

Tuberculosis Case Investigation



Satellite Conference and Live Webcast
 Thursday, December 18, 2014
 10:00 a.m. – 12:00 p.m. Central Time

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

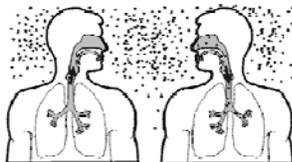
Faculty

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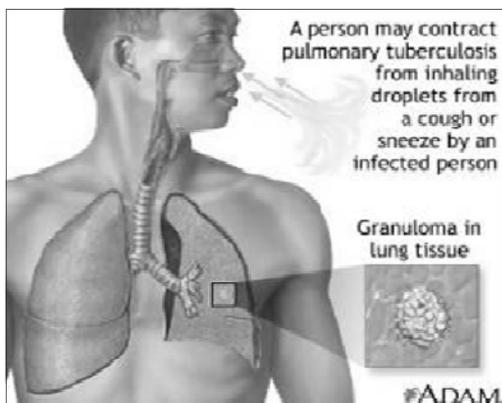
Transmission of *M. tuberculosis*

- TB is caused by *Mycobacterium tuberculosis*
- Transmission occurs from person to person



Transmission of *M. tuberculosis*

- When a person with infections TB disease coughs, sneezes, or speaks, droplet nuclei are expelled
 - 1 - 5 microns in diameter
 - Can remain suspended for several hours
 - If another person inhales these droplets, transmission may occur



Things to Know Prior to Starting an Investigation

- Anatomical Site of Disease
- Sputum Bacteriology
- Radiographic Findings

Tuberculosis

- **Mostly causes a chronic pneumonia that leads to wasting similar to cancer**
- **Can affect any organ system: bones, bone marrow, lymphnodes**
- **Common symptoms include weight loss, fever, night sweats, cough with bloody sputum**

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**

What Is a Contact Investigation?

- **A contact investigation is a procedure for identifying people who were exposed to someone with infectious TB disease**
- **Evaluating these people for latent TB infection (LTBI) and TB disease**
- **Providing appropriate treatment for those with LTBI and TB disease**

Terms

- **Contact: An individual who is at risk for TB infection or disease due to exposure to someone with infectious TB disease**
- **Index patient / case: The individual with confirmed or suspected TB disease reported to the health department**
 - **The index patient is not always the source patient**

Terms

- **High - risk contacts / High - Priority Contacts: Contacts who are to be evaluated without delay, including:**
 - **Those most likely to be infected (e.g., close contacts to highly infectious cases), and**
 - **Those with risk factors for progression to disease once infected**

Terms

- **Source Case, Source Patient: A person with confirmed infectious pulmonary or laryngeal TB who is responsible for transmitting *M.tb* to others**
 - **The source patient is not necessarily the index patient**

Why Is a Contact Investigation Important?

- A contact investigation is important to find contacts who:
 - Have TB disease so that they can be given treatment, and further transmission can be stopped
 - Have LTBI so that they can be given treatment for LTBI

Why Is a Contact Investigation Important?

- Are at high risk of developing TB disease and may need treatment for LTBI until it becomes clear whether they have TB infection

When Is a Contact Investigation Done?

- In general, a contact investigation should be done whenever a patient is found to have or is suspected of having infectious TB disease
- A contact investigation should be done when TB is confirmed or there is a high clinical suspicion of TB

Prioritizing Contact Investigations

- Who was exposed to the TB patients that is most likely to be infectious
- Who is at highest risk for TB infection or TB disease

How Quickly Should a Contact Investigation Be Carried Out?

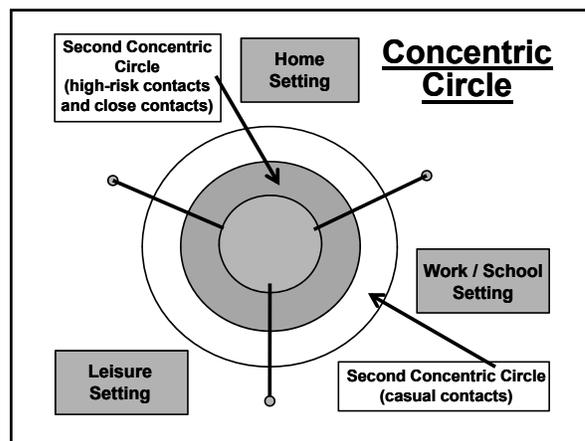
- No more than three working days after the case is reported to the health department
- Close contacts should be examined within seven working days after the index case has been diagnosed

Who is Responsible for a Contact Investigation?

