



FRANCIS J. CURRY  
NATIONAL  
TUBERCULOSIS  
CENTER

# Tuberculosis Contact Investigation in Jail

A FACILITATOR GUIDE



University of California  
San Francisco



**TUBERCULOSIS CONTACT INVESTIGATION IN JAIL:  
A FACILITATOR GUIDE**

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<http://www.nationaltbcenter.edu>

Feedback and comments related to this product are welcome, please email:  
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# INTRODUCTION

## What is Tuberculosis (TB)?

TB is a disease caused by a bacterium, or germ, called *Mycobacterium tuberculosis* (or *M. tb*). It usually attacks the lungs but it can affect any part of the body. If TB is in the lungs, it usually is contagious. TB can cause sickness and even death if left untreated. With proper diagnosis and treatment, TB is almost always curable.

TB bacteria can be spread through the air when someone with contagious TB coughs, sneezes, laughs, or sings. Anyone nearby can breathe in these germs and become infected depending on the duration, intensity, and frequency of the exposure they have had with the person with infectious TB.

## Why is TB a challenge in the jail setting?

TB has been a challenging problem in the jail setting for many years. Jails and prisons have been implicated in TB outbreaks. TB is a potentially fatal, contagious disease that can infect anyone in (or who visits) jail, including inmates and employees, family, and, in turn, the local community.

Careful testing for TB disease during jail intake is crucial, but studies have shown that screening practices sometime fall short of expectations. A continual emphasis on intake testing for TB decreases exposure risks for inmates and employees.

Certain correctional populations have a high prevalence of HIV infection. People with HIV infection are at a high risk for developing TB disease once they have been exposed to the TB bacteria. In some jails, HIV-infected inmates might be segregated for access to health care and this can increase TB transmission. HIV increases the urgency of watching carefully for TB.

If TB exposure is suspected, offering voluntary HIV counseling, testing, and referral is strongly recommended.

## What is a TB contact investigation?

A contact investigation is the process of finding, notifying, screening, and treating persons who might have latent TB infection (LTBI) or TB disease as a result of recent contact with a person diagnosed with TB disease. This process should be undertaken promptly after an inmate/TB patient is identified.

The overall goal of a TB contact investigation is to interrupt transmission of *M. tb* by: 1) identifying, isolating, and treating persons with TB disease; and 2) identifying infected contacts and providing them with a complete course of treatment for LTBI, which prevents TB disease from developing.

The contact investigation can also serve to educate jail staff and inmates about the risk, treatment, and prevention of TB in jail facilities. It can inform jail staff and inmates regarding the importance of engaging in recommended TB control practices and procedures within the jail system and the importance of completing therapy for persons with TB disease and LTBI.

## Why is it a challenge to conduct a contact investigation in the jail setting?

Multiple factors can make TB contact investigation in jail challenging. These factors include: 1) inmates move throughout a correctional facility on both daily and weekly schedules, this can affect TB exposures; 2) there is a rapid turnover of inmates and crowding; AND 3) the number of contacts who had close proximity to a TB patient/inmate can be high, and yet exposure might be brief. This complicates the process of assigning priorities to contacts; unless tracking records for inmates who were in a confined space with an infectious TB patient demonstrate that exposure was brief (e.g., <8 hours), then these contacts should be assigned as high-priority); and 4) high-priority contacts may be transferred, released, or paroled from a correctional facility before medical evaluation for TB (these contacts need to be traced).

As incarceration periods for jail inmates can often be brief (<one month), inmates in jails who are TB contacts are unlikely to be able to complete treatment while incarcerated. Prisons (where inmates are incarcerated for much longer periods) typically have onsite health services, but jails may not. Certain prisons and jails test new inmate admissions and employees for TB, and certain prisons have periodic surveillance testing of employees, inmates, or both. Health care providers in an onsite system can provide invaluable assistance in reviewing health records and evaluating and treating contacts. If medical record data (e.g., history of previous exposure to TB and/or TB test results) cannot be retrieved rapidly, health department officials may need additional resources.

TB contact investigation in the jail setting is resource-intensive and can disrupt normal activities, but is avoidable if the disease is detected at intake.

## What is the purpose of the *Facilitator Guide*?

This training product presents information for training about: the risk of TB transmission in a jail setting, how TB can affect jail inmates and employees, and how to perform a contact investigation in the jail setting.

Your role as facilitator will be to remind your participants that they are the first line of defense in recognizing TB and preventing its spread in their jail. Contact investigation is an effective strategy in preventing TB transmission if conducted in a timely manner and also in collaboration and cooperation with jail and local health department staff. The best strategy for performing a contact investigation in a jail is utilizing a pre-existing formal collaboration between jail and public health officials. If this collaborative relationship has not been established before a contact investigation is needed, creating it as part of the investigation is necessary.

This training material focuses on the steps to performing a TB contact investigation in the jail setting, based on the Centers for Disease Control and Prevention (CDC) Morbidity and Mortality Weekly Reports' *Prevention and Control of Tuberculosis in Correctional and Detention Facilities: Recommendations from CDC* (published in July 2006), and also the *Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis: Recommendations from the National Tuberculosis Controllers Association and the CDC* (published in December 2005). The Advisory Council for the Elimination of Tuberculosis (ACET) has also issued guidance on preventing and controlling TB in correctional facilities.

In 1999, the CDC initiated a study to: assess the extent to which jails had implemented CDC's 1996 recommendations for TB prevention and control in correctional facilities; assess the extent

of collaboration between jail systems and public health departments; and identify barriers to collaboration.

The study focused on jurisdictions having large city and county jail systems (i.e., those with average daily populations of at least 1,500) and having general community TB case rates at or above the national average.

Ninety-five percent of surveyed jail systems reported that they conduct contact investigations when inmates are diagnosed with or suspected of having infectious TB disease. However, only about one third of jail systems had written protocols for conducting a contact investigation. Furthermore, forty percent of the jail systems took at least a month to conduct the contact investigation at the jail, by which time a large percentage of inmates would have been transferred to another facility or released into the community.

City and county jail systems and public health departments face difficult choices regarding how to allocate scarce resources to the contact investigation process, which can be labor-intensive. However, as the jails' partners in TB control, public health departments can help jail systems increase the effectiveness and efficiency of their contact investigation process and thus their TB prevention and control efforts.

Specific recommendations from this study include: 1) increased collaboration with the health department in developing written contact investigation policies and protocols and in implementing them; 2) beginning the investigation sooner—within days; and 3) initiating a contact investigation for smear-positive patients and patients with abnormal radiographs suggestive of TB, rather than waiting until TB is culture-confirmed.

The development of the *Tuberculosis Contact Investigation in Jail: A Facilitator Guide* is based on a pilot training, *TB in Jail: A Contact Investigation Course*, conducted by the Francis J. Curry National Tuberculosis Center (CNTC) in 2004 in collaboration with the Institute for Medical Quality, the Florida Department of Public Health, and the Southeastern National Tuberculosis Center.

CNTC recognizes that the TB contact investigation processes in jail settings differ widely and there is no “one-size-fits-all” approach. The *Tuberculosis Contact Investigation in Jail: A Facilitator Guide* is designed to promote a core set of skills for staff who may need to perform a contact investigation regardless of the special circumstances that shape local jail policies and procedures.

## **What is the target audience for this training?**

The target audience is a combination of both jail and public health department staff who will work in collaboration to conduct a TB contact investigation in jail, when needed. These can include: correctional officers, classifications staff, senior custodial personnel, medical personnel, staff from the department of health, and also other designated correctional liaisons partnering with corrections medical and administrative staff.

## **Who should facilitate?**

This facilitator-led training product is designed for use by correctional liaisons who are responsible for facilitating the training of jail and health department staff who conduct TB contact investigation in jails. This may include:

- Public health department personnel
- Correctional medical personnel
- Private correctional health vendors
- Staff in federal and state agencies
- Staff in professional organizations
- Health care professionals

## What should participants know before taking this training?

This course is non-clinical and assumes that participants already have a basic understanding of TB pathogenesis, transmission, and ongoing, regular TB infection control practices such as TB testing, surveillance, isolation, TB treatment, and LTBI treatment.

If participants do not have this foundation, refer them to the **Resources List** found at the end of this guide (**page 168**) or integrate the material into a training module that precedes the implementation of this training.

Additional TB training resources regarding TB pathogenesis and transmission, LTBI, TB infection control practices, and/or TB medical case management are available. A list of these resources can also be found in the **Resources List**.

The following websites offer public information about TB:

- The Centers for Disease Control and Prevention (CDC) Division of Tuberculosis Elimination (DTBE) <http://www.cdc.gov/tb>
- CDC's Morbidity and Mortality Weekly Report <http://www.cdc.gov/mmwr>
- Questions and Answers About TB <http://www.cdc.gov/tb/faqs/>
- TB Education and Training Resources Website [www.findtbresources.org](http://www.findtbresources.org)

Regional Training and Medical Consultation Centers (RTMCCs):

- Francis J. Curry National Tuberculosis Center, San Francisco, CA [www.nationaltbcenter.edu](http://www.nationaltbcenter.edu)
- Heartland National TB Center, San Antonio, TX [www.heartlandntbc.org](http://www.heartlandntbc.org)
- New Jersey Medical School Global TB Institute, Newark, NJ [www.umdnj.edu/ntbcweb](http://www.umdnj.edu/ntbcweb)
- Southeastern National TB Center, Gainesville, FL [www.sntc.medicine.ufl.edu/](http://www.sntc.medicine.ufl.edu/)

## Format

This facilitator guide includes lectures with question/answer periods, exercises, and case studies.

Materials include:

- *Facilitator Materials* which contain presentation slides, slide-by-slide instructions and speaker notes, suggested timing guidelines, and instructions for conducting the questions, exercises, and case studies
- *Participant Materials* which include a reproducible master of the presentation slides and session handouts
- *Supplemental Materials*, including a **Glossary (page 163)**, a **Resource List Page (168)**, and **Job Aids (page 170)** that may assist jail and public health staff as they conduct contact investigation in jails; this section also includes the **Evaluation Form for Facilitators (page 187)**

## Acknowledgements

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**Materials Used in Preparing this Training Curriculum:**

- *TB in Corrections: Contact Investigation Course* by Ellen Murray, R.N., B.S.N., Training Specialist and Nurse Consultant, Southeastern National Tuberculosis Center
- CDC. Guidelines for the investigation of contacts of persons with infectious tuberculosis: Recommendations from the National Tuberculosis Controllers Association and CDC. *Morbidity and Mortality Weekly Report*. 2005 Dec 16;54(RR-15):1-47
- CDC. Prevention and Control of Tuberculosis in Correctional and Detention Facilities: Recommendations from CDC. *Morbidity and Mortality Weekly Report*. 2006 July 7; 55(RR-9):1-44
- Hutton MD, Cauthen GM, Bloch AB. Results of a 29-state survey of tuberculosis in nursing homes and correctional facilities. *Public Health Reports*. 1993;108:305-314

# HOW TO USE THIS TRAINING PRODUCT

## Overview

This training product was designed as an interactive educational process that allows participants to gain knowledge and skills to perform TB contact investigation in jail.

Before you conduct your first training, review the slide-by-slide instructions and speaker notes carefully to understand the information that you are about to present. Add any notes or comments that you may have regarding information that relates to your local program. It is suggested that the facilitator spend no less than two hours of review time in order to become familiar with the materials.

It is important to encourage your participants to engage in their own learning processes, to share their experiences, and to participate in the question/answer periods, exercises, and case studies. It is also helpful to get to know a little about your participants and relate the information to specific experiences or issues that they find pertinent. These training methods are designed to meet the different learning needs of your participants.

Each training session has the following elements:

- Introduction
- Learning objectives
- Time estimate
- General housekeeping
- Materials supplied for this session
- List of materials that you will need to provide
- Handouts to distribute to participants
- List of reference materials that were adapted for the session
- Instructions for asking questions (Session One)
- Instructions for asking questions and conducting exercises and/or case studies (Session Two)
- Facilitator evaluation
- Slide-by-slide instructions and speaker notes
- *Participant Materials* (slide handouts [6 per page] for both sessions to be photocopied and distributed to your audience)
- CD-ROM with:
  - PowerPoint presentation slides for the sessions to download onto an LCD projector and/or copy onto overhead transparencies
  - PowerPoint presentation slides for the case studies to download onto an LCD projector and/or copy onto overhead transparencies
  - PDF file of the entire *Facilitator Guide* for duplication purposes

It is important to review the learning objective(s) with your participants at the beginning of each session. If time allows, review and recap the training at the end of each session to determine whether participants believe the learning objectives were met.

