



The Role of TB Control Programs in Contact Investigations

Heidi Hammond-Epstein, RN, BSN, MPH
Senior Community Health Nursing Supervisor
Florida Department of Health- Broward County

Contact Investigations

- A crucial preventative strategy in the control and elimination of TB that encompasses all aspects of TB Control
- Second highest priority in a TB Control Program
- Health departments are responsible for contact investigations
- Contact investigations are complicated ongoing activities that require
 - Time-consuming and resource intensive interventions
 - Systematic processes

Why do contact investigations?

- Identify and treat additional TB disease cases (potentially interrupting further transmission)
- Identify and treat those with newly acquired infection to avert future cases
- Of those with newly acquired infection, 5% will progress to active disease within two years of exposure.
- Yields a 20-30% infection rate!
- The prevalence of TB disease among close contacts is much higher than in the general population.
- When possible to identify the source of the TB transmission

Decisions to Initiate a Contact Investigation

- Decision to investigate an index patient depends on the presence of 3 factors used to predict likelihood of transmission
 - Characteristics/Infectiousness of person with TB (*Person*)
 - Anatomical site of the disease
 - Positive sputum bacteriology
 - Radiographic findings
 - Age
 - Symptoms
 - Effective treatment
 - Environment in which exposure occurred (*Place*)
 - Duration of exposure (*Time*)
- Public Health designees must decide which Contact Investigations should be assigned a higher priority and which contacts to evaluate first

Prioritizing Contact Investigations

- CI should be done promptly on all cases verified to have infectious disease. AFB smear or culture positive sputum/laryngeal and cavitory disease are given the highest priority
- CI process should be initiated for Suspect TB case with positive smears and/or cavitory disease
- Should only be considered if resources allow on those whose are sputum smear negative and who have non cavitory CXR's consistent with TB.
- CI not usually indicated on pulmonary suspects with AFB smear positive, NAA negative; extra pulmonary disease and children under the age of 10

Prioritizing Contacts

- Based on probability of infection and risk of contact developing TB disease as well as availability of resources.
- Priority should be given to those who are HIV infected or have a weakened immune system; infants and children < 5 yrs of age; those exposed during medical procedures and secondary cases of TB
- Resources should be allocated to completing all investigative steps in high and medium risk priority contacts

Which Contact Investigation would you consider to be the highest priority?

1. AFB smear negative, cavitory x-ray, symptomatic
2. AFB smear positive, *M.tb* culture pos, HIV-pos
3. AFB smear positive sputum, NAA-pos, symptomatic
4. AFB smear positive, NAA-pos, asymptomatic

Pre-interview Phase

- Collecting comprehensive information on the index patient is the starting point of a contact investigation.
 - Collect information about the client's
 - PMH, diagnostic tests related to the current TB diagnosis, including onset, symptoms, bacteriology, x-ray results, treatment regimen and demographic data.
- Sources may include
 - Medical record
 - Reporting physician/care provider
 - Case Interview
- Determine whether the client is infectious and, if yes, when did the infectious period begin

Determining the Infectious Period

There Is No Precise Method

- Allows us to focus the investigation on contacts who are at risk and assists in setting timeframes
- In **Symptomatic** Patients
 - Infectious period = **3 months** before symptom onset.
- In **Asymptomatic** Patients with Positive Smear
 - Infectious period = **3 months** before positive finding consistent with TB.
- In **Asymptomatic** Patients with Negative Smear
 - Infectious period = **4 weeks** before positive findings consistent with TB

Closing the Infectious Period

- Infectious period closes when the following criteria have been met:
 - ✓ Index case has effective treatment for 2 weeks or longer
 - ✓ Clinical Improvement
 - ✓ Bacteriological improvement
- Effective isolation can end the infectious period for CI purposes
- Exposure period for contacts is determined by how much time they spent with the index case

Estimate the infectious period

Index patient Characteristics:

Cough since Christmas 2009, hospitalized 1/15/10

Smear-positive/MTD-positive 1/16/10

RIPE started 1/16/10

Leaves hospital against medical advice 1/20/10

1. 1/15/10 – 1/30/10
2. 9/20/09 – ?
3. 8/20/09 – 1/30/10
4. 11/25/09 – ?

