



# Fundamental Concepts of Contact Investigations

Statewide TB Nurse's Training  
2011

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## References:

Guidelines for the Investigation of Contact of Persons with Infectious Tuberculosis

Recommendations from the National Tuberculosis Controllers Association and CDC  
*MMWR* December 16, 2005  
54(No.RR-15)

## TB Control and Prevention

- **Priority 1 – Index patient**
  - Promptly detect, report and treat with effective drug regimens all persons who have, or are suspected of having, active TB disease.
- **Priority 2 – Contact investigation**
  - Identify close contacts of patients with contagious TB and completely treat those who are found to be infected.
- **Priority 3 – Targeted testing**
  - Prevent TB among populations infected with LTBI who are at greatest risk for progressing to disease.
- **Priority 4 – Infection control**
  - Prevent transmission in settings at high risk for transmission through effective infection control measures.

## Contact Investigation A Critical TB Control Strategy

- Most effective strategy for preventing future cases of TB
- On average, 10 contacts are identified for each person with infectious TB in the U.S.
- 30-40% of contacts will be infected
- Of those with new TB infection, 5% will progress to active disease within two years of exposure
- The prevalence of TB among close contacts is close to 100 fold higher than in the general population

## Goals and Objectives

- To prevent further cases of TB by
  - Finding secondary TB cases.
  - Identifying those who have been infected.
  - Treating infected contacts to completion.
- Additional Benefits
  - Prevent TB infection in contacts not already infected
  - Educate individuals and the community
  - Identify the source of disease when appropriate

## Know Who is Responsible

- The health department is . . .
  - Legally responsible for ensuring that a complete contact investigation is done for the TB cases reported in its area
- The TB case management team is . . .
  - A multidisciplinary team of individuals
    - Nurse, physician, ORW, state health office, clerk, lab .....
    - What resources are available?
    - Which investigations should be assigned higher priority?
    - Which contacts to evaluate first?

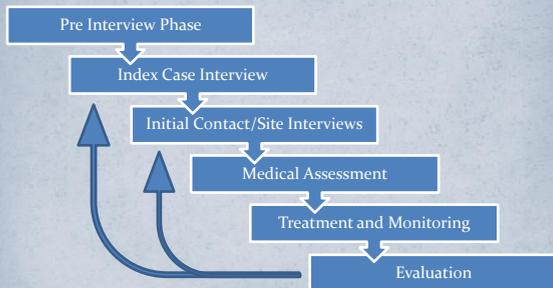
## Definitions

- **Index case:**
  - The first patient that comes to your attention as a TB case.
- **Contact:**
  - Refers to someone who has been exposed to tuberculosis by sharing air space with a person who is infectious.
- **Infectious period:**
  - The period of time a person with infectious TB disease is capable of transmitting TB bacilli.

## Definitions

- **Exposure:**
  - Length of time spent with a person with active infectious TB disease during the infectious period
- **Date of last exposure: (Break in exposure)**
  - Date a contact was last exposed to an infectious case of TB
- **Source investigation:**
  - An investigation which seeks the source of recent TB infection. This activity most commonly occurs when young children are involved

## Contact Investigation Process



## Medical Record Review

- Preliminary determination of the infectiousness of the client
- If infectious, determine when the infectious period begins
- Collect information about the client's TB disease, symptoms, bacteriology, x-ray results, and treatment regimen.



## Determining the Infectious Period

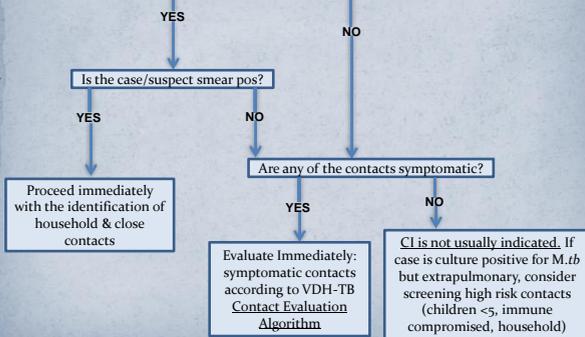
- The Beginning
  - Symptomatic Patients
    - **3 months** before symptom onset
  - Asymptomatic Patients with Positive Smear
    - **3 months** before positive finding consistent with TB
  - Asymptomatic Patients with Negative Smear
    - **4 weeks** before positive findings consistent with TB
- The End
  - Clinical improvement (subjective and objective)
  - Adherence to appropriate treatment for 2 – 3 weeks
  - Sputum smear negative – congregate settings
  - Drug Resistance??