An approximate time estimate is suggested for each session and also for each presentation slide. This should help you to plan accordingly, even if you decide to alter the schedule.

If it is possible to co-facilitate with another person, we recommend that you consider the advantages of using a team approach to training. Participants benefit from the diverse skills and approaches that a team of facilitators can bring to the learning experience. Facilitators can learn from one another by watching how their colleagues present the material, and the burden of training responsibilities does not rest exclusively on one individual.

To download this training product and any product updates, go to CNTC's website:  
<http://www.nationaltbcenter.ucsf.edu/tbcjail/>.

## Checklist for preparing for the training session(s)

This *Facilitator Guide* includes a list of materials that is provided for each training session and also lists materials that you will need to provide.

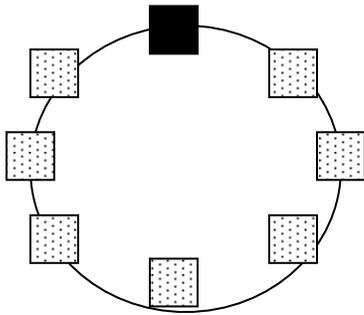
It is recommended you also use a checklist ([see sample below](#)) to track logistical issues well in advance of the training sessions. Plan ahead. Ideally, you should allow approximately 3-4 months to organize the training. This is only a suggested time frame and depending on your resources, the timing may need to be accelerated.

Task	Person Responsible	Due Date
Identify co-facilitator(s) and guest speaker(s)(if any)		
Recruit/select participants		
Notify participants of training date/location		
Send reminder to participants (1 week prior)		
Discuss expectations with guest speaker(s), roles and responsibilities with co-trainer(s), if applicable		
Arrange for refreshments (if allowed)		
Reserve training space		
Check light and temperature controls		
Secure audio/visual (A/V) equipment		
Check seating: enough seats? are they movable?		
Check parking logistics for participants		
Check restroom location		
Plan and prepare signs to direct participants		
Make duplicate copies of participant materials		
Prepare flipcharts, overheads, slides		

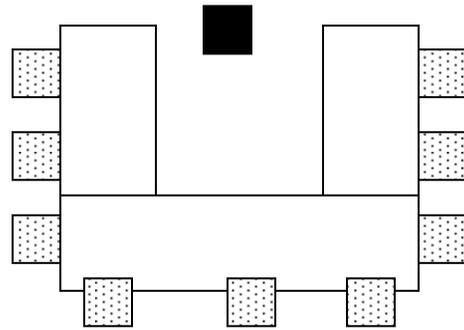
# Training room layout

Seating arrangements for training participants can greatly influence group dynamics and participants' ability to communicate and cooperate with the trainer and with one another. The *Facilitator Guide* includes exercises that involve traditional lecture formats and group discussions. No single seating configuration can ideally accommodate each activity; however, while using the *Facilitator Guide*, you are advised to use a circular, modified circular, or U-shaped seating formation.

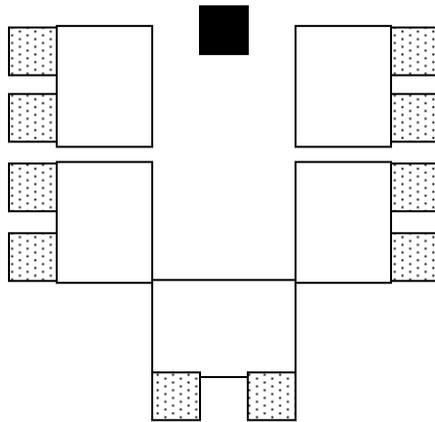
CIRCULAR



U-SHAPED



MODIFIED CIRCULAR



Trainer



Participant

# THE ART OF FACILITATING: SKILLS AND GUIDELINES FOR EFFECTIVE FACILITATORS\*

(\* This material was adapted from *AIDS outreach in the community: training design and delivery*, a trainer's manual developed by R.O.W. Sciences, Inc., Maryland. Sponsored by the U.S. Department of Health and Human Services; 1990.)

## Qualities of effective trainers/facilitators:

- Effective communication skills, including good delivery skills
- Group facilitation skills, including the ability to let the group work on its own
- Self-awareness, including a sense of the impact of your own behavior
- Ability to plan, organize, and make clear presentations
- Ability to plan objectives and to move a group toward them
- Patience, flexibility, and adaptability in regard to the group's needs
- Respect for the needs of adult learners and the ability to put adult learning theory into practice
- Ability to deal with one's own feelings and the feelings of others
- Ability to make appropriate interventions
- Ability to encourage the taking of risks without embarrassing participants
- Ability to give and receive feedback and criticism
- Ability to evaluate the training event

## Ground rules for participants

We advise you to start each training session with a brief review of "ground rules."

Ground rules are guidelines for participation that help you to create and maintain an effective, respectful, and non-threatening learning environment. Ground rules can be designed in advance and then modified by the group.

Ground rules often cover the following issues:

- *Punctuality and attendance*: the trainer will begin and end each session on time; participants will arrive on time and stay for the entire session
- *Respectful interaction*: trainer and participants will not interrupt one another; participants will actively contribute during group activities
- *Confidentiality*: personal disclosures and other sensitive information that are communicated during training sessions will not be shared outside of the training group

## Guidelines for giving and receiving feedback

Participants will benefit from receiving your constructive feedback, especially during exercises in which they are practicing new skills. The following guidelines will help you to provide feedback that is more likely to have a positive impact on participants and not raise their defenses. A shortened, modified version of these suggestions can be shared with participants to assist them in giving and receiving feedback to/from one another.

## **Giving feedback:**

- Frame your feedback in positive, rather than negative, terms. Help and feedback need to be given and heard as an *offer*, not an imposition
- Focus your feedback on *behaviors*. Comment on what a person does rather than what you think of the person. Describe actions instead of personal qualities
- Direct your feedback only toward behavior that the receiver has control to change. Frustration is only increased when a person is reminded of a characteristic over which he or she has little or no control. For example, “You’re much taller than most of our patients”
- Be specific in your feedback to what you see and hear; avoid being general or judgmental. To be told, “You are shy” is not as useful as being told, “When you did the role play I noticed that you looked away from the patient and I had trouble hearing you”
- Feedback is most useful when it is solicited rather than imposed
- Accompany your feedback with suggestions for improvement. Focus on an exploration of alternatives rather than answers, solutions, or advice
- Offer your feedback as immediately as possible in order to be concrete and free of the distortions that come with the lapse of time
- Check with the receiver of your feedback to ensure clear communication. Ask the participant to rephrase the feedback to see whether it matches what you had in mind
- Give your feedback in a measured amount. Overloading a participant with feedback reduces the possibility that he/she will use it effectively

## **Receiving feedback:**

- Accept feedback without comment or defensiveness. Do not say, “Yes, but...”
- Listen to what is being said
- Accept feedback with appreciation. Thank the person who is giving you feedback whether or not you agree with all of what he/she says
- If you are not sure that you understand the feedback, restate what you heard. Ask the person giving feedback, or others in the group, for further clarification

# **TUBERCULOSIS CONTACT INVESTIGATION IN JAIL: A FACILITATOR GUIDE**

## **Facilitator Materials**

(Slide-by-slide instructions and speaker notes)

### **SESSION ONE: TB IN JAIL**



# SESSION ONE: TB IN JAIL

## ***Introduction***

This session provides a brief introduction to TB in jail and covers factors that predict likely transmission of TB, general key terms, how to decide to initiate a contact investigation, the principles for guiding a contact investigation, and who comprises the contact investigation team.

## ***Learning objectives***

After completing this session, participants will be able to:

- Explain why tuberculosis (TB) is a concern for jails
- Describe the factors that predict likely transmission of TB
- Define a TB contact
- Define a contact investigation
- Describe the factors to consider when initiating a contact investigation
- Explain the principles guiding a contact investigation
- List the members of a contact investigation team

## ***Time***

Approximately one hour (31 slides)

## ***General housekeeping***

Go over general housekeeping items such as:

- Turn cell phones/pagers off or place on vibrate mode
- Location of restrooms
- Location of nearby restaurants for lunch
- Parking restrictions (if any)
- Water, refreshments (if available)

## ***Materials supplied for this session:***

- Slide-by-slide instructions and speaker notes for the facilitator
- *Participant Materials*: presentation slides (6 per page), slide enlargements (**pages 132-138**)
- Master set of PowerPoint presentation slides on CD-ROM
  - Download the PowerPoint presentation slides from the CD-ROM that accompanies this guide or by going to CNTC's website at [http://www.nationaltbcenter.ucsf.edu/tbci\\_jail/](http://www.nationaltbcenter.ucsf.edu/tbci_jail/)

## ***Materials you need to supply:***

- Laptop and LCD projector or overhead projector
- Copies of participant handouts
- Optional: poster paper, chalkboard, or dry-erase board, poster pens, chalk, or dry-erase markers

**Handouts to distribute to participants (in Participant Materials section):**

- Presentation slide handout (page 132)
- Figure 1: “Factors that predict likely transmission of TB” (page 138)
- Table 1: “Decision to initiate a contact investigation” (page 138)

**Material in this session is adapted from:**

- *TB in Corrections: Contact Investigation Course* by Ellen Murray, R.N., B.S.N., Training Specialist and Nurse Consultant, Southeastern National Tuberculosis Center
- CDC. Guidelines for the investigation of contacts of persons with infectious tuberculosis: Recommendations from the National Tuberculosis Controllers Association and CDC. *Morbidity and Mortality Weekly Report*. 2005 Dec 16;54(RR-15):1-47
- CDC. Prevention and control of tuberculosis in correctional and detention facilities: Recommendations from CDC, *Morbidity and Mortality Weekly Report*. 2006 July 7;55(RR-9): 1-44
- Hutton MD, Cauthen GM, Bloch AB. Results of a 29-state survey of tuberculosis in nursing homes and correctional facilities. *Public Health Reports*. 1993;108:305-314

**Questions**

Session One contains a total of 5 questions (there are no exercises or case studies for this session).

Questions help engage the participants in their learning process. They also help to ensure that your participants understand the information being shared. The 5 questions you will ask during this session are:

1. Why is TB a concern for your jail? (Slide #4)
2. What areas in your jail are most likely to promote transmission of TB? Why? (Slide #14)
3. Why do we need contact investigations in jails? (Slide #17)
4. How is your health department notified when symptoms indicative of TB appear in your jail? When? By whom? (Slide #24)
5. Any questions? (Slide #31)

### Legend for icons used in Session One

The following table contains an explanation of each icon type used in this session and the description of the activity that each represent.

Icon	Activity	Activity Description
	Present slide content	This icon prompts the facilitator to present the content and associated material for each slide, using the text that follows each slide in the <i>Facilitator Materials</i> .
	Present questions and answers	This icon prompts the facilitator to ask the question on the accompanying slide. Spend a minute or two for each question. Answers are provided in the speaker notes in the event participants are unaware of the correct responses.

# SESSION ONE: TB IN JAIL

## Slide-by-slide instructions and speaker notes

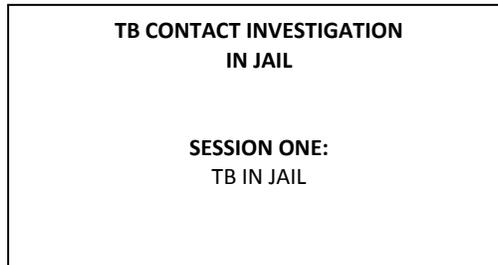
Session Time: Approximately one hour (31 slides)

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Slide 1

Time: 2-3 minutes



- Welcome participants to the training. Introduce yourself as the facilitator and introduce the topic: TB in Jail.
- You may wish to go around the room and ask participants to introduce themselves to the class.
- Explain “general housekeeping” items and any “ground rules” for class participation.
- Inform participants that this training is comprised of 2 sessions: 1) “TB in Jail” and 2) “The Steps for Conducting a TB Contact Investigation in Jail.”
- Explain that this course is non-clinical and assumes that participants already have a basic understanding of TB pathogenesis, transmission and ongoing, regular TB control practices such as TB screening, surveillance, isolation, and treatment for active or latent TB infection (LTBI). If participants do not have this basic understanding, you can either ask them to follow-up with the information found in their *Participant Materials* or you, as a facilitator, may plan a basic TB training (“TB 101”) prior to conducting this training. If more information regarding TB infection control is needed, please advise participants to contact their local or state health department or one of the four tuberculosis Regional Training and Medical Consultation Centers (RTMCCs) whose contact information is provided in the **Resource List (page 168)** of the *Participant Materials* contained in this guide.
- Also, tell participants that definitions of the terms, acronyms, and abbreviations used during the session can be found in the **Glossary (page 163)** in the *Participant Materials*. For example, explain that one acronym used repeatedly in this session is “LTBI” which stands for “latent TB infection.”

