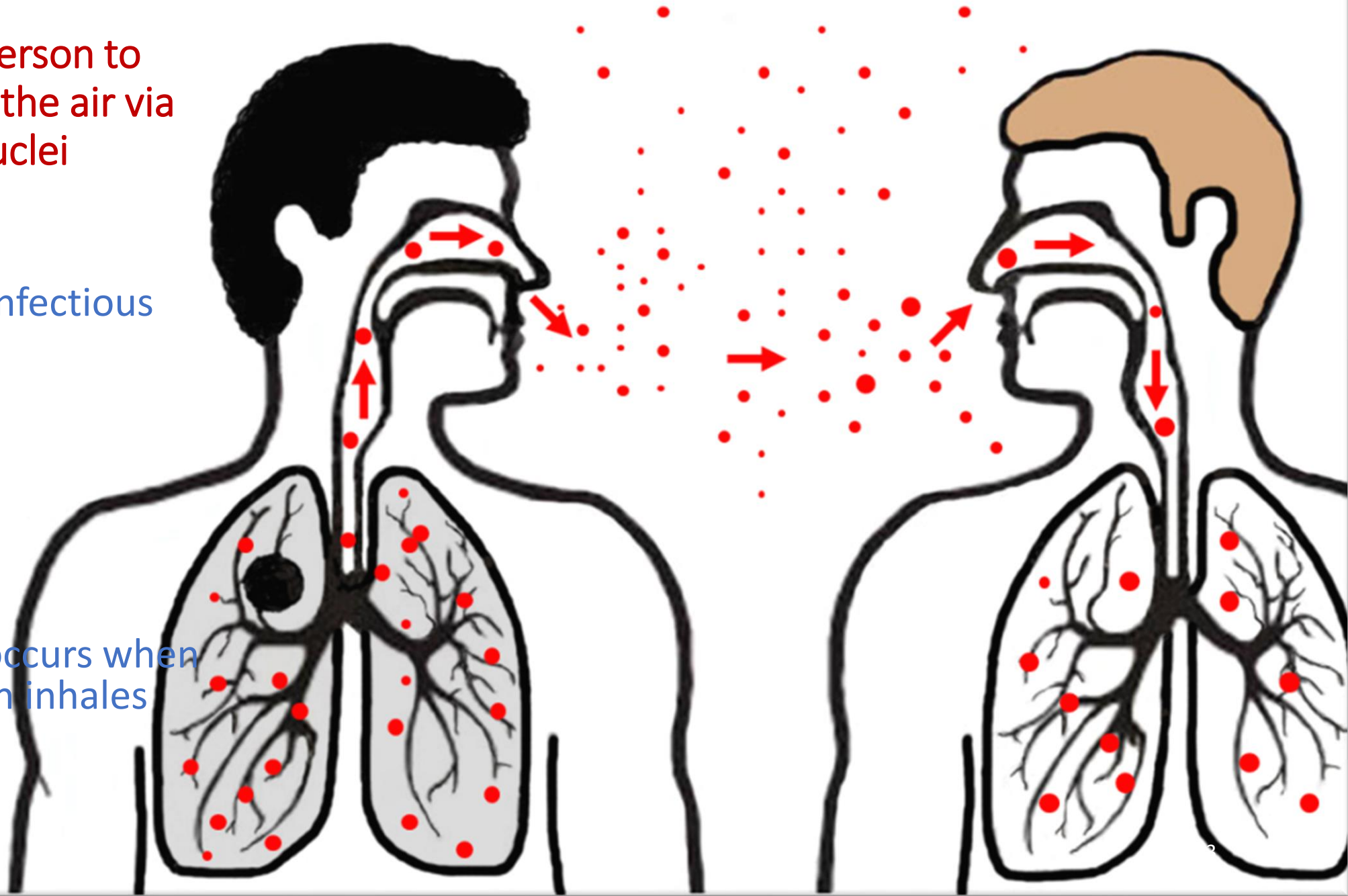
Zelalem Temesgen, MD FIDSA
Professor of Medicine
Principal Investigator, Mayo Clinic Center for Tuberculosis
Editor-in-Chief, Journal of Clinical Tuberculosis and Other Mycobacterial Diseases
Editor-in-Chief, IDCases

Learning Objectives

- Identify individuals who are at risk for tuberculosis.
- Conduct appropriate evaluation of patients at risk for tuberculosis.
- Conduct appropriate investigations in people at risk for tuberculosis.

TB is spread person to person through the air via droplet nuclei

- Exposure: An infectious person
  - Coughs
  - Sneezes
  - Speaks
  - Sings
- Transmission occurs when another person inhales droplet nuclei



Factors affecting transmission

Susceptibility of exposed person

Infectiousness of patient

- Cavitation
- Smear positive
- Laryngeal

Environment

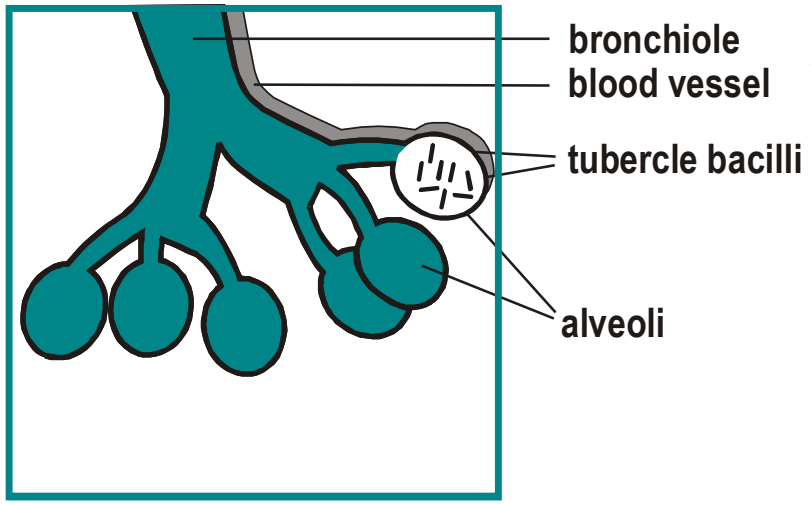
- Small enclosed spaces
- Poor ventilation

