Investigation of Contacts of Persons with Infectious Tuberculosis, 2005

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http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5415a1.htm
Contact Investigations – A Crucial Prevention Strategy

• On average, 10 contacts are identified for each person with infectious TB in the U.S.
• 20%–30% of all contacts have LTBI
• 1% of contacts have TB disease
• Of contacts who will ultimately have TB disease, approximately ½ develop disease in the first year after exposure

Benefits of Contact Investigations

• Finding and treating additional TB disease cases (potentially interrupting further transmission)
• Finding and treating persons with LTBI to avert future cases
Contact Investigation Responsibilities

• Health departments are responsible for ensuring contact investigations

• Contact investigations are complicated activities that require:
  – Many interdependent decisions
  – Time-consuming interventions

Key Terms (1)

• **Case** – A particular instance of a disease (e.g., TB). A case is detected, documented, and reported.

• **Contact** – Someone who has been exposed to *M. tuberculosis* by sharing air space with a person with infectious TB.
Key Terms (2)

• **Index** – The first case or patient who comes to attention as indicator of a potential public health problem.

• **Source case or patient** – The case or person who was the original source of infection for secondary cases or contacts; can be, but is not necessarily, the index case.

Decisions to Initiate a Contact Investigation
Characteristics of the Index Patient Associated with Increased Risk of TB Transmission

• Pulmonary, laryngeal, or pleural TB
• Acid-fast bacilli (AFB) positive sputum smear
• Cavitation on chest radiograph
• Adolescent or adult patient
• No or ineffective treatment of TB disease

Behaviors of the Index Patient Associated with Increased Risk of TB Transmission

• Frequent coughing
• Sneezing
• Singing
• Close social network
Decision to Initiate a TB Contact Investigation

- Site of disease
  - Pulmonary/laryngect/pleural
  - Pulmonary suspect (tests pending, e.g., cultures)
  - Non-pulmonary (primary and laryngeal tuberculosis ruled out)

AFB* sputum smear positive

NAA† positive or not performed

- Contact investigation should always be initiated

NAA‡ negative

- Contact investigation not indicated

AFB sputum smear negative or not performed

CXR§

- Abnormal CXR: non-cavitary consistent with TB
  - Contact investigation should be initiated if sufficient resources
- Abnormal CXR: not consistent with TB
  - Contact investigation should be initiated only in exceptional circumstances

*Acid-fast bacilli
†Nucleic acid assay
‡Approved indication for NAA
§Chest radiograph

Investigating the Index Patient and Sites of Transmission
Comprehensive Index Patient Information

• Foundation of a contact investigation
• Information to be gathered includes
  – Disease characteristics
  – Onset time of illness
  – Names of contacts
  – Exposure locations
  – Current medical factors (e.g., initiation of treatment and drug susceptibility results)

Determining the Infectious Period

• Focuses investigation on contacts most likely to be at risk for infection
• Sets time frame for testing contacts
• Information to assist with determining infectious period
  – Approximate dates TB symptoms were noticed
  – Bacteriologic results
  – Extent of disease
Start of Infectious Period

- Cannot be determined with precision; estimation is necessary
- Start is 3 months before TB diagnosis (recommended)
- Earlier start should be used in certain circumstances (e.g., patient aware of illness for longer period of time)

Estimating the Beginning of the Infectious Period

<table>
<thead>
<tr>
<th>Characteristic of Index Case</th>
<th>Likely period of infectiousness</th>
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<tr>
<td>TB symptoms</td>
<td>AFB sputum smear positive</td>
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<tr>
<td>Yes</td>
<td>No</td>
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<td>Yes</td>
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Closing the Infectious Period

Infectious period closed when all the following criteria are met

- Effective treatment for ≥2 weeks,
- Diminished symptoms, and
- Bacteriologic response

Exposure Period for Contacts

Determined by how much time the contact spent with the index patient during the infectious period
Contact Investigation Interview
General Principles

- Establish rapport with patient
- Exchange information
- Review transmission settings
- Record sites of transmission
- Compile list of contacts
- Provide closure
- Conduct follow-up interviews, if needed

Assigning Priorities to Contacts
Factors for Assigning Contact Priorities

• Characteristics of the index patient
• Characteristics of contacts
• Age
• Immune status
• Other medical conditions
• Exposure

Diagnostic and Public Health Evaluation of Contacts
Initial Assessment of Contacts

- Should be accomplished within 3 working days of the contact having been listed in the investigation
- Gathers background health information
- Permits face-to-face assessment of person’s health

Medical Evaluation

All contacts whose skin test reaction induration is $\geq 5$ mm or who report any symptoms consistent with TB disease should undergo further examination and testing for TB
Evaluation and Follow-up of Children <5 Years of Age

- Always assigned a high priority as contacts
- Should receive full diagnostic medical evaluation, including a chest radiograph
- If TST ≤5 mm of induration and last exposure <8 weeks, LTBI treatment recommended (after TB disease excluded)
- Second TST 8–10 weeks after exposure; decision to treat is reconsidered
  - Negative TST – treatment discontinued
  - Positive TST – treatment continued

Evaluation and Follow-up of Immunocompromised Contacts

- Should receive full diagnostic medical evaluation, including a chest radiograph
- If TST negative ≥8 weeks after end of exposure, full course of treatment for LTBI recommended (after TB disease is excluded)
Medical Treatment for Contacts with LTBI

Health Department Responsibilities

- Focusing resources on contacts in most need of treatment
- Monitoring treatment, including that of contacts who receive care outside the health department
- Providing directly observed therapy (DOT), incentives, and enablers
When to Expand a Contact Investigation

Determining When to Expand a Contact Investigation

Consideration of the following factors recommended

- Achievement of program objectives with high- and medium-priority contacts
- Extent of recent transmission
  - Unexpectedly large rate of infection or TB disease in high-priority contacts
  - Evidence of second-generation transmission
  - TB disease in any contacts who had been assigned low priority
  - Infection in any contacts aged <5 years
  - Contacts with change in skin test status from negative to positive
Contact Investigations in Special Circumstances

Congregate Settings

- Correctional Facilities
- Workplaces
- Hospitals and Other Health-Care Settings
- Schools and University Settings
- Shelters and Other Settings Providing Services for Homeless Persons
- Interjurisdictional Contact Investigations
Source-Case Investigations

• Seeks the source of recent *M.tuberculosis* infection
• In the absence of cavitary disease, young children usually do not transmit *M.tuberculosis* to others
• Recommended only when TB control program is achieving its objectives when investigating infectious cases
Reference

Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis: Recommendations from the National Tuberculosis Controllers Association and CDC. *MMWR* 2005; 54 (No. RR–15)


Additional Resources

For additional information on TB, visit the CDC Division of Tuberculosis Elimination Website at http://www.cdc.gov/tb

Guidelines Available Online