Notes:

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**Slide 2**

Time: <1 minute

**Objectives**

At the end of this session, you will be able to:

- explain why tuberculosis (TB) is a concern for jails
- describe the factors that predict likely transmission of TB
- define a TB contact
- define a contact investigation

- Review the learning objectives for this session with participants.
- Inform participants that they will be able to achieve these learning objectives by the end of this session.

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**Slide 3**

Time: <1 minute

**Objectives (2)**

At the end of this session, you will be able to (cont'd):

- describe what factors to consider when initiating a contact investigation
- explain the principles for guiding a contact investigation
- list the members of a contact investigation team

- Review the learning objectives for this session with participants.
- Inform participants that they will be able to achieve these learning objectives by the end of this session.

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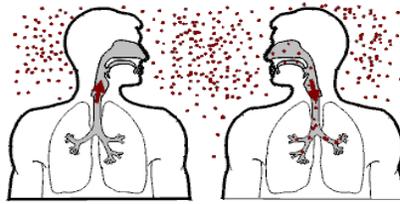
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#### Slide 4

Time: 1-3 minutes

#### Why is TB a Concern for Your Jail?



- Ask participants this question and explain why TB is a concern for jails.
- Explain that numerous outbreaks of TB have been reported in prisons and jails, particularly among HIV-infected inmates. TB spreads when a person with contagious TB disease coughs, laughs, speaks, or sings. The impact TB can have on staff and inmates if TB transmission occurs in a jail (and is not interrupted or prevented) is significant. TB can be a fatal disease.
- The identification of a case of TB disease in a jail should always provoke a rapid response because of the potential for widespread TB transmission. A prompt public health response in a congregate living setting (like a jail or homeless shelter) can prevent a TB outbreak or contain one that has already begun.
- If you need to provide a brief review of how TB spreads, here is a summary:
  - TB has affected humans for centuries. Until the 1940s and 1950s, there was no cure for TB. Many people were sent to sanatoriums (special rest homes where TB patients were segregated from society and followed a prescribed routine every day). After treatment drugs were discovered, TB became curable and the death rate for TB dropped dramatically.
  - TB is caused by an organism called *Mycobacterium tuberculosis* (also *M. tuberculosis* or *M. tb*) that is spread from person-to-person through the air. *M. tuberculosis* organisms are sometimes called tubercle bacilli. When a person with infectious TB disease coughs, sneezes, talks, or sings, microscopic droplets containing tubercle bacilli may be expelled into the air. Other people may inhale the air containing these droplet nuclei and become infected.
  - TB infection begins when the tubercle bacilli multiply in the small air sacs of the lungs. A small number enter the bloodstream and spread throughout the body. In healthy people, the body's immune system usually keeps the bacilli under control. People who have TB infection but not TB disease do not have symptoms of TB, and they cannot spread TB to others (i.e., they are *infected* but not *infectious*). They usually have a positive reaction to the tuberculin skin test (TST) or a positive interferon gamma release assay (IGRA)\*. An example of an IGRA is the QuantiFERON test (QFT). A positive reaction to either test is indicative of LTBI.
  - In some people who have TB infection, the immune system cannot keep the tubercle bacilli under control and the bacilli begin to multiply rapidly, causing TB disease. This can happen very soon after infection or many years after. About 10% of people who have TB infection will develop disease at some point, but the risk is greatest in the first year or two after infection. Also, the risk of developing TB disease is higher for people with certain medical conditions,

such as HIV infection. Individuals with TB disease (as opposed to LTBI) have symptoms, and can spread germs to others.

- TB disease usually occurs in the lungs (pulmonary TB), but it can also occur in other places in the body (extrapulmonary TB). Miliary TB occurs when tubercle bacilli enter the bloodstream and are carried to all parts of the body, where they grow and cause disease in multiple sites (e.g., the larynx, lymph nodes, pleura, etc.).

\*In this training product, the two primary TB testing techniques (tuberculin skin testing and interferon gamma release assay) will be referred to as “TST/IGRA,” unless otherwise noted.

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Slide 5

Time: 3-5 minutes

**Why is TB a Concern for Your Jail? (2)**

Jail is a high-risk environment for TB transmission due to:

- crowding
- poor ventilation
- some inmates at increased risk for TB (e.g., immunosuppression)
- frequent relocation of inmates makes disease control more challenging
- health status of new inmates is unknown at time of booking

- Explain that TB is a concern for all jails. Describe the factors that make a jail a high-risk environment for TB transmission and also describe some of the factors that can hinder a contact investigation in jail.
- Structural factors in most jails, such as crowding and poor ventilation, combined with inmates' increased risks for TB (e.g., immunosuppression, substance abuse, etc.), make jails a particularly high-risk environment for the transmission of TB. At the same time, frequent inmate relocation makes it difficult for many inmates to complete any TB treatment that is started in jail, unless follow-through supervision can be arranged. As a result, effective TB prevention and control measures in jails are needed to reduce TB rates in this setting. Contact investigation is an effective TB control practice when conducted in a timely manner and in collaboration with the public health department.
- Two major factors that can hinder a contact investigation in jail are: 1) the rapid turnover/relocation of inmates and, 2) crowding that can affect TB exposures. The number of contacts who had close proximity to a TB patient can be great, and yet exposure might be brief. This complicates the process of assigning priorities.

- Unless tracking records for inmates who were in a confined space with an infectious TB patient determine that aggregate exposure was brief (e.g., <8 hours), these contacts should be assigned a high priority. High-priority contacts that are transferred, released, or paroled from a correctional facility before medical evaluation for TB should be traced.
- Certain correctional settings have accessible and comprehensive records for the locations of inmates. These records are essential for drawing up contact lists, estimating exposure periods, and assigning priorities to contacts – all steps in a contact investigation. Visiting the exposure sites within each setting also helps in estimating exposure intensity.
- Although prisons typically have onsite health services, jails may not. Certain prisons and jails test new inmate admissions and employees for *M. tuberculosis* infection, and certain prisons have periodic surveillance testing of employees, inmates, or both. Health care providers in an onsite system can provide valuable assistance in reviewing health records and evaluating and treating contacts. If medical record data (e.g., previous TB exposure and/or skin test results) cannot be retrieved rapidly, health department officials should consider requesting additional resources.

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Slide 6

Time: <2 minutes

**Importance of TB Infection Control in Jail**

TB can affect anyone in a jail:

- inmates and staff
- visitors and family (who can, in turn, infect the community)

- Because jails and prisons have been implicated in TB outbreaks it is important to practice TB infection control in jail settings. Released inmates can bring TB into the community if they have not been diagnosed and treated. Inmates with undiagnosed TB can spread it to other inmates, visitors, and/or custodial or correctional staff (who, in turn, can infect their families or fellow staff members). High-priority LTBI contacts are also at risk of developing TB disease if they do not complete an adequate treatment regimen after their release to the community or other facility.
- Inform participants that if they want more information regarding how to implement TB infection control in their jails, the Francis J. Curry National Tuberculosis Center (CNTC) has a downloadable product “The TB Infection Control Plan – Template for Jails,” available online: <http://www.nationaltbcenter.edu/jailtemplate/start.html>.

- You should emphasize that jails are potentially legally liable if: 1) contacts are not identified, 2) contacts are identified but are not examined, or 3) unidentified or unexamined contacts develop TB disease and transmit it to others.

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Slide 7

Time: 1-2 minutes

**Key Term**

TB patient:

A person diagnosed with infectious TB disease  
(inmate or staff)

- Read aloud the definition of “TB patient.”
- Explain to participants that they may hear the public health department staff using terms such as “index patient,” “index case,” “source patient,” or “source case” to describe a TB patient. Explain to participants that, for the purposes of this course, the term “TB patient” will refer to an inmate or staff member diagnosed with TB disease (not latent TB infection). You may need to again explain the difference between TB disease and latent TB infection to your participants.
- Explain that latent TB infection (LTBI) occurs when someone breathes in the TB bacteria into his/her body. If the body’s immune system is able to prevent the TB germs from growing, the person remains healthy (although they are infected the person will not develop TB disease). TB infection needs to be medically treated even though not contagious at this stage.
- Explain that TB disease occurs when the infection progresses to disease. TB bacteria become active and grow. This often happens when a person’s immune system breaks down or is compromised by a health condition such as HIV, diabetes, injection drug use, or poor nutrition. Some people develop TB disease soon after becoming infected, before their immune system can fight the TB bacteria. Other people may get sick much later, when their immune system becomes weak. TB is contagious, but it is treatable and can usually be cured if the person is diagnosed and receives treatment right away.

- The first inmate or jail staff suspected or confirmed as having TB disease is the initial case reported to the health department. The CDC defines “case” as a particular instance of a disease (e.g., TB). A case is detected, documented, and reported.

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Slide 8

Time: <1 minute

**Another Key Term**

TB contact:

A person who is at risk of becoming infected with *M. tuberculosis* due to exposure to a person with infectious TB disease

- Read aloud the definition of the term “TB contact.”
- Explain that “contact” refers to a person who has been exposed to *M. tuberculosis* by sharing air space with a person who has infectious TB disease.
- Explain that persons exposed to a TB case with infectious TB disease are called the “contacts” of that person; “exposure to TB” is time spent with or near the TB patient and is evaluated by the duration, proximity, and intensity.
- Outside of the jail setting, contacts generally include family members, roommates or housemates, close friends, co-workers, and classmates. Health care workers usually identify contacts by interviewing the TB patient, by visiting the places where the TB patient spends time on a regular basis, and—in the corrections setting—by identifying those other inmates who were housed with or spent time with the TB patient.
- High-risk contacts are given a medical evaluation and may receive treatment for LTBI or TB disease.

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**Slide 9**

Time: <1 minute

**Factors That Predict Likely Transmission of TB**

- Characteristics of the TB patient
- Environment where the exposure occurred and length of exposure

- Two factors that predict likely transmission of TB are:
  - Characteristics of the TB patient
  - Circumstances surrounding the exposure that might result in ongoing transmission, such as the environment in which the exposure occurred (i.e., a small cell versus an open dormitory and presence/absence of re-circulated air) and the length of exposure (i.e., frequency and duration).

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**Slide 10**

Time: 2-3 minutes

**Factors That Predict Likely Transmission of TB (2)**

Characteristics of the TB patient:

- location of TB disease in the body
- lab test results (i.e., sputum bacteriology)
- x-ray findings
- behaviors that increase aerosolization of respiratory secretions
- age
- adherence to an effective course of treatment

- Describe the characteristics of the TB patient and factors associated with increased risk for TB transmission.
- The following factors should be considered when planning a contact investigation:
  - **Location of TB disease in the body**  
With limited exceptions, only patients with pulmonary or laryngeal TB can transmit their infection. For contact investigations, pleural disease is grouped with pulmonary disease because sputum cultures can yield *M. tuberculosis* even when no lung abnormalities are

apparent on an x-ray. Explain that TB can be in other parts of the body (approximately 15% of cases) but are generally not infectious unless aerosolized (such as when suctioning a wound).

- **Lab tests and results**

Relative infectiousness has been associated with positive sputum culture results and is highest when the smear and/or nucleic acid amplification (NAA) mycobacterium TB direct (MTD) results are also positive.

- **X-ray findings**

Patients who have lung cavities observed on a chest x-ray typically are more infectious than patients with noncavitary pulmonary disease.