Proximity, frequency and duration of exposure

1

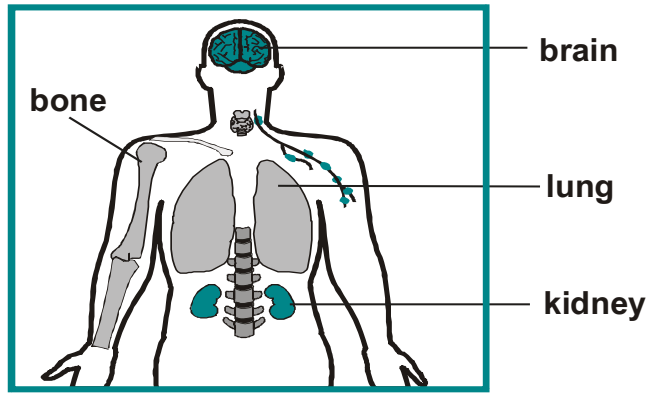
Droplet nuclei containing tubercle bacilli are inhaled, enter the lungs, and travel to the small alveoli

2



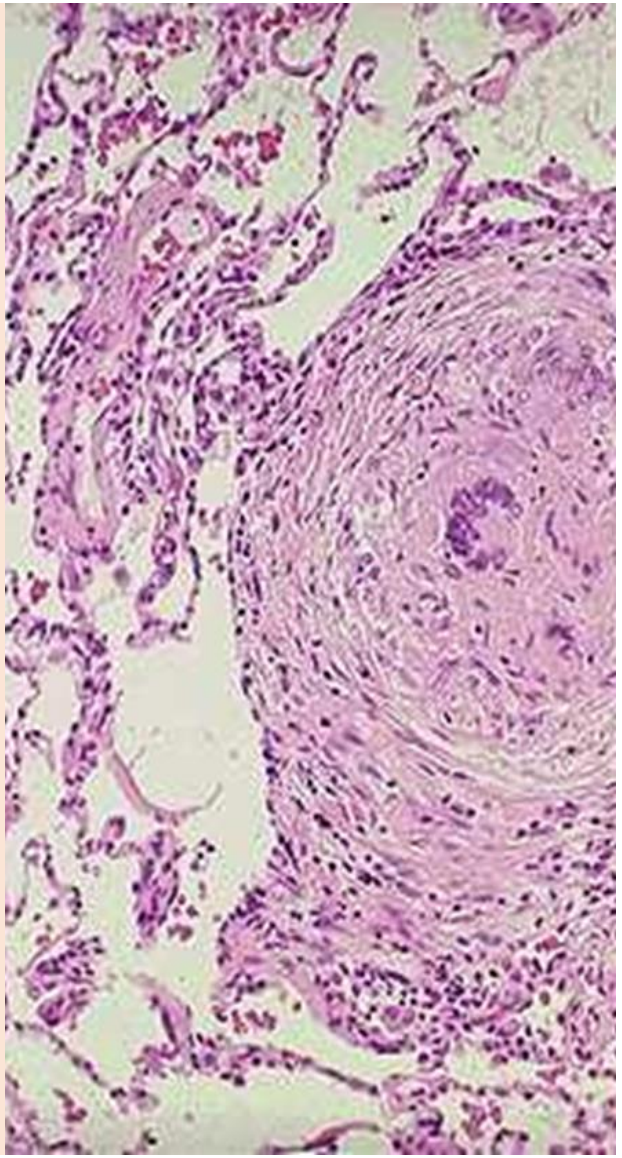
Tubercle bacilli multiply in alveoli

3

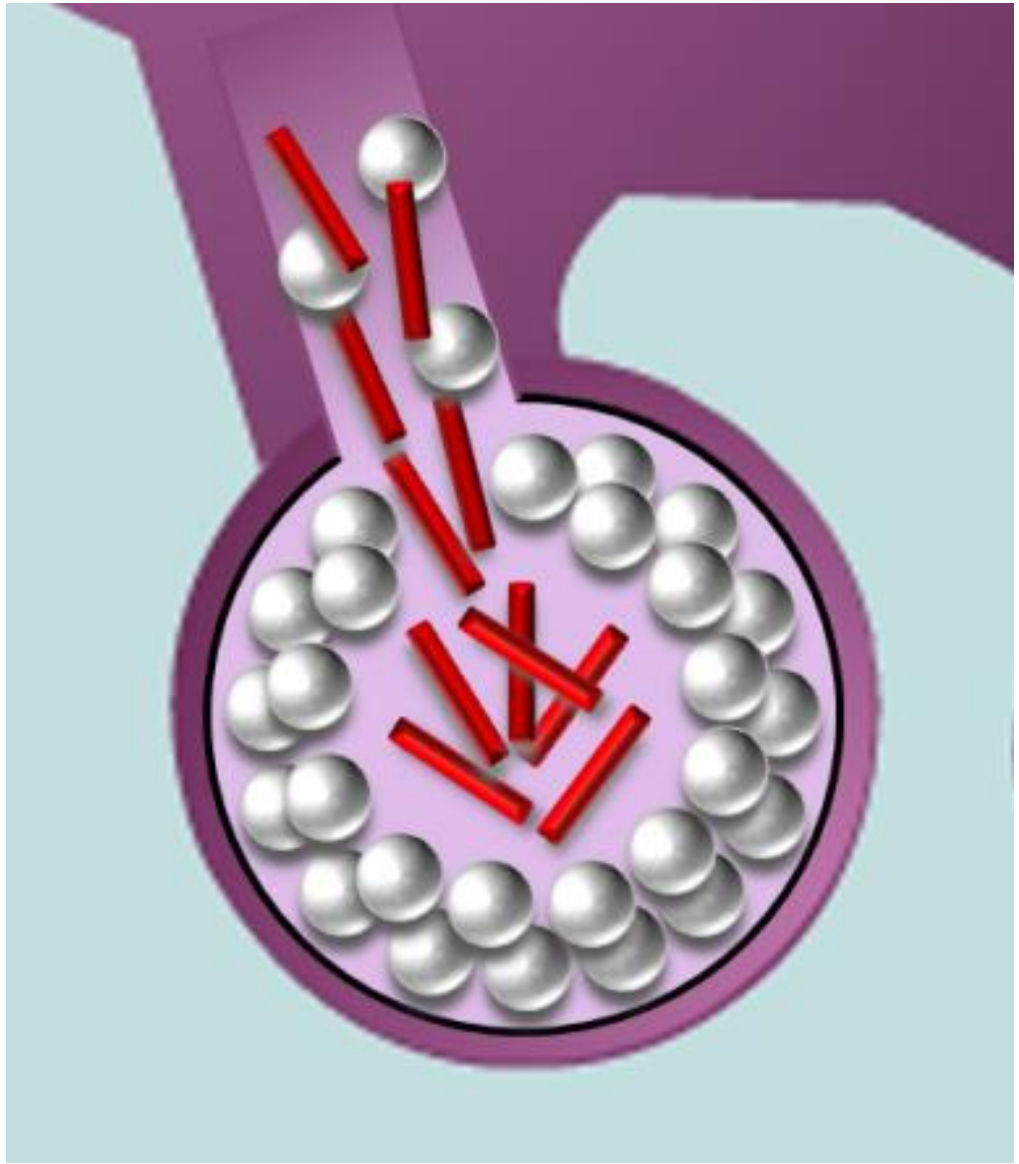


A small number of tubercle bacilli enter bloodstream and spread throughout body

- Within 2 to 8 weeks, special immune cells called macrophages ingest and surround the tubercle bacilli. The cells form a barrier shell, called a granuloma, that keeps the bacilli contained and under control.