## Interview of the Index Case

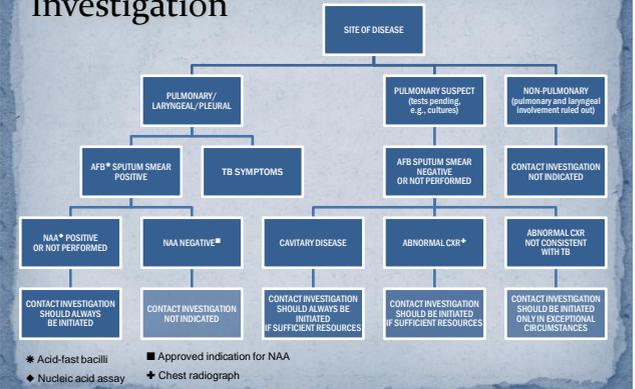
- One to three days after notification
  - repeat in 2 weeks and periodically during course of care
- Includes:
  - **Potential exposure locations**
  - **Potential contacts**
  - Disease characteristics
  - Current medical information



## A suspect or confirmed case is reported! Is the site of disease pulmonary or laryngeal?



## Decision to Initiate a TB Contact Investigation



## Environmental Factors that Predict Likely Transmission

- Small or Crowded Rooms
- Recirculated air
- Areas that are poorly ventilated
- Areas without air cleaning systems.

Grade	Space Description	Locally Identified Environmental Limits
1	Very small space (car, small office, 120 ft <sup>2</sup> )	8 hours
2	Small/Medium space (bedroom, classroom, meeting room, etc.)	24 hours
3	Medium/Large space (cafeteria, small church, etc.)	50 hours
4	Large space (gymnasium, auditorium, etc.)	100 hours

- Monthly hourly total of 120 hrs when exposed to non-cavitary cases.
- If seated closely to a contagious patient on a single trip of  $\geq 8$  hrs.

## Initial Contact Encounter

- Accomplish this face to face meeting within 3 working days of identification.
- Gather background health/psychosocial information:
  - Symptoms of TB
  - Assess extent of exposure to the index case
  - Previous TB disease/testing
  - Other medical co-morbidities (abnormal CXR, immune compromising disease, medications, mental health)
  - Place the TST at this time if possible
  - Perform HIV test if status is unknown
  - Demographics – distinguishing characteristics

## Contact Medical Evaluation

- HIV Testing
- TST if not done at initial encounter (5 days for high/higher, 10 days for medium)
- Chest X-ray and Medical Exam
  - Children < 4 years old
  - HIV + individuals
  - TB symptoms
  - TST > 5 mm
- Sputum Exam X 3 (early morning specimens)
  - TB symptoms
  - Suspicious chest x-ray

## Treatment of TST Positive ( $\geq 5$ mm) Contacts

- Rule out TB disease
- Acceptable regimens:
  - Preferred – Isoniazid:
    - Nine months: daily (270 doses – 12 months)
    - Intermittent DOT (76 doses – 12 months)
  - Acceptable – Rifampin: Four months daily (120 doses)
  - Generally Not Recommended – Rifampin/Pyrazinamide

A decision to test is a decision to treat to completion

## Evaluation and Treatment of Contacts with Documented Previous Positive TST

- Gather background health/psychosocial information.
- Determine current risk for progression to disease.
- Assess for symptoms of active TB. If present, conduct:
  - Medical evaluation
  - Chest x-ray
  - Sputum for AFB x 3
- Provide education.
- Individualize treatment.

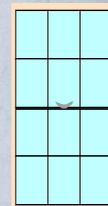
## What is the window period?