- **Behaviors that increase aerosolization of respiratory secretions**

If a cough is present during the TB patient's infectious period, transmission is more likely. Cough frequency and severity may not be predictive of contagiousness but they are associated with transmission. Singing is associated with significant rates of TB transmission. Sociability of the TB patient might contribute to contagiousness because of the increased number of contacts and the intensity of exposure.

- **Age**

Young children (i.e., those aged <5 years) exposed to TB are at high risk for rapid development of TB disease, particularly TB meningitis. If an inmate with TB identifies a young child as a community contact, a health department referral should be made immediately.

- **Adherence to an effective course of treatment**

Explain that treatment for TB disease requires taking several different medications and lasts six to nine months or longer (LTBI treatment is also generally six to nine months). Two weeks of medication will usually make a person with TB disease non-infectious unless the infection is drug-resistant. Two weeks of medication usually makes the TB patient feel better as well. Adequate and appropriate treatment is essential to decreasing infectiousness. Ensuring that the TB patient adheres to treatment can be difficult because many TB patients are reluctant to take their medication for the entire course of therapy. Some may quit taking medication once they start feeling better. Incomplete treatment regimens can contribute to the emergence of drug-resistant strains of TB. To prevent the spread of TB, the TB patient needs to complete their course of treatment. TB education (for both providers and patients) regarding adherence is essential to decrease the potential for drug-resistant TB.

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Slide 11

Time: 1-2 minutes

**Factors That Predict Likely Transmission of TB (3)**

**TABLE 1. Characteristics of the index patient and behaviors associated with increased risk for tuberculosis (TB) transmission**

Characteristic	Behavior
Pulmonary, laryngeal, or pleural TB	Frequent coughing
AFB* positive sputum smear	Sneezing
Cavitation on chest radiograph	Singing
Adolescent or adult patient	Close social network
No or ineffective treatment of TB disease	

\* Acid-fast bacilli.

Centers for Disease Control and Prevention. Guidelines for the investigation of contacts of persons with infectious tuberculosis; recommendations from the National Tuberculosis Controllers Association and CDC, and the Guidelines for using the QuantiFERON®-TB Gold test for detecting *Mycobacterium tuberculosis* infection, United States. MMWR 2005; 54(No.RR-15): [page 4].

- Explain that this chart is a visual tool that describes the characteristics of the TB patient, referred to as the “index patient” in this chart. Remind participants that “index patient” is a term that the health department uses to refer to the person with infectious TB disease. Remind participants that, in this training, we will use the term “TB patient” to refer to a person who is diagnosed with TB disease and that the behaviors mentioned in the table could correspond to any/all of the characteristics. Participants can find an enlarged handout of this chart in their *Participant Materials* (page 138).
- TB patients with either cavitation on chest x-ray or acid fast bacilli (AFB) smear-positive respiratory specimens are substantially more likely to transmit TB than persons who have neither characteristic.
- Delays in a patient’s TB diagnosis have also been associated with an increased likelihood of transmission because the TB patient does not receive treatment and the disease progresses; both of these factors can increase the likelihood of infectiousness. Nonetheless, substantial variability exists regarding the infectiousness of a TB patient.
- A positive AFB smear status, cavitory disease, and delayed diagnosis are factors that increase the likelihood of transmission. However, some people with these characteristics infect few others, while others with none of these characteristics might infect multiple persons. This is due to other factors, such as the frequency of exposure and the environment in which the exposure took place.
- The best measure of the infectiousness of the TB patient is the documented infection rate among their contacts. The infection rate calculation will be discussed in Session Two of this training (Session Two, slides 52 and 53, pages 87-88 of *Facilitator Materials*) and also in Exercise 3.

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## Slide 12

Time: 2-4 minutes

### Factors That Predict Likely Transmission of TB (4)

Environment where exposure occurred and length of exposure:

- amount of time contact shared same air space with TB patient (during TB patient's infectious period)
- exposure characteristics:
  - air volume (size of exposure site)
  - ventilation/circulation
  - duration of exposure
  - exposure settings

- Describe the exposure period and exposure characteristics. Again, the likelihood of infection depends on the environment, intensity, proximity, frequency, and duration of exposure to the TB patient. For example, an inmate who shares the same two-man dorm cell with the TB patient daily is much more likely to be infected than an inmate who sits across from the TB patient at lunch once or twice a week in an open dining hall.
- The “exposure period” is defined as the period of time when the contact shares the same air space with the TB patient during the TB patient's infectious period.
- Outline the exposure characteristics:
  - **Air volume (size of exposure site)**

The volume of air shared between an infectious TB case and susceptible contacts is a major determinant of the likelihood of transmission. The smaller the exposure site, the more concentrated the organisms are and the more easily the germs can be inhaled. Basically, a smaller room space equals less volume and more concentration of germs and increases the likelihood that the infectious particles can be inhaled whereas the larger the room and air volume, the more likely that the infectious particles are widely distributed and less likely to be inhaled. For example, transmission is more likely to occur when sharing spaces that are the size of a car than sharing a space the size of a warehouse office space. The greater the volume of air and the greater the distance from the inmate/patient, the less likely it is that transmission will occur.
  - **Ventilation/circulation**

Ventilation is another key factor. Areas that have confined air systems with little or no outside ventilation or which have re-circulated air without HEPA (“high efficiency particulate air”) filtration have been associated with increased TB transmission. Again, germs are more concentrated due to lack of air movement and air dilution. Air circulation in an enclosed space is a factor that can predict the likelihood of transmission. Notice whether the air circulates out of the room or fresh air moves into the room, whether the air stands still in the room or a fan moves air within the room.

If air from a room in which the TB patient is sitting or frequently spends time is redirected to other parts of the building, there will be a need to look at the overall air circulation patterns of the building. These factors will have to be considered.

- **Duration of exposure**  
Defining what constitutes a substantial duration of exposure for any given contact is difficult. When conducting a contact investigation, priority should be given first to inmates and employees who had the highest degree (longest duration) of exposure to the TB patient. One set of criteria for estimating a “safe” amount exposure to a TB patient uses a cut-off of 120 hours of exposure per month. However, for any specific setting, TB patient and contact, the optimal cut-off duration is undetermined. Administratively determined durations derived from local experience are recommended, with frequent reassessments on the basis of results.
- **Exposure settings**  
The most practical system for grading exposure settings is to categorize them by size as well as intensity, frequency, and duration. For example, a grade of "1" can be the size of a single cell and the most likely size for a transmission setting; "2" the size of a 2 or 4 man cell; "3" the size of an open dorm; and "4" the size of a community hall or larger and a less likely size for transmission setting. This has the added advantage of familiarity for the TB patient and contacts, which enables them to provide clearer information.

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**Slide 13**

Time: 2-3 minutes

**Factors That Predict Risk of TB Disease**

Characteristics of persons who have been identified as contacts:

- immunosuppression (i.e., HIV, prolonged therapy with corticosteroids, chemotherapy for cancer or other immunosuppressive agents, end-stage renal disease, and diabetes mellitus)
- age (i.e., those <5 years)

- Describe the characteristics of persons who have been identified as contacts and factors that predict risk TB disease.
  - **Immunosuppression (TB/HIV coinfection)**  
Tell participants that HIV infection is the greatest single risk factor for progression to TB disease. HIV-infected contacts should receive the highest priority for evaluation of TB infection, even if these persons had shorter duration of exposure than other contacts. Progression from exposure to death can be rapid among HIV-infected persons. In a facility in which HIV-infected persons are housed or congregated separately, the entire group should be given the highest priority. Certain correctional populations have a high prevalence of HIV infection, and reviewing the HIV testing policies, procedures, and aggregate statistics of your jail is recommended.
    - HIV infection can affect the progression of TB in two ways:
      - Reactivation of LTBI to TB disease. This is the main driving force behind today’s rising TB rates in HIV-infected individuals. This reactivation is preventable though the use of LTBI therapy.

- Rapid progression from TB infection to TB disease. If an immunocompromised person is infected with TB bacilli from a patient with infectious pulmonary TB, TB disease may develop within a number of weeks.
- For contacts who do not know their HIV infection status (and TB exposure is suspected), HIV counseling and testing should be provided as part of the contact evaluation and referral made for treatment and care when HIV infection is identified.
- Numerous outbreaks of TB, including those involving multidrug-resistant (MDR) TB, have been reported in prisons and jails, particularly among HIV-infected inmates. The identification of an infectious case of TB in a jail should always provoke a rapid response because of the potential for widespread TB transmission. A prompt public health response in a confined setting can prevent a TB outbreak or contain one that has already begun.
- **Persons receiving immunosuppressive medications**  
Persons receiving prolonged therapy with corticosteroids, chemotherapy for cancer, or other immunosuppressive agents (e.g., TNF- $\alpha$  antagonists) also should be considered a high priority for investigation. In addition, persons with end-stage renal disease and diabetes mellitus should be promptly evaluated, because these conditions are also associated with compromised immune function. Substance abusers and alcoholics with greater than 10% body weight loss must also be included as they may be immunocompromised and may also progress to active disease quickly, once infected.
- **Age**  
Young children (i.e., those <5 years) are at high risk for rapid development of TB disease, particularly TB meningitis. If an inmate with TB identifies a young child as a community contact, a health department referral should be made immediately.
- Explain to participants that they should prioritize contacts according to duration of exposure, intensity of exposure, and risk factors for becoming infected with TB and progressing to TB disease, on a scale of “high,” “medium,” and “low.”
- Priorities for contact investigation are determined on the basis of the characteristics of the TB patient, susceptibility and vulnerability of contacts, and circumstances of the exposures. Any contacts who are not classified as high- or medium-priority are assigned as low-priority. Because priority assignments are practical approximations derived from imperfect information, priority classifications should be reconsidered throughout the investigation as findings are analyzed.

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**Slide 14**

Time: 1-2 minutes

**Question**

What areas in your jail are most likely to promote transmission of TB? Why?

- Ask participants this question. Encourage them to think about what areas in their jails are more or less likely to promote the transmission of TB (e.g., cells, dorms, work sites, dining areas, recreational facilities). Ask participants to describe these areas and discuss factors such as air volume, ventilation, and crowding.
- Also, advise participants to consult with their jail facility engineer to confirm what areas are more likely to promote the transmission of TB.

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**Slide 15**

Time: 1-2 minutes

**Key Term**

**Contact investigation (CI)**

The process of finding, notifying, screening, and treating persons who might have LTBI or TB disease as a result of recent contact with a person diagnosed with TB disease. This process is undertaken promptly after a TB patient is identified

- Introduce the above definition of a contact investigation, as defined by the CDC, to participants. The contact investigation (CI) process is undertaken promptly after an inmate or staff member with infectious TB disease is identified.
- Explain that a tuberculosis contact investigation is one of the tools used in TB infection control and prevention. The contact investigation can serve to: educate jail staff and inmates about the risk,

treatment, and prevention of TB in correctional facilities; inform staff and inmates regarding the importance of engaging in recommended TB control practices and procedures within the correctional system; and emphasize the importance of completion of therapy for persons with TB disease and treatment for LTBI.

- A contact investigation is a procedure for:
  - Identifying persons who were exposed to a person with infectious TB disease
  - Evaluating these persons for LTBI and TB disease
  - Providing appropriate treatment for those with LTBI and TB disease.
- Again, review with participants that LTBI is also referred to as “TB infection.” Persons with latent TB infection carry the organism that causes TB but do not have TB disease, do not have symptoms, and are not infectious. Such persons usually have a positive reaction to the TST and can also be identified through an IGRA.

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Slide 16

Time: 1-2 minutes

**Key Term (2)**

**Contact investigation (cont'd)**

The goal of a CI is to interrupt the transmission of TB

- TB contact investigation in a jail:
  - disrupts normal activities
  - is labor/resource intensive
  - can be avoided if the disease is detected at intake, which promptly initiates infection control practices

- The overall goal of a TB contact investigation is to interrupt the transmission of *M. tuberculosis*. Ongoing transmission is prevented when jail and health department staff can work together to:
  - identify, isolate, and treat persons with TB disease
  - identify infected contacts so they can be treated for TB or for LTBI.
- Explain to participants that contact investigations are resource-intensive. Competing demands may restrict the resources that can be allocated to contact investigation activities. Therefore, public health department and jail staff must decide which contact investigations are assigned a higher priority and which contacts to evaluate first. Contact investigations are like complicated puzzles and participants will need to find all the pieces and put them together to create a picture of the exposure.