- The health department is legally responsible for ensuring that a complete contact investigation is done for the TB cases reported in its area
- This includes:
 - Identifying and evaluating contacts

Who is Responsible for a Contact Investigation?

- Treating any contacts found to have TB disease
- Offering treatment for LTBI to infected contacts
- Monitoring adherence to prescribed regimens and ensuring a system is in place to assess completion of treatment



Concentric Circle

- Concentric Circle:
 - A method of classifying and screening contacts in order of intensity of exposure and risk of being infected
 - Contacts with the most exposure or highest risk of infection are screened first

Steps in a Contact Investigation

- In general, contact investigations follow a process that includes these steps:
 - Medical record review
 - Patient interview
 - Field investigation
 - Risk assessment for *M. tuberculosis* transmission

Medical Record Review / Interview

- The first step in a contact investigation is to review the TB patient's medical record and ask the clinician for information to determine whether the patient has been infectious and, if so, when

Medical Record Review / Interview

- The Interview, this information includes disease characteristics, onset time of illness, names of contacts, exposure locations, and current medical factors (e.g., initiation of effective treatment and drug susceptibility results)

Patient Interview

- The patient interview is one of the most critical parts of the contact investigation, because the health care worker who interviews the patient serves as the main link between the health department and the contacts

Interviewing the Patient

- In addition to setting the direction for the contact investigation, the first interview provides opportunities for the patient to acquire information regarding TB and its control and for the public health worker to learn how to provide treatment and specific care for the patient

The Period of Infectiousness

- The period of infectiousness is the time period during which a person with TB disease is capable of transmitting *M. tuberculosis*
- Determining the period of infectiousness can help focus the contact investigation efforts on those persons who were exposed while the patient was infectious

The Period of Infectiousness

- Estimating the period of infectiousness should be done by clinical and supervisory staff after a complete assessment of the information available

Completing the Interview

- Before completing the interview, the health care worker and the patient should decide who will notify the contacts
 - Some TB patients prefer to notify their contacts themselves, especially when the contacts are family members or close friends
 - Others prefer that the health care worker notify the contacts

Investigation

- Establishing rapport
- Information exchange
- Transmission settings
- Sites of transmission
- List of contacts
- Closure
- Follow - up interviews

Steps in a Contact Investigation

- Decision about priority of contacts
- Evaluation of contacts
- Treatment and follow - up for contacts
- Decision about whether to expand testing
- Evaluation of contact investigation activities

Field Investigation

- Field investigation - visiting the patient's home or shelter, workplace (if any), and the other places where the patient said he or she spent time while infectious

Field Investigation

- Visiting the index patient's residence is especially helpful for finding children who are contacts
 - The visit should be made < 3 days of the initial interview
 - Each site visit creates opportunities to interview the index

Field Investigation

- Pertinent details include room sizes, ventilation systems and airflow patterns
 - These factors should be considered in the context of how often and how long the index patient was in each setting

Field Investigation

- Health care workers should remember to follow infection control precautions while visiting a potentially infectious TB patient at home or in any other location
- Another critical consideration during field investigation is safety

Confidentiality and Consent in Contact Investigations

- HIPPA
- Maintaining confidentiality is challenging during contact investigations because of the social connections between an index patient and contacts
- Constant attention is required to maintain confidentiality

Review Source - Case Investigations

- A source - case investigation seeks the source of recent *M. tuberculosis* infection, perhaps newly diagnosed TB disease
 - TB disease in children aged < 5 years typically indicates that the infection must be recent

Review Source - Case Investigations

- For this reason, it is a sentinel public health event
- Young children usually do not transmit TB to others, and their contacts are unlikely to be infected because of exposure to them

Field Investigation (Site Visits)

- Site visits are complementary to interviewing
- Should be made ≤ 3 days of the initial interview
- Elicits additional contact information; especially helpful for finding children
- Lack of site visits has contributed to TB outbreaks

