Tuberculosis Screening and Targeted Testing of College and University Students: Developing a Best Practice Approach:

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Learning Objectives

- Discuss TB on a Global Scale and its impact within Institutions of Higher Education
- Review American College Health Association screening recommendations for IHE
- Explain target testing and management for at risk populations
- Discuss importance of intra/inter departmental resource allocation
- Review questions, quiz!
Key Terms

- **ACHA** refers to the American College Health Association
- **IHE** refers to Institution of Higher Education
- **Screening** refers to the process of identifying those at high risk for TB infection and disease
- **Latent TB Infection (LTBI)**: diagnosed by positive history and positive Mantoux tuberculin skin test (TST) or interferon gamma release assay (IGRA)
Global impact

- WHO cares
- Prevalence
- Incidence
- Mortality
High Risk Countries
College and University Impact

- Enrollment
- Recruiting & Retention
- Student Health Centers
- Individual Student Physical and Mental Health
## Incidence Rates of TB in NYC per 100,000

<table>
<thead>
<tr>
<th>Region/Country</th>
<th>Cases 2009</th>
<th>Cases 2010</th>
<th>Cases 2011</th>
<th>Total Cases</th>
<th>Average Population 2009-2011</th>
<th>Crude Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronx</td>
<td>138</td>
<td>116</td>
<td>101</td>
<td>355</td>
<td>1,391,466</td>
<td>8.5</td>
</tr>
<tr>
<td>Kings</td>
<td>208</td>
<td>233</td>
<td>218</td>
<td>659</td>
<td>2,534,814</td>
<td>8.7</td>
</tr>
<tr>
<td>New York</td>
<td>121</td>
<td>90</td>
<td>107</td>
<td>318</td>
<td>1,605,625</td>
<td>6.6</td>
</tr>
<tr>
<td>Queens</td>
<td>275</td>
<td>259</td>
<td>249</td>
<td>783</td>
<td>2,261,761</td>
<td>11.5</td>
</tr>
<tr>
<td>Richmond</td>
<td>18</td>
<td>13</td>
<td>14</td>
<td>45</td>
<td>476,976</td>
<td>3.1</td>
</tr>
<tr>
<td>Region Total</td>
<td>760</td>
<td>711</td>
<td>689</td>
<td>2,160</td>
<td>8,270,641</td>
<td>8.7</td>
</tr>
</tbody>
</table>

*2009-2011 Bureau of Communicable Disease Control Data as of June, 2013*
ACHA Screening Guidelines

- April 2012, ACHA published initial guidelines to IHE: *Tuberculosis Screening and Targeted Testing of College and University Students*
- Originally prepared by ACHA’s Tuberculosis Guidelines Task Force
- Revised in April 2014 by Emerging Public Health Threats and Emergency Response Coalition
- Purpose: Provide guidelines for the...
  - Screening of incoming student populace
  - Target testing for those identified at increased risk for TB testing
  - Reviewing appropriate follow-up care for students diagnosed with latent TB infection (LTBI) or TB infection
Whom to Screen?

- Everyone
- Most U.S. born incoming students will not have risk factors for TB and not require testing
- Low risk students should not be tested for TB
- International students arriving from countries with an increased incidence of TB should be tested
- In 2009, approximately 60% of TB cases in the US occurred in foreign-born individuals
- Majority from 7 countries: Mexico, China, India, Vietnam, Philippines, Haiti, and Guatemala
High Incidence Areas

- Defined as countries with an annual incidence of TB disease greater than or equal to 20 cases per 100,000 population
- Most countries in Africa, Asia, Central America, Eastern Europe, and South America
- World Health Organization (WHO) Global Health Observatory Lists
  - Low Incidence-Appendix A
  - High Incidence-Appendix B

Source: World Health Organization Global health Observatory, Tuberculosis Incidence 2012. Countries with incidence rates of >= 20 cases per 100,000 population. For future updates, refer to http://apps.who.int/ghodata
When to Screen and Test: Incoming Students

- TB screening by questionnaire should be completed prior to arrival to campus
- Completed in conjunction with verification of pre-matriculation immunization requirements
- Testing should be no sooner than 3-6 months prior to college entrance
- Should be completed prior to the 2nd semester registration
When to Screen and Test: Current Students

- Should only be tested when their activities place them at risk for a new infection or to meet an academic programmatic requirement
  - Health profession students should be tested annually
- No evidence-based data exists that identifies the amount of time spent in a given high-risk country that constitutes significant exposure
- Encourage students to discuss specific travel circumstances with a medical provider who can determine appropriate evaluation
  - Recommend testing 8-10 weeks after leaving the high-incidence area
Screening Process: Screening Questionnaire

- Sample screening questionnaire has been developed based on risk factors
- Designed for use by IHE for the incoming student populace to target students at risk for TB
- Effectively screens students for risk factors for TB
- Only those students with identifiable risk factors for exposure should be tested
- Low risk students should not be tested for TB
Target Testing:

All students identified at increased risk for LTBI or TB disease through screening process will require additional testing.

