Surveillance for Healthcare Workers

Tuberculosis (TB)

- 1/3 world with latent TB
- 9 million in 2013
- Killed 1.5 million 2013
- 10% lifetime disease risk /↑ risk HIV
- 60% new cases Asia/Africa
- ↑ fatalities low & mid income
- Good news- examples

TB in HCWs

- HCWs average lifetime occ. risk of TB infection 30-386/1000 workers exposed
- Average lifetime occ. risk of TB disease: 3-39/1000 workers exposed
- 1,751 reported TB cases in healthcare occupation 2009-2013

Factors Contributing to TB Outbreaks

- Delayed diagnosis of TB
- Delayed initiation & inadequate airborne precautions
- Lapses in all practices & precautions for cough-inducing & aerosol-generating procedures
- Lack of adequate respiratory protection

OSHA’s Tuberculosis Exposure Control Plan

- Drafted in 1997; WITHDRAWN in 2003
- OSHA's general duty clause
- OSHA Respiratory Protection Standard 1910.134
- Use CDC 2005 recommendations for HCW protection & surveillance
What are the Latest?
CDC Guidelines for Preventing Transmission of *Mycobacterium tuberculosis* in Healthcare Settings, *December, 2005*

147 pages of material

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**Explanation of Terms**
- **BAMT** = Blood Assay for *Mycobacterium tuberculosis (MTB)*
- **TST** = Tuberculin Skin Test
- **LTBI** = Latent Tuberculosis Infection
- **BCG** = Bacillus Calmette-Guerin

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**HCWs Included in TB Surveillance Program**
- All paid & unpaid persons working in healthcare settings with potential exposure to *MTB* through air space shared with infectious TB disease
- Part time, temporary, contract, & full-time HCWs
- All HCWs with duties that involve face-to-face contact with TB patients

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**Examples**
- Chaplains
- Correctional officers
- Dieticians/food service
- Health/safety staff
- Infection control staff
- Laboratory staff
- Maintenance staff
- Morgue staff
- Nurses
- Pharmacists
- Phlebotomists
- Physical & occup. therapy
- Respiratory therapists
- Scientists
- Social workers
- Students
- Volunteers

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**Include HCWs with any of the following activities:**
- entering patient rooms/treatment rooms whether or not patient is present
- participating in aerosol-generating or aerosol-producing procedures
- participating in suspected/confirmed *MTB* specimen processing or
- installing, maintaining, replacing environmental controls in TB disease areas

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**Why Do We Need Surveillance for TB in HCWs?**

TB screening programs provide critical information for caring for individual HCWs & information that facilitates detection of *MTB* transmission
The TB screening program has 4 major components:

1. baseline testing for MTB infection
2. serial testing for MTB infection
3. serial screening for symptoms or signs of TB disease
4. TB training & education

1. Baseline Testing for MTB
   - Recommended for all newly hired HCWs regardless of risk classification
   - Can be conducted with TST or BAMT
   - Recommended for those who will receive serial TB screening
   - Certain settings may not choose to perform baseline TB testing

Baseline Testing
   - Results:
     - Provide basis for comparison for potential / known TB exposure
     - Facilitate detection / treatment of LTBI / TB in HCW before employment
     - TST will minimize possibility that boosting will lead to unwarranted suspicion of transmission of TB with subsequent testing

2. Serial Follow-Up of TB Screening & Testing for MTB Infection
   - Need for serial follow-up screening of HCWs with (-) TB test institutional decision
     - based on setting’s risk classification
     - changes with updated risk assessments
   - If required, risk assessment includes which HCWs & frequency

Serial Follow-Up of TB Screening
   - 2-step TST testing should NOT be performed for follow-up testing
   - Stagger follow-up screening
   - Staggered screening opportunities for early recognition
   - Processing aggregate analysis of TB screening data on periodic regular basis important

Interpreting TST Results
HCWs with Newly Recognized Positive Test Results for TB Infection

Definitions for a positive test result:
- Symptoms of disease in lung, pleura, airways, and/or larynx
- Include coughing for >3 weeks, loss of appetite, unexplained weight loss, night sweats, bloody sputum or hemoptysis, hoarseness, fever, fatigue, or chest pain