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**Slide 17**

Time: <1 minute

**Why Do We Need Contact Investigations in Jails?**



*Slide courtesy of Zachary Taylor, M.D., CDC, 2003*

- Ask participants this question. Then proceed to next slide to explain in further detail.

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**Slide 18**

Time: 1-2 minutes

**Why Do We Need Contact Investigation  
in Jails?**

To protect inmates and staff from contagious  
disease and other health hazards

- Explain that we need contact investigations because we need to protect inmates and staff from contagious disease and other health hazards. Thus, it is important to identify each contact **because every case of TB was once a contact.**
- Explain that it 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 and prevent progression to TB disease
  - are at high risk of developing TB disease and may need treatment for LTBI until it becomes clear whether or not they have TB infection.
- Some contacts who become infected with *M. tuberculosis* develop TB disease before the contact investigation is started. Conducting a contact investigation is one of the best ways to find people who have TB disease.
- It is also important to find infected contacts who do not yet have TB disease, so they can be given treatment for LTBI. Contacts are a high-priority group for treatment for LTBI because if they become infected, they are at risk of developing disease.
- It is not enough to simply find and test contacts of an infectious TB patient. For a contact investigation to be successful, infected contacts should begin and complete a regimen of treatment for LTBI. Likewise, contacts with TB disease should begin and complete treatment for TB disease. A successful contact investigation can interrupt transmission and prevent future cases of disease.

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**Slide 19**

Time: 2-3 minutes

**Decision to Initiate a Contact Investigation**

Collaboration between the jail and the health department helps decide whether to start a CI

- Explain that the decision to initiate a contact investigation should be done in collaboration with the jail and local health department TB program. The decision to initiate a contact investigation for an inmate or staff member with possible TB is made on a case-by-case basis. Competing demands

restrict the resources that can be allocated to contact investigations. Therefore, public health and jail staff must decide which contacts are assigned a higher priority and evaluate them first.

- A decision to investigate a TB patient depends on the presence of factors used to predict the likely transmission of TB. In addition, other information regarding the TB patient can influence the investigative strategy. Each potential TB patient's clinical presentation and opportunities for exposure should be evaluated.
- In general, a contact investigation should be considered whenever a person is found to have or is suspected of having infectious TB disease (see **Slide 20, Figure 1**). Infectiousness depends on a variety of factors, but is more likely when the TB patient has:
  - a cough
  - hoarseness
  - and/or other symptoms of pulmonary or laryngeal TB.
- Other factors that increase the likelihood of infectiousness include:
  - positive acid-fast bacilli (AFB) sputum smear or culture results
  - a cavity on the chest x-ray
  - inadequate or no treatment.
- Explain that even if these conditions are not present, a contact investigation should be considered if TB patient's chest x-ray is consistent with pulmonary TB.

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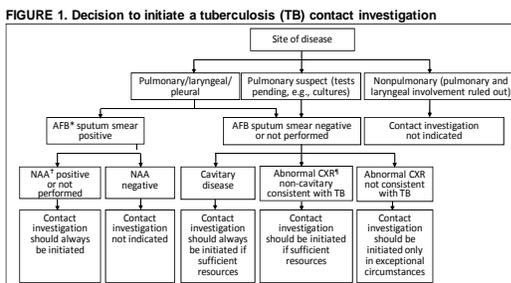
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Slide 20

Time: 3-4 minutes

### Decision to Initiate a Contact Investigation (2)



\* Acid-fast bacilli.  
 † Nucleic acid assay.  
 ‡ According to CDC guidelines.  
 § Chest radiograph.

Centers for Disease Control and Prevention. Guidelines for the investigation of contacts of persons with infectious tuberculosis; recommendations from the National Tuberculosis Controllers Association and CDC, and the Guidelines for using the QuantiFERON®-TB Gold test for detecting *Mycobacterium tuberculosis* infection, United States. *MMWR* 2005; 54(No.RR-15): [page 5].

- Explain that this chart is a visual tool that serves as a guide in the decision-making process as to whether to initiate a contact investigation. Walk participants through the paths of this chart. Participants can find a larger handout of this chart in the *Participant Materials* section (**page 138**).
- Remind participants that a contact investigation should be considered when TB is confirmed or when there is high clinical suspicion of TB.
- If participants request a clinical description of how to prioritize a CI, you can read the following aloud:
  - While acid-fast bacilli (AFB) sputum smear-negative TB disease usually indicates a lower bacterial burden than AFB smear-positive disease, and thus a lower risk of transmission, contact investigations for smear-negative cases usually should be conducted. Recent evidence suggests that transmission can occur from these AFB sputum smear-negative cases as well. Moreover, a negative AFB sputum smear may be the result of a poor quality sputum specimen. Contact investigations for cases with negative AFB sputum smears are, however, a lower priority than those with positive AFB sputum smears. Decisions about the prioritization of contact investigations should be made by supervisory clinical and management staff in conjunction with the TB program staff at the local health department.
- There are some instances in which contact investigations are not performed. For example, extrapulmonary TB (without pulmonary TB) typically does not carry any risk for transmission and contact investigations are not performed unless aerosolization occurs.
- Likewise, contact investigations are not performed for people with diseases caused by nontuberculous mycobacteria (or NTMs) only, such as *M. avium* complex. (Nontuberculous mycobacteria are not spread from person-to-person.) When information about the type of mycobacteria-causing disease in a particular person is not available at the time the case is reported to the health department, a contact investigation should be initiated if TB is strongly suspected, especially if AFB sputum smears are positive. When the culture results are available and only NTMs are identified, the patient should be evaluated clinically to rule out TB disease and, if it is ruled out, the contact investigation is usually stopped.
- Special laboratory tests such as nucleic acid amplification (NAA) tests have been used in some areas to more quickly detect *M. tuberculosis* complex.

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**Slide 21**

Time: 2 minutes

**Principles Guiding a Contact Investigation**

- determine the TB patient’s degree of infectiousness
- determine contacts’ duration and intensity of exposure to TB patient
- determine the contacts’ susceptibility to infection (e.g., HIV status)
- contacts with the greatest risk of infection should be screened immediately

- Explain the principles guiding a contact investigation. Inform participants that there is no simple formula devised for deciding which contacts to target in a jail facility contact investigation.
- However, the investigation should be guided by the following basic principles:
  - Determine the TB patient’s degree of infectiousness
  - Determine the contacts’ duration and intensity of exposure to the TB patient
  - Determine the contacts’ susceptibility to becoming infected. HIV-infected contacts should be classified as the highest priority group for screening and initiation of latent tuberculosis infection (LTBI) therapy, regardless of duration and intensity of exposure. Progression from exposure to death can be rapid among HIV-infected persons
  - Identified groups of contacts with the greatest degree of exposure should be screened immediately, followed by repeat testing at 8-10 weeks if the initial TST/IGRA is negative.

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**Slide 22**

Time: 2-3 minutes

**Principles Guiding a Contact Investigation (2)**

- calculate infection rate to assess the level of TB transmission
- if minimal or no evidence of transmission is observed, do not expand contact investigation
  - determined by both jail facility and health department
- jail and medical staff should be included in the contact investigation depending on their exposure risks

- Continue to explain the principles for guiding a contact investigation:

- The infection rate should be calculated to assess the level of TB transmission. To learn the steps of calculating the infection rate in their facility, participants can turn to Session Two (**Session Two, slides 52 and 53, pages 87-88** of *Facilitator Materials*) for an explanation. The facilitator can find step-by-step instructions for calculating this rate in *Facilitator Materials (Session Two Exercise 3 Answer Key, page 108)*. This information will be covered in Session Two.
- If minimal or no evidence of transmission is observed, do not expand the contact investigation:
  - This is determined by both jail facility and the health department.
  - In settings in which health departments are not meeting their objectives for high- and medium-priority contacts, contact investigations generally should not be expanded beyond high- and medium-priority contacts. However, if data from an investigation indicate more transmission than anticipated, more contacts might need to be included. In the absence of evidence of recent transmission, an investigation should not be expanded to low-priority contacts. When program evaluation objectives are not being achieved, a contact investigation should be expanded only in exceptional circumstances, generally those involving highly infectious persons with high rates of infection among contacts or evidence for secondary cases and secondary transmission. Expanded investigations must be accompanied by efforts to ensure completion of therapy.
- Jail and medical staff should be included in the contact investigation depending on their exposure risks.
- Explain that decisions regarding the contact investigation should be made collaboratively by the contact investigation team with input from the state or local health department. Using TST/IGRA to screen a convenience sample before expanding the investigation may be useful. For example, numerous contacts may already have been released from jail, rendering those who remain incarcerated the only available group for TB testing. If a substantial number of high-priority contacts cannot be evaluated fully, a wider community contact investigation by the health department should be considered.
- Emphasize that the investigation should focus on identifying the contacts at highest risk for transmission, screening, and if applicable, testing them all, and providing a full course of LTBI treatment for persons found to be infected. In general, because wide-scale investigations divert attention away from the high-priority activities necessary to interrupt transmission in the facility, mass TB testing of all persons (such as those who had minimal contact with the TB patient) should be avoided. Rarely is a person so infectious that wide-scale expansion of the contact investigation is necessary or beneficial. However, an inability to estimate the degree of exposure sometimes forces testing of all inmates and employees.
- Remind participants that it is important to conduct a symptom review for TB when administering TSTs/IGRAs to identify any suspected TB cases among the contacts.

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**Slide 23**

Time: 2-3 minutes

**The Contact Investigation Team**

- Jail medical personnel
- Correctional staff: officers, custody, classification, booking
- Health department staff: infection control, medical, nursing, outreach staff

- Explain that a multidisciplinary team is preferable because decisions involved in planning contact investigations and prioritizing contacts in jail facilities are seldom simple. Written policies and procedures for contact investigations improve the efficiency and uniformity of investigations. Health departments often can help jail facilities in planning, implementing, and evaluating a TB contact investigation. Sometimes health departments do the entire contact investigation.
- Advise participants that the best preparation for conducting contact investigations in jails is establishing formal collaboration between jails and public health officials *before* a contact investigation occurs.
- The health department is legally responsible for ensuring that a complete contact investigation is done for the TB patient reported in jail. This includes:
  - identifying and evaluating contacts
  - identifying and evaluating suspects/secondary cases
  - 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 for cases, not necessarily for LTBI treatment
  - educating TB suspects/cases and LTBI contacts about the disease.
- The jail's obligation to protect inmates from health hazards overrides the health department's responsibility in the same setting. Occasionally, some steps of the investigation may be performed by people outside the health department, but under its supervision. For example, if an inmate or staff member is found to have TB disease, the jail medical staff may evaluate inmates and staff who were exposed, while the health department staff would evaluate contacts outside the jail. At a minimum, the health department staff should work with jail staff to plan the contact investigation and receive a summary report. Such a report includes the number of contacts identified, the number with newly documented infections, the number with TB disease, detailed treatment plans, and documentation of therapy administered and completed.
- Explain the roles of the jail medical staff, corrections officer, and local health department.
- Explain that a team of health professionals (e.g., infection control, medical, nursing, custody, and local public health personnel) is convened and charged with planning the contact investigation after TB is diagnosed. Identify a team leader, define the roles and responsibilities of each team member, and establish a schedule of regular meetings (documented formally with written

minutes). For example, the jail staff may be responsible for collecting the data (e.g., compiling lists of exposed contacts per location to include inmates, staff, visitors, volunteers, etc., and inmates' housing history), while the health department can provide the scope and guidance in conducting a contact investigation.

- Please make clear to participants that this does not necessarily mean that jail staff (e.g., custody, classifications, booking) will drop other duties and be detailed to work on the investigation full time. In some jurisdictions, custodial staff is not allowed to have knowledge of medical issues (i.e., confidentiality) and this creates conflicts. However, jail staff will be asked to contribute to the investigation by working with jail medical staff and the health department since they have access to information needed for the contact investigation.

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Slide 24

Time: 1-2 minutes

Question
How is your health department notified when symptoms indicative of TB appear in your jail?
When?
By whom?

- Ask participants this 3-part question.
- The purpose of this question is to see if participants know the following:
  - The protocol for contacting their health department
  - Their point person/correctional liaison at the health department
- If participants are not aware of whom to contact, provide the information or the names/contact information of their state health office corrections liaison.