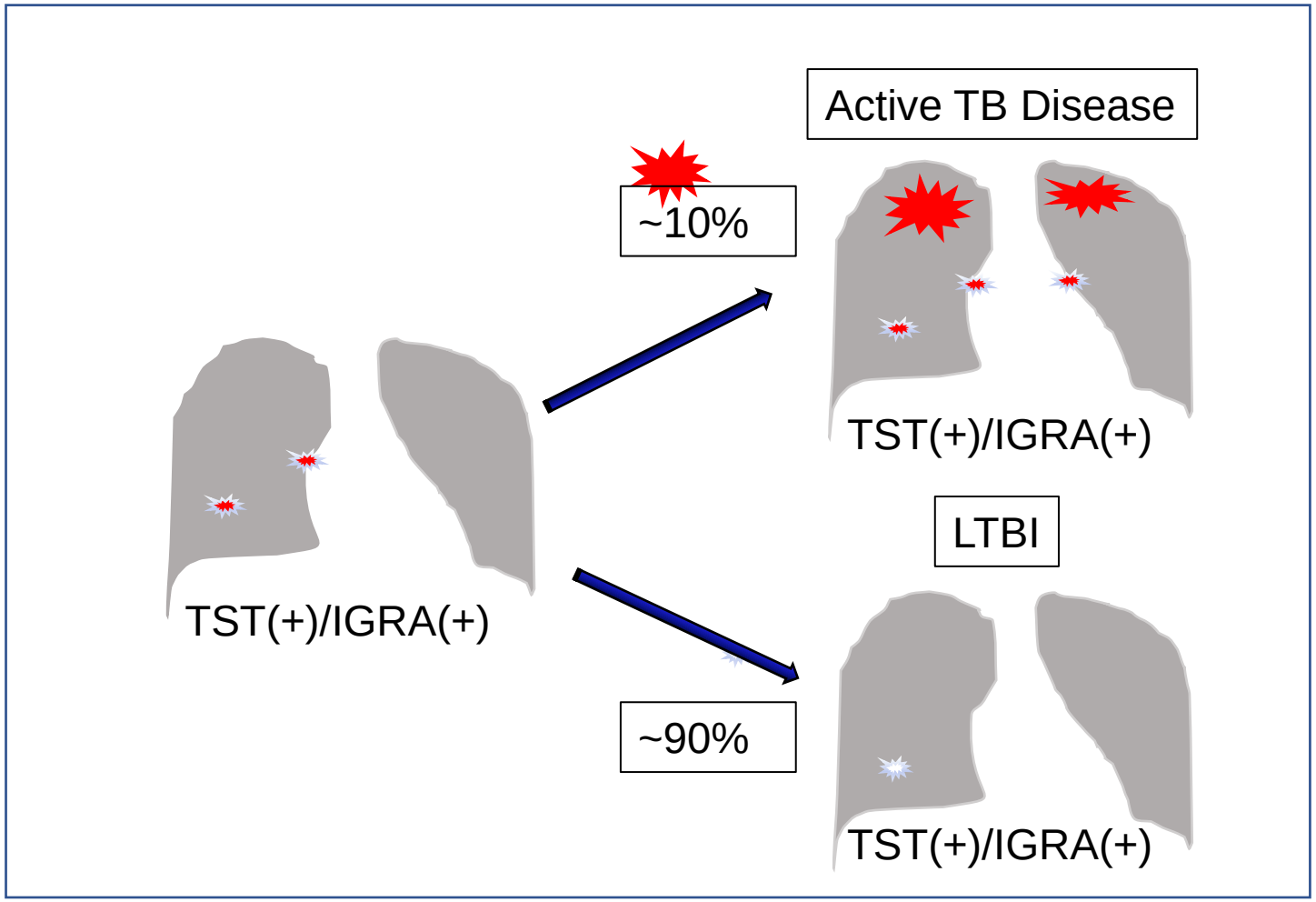


- Over time, the immune system, for various reasons, may lose the ability to keep the tubercle bacilli under control.
- Thus, the bacilli begin to multiply rapidly = Reactivation
- Reactivation can occur in different areas in the body, such as the lungs, kidneys, brain, or bone.



Natural History of Untreated TB

Approxiamtely 50% of people clear the TB infection before T cell priming and never develop a positive TST or IGRA



When should we suspect TB?