- **TST**
  - Mantoux test is the only acceptable TST

- **IGRAs**
  - May be used in all circumstances in which TST is currently used

- **Combination**
  - Although not routinely recommended, both may be useful
Tuberculin Skin Test (TST)

- Inject 0.1 ml of purified protein derivative (PPD) tuberculin containing 5 tuberculin units (TU)
- Can be administered during pregnancy
- May give on same day as a live vaccine without compromising integrity of the result
- TST should be delayed 4-6 weeks if they have recently received a live vaccine
- Cross reactivity b/t PPD and BCG is possible
- A history of BCG vaccination should NOT preclude TST of students
- Testing with an IGRA may be preferable if feasible
Interpretation of TST

• Read in 48-72 hours after placement of PPD
• Measure the transverse diameter of the induration across the forearm, perpendicular to the long axis
• Redness and bruising is not measured
• Results are recorded in millimeters of induration such as “3 mm”
• If no induration is present, “0 mm” is recorded
• Interpretation depends on:
  • Millimeters of induration
  • Factors related to risk of exposure to TB disease
  • Risk for progression to TB disease once infected
Tuberculin Skin Test: Two-Step Testing

1st PPD

Negative

Positive

Repeat PPD in 1-3 weeks

If negative result within 12 months, give only one

Consider infected

Negative-no treatment required

Positive- consider infected

No need to give 2nd PPD
**Interpretation Guidelines:**

<table>
<thead>
<tr>
<th>&gt;5 mm is positive:</th>
<th>&gt;10 mm is positive:</th>
<th>&gt;15 mm is positive:</th>
</tr>
</thead>
</table>
| • HIV-infected persons  
 • Recent contacts of a person with infectious TB disease  
 • Fibrotic changes on CXR  
 • Organ transplants and other immunosuppressed patients  
 • Including patients taking >_ 15 mg/day of prednisone for 1 month | • Recent arrival to US (5 yrs)  
 • Injection drug users  
 • Residents/employees of high risk setting  
 • Mycobacteriology lab personnel  
 • Persons with medical conditions that increase risk for progression of TB disease  
 • Child under 5 years old  
 • Family members of adults in high risk category | • Persons with no known risk factors for TB |

Interferon Gamma Release Assays (IGRAs)

- Method may be used in all circumstances in which TST is currently used.
- Should be used with caution in immune compromised patients.
- Sensitivity is similar to TST in infected persons with culture-positive TB.
- IGRAs are thought to be more specific than the TST b/c they do not cross-react to BCG vaccine or commonly encountered non-tuberculosis mycobacteria.
- IGRAs may be preferred testing for persons who have received BCG and person unlikely to return for TST reading.
Interferon Gamma Release Assays (IGRAs)

- May be preferred for testing persons who are unlikely to return for PPD reading
- Two-step testing not required
- IGRA & Live vaccines-
  - IGRA testing can be performed on the same day as a live vaccine without compromising integrity of the result
  - IGRA testing should be delayed 4-6 weeks if they have recently received a live vaccine
Situations when both TST & IGRA testing

Initial test is negative and

- High risk for infection, progression to disease, and poor outcome (HIV) are increased
- Clinical suspicion for TB disease and confirmation of M. tuberculosis infection is desired

Initial test if positive and

- Additional evidence of infection is required to encourage acceptance and adherence
- Example: foreign-born persons who attribute a positive TST to prior BCG vaccination
What to do When TST or IGRA is Positive:

All students with a positive TST or IGRA **MUST** get a chest X-Ray

**CXR Positive:**
- Changes or sign/symptoms of active TB are identified, active disease must be excluded

**CXR Negative:**
- Treatment for LTBI should be recommended
- HIV screening is recommended for all LTBI patients. Right to decline.
Treatment:

- INH daily for nine months is the preferred regimen
- However, other regimens may be appropriate
- Completion of treatment should be highest priority
- Supported by education in student’s primary language
- Ensure confidentiality
- Offer incentives to mark treatment milestones
- Case management by a culturally competent health care provider
- Collaboration with County Health Department is recommended
Role of Student Health Services
Community Resources
Develop Standard Operating Procedures

Title: PPD/MANTOUX TEST PROCEDURAL CHECKLIST
Manual: Administration Policies and Procedures
Latest Revision date: 1/3/2013

General Guidelines: To ensure consistent and safe practice when performing PPD testing

<table>
<thead>
<tr>
<th>Date</th>
<th>Procedure Item</th>
<th>Completed</th>
<th>Reviewer Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Verify orders, gather equipment, identify pt. using 2 identifiers (one must be full name) and explain the procedure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Review risk factors and information from CDC with pt. to assess their understanding and answer any questions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Obtain written consent within their EMR and verify their ability to return for a site reading 48-72 hours after placement.</td>
<td></td>
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</tr>
<tr>
<td>4.</td>
<td>Perform hand hygiene and then examine the patient's forearms to identify the most suitable site for intradermal injection.</td>
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</table>

Yale University Environmental Health & Safety

Infection Control Policies and Procedures

Yale-New Haven Hospital. Ambulance as well as emergency room personnel at the admitting facility must be notified of the suspected diagnosis so that appropriate precautions can be taken.

The examining room used as a holding area should be closed and terminally cleaned after the patient has left and then disinfect.

Immediately notify your supervisor and OEH.

Any case of TB in a patient immediately by telephone and by health departments and to Employ and follow up investigation.

Wear a respirator for close or p. When in close contact with a sus.

HEPA respirator. The employee wearing a respirator. Personnel University Health Services (785-3550) at testing, and use.

1.7.5 Evaluation of Health Care 1
Health care workers who have 1 initial baseline TB test at time of Health care workers with PPD t advised to have a chest x-ray and

1.7.6 Continuing Risk Assessment
PPD conversion rates among e reviewed annually by Employee assessment. Any evidence of P.
Challenges of Process Change Improvements

- Cooperation Local Health Departments
- Attrition
- Staff Accountability
- Evaluation
Resources:

- http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5412a1.htm
- http://www.who.int/mediacentre/factsheets/fs104/en/
Questions?

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