- 10 week interval beginning at 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 TST/IGRA

## Contacts of MDR/XDR Cases

- **Seek expert consultation**
  - YOUR State Health Office 804- 864-7935
- Prioritization strategy is the same as for those who are contacts to pan sensitive cases.
- There are no **proven** effective treatment regimens
  - PZA/EMB
- Monitor every six months for two years

*CDC. Management of persons exposed to multidrug-resistant tuberculosis. MMWR 1992;4(No. RR-11):59-71*

## Assigning Priorities to Contacts

Who do I Find First?



**I: AFB sputum smear (+) pulmonary/laryngeal/pleural TB;  
TB suspects or confirmed cases with cavitary chest radiographs:**

### High Priority Contacts:

- All household contacts
- Anyone aged <5 yrs old
- Contacts with Medical Risk Factors: HIV or other immune compromising condition
- Contacts exposed during a medical procedure: Bronchoscope, Sputum induction or Autopsy
- Contacts in a congregate setting
- Contacts with exposure exceeding environmental limits (Nurse Case Manager discretion)



**This type of case has the most high priority groups listed and should have the most contacts located...**

**I: AFB sputum smear (+) pulmonary/laryngeal/pleural TB;  
TB suspects or confirmed cases with cavitary chest radiographs:**

### Medium Priority Contacts:

- Anyone aged 5-15 yrs old
- Contacts with exposure exceeding environmental limits (TB Control suggested limits)

### Low Priority Contacts:

- Anyone other than above; only considered if expansion is warranted

**II: AFB sputum smear (-) Suspect or Case; pulmonary/ laryngeal or pleural TB; abnormal/non-cavitary chest radiograph consistent with TB disease; NAA (+/-); Culture (+)**

**High Priority Contacts:**

- Anyone aged <5yrs old
- Contacts with Medical Risk Factors: see above
- Contacts exposed during a medical procedure: see above

**This type of case has a smaller chance to transmit TB, (12%-24%) compared to smear (+) cases. High priority contacts still must be located...**

**II: AFB sputum smear (-) Suspect or Case; pulmonary/ laryngeal or pleural TB; abnormal/non-cavitary chest radiograph consistent with TB disease; NAA (+/-); Culture (+)**

**Medium Priority Contacts:**

- All household contacts
- Contacts in a congregate setting
- Contacts with exposure exceeding environmental limits (TB Control suggested limits)

**Low Priority Contacts:**

- Anyone other than above; only considered if expansion is warranted

**III: Suspected tuberculosis; (TB) with abnormal chest radiographs not consistent with TB disease; AFB sputum smear (-); NAA (-); Culture (-)..."Clinical Cases"**

**Medium Priority Contacts:**

- All household contacts
- Anyone aged <5yrs old
- Contacts with Medical Risk Factors: see above
- Contacts exposed during a medical procedure: see above

**Low Priority Contacts:**

- Anyone other than above; only considered if expansion is warranted

**This type of case has No High Priority Contacts. Contact Investigation is limited or not indicated. Resources should be used for culture (+) cases...**

**IV: Nonpulmonary or Extra-pulmonary TB**

Contact investigation is **not indicated** for these cases if **pulmonary and pleural TB are appropriately ruled out**.

## What's New on the 502!

- Date Reported to HD
  - CDC question
  - Timely reporting = timely intervention
- Date CI Initiated
  - Program Evaluation question
- Last exposure date
  - Necessary to determine
    - "Round 2" testing dates
    - Conversions
- IGRA

## Reporting Contacts

- Using the 502
  - Why
  - How
  - When

The image shows a sample of the 'GENERAL DEPARTMENT OF HEALTH SERVICES OF FURBERG COUNTY, IOWA - THE CONTACT INVESTIGATION FORM FOR 502'. The form is a structured table with multiple columns and rows, designed for recording contact investigation data. The columns include fields for 'Case No.', 'Name', 'Address', 'City', 'State', 'Zip', 'Date Reported', 'Date of Exposure', 'Date of Onset', 'Date of Completion', 'Status', 'Type of Contact', 'Investigator', 'Comments', and 'Remarks'. The rows are organized into sections for 'Case Information', 'Contact Information', and 'Investigation Details'. The form is intended to be filled out by health department staff during contact investigations.

