TB
Yesterday, Today, and Tomorrow

Produced by the Alabama Department of Public Health Video Communications and Distance Learning Division
Faculty

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Other Names For Tuberculosis

- TB
- Consumption
- White Plague
- Phthisis
- Scrofula
- Potts Disease
What is TB?

• An airborne disease caused by *Mycobacterium Tuberculosis*

• Once the leading cause of death in the United States

• Preventable and curable

• One-third of the world is infected

• Over 2 million die from TB each year
How is it Spread?

• Spread through the air when infectious people cough, sneeze, or speak

• Spreads easier in small closed spaces where air does not move
Probability TB Will Be Transmitted

- Infectiousness of the person with TB
  - Symptoms such as cough
- Environment where exposure occurred
- Duration of exposure
- Virulence of the organism
  - Some “bugs” are more aggressive
TB Exposure

- Exposure occurs from being in VERY CLOSE CONTACT with someone who is sick with TB
  - Breathing the same air
Exposure: What Happens Next?

• TB Infection
  - Healthy immune systems fight off the bacterial infection, so the person does not get sick
Exposure: What Happens Next?

- **TB Disease**
  - Immune systems are unable to fight off the bacterial infection and so the bacteria thrive and progress to active TB disease
  - Occurs in about 10% of those infected who are not treated preventively
Differences Between Them

- TBI
  - Positive TB skin test
  - Normal chest X-ray
  - No symptoms
  - Cannot transmit to others
  - May be treated preventively
Differences Between Them

- TB Disease
  - Positive TB skin test
  - Abnormal chest X-ray
  - Has symptoms
  - May transmit to others
  - May be treated and cured
Common Sites of TB Disease

- Lungs (85% of the time)
- Pleura
- Central nervous system (Meningitis)
- Lymphatic system
- Genitourinary systems
- Bones and joints
- Disseminated (miliary TB)
Persons at Higher Risk for Exposure to TB

- Close contacts of persons known or suspected to have TB
- Unemployed / minority populations / foreign-born people where TB is common
- Residents and employees of high-risk congregate settings
Persons at Higher Risk for Exposure to TB

• Health care workers and first responders who serve high risk clients
Conditions That Increase the Risk of Progression to TB Disease

- Recent TB infection
- HIV infection
- Substance abuse
- Diabetes, silicosis, cancer of head or neck, intestinal bypass
- Prolonged corticosteroid therapy
Conditions That Increase the Risk of Progression to TB Disease

- Other immunosuppressive therapy
- Age
  - Very young or very old
Keep Windows Open: Ventilate and Circulate Air

- TB cannot spread outside or in fresh air
- Ultraviolet light kills TB germs
TB Germs are NOT Spread By Handling

- Bedding
- Rubbish
- Clothes or towels
- Food
Health Care Workers Wear an N-95 Mask

- Proper fit testing is needed annually
- Get the right size
- No gaps
- Filters out germs
Tools For TB Diagnosis

- Bacteriology
  - Acid Fast Bacilli (AFB) Smear
  - PCR (rapid test) for +AFB Smear Specimens
  - Culture (6 - 8 weeks)

- Chest X-ray (PA / Lat)

- Tuberculin Skin Test (TST)
Tools For TB Diagnosis

- Blood Assay for M. tuberculosis (BAMT) Bacteriology
  - Quantiferon TB Gold
  - QFT - TB Gold
  - T - Spot
Caution!

- Tuberculin Skin Test (TST) should not be the first test to diagnose disease.

  - It is the test for latent tuberculosis infection.

  - Can be used to help support that the patient was infected with TB.
Testing For Contacts to TB Cases or TB Suspects

- Concentric circle method and priority model used to determine who needs testing
- T-Spot is preferred or place a TST as soon as contact is identified
- 5 mm induration considered positive TST
Testing For Contacts to TB Cases or TB Suspects

• Second test (T-Spot or TST) done in 8-10 weeks (if first test negative) due to incubation period
Measuring A Positive TB Skin Test
What Really Matters?