Person

Symptoms

Tests

Persons at Risk for Developing TB Disease

Those who have an increased likelihood of exposure to persons with TB disease

Those with clinical conditions that increase their risk of progressing from LTBI to TB disease

Increased Likelihood of Exposure to Persons with TB Disease

Close contacts to person with infectious TB

Residents and employees of high-risk congregate settings facilities)

Individuals from TB-endemic regions of the world

Increased Risk for Progression to TB Disease

HIV-infected and other immune-compromised persons

Those with a history of prior, untreated TB or fibrotic lesions on chest radiograph

Children ≤ 5 years with a positive skin test for latent tuberculosis

Underweight or malnourished persons

Substance use (such as smoking, alcohol abusers, or injection drug use)

Those receiving biologics

Those with certain medical conditions

- Silicosis
- Chronic renal failure/hemodialysis
- Carcinoma of head or neck
- Gastrectomy or jejunoileal bypass

When should we suspect TB?

Person

Symptoms

Tests

Symptoms of Tuberculosis

Non-specific constitutional symptoms

- Loss of appetite
- unexplained weight loss
- Night sweats,
- fever
- Fatigue

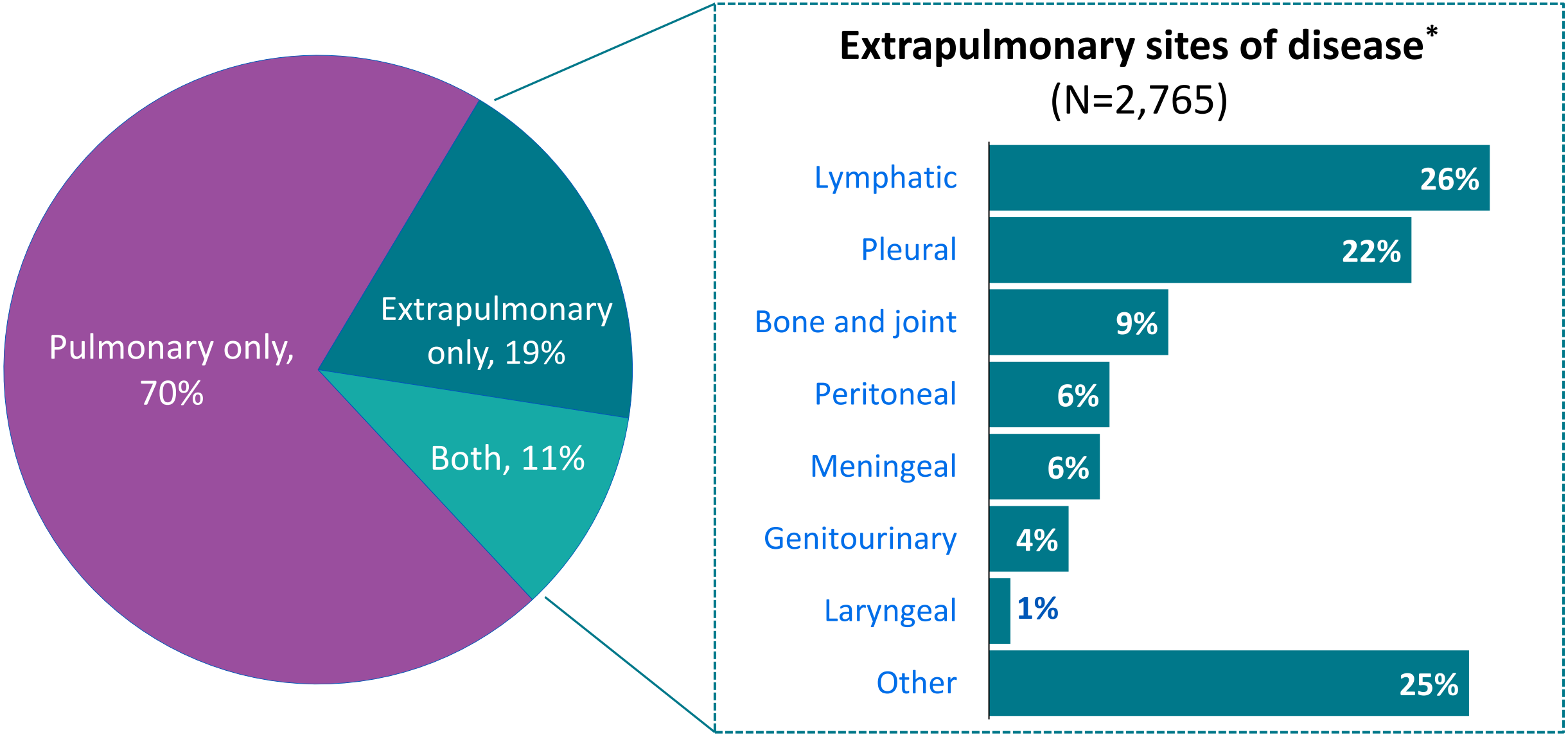
Respiratory symptoms

- Prolonged cough (3 weeks or longer)
- Shortness of breath
- Hemoptysis
- Chest pain

Symptoms of possible extra-pulmonary TB

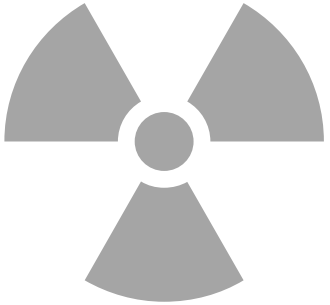
- Blood in the urine (TB of the kidney)
- Headache/confusion (TB meningitis)
- Back pain (TB of the spine)
- Hoarseness (TB of the larynx)