Prioritization of Contacts (1)
Patient has pulmonary, laryngeal, or pleural TB with cavitory lesion on chest radiograph or is AFB sputum smear positive

Household contact	High
Contact < 5 years of age	High
Contact with medical risk factor (HIV or other medical risk factor)	High
Contact with exposure during medical procedure (bronchoscopy, sputum induction, or autopsy)	High
Contact in a congregate setting	High
Contact exceeds duration/environment limits (limits per unit time established by the health department for high-priority contacts)	High
Contact is ≥ 5 years and ≤ 15 years of age	Medium
Contact exceeds duration/environment limits (limits per unit time established by the health department for medium - priority contacts)	Medium

Any contact not classified as high or medium priority is assigned a low priority.

Special Considerations

Contact Investigations in Congregate Setting (CICS)

- Schools
- Workplaces
- Prisons / Jails
- Shelters
- Places of Worship

Congregate Settings

- **Concerns associated with congregate settings**
 - Substantial number of contacts
 - Incomplete information regarding names and locations
 - Incomplete data for determining priorities
 - Difficulty in maintaining confidentiality

Congregate Settings

- **Concerns associated with congregate settings**
 - Collaboration with officials and administrators who are unfamiliar with TB
 - Legal implications
 - Media coverage

Possible Situations for News Coverage

- **Certain contact investigations have the potential for sensational news coverage**
- **Examples include:**
 - Involving numerous contacts (especially children)

Possible Situations for News Coverage

- Occurring in public settings
- Occurring in workplaces
- Associated with TB fatalities
- Associated with drug - resistant TB

Schools

- Day Care
- Elementary
- High School
- College / University

Schools

- **Early collaboration with school officials and community members is recommended**
- **Issues of consent, assent and disclosure of information more complex for minors**
- **Site visits should be conducted to check indoor space, observe general conditions and interview maintenance personnel regarding ventilation**

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
- TST \leq 5 mm of induration and last exposure < 8 weeks, LTBI treatment recommended (after TB disease excluded)

Evaluation and Follow - Up of Children < 5 Years of Age

- Second TST 10 - 12 weeks after exposure; decision to treat is reconsidered
 - Negative TST – treatment discontinued
 - Positive TST – treatment continued

Workplaces

- Private Industry
- Hospital
- University
- Military Installation

Workplaces

- Duration and proximity of exposure can be greater than for other settings
- Details to gather from index patient during initial interview include
 - Employment hours
 - Working conditions
 - Workplace contacts

Workplaces

- Occasional customer of workplace should be designated as low priority

Prisons / Jails

- Detention Group Home / Center
- Local Jail
- Prison (DOC)

Correctional Facilities

- Establish preexisting formal collaboration between correctional and public health officials
- Trace high priority contacts who are transferred, released, or paroled before medical evaluation for TB
- Low completion rate is anticipated unless follow-through supervision can be arranged for released or paroled inmates

Shelters

- In House Population
- Transient Population

Shelters and Other Settings Providing Services for Homeless Persons

- Challenges include
 - Locating the patient and contacts if mobile
 - Episodic incarceration
 - Migration from one jurisdiction to another

Shelters and Other Settings Providing Services for Homeless Persons

- Psychiatric illness
- Preexisting medical conditions
- Site visits and interviews are crucial
- Work with setting administrators to offer onsite supervised intermittent treatment

Places of Worship

- Mega Church
- Small Church
- Non - traditional Church

Congregate Setting Setting - Based Investigation

- Interview and test contacts on site is optimum approach
- Alternative is evaluation at the health department with additional personnel and extended hours
- As last resort, notify contacts in writing to seek diagnostic evaluation with their own health care provider

Congregate Setting Designing Priorities

- **Site Specific**
- **Customized algorithm required for each situation**
 - **Source - case characteristic**
 - **Duration and proximity of exposure**

Congregate Setting Designing Priorities

- **Environmental factors that modify transmission**
- **Susceptibility of contacts**

TB Transmission

- **Probability that TB will be transmitted depends on:**
 - **Infectiousness of person with TB disease**
 - **Environment in which exposure occurred**
 - **Length of exposure**
 - **Virulence (strength) of the tubercle bacilli**

TB Transmission

- **The best way to stop transmission is to:**
 - **Isolate infectious persons**
 - **Provide effective treatment to infectious persons as soon as possible**