- Measure induration or raised area only
- Do not include areas of redness outside the indurated area
- Record reading using millimeters (mm)
Factors Impacting TST Readings: Positive Results

• $\geq 5\text{mm} = + \text{risk factors}$

  – Contact, HIV/AIDS,
    Immunosuppressive therapy,
    Cancer, Renal Disease,
    Abnormal CXR, IV Drug Abuser
Factors Impacting TST Readings: Positive Results

- $\geq 10\text{mm} = +\text{ risk factors}$
  - Foreign born, substance abuser, congregate settings (jail / prison, nursing home), Elderly $>70$, Healthcare Workers, Low Income (homeless), Medical Conditions (Diabetes, Post Gastrectomy, Corticosteroid Therapy, Silicosis)
Factors Impacting TST Readings: Positive Results

- \( \geq 15\text{mm} = + \text{risk factors} \)
  
  - General population

- With no known risk factors listed above
TB Skin Testing Using Two - Step Method

• Use two step testing for the initial skin testing of adults who will be retested periodically.
• If first test is positive, consider the person infected.
• If first test is negative, repeat in 1-3 weeks.
TB Skin Testing Using Two - Step Method

- If second test is positive, consider the person infected
- If second test is negative, consider the person uninfected
Starting Therapy

• Initial visit / Baseline:
  – Skilled assessment
  – Symptom review
  – Weight
  – Vision screening
    • Red / green color blindness and acuity
Starting Therapy

- Sputum collection
  - Daily 3 consecutive days

- Laboratory testing
  - T-Spot
  - HIV
  - Liver Function Test (LFTs)
  - CBC
Monitoring Therapy

• Sputum smears
  – Initial 3 specimens
    • Ideally over 3 consecutive days
  – Weekly for SMEAR +
  – At least monthly until the end of therapy
Monitoring Therapy

• Sputum cultures (same as above)
  – At least monthly until the end of therapy
  – Failure to convert cultures in a timely manner is an indication to extend therapy
Monitoring Therapy

- Chest X-rays
  - Baseline for all TB cases / patients
  - Interim 2 - 3 months into therapy
  - Closing CXR at end of therapy
Monthly Monitoring

• Monthly
  – Face-to-face skilled assessment (RN or MD)
  – Symptom review / side effects of treatment
  – Vision screenings while on EMB
  – Weight
Monthly Monitoring

- Sputum collection for AFB smear and culture during treatment

- Additional laboratory testing requested by physician or as indicated by patient’s medical condition
Treatment for TB: General Principles

- Use Rifampin (R) Isoniazid (I), Pyrazinamide (P), and Ethambutol (E) together
  - These drugs are the basis of modern short-course (6-month) therapy
- Always treat with a multiple drug regimen (RIPE)
Treatment for TB: General Principles

• Never add a single drug to a falling regimen
• Determine the duration of therapy based on the drugs used
• Alabama Department of Public Health (ADPH) will facilitate directly observed therapy (DOT) for all patients
Diagnosing Tuberculosis

- 77% of all Alabama’s cases in 2014 were confirmed by AFB culture
- Can be culture negative and still considered a clinical case
- A negative TST should not deter diagnosis
Diagnosing Tuberculosis

• Delayed diagnosis occurs often, resulting in a greater chance of secondary cases

• 133 cases were reported in Alabama in 2014
Public Health Laws

• Tuberculosis is a notifiable disease
  – Healthcare workers, hospital administrators, correctional facilities, patient - transport workers, medical examiners, nursing - home administrators, laboratory authorities, pharmacists, school authorities, daycare facilities, emergency medical service employees

• Confirmed or suspected cases must be reported within 24 hours
TB and HIPAA (45-CFR-164.512)

• 45 CFR – 164.512 uses and disclosures for which consent, an authorization, or opportunity to agree or object is not required:
  
  – (b) Standard: uses and disclosures for public health activities
TB and HIPAA (45-CFR-164.512)

(1) Permitted disclosures

- A covered entity may disclose protected health information for the public health activities and purposes described in this paragraph to:
TB and HIPAA (45-CFR-164.512)

(ii) A public health authority that is authorized by law to collect or receive such information for the purpose of preventing or controlling disease, . . . and the conduct of public health surveillance, public health investigations, and public health interventions; or, at the direction of a public health authority . . .
TB Control

- The Division of TB Control has the responsibility to assure that training, education, and services are available for the identification, diagnosis, and treatment of tuberculosis

- Health care workers are encouraged to begin collaborative efforts with TB Control staff in their area
TB Control

– Both immediate and long-term gains can be achieved as we work together to protect the public, our staff, and those in our care.
A Global Perspective

- One-third of the world’s population is infected with TB
- Each year, 9 million people around the world become sick with TB
- Each year, there are over 2 million TB-related deaths worldwide
- TB is the leading killer of people who are HIV infected
- 9,412 cases were reported in the United States in 2014
Contact Information

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