TB Cases by Site of Disease, United States, 2022



It is not just the symptom

The chronicity of symptoms



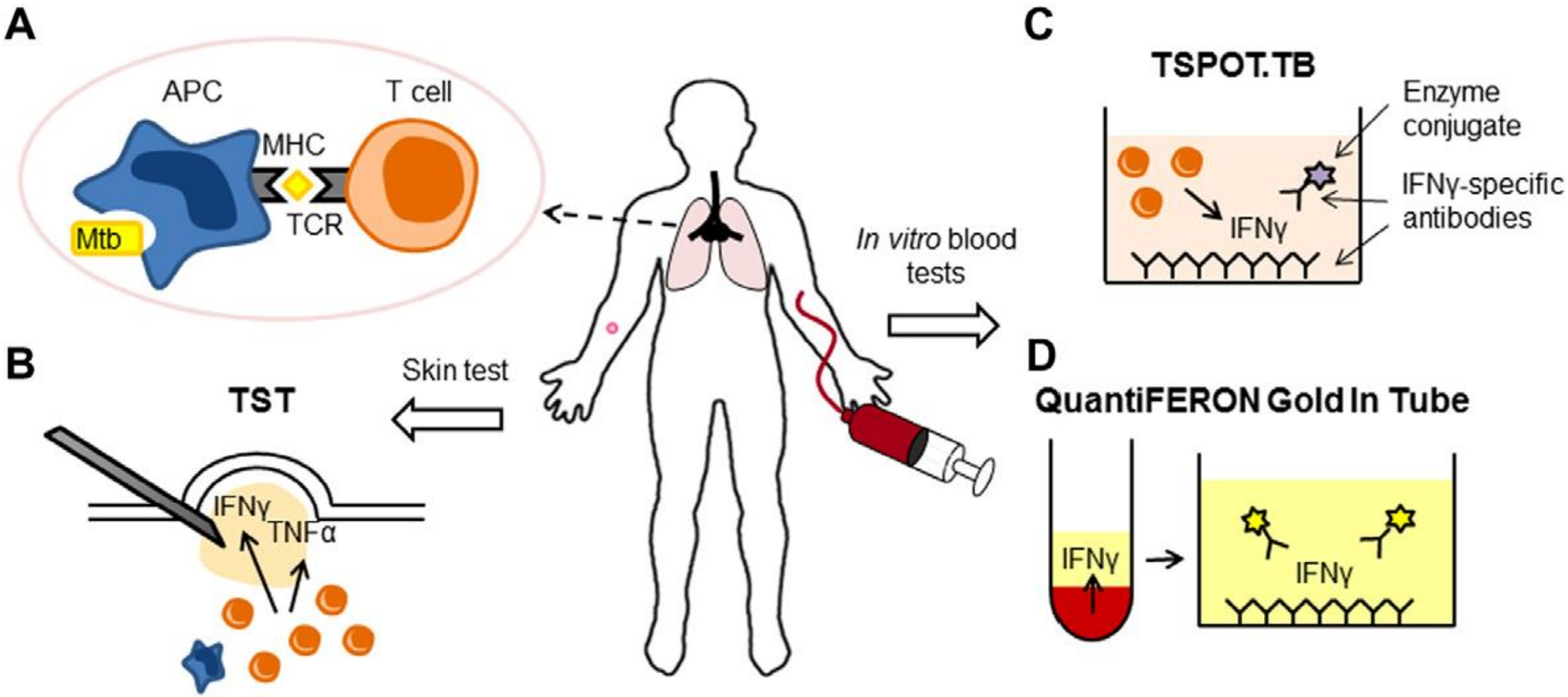
Association with known exposure or risk for exposure

When should we suspect TB?