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**Slide 25**

Time: 1 minute

**Contact Investigation Team Roles**

Jail staff is responsible for the following:

- identifying and isolating persons suspected of having or diagnosed with TB
- identifying contacts exposed to TB and evaluating them (inmates and staff)\*
- providing appropriate treatment and care for TB case and contacts\*

*\*The health department may play a direct role in some communities*

- Describe the roles of the jail staff (in addition to collaborating with the local health department).
- Explain that jail medical staff may take the lead in organizing the contact investigation while in consultation with the health department since the health department is more familiar with TB. The jail medical staff can provide direction to fellow jail staff members (e.g., officers, custody, classification) in collecting information needed for the contact investigation.
- Also remind participants to assess all contacts for TB symptoms when administering TSTs/IGRAs.

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**Slide 26**

Time: 1 minute

**Contact Investigation Team Roles (2)**

Jail staff is responsible for the following (cont'd):

- initiating a timely contact investigation with public health involvement—providing public health department with names and locating information for contacts who are no longer there (i.e., released inmates or staff who have quit or transferred)\*
- providing medical and housing records for TB patient and contacts and identifying inmate and staff contacts to the health department

*\*The health department may play a direct role in some communities*

- Continue to describe the role of the jail staff (in addition to collaborating with the local health department).
- You may want to clarify that the roles of the custody staff, jail medical staff, and the health department staff may vary by jurisdiction and state law, and may be negotiated or delegated. For

example, in certain jurisdictions, discharge planning (continuity of care) may be done by the health department.

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Slide 27

Time: 1 minute

**Contact Investigation Team Roles (3)**

Jail staff is responsible for the following (cont'd):

- placing and reading TSTs (or drawing blood for IGRAs and sending specimens to the lab) and notifying public health department of positive results\*
- initiating LTBI treatment for staff and inmates still in jail\*
- providing continuity of care (discharge planning) for TB patients and high-priority LTBI patients

*\*The health department may play a direct role in some communities*

- Continue to describe the role of the jail staff (in addition to collaborating with the local health department).
- If using the tuberculin skin test (TST) method, ensure that jail medical staff demonstrates accurate administration and reading of these tests. Suggest that health department staff observe how the first few TSTs are placed, if this is the testing method used.

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Slide 28

Time: <1 minute

**Contact Investigation Team Roles (4)**

The health department is responsible for the following:

- overseeing and managing all cases of TB (monitoring the treatment and ongoing medical follow-up of inmates with TB disease; providing consultation)

- Describe the role of the local health department (in addition to collaboration with the jail staff).

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Slide 29

Time: <1 minute

**Contact Investigation Team Roles (5)**

The health department is responsible for the following (cont'd):

- assisting the jail to initiate and conduct timely and effective contact investigations with jail involvement; providing consultation, direction for contact investigation activities as needed
- reporting results to the TB control program at the state department of health services, if needed

- Continue to describe the role of the health department (in addition to collaborating with the jail staff).

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**Slide 30**

Time: <1 minute

**Contact Investigation Team Roles (6)**

The health department is responsible for the following (cont'd):

- providing consultation for jails in the treatment of LTBI for contacts whose TST/IGRA is positive
- locating and assessing contacts outside the jails – in the community
- assisting as needed with education for staff and inmates with TB disease or LTBI

- Continue to describe the role of the health department (in addition to collaborating with the jail staff).

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**Slide 31**

Time: 2-3 minutes

**Any Questions?**

- Finally, conclude this session by asking participants what kinds of questions they may have. Spend a few minutes responding if you are able. If your participants request further guidance, refer them to the **Resources List** in the *Participant Materials* (**page 168**).
- You can use this time to briefly summarize and recap the session by reviewing the learning objectives. You can also ask participants if they believe they achieved the learning objectives after attending this session. And as time permits, you may do a brief review to determine what learning has occurred by asking participants to do the following:
  - Explain why tuberculosis (TB) is a concern for jails (see **Slide #4** for review)
  - Define a TB contact (see **Slide #8** for review)
  - Describe the factors that predict likely transmission of TB (see **Slides #9-12** for review)
  - Define a contact investigation (see **Slide #15** for review)

- Describe the factors to consider when initiating a contact investigation (see **Slides #19-20** for review)
- Explain the principles guiding a contact investigation (see **Slides #21-22** for review), and
- List the members of a contact investigation team (see **Slide #23** for review).

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Please proceed to facilitate Session Two or conduct Session Two at another time.

If you plan to conduct Session Two at another time, please thank participants for their time and attendance. If you wish to share your contact information with participants in response to any follow up questions, you can provide your information at this time.

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**Facilitator Evaluation**

After facilitating this training session, please complete the **Evaluation Form for Facilitators** included in your facilitator guide (**Page 187**). Your feedback is important because it helps to improve and develop our future trainings. Mail the facilitator course evaluation to:

**Francis J. Curry National Tuberculosis Center**  
**3180-18<sup>th</sup> St., Ste. 101**  
**San Francisco, CA 94110-2028**  
**or fax to 415/502-4620**



# **TUBERCULOSIS CONTACT INVESTIGATION IN JAIL: A FACILITATOR GUIDE**

## **Facilitator Materials**

(Slide-by-slide instructions and speaker notes)

### **SESSION TWO: THE STEPS FOR CONDUCTING A TB CONTACT INVESTIGATION IN JAIL**



# SESSION TWO: THE STEPS FOR CONDUCTING A TB CONTACT INVESTIGATION IN JAIL

## ***Introduction***

This session describes a step-by-step process for performing a TB contact investigation in jail. These steps include establishing a relationship between jails and local health departments, the data collection required when reviewing a TB patient's medical record, interviewing the TB patient, conducting a field investigation, conducting a risk assessment for prioritizing contacts, evaluating contacts, treating and following up on contacts, and deciding whether to expand testing.

## ***Learning objective***

After completing this session, participants will be able to:

- Describe the steps for performing a contact investigation in jail

## ***Enabling Objectives***

Enabling objectives are the steps needed to achieve the main learning objective. A handout with these enabling objectives for a contact investigation is available in the *Participant Materials* (page 154). Participants should be given a copy of this list of objectives to follow along as the training is conducted or they can review them after the session is completed to ensure that all enabling objectives were covered in the training. The enabling objectives are printed in bold under the corresponding slide in your *Facilitator Materials*. They are as follows:

- Identify the jail management officials to notify when TB is suspected
- Describe at least 3 pieces of information to collect when reviewing a TB patient's medical records
- Define the infectious period
- Determine the exposure period
- List at least 3 pieces of information to collect during an interview with a TB patient
- List at least 3 types of information to share when updating correctional management officials about a contact investigation
- List at least 2 pieces of information to obtain from reviewing a TB patient's housing and movement history
- List at least 3 pieces of information to collect during a visit of the exposure site(s)
- Describe how to prioritize contacts as high, medium, or low
- Describe at least 2 pieces of information to include on documentation for exposed contacts
- Identify at least 3 pieces of information to collect when reviewing the medical record for a high- and/or medium-priority contact
- Explain why evaluation of HIV-infected contacts should be done promptly
- Explain the importance of conducting initial tuberculin skin tests (TSTs) or interferon gamma release assays (IGRAs) on eligible contacts
- Describe the referral process for contact evaluation
- Calculate the infection rate to assess the level of TB transmission
- Identify when to conduct follow-up TSTs or IGRAs

- Calculate the infection/transmission rate from the second round of testing
- Describe what information to include in a summary report

### **General housekeeping**

Go over general housekeeping items such as:

- Turn cell phones/pagers off or place on vibrate mode
- Location of restrooms
- Location of nearby restaurants for lunch
- Parking restrictions (if any)
- Water, refreshments (if available)

### **Materials supplied for this session:**

- Slide-by-slide instructions and speaker notes for the facilitator
- *Participant Materials*: presentation slides (6 per page), slide enlargements, enabling objectives, exercise worksheets (**pages 140-161**)
- Master set of PowerPoint presentation slides on CD-ROM
  - Download the PowerPoint presentation slides from the CD-ROM that accompanies this guide or by going to CNTC's website at [http://www.nationaltbcenter.ucsf.edu/tbci\\_jail/](http://www.nationaltbcenter.ucsf.edu/tbci_jail/)

### **Materials you need to supply:**

- Poster paper, chalkboard, or dry-erase board
- Laptop and LCD projector or overhead projector
- Poster pens, chalk, or dry-erase markers
- Copies of participant handouts

### **Supplemental materials to distribute to participants (in Participant Materials section):**

- Presentation slide handout (6 per page) (**page 140**)
- List of enabling objectives (**page 154**)
- Table 2: "Define the infectious period" (**page 152**)
- Table 3: "Time frames for initial follow-up of contacts of person exposed to TB" (**page 152**)
- Participant Exercise Worksheet(s) (**pages 155-161**)

### **Job aid:**

- Checklist of the steps for performing a contact investigation (**page 171**)  
*This handout outlines the steps of a contact investigation and provides suggested time frames for each step.*
- Symptom review forms:
  - Initial TB Screening Questions for Inmates (**page 182**)
  - TB Intake Screening Questionnaire (one page) (**page 185**)*These handouts provide information on the symptoms that patients/contacts should be asked about during the interview process.*

**Material in this session is adapted from:**

- *TB in Corrections: Contact Investigation Course* by Ellen Murray, R.N., B.S.N., Training Specialist and Nurse Consultant, Southeastern National Tuberculosis Center
- Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis: Recommendations from the National Tuberculosis Controllers Association and CDC. *Morbidity and Mortality Weekly Report*. 2005 Dec 16;54(RR-15):1-47
- Prevention and Control of Tuberculosis in Correctional and Detention Facilities: Recommendations from CDC. *Morbidity and Mortality Weekly Report*. 2006 July 7;55 (RR-9):1-44
- Hutton MD, Cauthen GM, Bloch AB. Results of a 29-state survey of tuberculosis in nursing homes and correctional facilities. *Public Health Reports*. 1993;108:305-314

**Instructions for asking questions, conducting exercises, and case studies**

This session contains a total of 6 questions, 3 exercises, and 3 case studies.

- **Questions**

The speaker notes will prompt you when to ask the following questions. Spend a minute or two for each question. Answers are provided in the speaker notes in the event participants are unaware of the correct responses.

1. Who is responsible for making notification to the health department when TB is suspected at your jail facility? **(Slide #5)**
2. Where are medical records kept in your jail facility? **(Slide #11)**
3. Who would you contact at your jail to research a TB patient's movement records? **(Slide #27)**
4. How might you determine air flow in a defined area in your jail? **(Slide #30)**
5. Who places and reads the TST? Who draws blood for an IGRA? Who is responsible for getting IGRA sample to the lab? **(Slide #50)**
6. Any questions?? **(Slide #66)**

- **Exercises**

There are 3 exercises in this session. The speaker notes will prompt you when to conduct the exercises. Instructions and the answer key for the exercises are included at the end of this session. Read the exercises aloud. Spend 5-10 minutes for each exercise.

Make copies of the exercise worksheets to distribute to participants. Participant exercise worksheets can be found in the *Participant Materials* section (**pages 155-161**).

**Exercise 1:** A scenario to determine: 1) the infectious period for TB patient, and 2) the contacts who were exposed during the infectious period **(Slide #23)**

**Exercise 2:** A scenario in which participants will be asked to prioritize contacts as either high, medium, or low **(Slide #36)**

**Exercise 3:** A scenario in which participants will need to calculate the infection rate **(Slide #54)**

- **Case studies**

You can download the case study PowerPoint presentation slides from the CD-ROM that accompanies this guide or by going to CNTC's website at [http://www.nationaltbcenter.ucsf.edu/tbci\\_jail/](http://www.nationaltbcenter.ucsf.edu/tbci_jail/).

Instructions for Conducting Case Studies #1-3 can be found in *Facilitator Materials* (**page 111**).

There is a choice of 3 case studies. You may discuss one, all, or none of the case studies, as time permits. Instructions and answer key for conducting the case studies are included at the end of this session. Read the case study aloud. Spend 5-15 minutes for each one. Feel free to share a case study from your own experience.