HCWs with Newly Recognized (+) Test Results for TB Infection

- All evaluations should include:
  - Clinical examination
  - Symptom screen
  - Chest radiograph
  - Collection of sputum specimens
- If TB diagnosed, begin treatment immediately
- If TB is excluded, offer HCW treatment for LTBI according to published guidelines

Chest Radiography
- HCW with baseline (+) or newly (+) TST or BAMT
- After baseline, repeat radiographs not needed
- Only when symptomatic
- Serial chest x-rays NOT recommended: when?

Workplace Restrictions
- HCWs with confirmed infectious pulmonary, laryngeal, endobronchial, or tracheal TB disease, or draining TB skin lesion pose risk to patients, HCWs, & others
- HCWs with extrapulmonary TB disease usually do not workplace exclusion if no involvement of respiratory track
- HCWs receiving treatment for LTBI can return to work immediately

These HCWs should not be allowed RTW until:
- 3 consecutive (-) sputum samples collected in 8-24 hour intervals (at least 1 early AM sample)
- Person responded to anti-TB effective treatment
- Non-infectious by MD with knowledge & experienced re: TB

Surveillance of Patient TB Cases Indicates Possible Pt.-to-Pt. Transmission
- Healthcare setting should collaborate to conduct investigation
- Where HCWs serially tested, review records or ↑ in # of TST conversions
- Review patient surveillance data & medical records for additional TB cases
3. Screening

- HCWs who might need to perform job duties while wearing a respirator should be screened by a licensed healthcare professional
- Include questionnaire for pertinent medical conditions

3. Screening

- Classification of potential on-going transmission warrants immediate investigation & corrective steps
- If transmission has ceased, setting reclassified as medium risk
- Maintaining classification of medium risk recommended for 1 year

4. Training

- HCWs should be provided with annual training on multiple topics:
  - Nature, extent, & hazards of TB disease in healthcare setting
  - Risk assessment process & relation to respirator program
  - Signs & symbols used to demonstrate that respirators are required in an area
  - Examples

Trainees’ Resources

Resources available as adjunct to respiratory protection program:
- Opportunities to handle & wear respirator until trainees proficient
- Educational materials for references
- Instructions to refer all problems immediately to program administrator

Hierarchy of Infection Control for TB

- Administrative Controls
- Environmental Controls
- Respiratory Protection

TB Hierarchy of Controls

Elimination/Substitution

- May send TB patients to another facility if unable to provide isolation
- If “x” cases/year - do not have to provide respiratory isolation
- Surveillance: # cases of TB per year and if transmission
TB Hierarchy of Controls

**Engineering Controls:**
- Negative pressure ventilation rooms
- HEPA filtration of exhausted air if can’t be exhausted to outside
- **Surveillance:** measuring (-) pressure in isolation rooms

**Administrative & Work Practice Controls**
- **Policies re:**
  - isolation of TB patients *(high index)*
  - what HCWs must wear for respiratory protection
  - maintenance of negative pressure isolation & air handling
  - masking of patients

TB Hierarchy of Controls

**Personal Protective Equipment (PPE)**
- N-95 respirators
- PAPRs
- **Surveillance:** TST skin testing of employees

Hand Hygiene

TJC mandates that hospitals perform surveillance on HCW compliance with hand hygiene
- **Scenario:** You must come up with some options to present to the infection control committee to vote on at the next meeting

Hand Hygiene (HH) Surveillance Recommendations
- Periodically **monitor & record adherence of # of HH episodes** performed by personnel/# of HH opportunities
- **Monitor volume of alcohol-based hand rub** (or detergent) used for handwashing or hand antisepsis per 1,000 patient-days
- When outbreaks of infection occur, **assess adequacy of HCW hand hygiene**

Summary
- **Important Occupational Safety & Health Concepts**
- **Application of surveillance concepts**
  - Online exercise due this week

*Be familiar with elimination, substitution, engineering, administrative, work practice controls & PPE as applied to BBP & TB in HCWs*