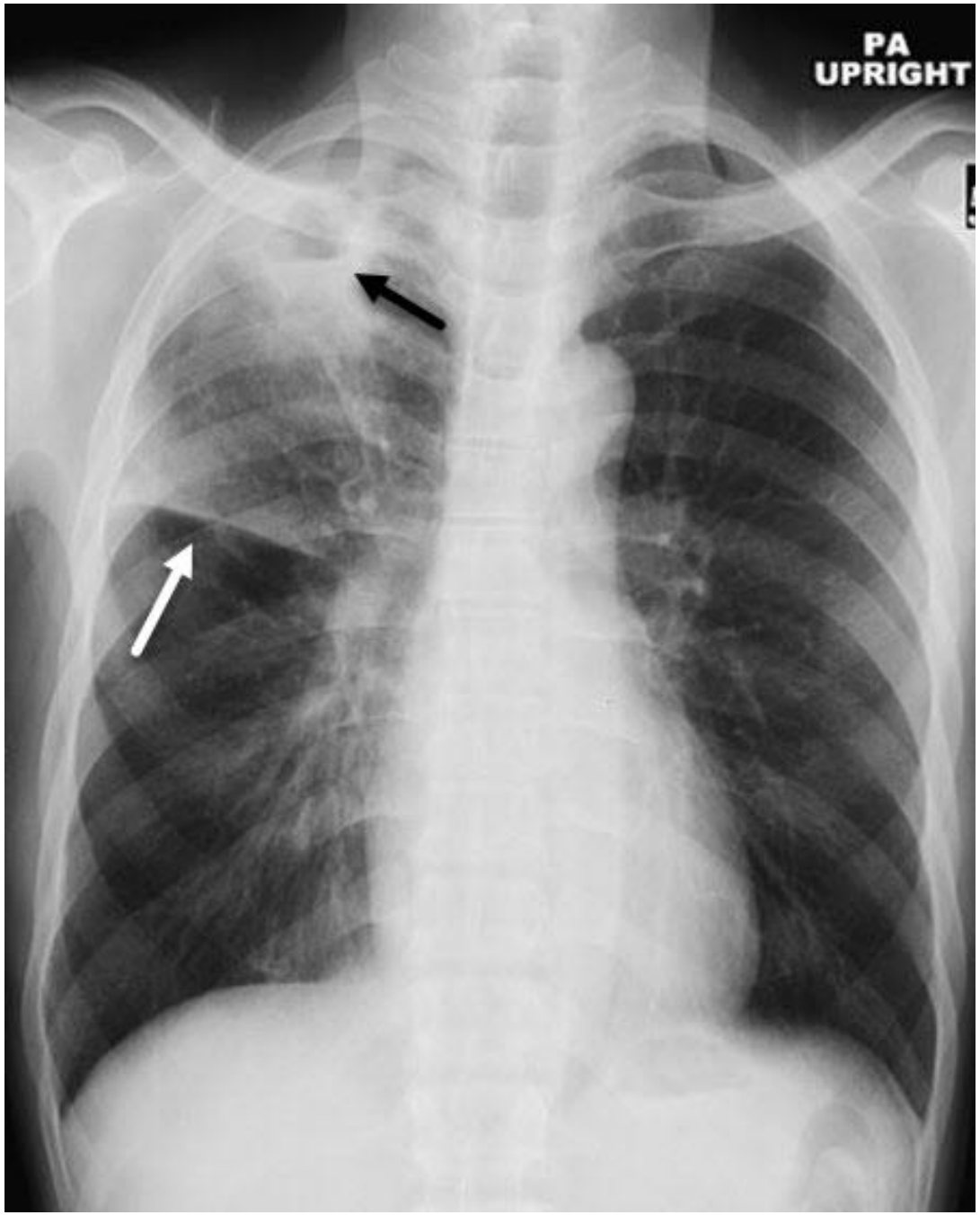
Person

Symptoms

Tests



Whitworth, Hilary S. et al. “IGRAs--the gateway to T cell based TB diagnosis.” *Methods* 61 1 (2013): 52-62 .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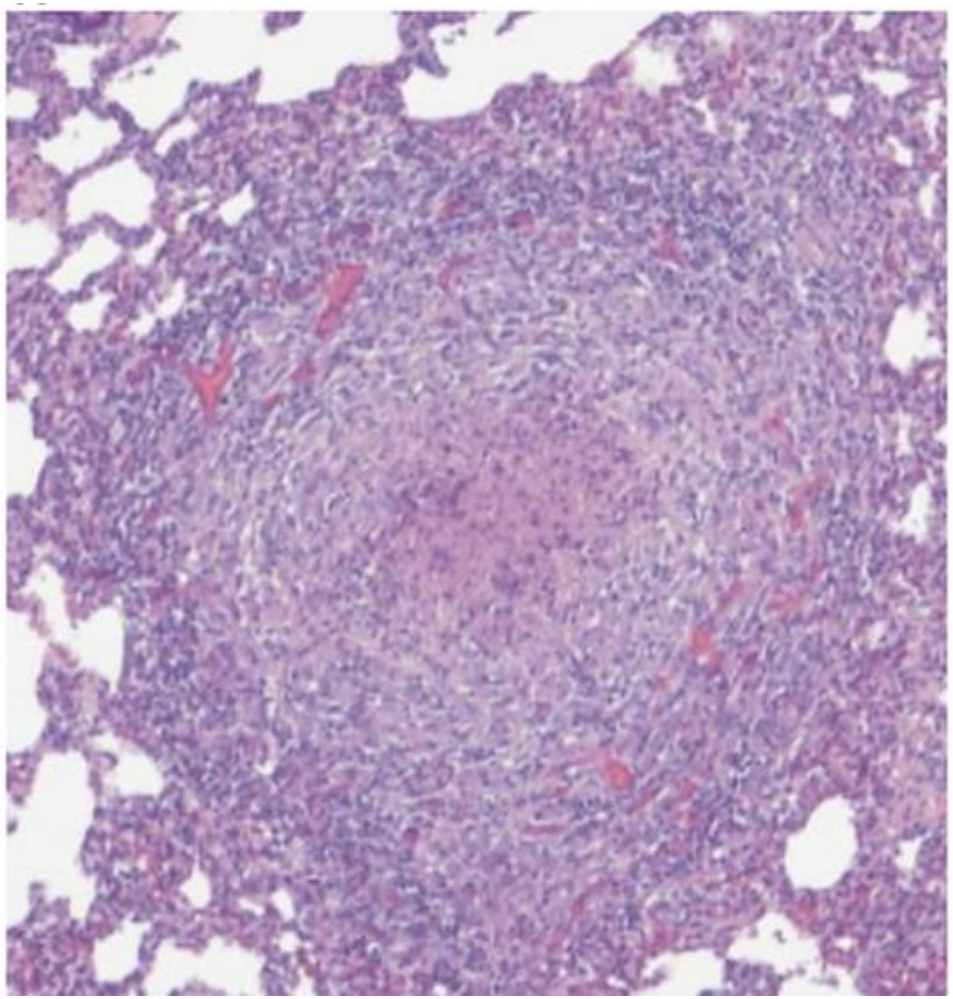


Clinical Evaluation for TB

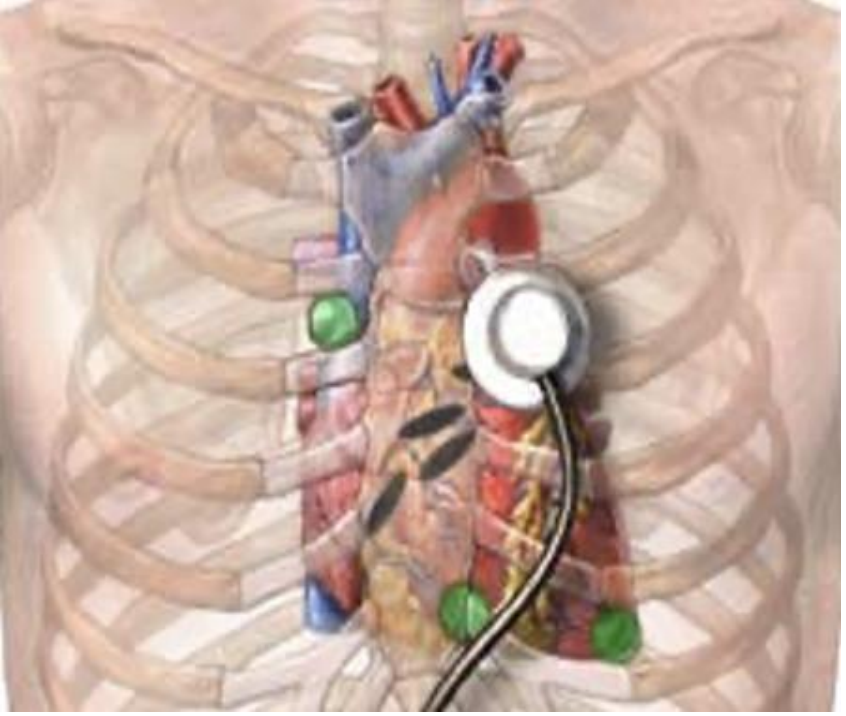
- Medical history
- Physical examination
- Test for TB infection
- Chest radiograph
- Bacteriologic examination