**Case Studies (Slide #59)**

Case 1: 39-year-old male released from jail

Case 2: 30-year-old female prostitute

Case 3: 38-year-old male TB suspect during routine entry screening

### Legend for icons used in Session Two

The following table contains an explanation of each icon type used in this document and the description of the activity that each represent.

Icon	Activity	Activity Description
	Present slide content	This icon prompts the facilitator to present the content and associated material for each slide, using the text that follows each slide in the <i>Facilitator Materials</i> .
	Present questions and answers	This icon prompts the facilitator to ask the question on the accompanying slide. Spend a minute or two for each question. Answers are provided in the speaker notes in the event participants are unaware of the correct responses.
	Conduct Exercise	<p>This icon prompts the facilitator to conduct the exercises. Instructions and the answer key for the exercises are included at the end of this session. Read the exercises aloud. Spend 5-10 minutes for each exercise.</p> <p>Make copies of the exercise worksheets to distribute to participants. Participant exercise worksheets can be found in the <i>Participant Materials</i> section (<b>pages 155-161</b>).</p>
	Conduct Case Study	This icon prompts the facilitator to conduct one of the three case studies. Instructions and answer key for conducting the case studies are included at the end of this session ( <b>page 111</b> ). Case study presentation slides can be found on the CD-ROM that accompanies this <i>Facilitator Guide</i> .

# SESSION TWO: THE STEPS FOR CONDUCTING A TB CONTACT INVESTIGATION IN JAIL

Slide-by-slide instructions and speaker notes

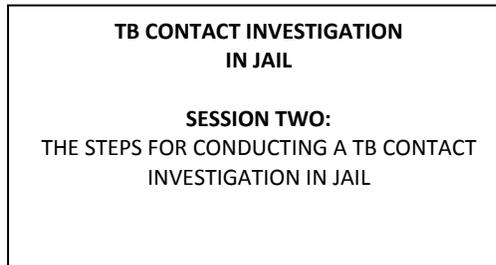
Time: Approximately 90-150 minutes (68 slides + cases/exercise)

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Slide 1

Time: 1-3 minutes



- Introduce the session topic. If you conducted Session One just prior to implementing this session, please proceed to Slide 2. If you are conducting this session independently from Session One, please go to **Session One, slide 1, page 18** of the *Facilitator Materials* for introductory remarks.

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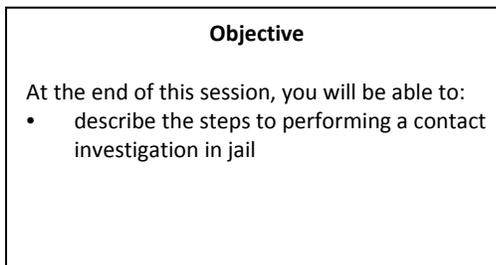
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Slide 2

Time: <1 minute



- Review the learning objective for this session with participants.
- Inform participants that they will be able to achieve this learning objective by the end of this session. Let them know that the learning objective is supported by a number of enabling objectives. A handout of these enabling objectives can be found on **page 154** of the *Participant Materials*.

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**Slide 3**

Time: 2 minutes

**The Steps for Conducting a TB Contact  
Investigation in Jail:  
  
An Overview**

- Explain that a contact investigation will follow a process that includes the steps that will be covered in this session. Although these steps are presented in sequence for the purposes of this training, it is important to remember that a contact investigation will not always follow a predetermined sequence. Some steps may overlap in time.
- As soon as an inmate/staff member is confirmed or suspected of having TB disease, this person--the "TB patient"--should be reported to the appropriate local jail and health authorities. Contacts should be promptly evaluated.
- Remind participants about the definition of a "TB patient" (**Session One, Slide 7, page 23**).
- Explain to participants that they may hear the public health department staff using terms such as "index patient," "index case," "source patient," or "source case" to describe a TB patient. Explain to participants that, for the purposes of this training, the term "TB patient" will refer to an inmate or staff member diagnosed with TB disease.
- The CDC defines "case" as a particular instance of a disease (e.g., TB). A case is detected, documented, and reported.
- Emphasize to participants that it is important to track and provide documentation for each step of the contact investigation. Having an existing contact investigation strategy, policy, and data system in place is helpful in conducting contact investigations in a timely and effective manner.

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Slide 4

Time: 2-3 minutes

**Notify Jail Management and Health  
Department Officials Directly**

Know who your point people are at the  
health department

**Enabling Objective:**

**Identify the jail management officials to notify when TB is suspected**

- Explain that identification of TB in an inmate or staff member can be alarming for other inmates, jail staff, and the community. And ideally, TB should be diagnosed before inmates and staff are exposed. To achieve this goal, explain that conducting TB screening (TST /IGRA and TB symptoms review) during inmate intake/booking is critical.
- Tell participants that they should be aware of their facility's TB infection control policy. This policy/protocol should be developed and negotiated between the health department and the jail facility. For example, how would jails handle an inmate who had TB diagnosed outside of jail, prior to being incarcerated? Or, what if the diagnosis of TB is made during the time of intake into the jail?
- The jail administrator should be notified, through the appropriate chain of command, that a case of TB has been identified in the institution. Appropriate briefing and educational efforts should then be initiated. These initial efforts include isolating the TB patient by transporting the TB patient to a hospital for isolation, confirming the diagnosis, and starting treatment. Once treatment is underway and medical personnel confirm that the TB patient is no longer infectious, the TB patient can then be returned to jail. Again, this protocol needs to be negotiated with the health department and jail facility.
- If, during the intake, an inmate informs the jail that he has TB, it will be important for the jail medical personnel to look at the medical records to confirm. However, in the case of an inmate diagnosed with TB prior to entry, there may not be a medical record immediately available, unless the inmate is a transfer from another facility (in which case, the staff should have been informed prior to transfer). If the new inmate is coming in from the community, jail staff may need to call the local health department for help in obtaining necessary information. Intake staff should also find out if the inmate has been on medication, what medication (and when it started), and whether the inmate has been taking it regularly. Based upon the information obtained, the inmate might have to be isolated until TB status is confirmed.
- Once the jail administrator is notified, the jail will need to notify and report the case to the local TB control program at the health department for consultation, direction, resource assistance, and case management to assure appropriate follow-up of the TB patient and also to assist in the initiation of the contact investigation.

- An inmate may be diagnosed after release from jail. In this case, the health department will help determine the infectious period and notify the jail if an exposure may have occurred in your facility. The health department will also assist the jail staff in conducting the contact investigation.
- Emphasize the importance of having a pre-existing collaborative strategy between the jail and local health department (LHD). This is a strategy for TB infection control as well as for contact investigation activities, which require the careful gathering and evaluation of detailed information, often involving many people and resources.

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Slide 5

Time: 1-2 minutes

**Question**

Who is responsible for making notification to the health department when TB is suspected in your jail facility?

- Ask your participants this question.
- Explain that the purpose of this question is to determine if participants know whom to notify if they suspect TB in their facility and who to contact at their local health department. If they do not know, emphasize the importance of finding out.

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Slide 6

Time: 1-2 minutes

**Review Medical Record for TB Patient**

Collect the following information and dates for:

- previous exposure to TB
- previous diagnosis and treatment of TB
- site of TB disease
- TB symptoms and approximate date symptoms began
- lab test results (e.g., AFB smears, nucleic acid amplification tests), including dates obtained

**Enabling Objective:**

**Describe at least 3 pieces of information to collect when reviewing a TB patient's medical record**

- The first step in a contact investigation is to review the TB patient's medical record. Jail medical staff or a health department clinician will determine whether the TB patient is infectious and also their infectious period. Knowing the TB patient's period of infectiousness helps health care workers decide which contacts are at risk. This may require talking with the jail medical staff, reviewing laboratory test results, and interviewing the TB patient directly.
- Patients are more likely to be infectious if they:
  - have pulmonary or laryngeal TB
  - are coughing (especially if they are producing a lot of sputum)
  - have positive sputum AFB smear results and a positive culture for *M. tuberculosis*
  - have chest x-ray results showing a cavity in the lung
  - have had no treatment, or recently started treatment.
- Jail medical records may be lacking due to frequent inmate relocation or release. Thus, there is a need for a timely response to collect the appropriate data for a contact investigation.

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**Slide 7**

Time: 1 minute

**Review Medical Record for TB Patient (2)**  
 Collect the following information (and dates for):

- chest x-ray results
- TB treatment (medications, dosage, and when treatment was started)
- method of treatment administration (DOT or self-administered)
- TST/IGRA result
- HIV status

- Read the slide aloud. If needed, explain any acronyms or refer participants to the glossary.

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**Slide 8**

Time: 1 minute

**Review Medical Record for TB Patient (3)**  
 Collect the following information for other medical conditions that could affect treatment:

- HIV
- diabetes
- end-stage renal disease
- anti-cancer drugs

- Read the slide aloud.

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**Slide 9**

Time: 1-2 minutes

Minimal Recommended Data to Collect About Patient:

- when TB patient was first incarcerated
- movement list, including housing locations
- work history within jail setting
- cellmates
- visits to clinic health services/lab draws
- court appearances
- visitors (i.e., lawyers, children, etc.)
- classes/programs attended

- Explain to participants that they need to collect information at a level of detail that helps to identify, if possible, every person who came into contact with the TB patient during his infectious period.
- Advise participants to meet with jails classifications staff. The involvement of the classifications staff is important because they have access to information that tracks the movement of inmates. They can help identify the cells in which the TB patient was housed and other areas of potential exposure (e.g., holding cells, court, intake/booking, clinic, school/classroom, worksites, law library, transport to other areas). They can also help identify other inmates/contacts who shared the same spaces with the TB patient.

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**Slide 10**

Time: 1 minute

Minimal Recommended Data to Collect About Patient (2):

- Staff who did lab work and chest x-rays

Remind participants that they can use this information to help determine who may have been exposed to the TB patient.

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**Slide 11**

Time: 1-2 minutes

**Question**

Where are medical records kept in your jail facility?

- Ask participants this question.
- Explain the purpose of this question is to determine if jail staff members know where to look if they are asked to provide the medical records for an inmate or staff member with infectious TB disease.

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**Slide 12**

Time: 1-2 minutes

**Data Collection and Management**

Two systems critical to the efficient conduct of a contact investigation:

- an inmate medical record system containing TST/IGRA results and other relevant information
- an inmate location tracking system

- Emphasize to participants that in addition to the two systems shown on the slide, plans for handling contact investigation data and communicating with the community health department should be developed before the need to conduct a contact investigation.
- Explain that data collection and data management are essential components of a successful investigation. This requires a systematic approach to collecting, organizing, and analyzing TB-associated data. As part of the contact investigation, all staff and investigation personnel should adopt a uniform approach. Also mention that data may be lacking due to the rapid movement of inmates/contacts. Thus, there is a need for a timely collection of the appropriate data for a contact investigation.

- Data collection and management systems:
  - Inmate medical record system containing TST/IGRA results and other relevant information
    - Describe that adequate knowledge of test result data is possible only through use of a medical record system that is complete, up-to-date, and reliable with regard to TST/IGRA status, testing date(s), and for TSTs, the documentation of the reading in millimeters. Without an adequate medical record system (and therefore definitive information regarding prior TST/IGRA results), the true infection rate and transmission rate cannot be determined. The lack of such information is likely to lead to unnecessary expansion of the contact investigation.
  - Inmate location tracking system
    - Explain that adequate records for tracking an inmate’s movements within the jail help to determine the environment(s) in which the TB exposure may have occurred and focuses resources on those contacts who are high-priority.
- Point out that the lack of either system can lead to the unnecessary use of costly personnel time and medical evaluation resources (e.g., TSTs, IGRAs, and chest x-rays). Without these information systems, facilities also might be forced to implement costly lockdowns and mass TB screenings.

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**Slide 13**

Time: 1 minute

**Updating Jail Management Staff**

Update jail management officials on the extent of the exposure, the strategy, process, and action steps for dealing with, identifying, and assessing contacts.

**Enabling Objective:**

**List at least 3 types of information to include when updating jail management officials about a contact investigation**

- Read the slide aloud. Explain the importance of collecting appropriate data and having a methodical process for performing the contact investigation. This also assists in providing accurate information to jail management officials.