## Why must we report contacts?

- The CDC is changing focus
- Fewest cases counted in recorded history
- Missed contacts slow the decline of morbidity

“Every case was once a contact...”

## How to Report Contacts

- Follow the definitions and instructions provided on the reverse side of the form
- Fill out the 502 as completely as possible
- Help is always available – Call me anytime

Paul Regan PHA – 804-864-7969

Fax – 804-371-0248

## When to fax the 502 CI report form

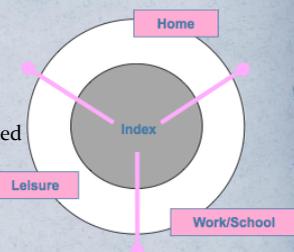
- **Initial - 4 weeks** after the date the CI was initiated
  - Include round 1 testing information
  - Include as much as is available at that time
- **Follow-up - 4 months** after the date the CI was initiated
  - Include round 2 testing results & updates from round 1
  - Normally, round 1 testing should be complete with infected contacts starting LTBI treatment within 4 months
- **Final - no later than 15 months** after the CI was initiated
  - Include final outcomes for all identified contacts
  - For all contacts who started LTBI treatment, include the completion date or the 'stop' reason with date

## Stretch Break – Take 5.....quickly!



## Priority Ranking/Concentric Circle

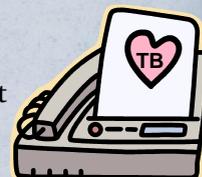
- Current surrogates for estimating exposure do not predict chance of infection
- The vulnerability of the contacts are not accommodated
- Estimates for community prevalence are not known
- When prevalence is known, but high, end-point for the investigation is obscured



## The Whole Shebang!

Making the decisions!

The Case  
The Site  
The Contact



## Prioritizing: The Big Picture - Cases

It's 4:45 pm, Friday. All index pts. are NAA, Mtb pos.

INDEX CASE	SITE	CONTACT
Pulmonary, smear negative, weight loss, slight cough		
Laryngeal disease, febrile, weakness		
BAL smear negative, cough, weakness		
Pulmonary, smear 3+, asymptomatic		
Pulmonary, smear negative, chronic cough		
Lymphatic disease, night sweats, febrile, weight loss		

## Prioritizing: The Big Picture - Sites

It's 4:45 pm, Friday. All index pts. are NAA, Mtb pos.

INDEX CASE	SITE	CONTACT
Pulmonary, smear negative, weight loss, slight cough	Daycare	
Laryngeal disease, febrile, weakness	Prison	
BAL smear negative, cough, weakness	Assisted Living Facility	
Pulmonary, smear 3+, asymptomatic	Kidney Dialysis Center	
Pulmonary, smear negative, chronic cough	Middle School	
Lymphatic disease, night sweats, febrile, weight loss	Homeless Shelter	

## Prioritizing: The Big Picture - Contacts

- Work independently!
- Review the handout
- Steps
  1. Consider the infectiousness of the case
  2. Consider the likelihood of transmission at the site identified
  3. Determine the vulnerability of the listed contact
  4. Decide what you would do first, second and third

## Prioritizing: The Big Picture - Contacts

It's 4:45 pm, Friday. All index pts. are NAA, Mtb pos.

INDEX CASE	SITE	CONTACT
Pulmonary, smear negative, weight loss, slight cough	Daycare	Healthy Infant
Laryngeal disease, febrile, weakness	Prison	45 y/o transport driver
BAL smear negative, cough, weakness	Assisted Living Facility	79 y/o roommate, dementia
Pulmonary, smear 3+, asymptomatic	Kidney Dialysis Center	22 y/o diabetic, kidney failure
Pulmonary, smear negative, chronic cough	Middle School	14 y/o student, seems healthy but has missed school
Lymphatic disease, night sweats, febrile, weight loss	Homeless Shelter	Shelter volunteer, HIV+, cough, SOB, febrile, night sweats

Questions?

**Remember!**

Every TB case  
started out as a contact