Medical History

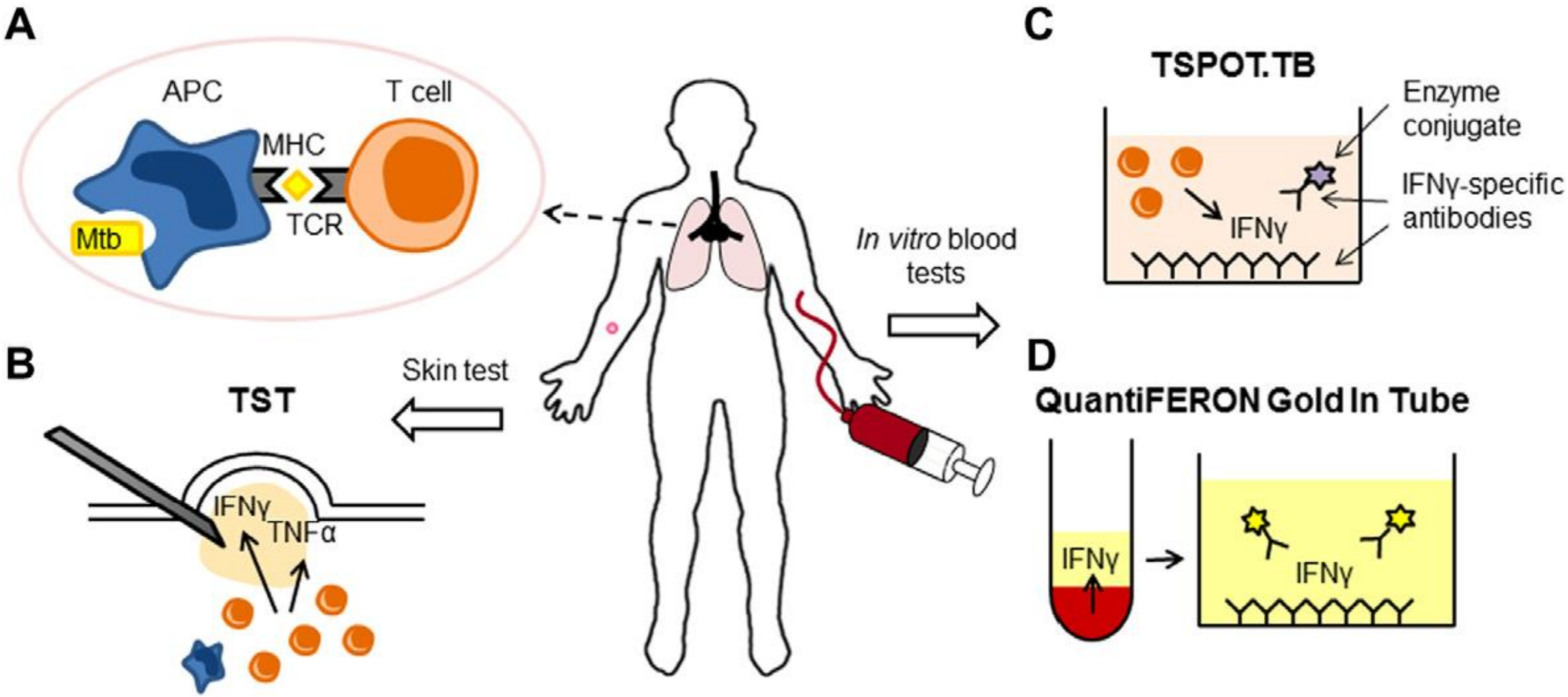
- Symptoms of disease; how long
- History of TB exposure, infection, or disease
- Past TB treatment
- Demographic risk factors for TB
- Medical conditions that increase risk for TB disease

Symptoms of Tuberculosis

Symptoms of Pulmonary TB Disease	Symptoms of Extrapulmonary TB Disease
• Cough (especially if lasting for 3 weeks or longer) • Coughing up sputum or blood (hemoptysis) • Chest pain • Loss of appetite • Unexplained weight loss • Night sweats • Fever • Fatigue	• TB of the kidney may cause blood in the urine • TB meningitis may cause headache or confusion • TB of the spine may cause back pain • TB of the larynx can cause hoarseness • Loss of appetite • Unexplained weight loss • Night sweats • Fever • Fatigue