Case Interview Phase

- Initial Interviews should be conducted in person within 1 business day of reporting for infectious cases and again 1-2 weeks later followed with a **complementary site/field visit**
- Establish **rapport** with patient
- Assure privacy and **confidentiality**
- Assess accuracy of pre interview information
- Ascertain knowledge base/provide **client education**
- Review transmission settings/duration
- Compile list of contacts based on the start of the infectious period
- Develop **Contact Investigation Plan** to include
 - List of identified contacts and their **assigned priority**, written timeframes for monitoring investigation process, evaluation and treatment outcomes and standardized recording of data,
- **Proxy interviews** may be conducted if necessary
- Follow up interviews may be indicated

Prioritizing Contacts

Select the three highest priority CI's.

INDEX CASE	CONTACT	SITE
1. Pulmonary, smear negative, weight loss, slight cough	Healthy infant	Daycare
2. Laryngeal disease, febrile, weakness	45 yr old transport driver, health status unknown	Prison
3. BAL smear negative, cough, weakness	79 yr old roommate, dementia	Assisted living facility
4. Pulmonary, smr 3+, asymptomatic	22 yr old diabetic, kidney failure	Kidney dialysis center
5. Pulmonary, smear negative, chronic cough	14 yr old student, seems healthy but has missed school	Middle school
6. Lymphatic disease, night sweats, febrile, weight loss	Shelter volunteer, HIV+, cough, SOB, febrile, night sweats	Homeless shelter

Contact Interview Phase

- Should be conducted in person within 7 working days after identification on high priority contacts
- Obtain information about the client's medical history, co-morbidities, previous TB history
- **Current symptoms of TB illness**
- HIV status; contacts should be offered HIV counseling and testing if status unknown
- Type, duration, and intensity of TB exposure
- Barriers to Adherence

Initial Assessment of Contacts

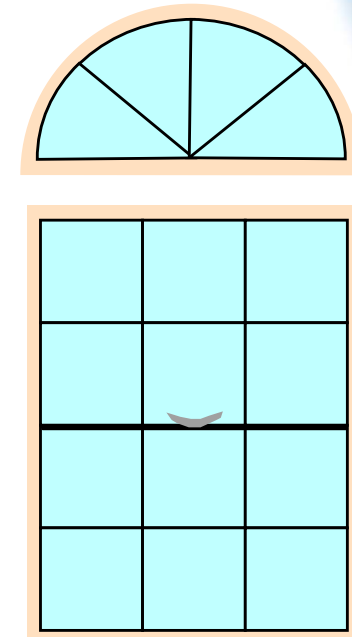
- Symptom screening
- TST/IGRA – high/medium priority contacts, regardless of age
- HIV – all high and medium contacts with unknown HIV status
- CXR –
 - All symptomatic contacts
 - Immune suppressed contacts regardless of TST/IGRA results
 - All contacts who have a TST ≥ 5 mm or a positive IGRA
 - Children under the age of 5 years
- Determine which contacts should receive window period treatment.
- Treatment as indicated

What is the “window period”?

- 8-10 week interval from a contacts last exposure to an infectious case of TB

What is “window period” testing?

- Repeat TST/IGRA done at the end of the window period if the initial TST/IGRA was negative



What is “window period” treatment?

- LTBI treatment offered to immune suppressed contacts who have an initial negative test

When to Expand a Contact Investigation

- Review and evaluation of data and outcomes should be performed at 2 weeks then at regular intervals thereafter
- Expanding a Contact Investigation should be based on investigation data and take into consideration the following factors
 - Program objectives with high- and medium-priority contacts have been met
 - Evidence of recent transmission
 - Unexpectedly large rate of infection or TB disease
 - Infection in any contacts aged <5 years
 - Contacts with change in skin test status from negative to positive
 - TB disease in any contacts who had been assigned low priority
- In absence of recent transmission, investigation should not be expanded

Promoting and Supporting Adherence

- Case manage infected contacts as a part of the management of the index case
- Use DO(P)T, incentives and enablers
- Make phone calls, send reminder letters, make home visits, and track medication pick-ups
- Focus resources on contacts in most need of treatment
- Reinforce education and the importance of completing treatment at every opportunity
- Inter-jurisdictional follow-up

Congregate Settings

- Congregate settings may include schools, jails, homeless shelters, ACLF's, hospitals
- Concerns and challenges associated with exposure in these types of settings
 - Large numbers of contacts
 - Vulnerable contacts
 - Inaccuracy or unavailable information
 - Difficulty maintaining confidentiality
 - Movement/transient
 - Lack of formal collaboration
 - Legal implications
 - Media

