

Nursing Perspective of TB Control

**Satellite Conference and Live Webcast
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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 U.S.
- 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 doesn't 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?

- Infection
 - Healthy immune systems fight off the bacterial infection so the person doesn't get sick
 - This is Latent TB Infection (LTBI)
 - Occurs in 90% of those infected

Exposure: What Happens Next?

- Disease
 - Immuno-suppressed immune systems are unable to fight off the bacterial infection and so the bacteria thrive and progress to active TB Disease
 - This occurs in about 10% of those infected

Differences

- Latent TB Infection (LTBI)
 - Positive TB skin test
 - Normal chest x-ray
 - No symptoms
 - Cannot transmit to others
 - May be treated preventively

Differences

- 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 Increasing Risk of Progression to TB Disease

- Recent TB infection
 - 10% within 2 years of exposure
- HIV infection
- Substance abuse
- Diabetes, silicosis, cancer of head or neck, intestinal bypass

Conditions Increasing Risk of Progression to TB Disease

- Prolonged corticosteroid therapy
- Other immunosuppressive therapy
- Age
 - Very young or very old

Protection: Cover Your Cough

- TB patient wears paper mask

Protection: Keep Windows Open

- Air: ventilate and circulate
 - 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 10-12 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

- >5mm = + risk factors:
 - Contact, HIV/AIDS, Immunosuppressive therapy, cancer, renal disease, abnormal CXR, IV drug abuser

Factors Impacting TST Readings: Positive Results

- >10mm = + 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

- >15mm = + Risk Factors:
 - General population
 - With no known risk factors listed

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
 - 3 consecutive days
- Laboratory testing
 - T-Spot
 - Mailer provided by Oxford Lab
 - HIV
 - Liver Function Test (LFTs)

Monitoring Therapy: Sputum samples

- Sputum Smears
 - Initial 3 specimens
 - Ideally over 3 consecutive days
 - Weekly for SMEAR +
 - After 3 consecutive NEGATIVES, then monthly until the end of therapy

Monitoring Therapy: Sputum samples

- Sputum Cultures
 - Monthly until the end of therapy
 - Failure to convert cultures in a timely manner is an indication to extend therapy

Monthly Monitoring

- Face-to-face skilled assessment
 - RN or MD
- Symptom review / side effects of treatment
- Vision screenings while on EMB
- Weight
- Sputum collection for AFB Smear and Culture during treatment

Monitoring Therapy

- Chest x-rays
 1. Baseline for all TB Cases / Patients
 2. Interim 2-3 months into therapy
 3. Closing CXR at end of therapy

Treatment for TB: Therapy I General Principles

- Use Rifampin (R) Isoniazid (I), Pyrazinamide (P), and Ethambutol (E) together
 - These drugs are the basis of modern short-course therapy
 - 6 months

Treatment for TB: Therapy I General Principles

- Always treat with a multiple drug regimen (RIPE)
- Never add a single drug to a failing regimen
- Determine the duration of therapy based on the drugs used

Treatment for TB: Therapy I General Principles

- Partnering with the Alabama Department of Public Health (ADPH) will facilitate directly observed therapy (DOT) for all patients

RIF (Rifampin)

- Excellent intracellular killing of both active and quiescent organisms
- Required to shorten therapy to <12 months
- Increasing evidence for efficacy in the latent stage

INH (Isoniazid)

- Good killing of actively dividing organisms
- Documented efficacy in the latent stage

PZA (Pyrazinamide)

- Good killing of actively dividing organisms in an acidic environment
- Decreasing effect after first 2 months of therapy
- Required to shorten therapy to 6 months

EMB (Ethambutol)

- Bacteriostatic only
- Provides extra agent in case of resistance

Diagnosing Tuberculosis

- 81% of all Alabama's cases in 2012 were confirmed by AFB culture
- Can be culture negative and still considered a clinical case
 - 19% of all Alabama's cases in 2012
- A negative TST should not deter diagnosis

Diagnosing Tuberculosis

- Delayed diagnosis occurs often, resulting in a greater chance of secondary cases
- 138 cases were reported in Alabama in 2012

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

Public Health Laws

- Confirmed or suspected cases must be reported within 24 hours

TB and HIPAA

- 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

- (1) Permitted disclosures. A covered entity may disclose protected health information for the public health activities and purposes describes in this paragraph to:

TB and HIPAA

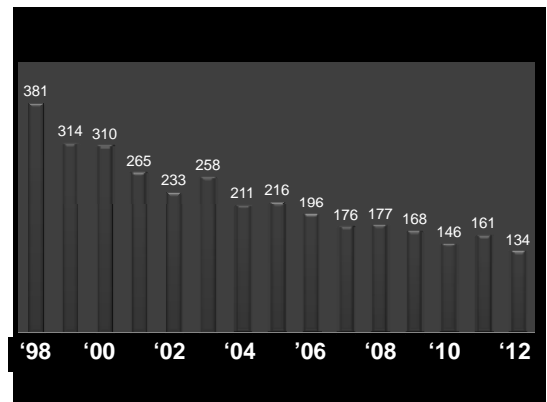
- (i) A public health authority that is authorized by law to collect or receive such information for the purpose of preventing or controlling disease, . . . and the conduct of public health surveillance, public health investigations, and public health interventions; or, at the direction of a public health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

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

The Division of TB Control

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

A Global Perspective

- **TB is the leading killer of people who are HIV infected**
- **10,528 cases were reported in the U.S. in 2011**

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