Testing for TB Infection



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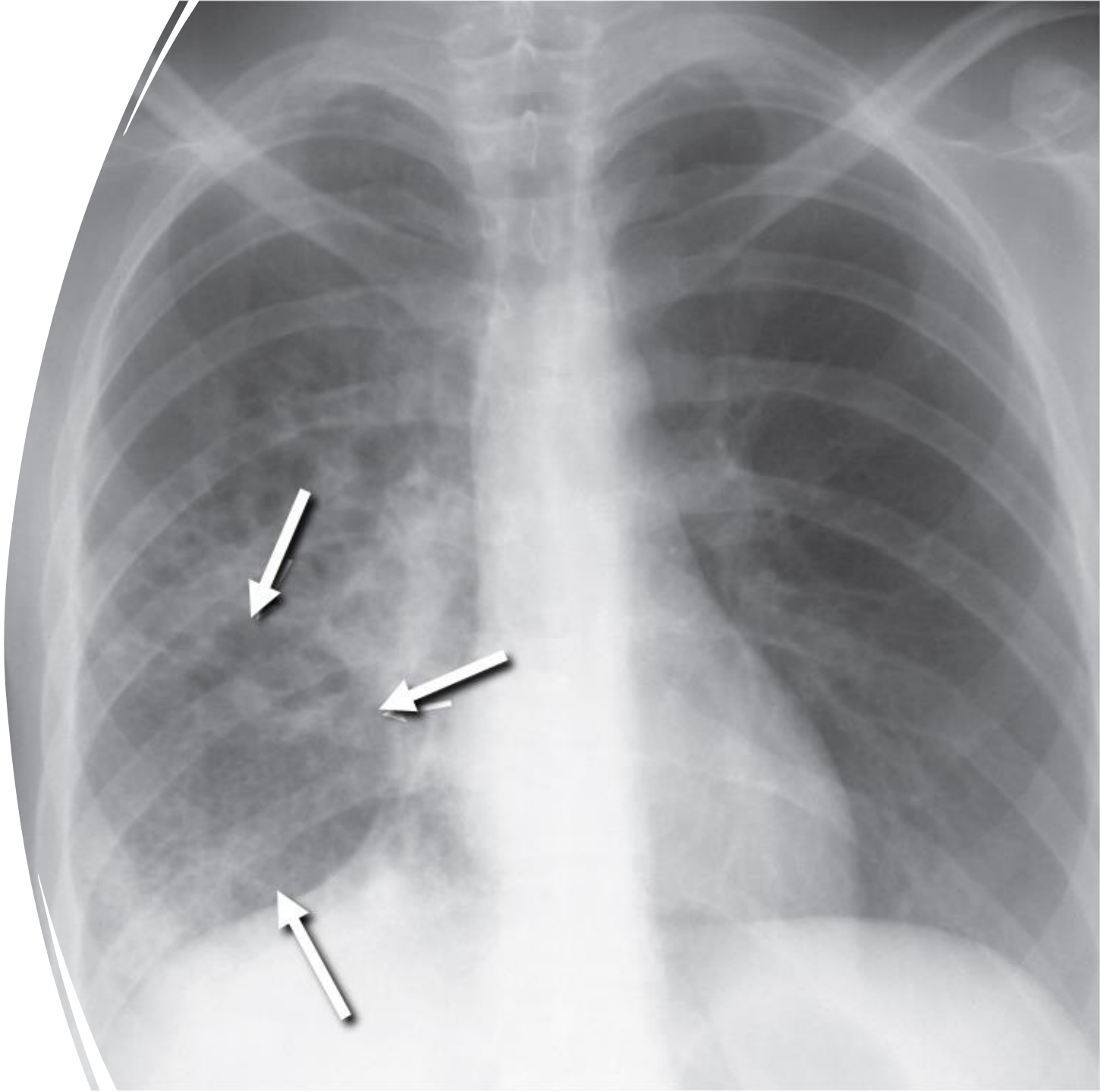
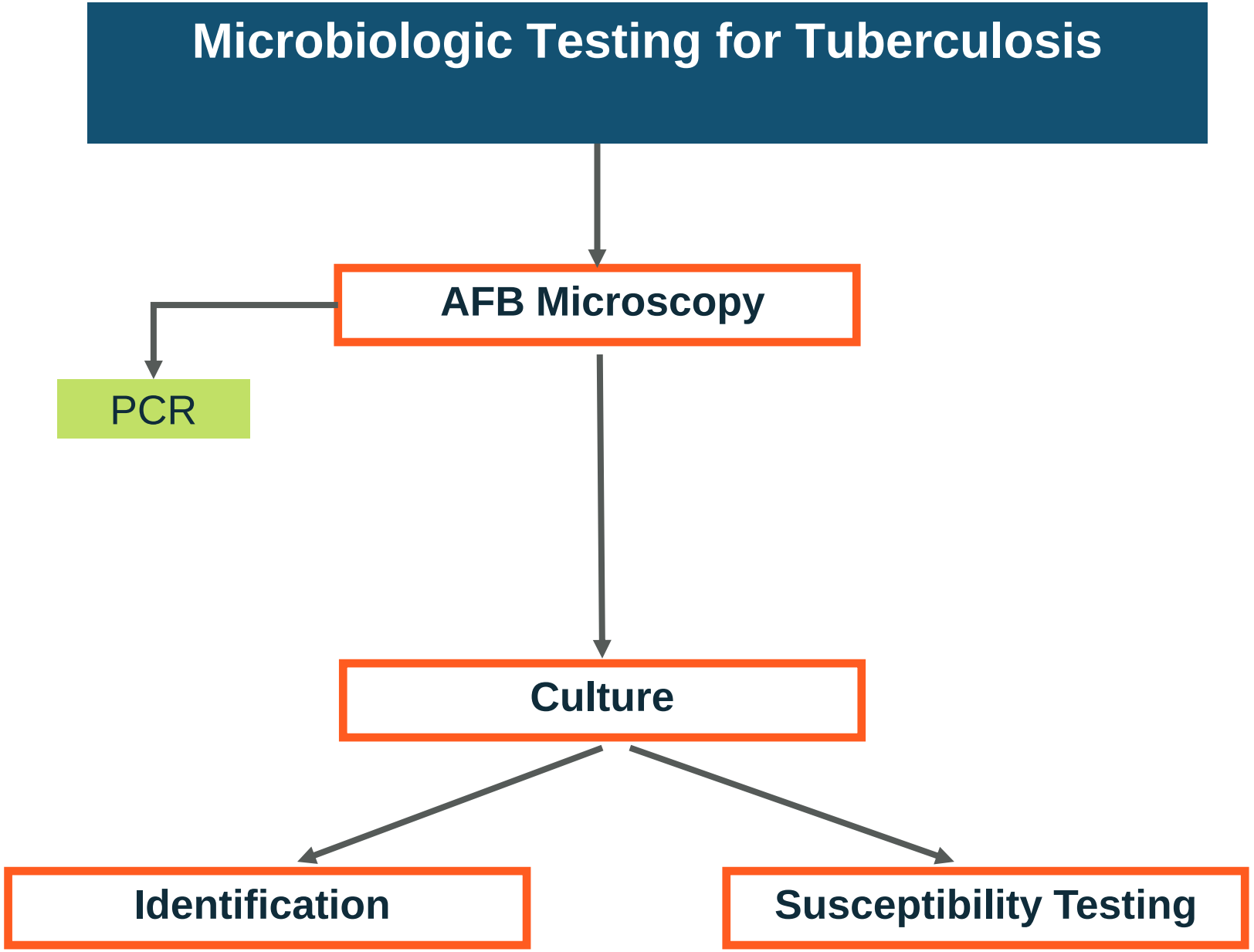
Testing for TB Disease

Chest X-ray

- Posterior-anterior view is standard
- Chest abnormalities suggest, but do not confirm, TB disease
- Require microbiologic confirmation




Microbiologic Testing for Tuberculosis
AFB Microscopy
PCR
Culture
Identification
Susceptibility Testing

Importance of Careful and Thorough Evaluation

Identify individuals with Latent TB

Early Detection of Active TB

Public Health Interventions

Improve individual health outcomes

Alleviate the burden on healthcare systems.

Thank you