Case Review

- Identifying Data:
 - Age: 16
 - Race: Black
 - Sex: Female
 - Country of Birth: USA
- Risk Factors:
 - Homeless: No -Drug Use: No
 - Alcohol: No -HIV status: Neg.
 - Close Contact: Yes

Case Review

- Objective Findings:
 - Symptoms
 - Cough, weight loss, and fever for 1 month
 - Previous TB History:
 - None
 - TST results:
 - 18mm
 - Initial X-ray:
 - Extensive infiltrates Left upper lobe(LUL) with large cavitary lesions

Case Review

- Objective Findings: continued
 - Smear
 - Sputum: Many AFB on smear-4/3/00, 4/4/00, 4/5/00
 - MTD
 - Positive
 - CULTURE:
 - Positive
 - Sensitivity:
 - Pan-sensitive
 - Site of TB:
 - Pulmonary

Case Review

- Lives with her 39 yr old mother and 2 brothers ages 1½ and 5.
- Attends 10th grade at a local high school in a special education class, which included a work release program on Mondays & Fridays at a local daycare, where she assisted in the Pre-K classroom for approximately 2 1/2 hours each day.
- She spent many hours of her time at her grand-mother's house, where the grand-father was treated for pulmonary TB by the Broward County Health Department (BCHD) in 1999.

Case Review

- THE CONTACT INVESTIGATION

- Household:

- #identified 3
 - #evaluated 3
 - #prior TST+ 0
 - #with TB disease 0
 - #with LTBI 3
 - #started LTBI 3
 - #completed LTBI Treatment 3

Case Review

- Was evidence of transmission found?
 - Yes
 - 1 and 1/2 year old converted at 3 month repeat test
 - 39 year old and 5 year old PPD+ at initial testing
- High School: last date attended March 30, 2000
 - Initial Screening on April 12, 2000
 - # identified 51
 - #evaluated 51
 - #prior TST positive 01
 - #with TB disease 00
 - #with LTBI 02

Case Review

- Was evidence of transmission found?
 - NO
 - The positivity rate was only 4%
 - Repeat screening on June 12, 2000
 - #identified 51
 - #evaluated 39
 - #with TB disease 00
 - #with LTBI 04
- Was evidence of transmission found?
 - Yes
 - We had 4 conversions out of 39 retested (10%)

Case Review

- Day Care: Last day worked 03/27/2000
 - #identified 14
 - #evaluated 14
 - #prior TST positive 00
 - #with TB disease 00
 - #with LTBI 00
- Was evidence of transmission found?
 - No
 - All had previous negative PPD's for school entrance. No conversions three months post exposure.
- Contact investigation complete

Contact Investigation Exercise

- MJ is a 35 year old male who was hospitalized on August, 1st with symptoms of fever, SOB, productive cough and a 20 pound weight loss. He was admitted to the hospital and placed in airborne isolation. MJ states the symptoms began around 8 weeks ago after he got wet in the rain while at work. AFB sputum smears were positive with a positive NAA for MTBc. CXR findings revealed a RUL cavity. RIPE therapy started on August 3rd. His symptoms subsided on August 24th and his AFB sputum smears became negative on August 30. He works as a landscaper and lives with his wife and their 2 year old son and 8 month old daughter. His wife babysits the neighbor's 8 year old son during the week while his mother works the night shift at a local store.
1. Is a CI warranted?
 2. If yes, what are the dates of the beginning and end of the infectious period?
 3. Which contacts would you give the highest priority?
 4. What would your initial assessment/work up of the contacts include?

Summary

- Contact Investigation is a vital strategy in the control and elimination of TB and must be a priority within a TB Control program
- Requires, extensive interventions, prompt identification, continuous and close follow-up, collaboration, education, and pre existing partnerships.
- Public Health Departments are tasked with the responsibility of
 - Protecting the public's health
 - Ensuring that contact investigations are performed and completed in a timely and cost effective manner .
 - Exposed and or infected contacts receive appropriate medical interventions and **complete an adequate course of therapy** if indicated, including that of contacts who receive care outside the health department.
- Every case of TB started as a contact, without the ability to identify cases and conduct contact investigation, TB elimination will be impossible