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Slide 14

Time: 2-3 minutes

Define the Infectious Period			
TABLE 2. Guidelines for estimating the beginning of the period of infectiousness of persons with tuberculosis (TB), by index case characteristic			
TB symptoms	Characteristic		Recommended minimum beginning of likely period of infectiousness
	AFB* sputum smear positive	Cavitary chest radiograph	
Yes	No	No	3 months before symptom onset or first positive finding (e.g., abnormal chest radiograph) consistent with TB disease, whichever is longer
Yes	Yes	Yes	3 months before symptom onset or first positive finding consistent with TB disease, whichever is longer
No	No	No	4 weeks before date of suspected diagnosis
No	Yes	Yes	3 months before first positive finding consistent with TB

SOURCE: California Department of Health Services Tuberculosis Control Branch; California Tuberculosis Controllers Association. Contact investigation guidelines. Berkeley, CA: California Department of Health Services; 1998.  
\*Acid-fast bacilli.

Centers for Disease Control and Prevention. Guidelines for the investigation of contacts of persons with infectious tuberculosis; recommendations from the National Tuberculosis Controllers Association and CDC, and the Guidelines for using the QuantiFERON®-TB Gold test for detecting *Mycobacterium tuberculosis* infection, United States. MMWR 2005; 54(No. RR-15): [page 9].

**Enabling Objective:  
Define the infectious period**

- Inform participants that they can find a larger copy of this chart in their *Participant Materials* (page 152). Explain that the infectious period is defined as the time when a person with infectious TB disease is capable of transmitting TB bacilli.
- Explain that determining the infectious period focuses the investigation on those contacts most likely to be at risk for infection and sets the time frame for providing tuberculosis testing for contacts.
- Inform participants that defining the infectious period for a TB patient helps investigators establish a timeline to determine how far back to go when investigating potential contacts. The infectious period is typically defined as 12 weeks before TB diagnosis or onset of cough (whichever is longer). If a patient has no TB symptoms, is acid-fast bacilli (AFB) smear-negative, and has a noncavitary chest radiograph, the presumed infectious period can be reduced to 4 weeks before the date of first positive finding consistent with TB. If the contact investigation reveals that TB transmission occurred throughout the identified infectious period, the period for contact investigation might need to be expanded beyond 12 weeks.
- Also explain to participants that when the start of the infectious period cannot be determined with precision by available methods, a practical estimation is necessary. On the basis of expert opinion, this practical estimation is 3 months before onset of TB symptoms. Go over this process in the table shown in this slide.
- Clarify that in certain circumstances, an even earlier start date should be used. For example, a patient (or the patient's associates) might have been aware of protracted illness (in extreme

cases, >1 year). Information from the interview with the TB case and from other sources should be compiled to assist in estimating the infectious period. Helpful details include the approximate dates that TB symptoms were noticed, lab test results, and extent of disease (especially the presence of large lung cavities, which imply prolonged illness and a higher degree of infectiousness).

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Slide 15

Time: 1-2 minutes:

**Define the Infectious Period (2)**

Consider infectious period “closed” when all of the following has occurred for the TB patient:

- effective/appropriate treatment for  $\geq 2$  weeks
- diminished symptoms
- shows clinical improvement
- shows lab result response

- Explain that the infectious period is considered “closed” when all of the following criteria are satisfied: 1) effective and appropriate treatment for 2 or more weeks (i.e., correct medication, correct dosage)—if not effective and appropriate treatment, 2 weeks of medication is not enough to “close” the infectious period; 2) diminished symptoms; and 3) lab test results (i.e., converts to smear-negative).
- More stringent criteria should be applied for setting the end of the infectious period if particularly susceptible contacts or drug resistance is involved. A TB patient returning to a congregate living setting or to any setting in which susceptible persons might be exposed should have at least three negative smears collected 24 hours apart before being considered noninfectious (with 1 specimen collected during the early morning).
- Inmates who are highly infectious may have to remain in isolation longer. This decreases the risk to the general jail population.

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Slide 16

Time: 1 minute

**Determine Exposure Period for Contacts**

The exposure period for individual contacts is determined by how much time they spent with the TB patient during the infectious period

**Enabling Objective:**

**Determine the exposure period**

- The exposure period for individual contacts is determined by how much time the contacts spent with the TB patient during the TB patient's infectious period (*duration* describes how long and *frequency* describes how often).
- The optimal exposure cut-off durations for assigning priorities to contacts have not been clinically determined because available data lack this level of precision.
- The National Tuberculosis Controllers Association (NTCA) work group did not reach consensus on cut-off durations during the development of the 2005 Guidelines.
- On the basis of local experience and adjusting for resource limitations, public health officials and the jails should set local standards for the durations of exposure that define high-, medium- and low-priority.
- Identify those at highest risk to progress to active disease and evaluate them first (e.g., six diabetics in holding cell for six hours waiting for clinic appointment would be a priority over cellmates in open dorm-style cell).

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**Slide 17**

Time: 1-2 minute

**Determine Exposure Period for Contacts (2)**

- Frequency and duration:
  - how often they spent time together
  - length of each time period

- Explain that the likelihood of infection depends on the intensity, frequency, and duration of the exposure to the TB patient. For example, there may be a higher likelihood of TB transmission for an inmate who shared a small, enclosed cell for 8 hours a day with the TB patient rather than an inmate who sat in an open space dining hall once or twice a day with the TB patient. The latter inmate had only minimal contact with the TB patient.

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**Slide 18**

Time: 1-2 minute

**Key Term**

“Date of last exposure”

or

“Date exposure was broken”

The last day contact spent time with the TB patient during the TB patient’s infectious period

- Define the “date of last exposure”/“date exposure was broken” as being the last day the contact shared space with the TB patient during the infectious period of the TB patient. Inform participants that this “date of last exposure” is an important time frame because it helps determine when to place and read the follow-up tuberculin skin test on contacts (if this is your testing method) or conduct the IGRA.

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**Slide 19**

Time: 2-3 minutes

**Interview the TB Patient**

Goals:

- confirm medical review findings
- perform physical assessment
- identify contacts

- A review of the medical records and an interview with the TB patient should be accomplished within 1 working day of reporting the case to the health department for persons with acid-fast bacilli (AFB) smear-positive respiratory specimens or cavitation on chest x-ray, and within 3 days for all other persons. Ask TB patient about his/her TB symptom history (using the TB intake questionnaires found in **Job Aids, pages 182 and 185**), with a particular focus on the duration of cough. Review prior incarceration history (records) for signs and symptoms of TB.
- A minimum of 2 interviews is recommended. The second follow-up interview should happen 1-2 weeks after the first interview. The TB patient may be interviewed a third time, as necessary, for clarification and additional information. As a standard, a minimum of 2 interviews should be conducted.
- The interviewer should confirm information from the review of the TB patient’s medical record, obtain missing information, and resolve disparities. The beginning of the infectious period should be determined after conducting the initial interview.

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Slide 20

Time: 1 minute

**Interview the TB Patient (2)**

Information includes:

- history of prior TB disease or latent tuberculosis infection and treatment history
- TB symptom history and date
- review prior incarceration records for signs and symptoms of TB
- daily activities of the TB patient
- possible jail cell inmate and staff contacts, particularly HIV-infected persons
- community contacts (especially young children) and their location

**Enabling Objective:**

**List at least 3 pieces of information to collect during an interview with a TB patient**

- The TB patient should be interviewed regarding jail contacts (both inmates and staff; particularly HIV-infected and other immunocompromised persons), as well as community contacts (such as young children). Information regarding the location of community contacts should also be obtained (contacts outside the jails are followed up by the health department).
- Highlight information regarding transmission settings in which the TB patient spent time during the infectious period. This information helps to identify contacts and assign priorities. The interviewer should ask specific questions about congregate settings (e.g., other correctional facilities, homeless shelters).
- After the interview with the patient, the interviewer will compile a list of contacts. The interviewer should ask for the names of contacts, a description of each setting, and the approximate frequencies and durations of exposure for each transmission setting. Information regarding each contact optimally includes full name, aliases or "street names," a physical description, community contact information (e.g., addresses and telephone numbers), and current general health.
- The key to effective contact investigations is setting priorities. The investigator must constantly balance available resources (e.g., staff time) with anticipated goals. All possible sites of transmission should be listed, regardless of how long the TB patient spent at the sites. Priorities for contacts should be set on the basis of the time spent at a site with the TB patient, and decisions regarding investigation of the sites and contacts should be made after all the information has been collected.

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**Slide 21**

Time: 1 minute

**Keys to an Effective Interview**

Jail and/or health department staff interview TB patient within 1-3 working days:

- prepare for interview—plan and be flexible
- address patient concerns and provide TB education

- It is important to prepare for the interview with the TB patient. Inform participants that if they need more information regarding interviewing skills, the CDC has many helpful resources on its Website. Refer participants to the **Resources** List of the *Participant Materials* (**page 168**) to obtain the weblink to the CDC Website.
- Explain to participants that the following are keys to effective interviewing:
  - planning enough time for a two-way exchange of information, possibly >1 hour
  - establishing rapport. Respect should be demonstrated by assuring privacy during the interview. Establishing trust and respect is critical, and
  - providing TB education and addressing any concerns the TB patient may have about TB.

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**Slide 22**

Time: 1 minute

**Keys to an Effective Interview (2)**

- discuss confidentiality and privacy
  - build trust and rapport—this is critical
- ask open-ended questions to get detailed information
- express appreciation
- provide an overview of the CI process
- plan for at least two interviews

- Establishing rapport is important and one way to do this is to emphasize confidentiality and privacy several times during the interview. Maintaining confidentiality is challenging during contact investigations because of the social connections between the TB patient and their contacts. Constant attention is required to maintain confidentiality.
- Remind participants about the multiple laws and regulations that protect the privacy and confidentiality of patients' health care information. Foremost among these is the Privacy Rule of

HIPPA, which protects individually identifiable health information and requires an authorization of disclosure. For more information on these laws, please consult your local health department.

- If a deputy/officer must be present while discussing information with the TB patient, the interviewer should inform the deputy/officer about the confidentiality laws surrounding TB, and that they are bound by the same laws. Do this in front of the patient so that they are aware of your efforts. This also helps build trust with the patient.
- Explain to participants that the interviewer should express appreciation, provide an overview of the contact investigation, and inform the TB patient about confidentiality and its limits. And emphasize to participants that an appointment for the next interview should be set within the context of the schedule for medical care.

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**Slide 23**

Time: 5-10 minutes

**Exercise 1**

Given the case scenario, determine the following:

- infectious period for the TB patient
- contacts who were exposed during the infectious period

- Refer to “Instructions for asking questions, conducting exercises and case studies” on **page 49** of your *Facilitator Materials*. Specific instructions for this exercise can be found at the end of this session (**page 102**).

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**Slide 24**

Time: 1-2 minutes

**Obtain Movement and Housing History  
for the TB Patient**

Goal: To identify inmates, staff, and volunteers who may have been exposed during the TB patient's infectious period, including visitors and transferred or released inmates

**Enabling Objective:**

**List at least 2 pieces of information to obtain from reviewing a TB patient's movement and housing history**

- Emphasize to participants that they should track the TB patient's movement history through the jail system during the TB patient's infectious period. This information helps to identify possible contacts.
- Remind participants about the key role that jails classifications staff can have in assisting in a contact investigation. They have access to information that tracks the movement of inmates.

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**Slide 25**

Time: 1 minute

**Obtain Housing and Movement History for the  
TB Patient (2)**

Identify all locations and the length of time spent in each location:

- cells (single, double, holding, isolation, multiple occupancy, open dorm)
- bunk/cell mates
- general population areas
- court

- Emphasize to participants the importance of determining the dates and locations of the TB patient's housing and movement history during the TB patient's infectious period. This helps to identify possible contacts.

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Slide 26

Time: 1 minute

**Obtain Housing and Movement History for the TB Patient (3)**

Identify all locations and the length of time spent in each location (cont'd):

- programs (e.g., GED, substance abuse)
- Intake/booking/custody department
- clinic, church
- school/classroom
- transportation to other areas

- Continue to provide participants with examples of possible locations and persons with whom the TB patient may have come into contact.

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Slide 27

Time: 1-2 minutes

**Question**

Who would you contact at your jail to research a TB patient's movement records?

- Explain to participants that the purpose of this question is to get participants to start thinking about where they can find information. For example, classification staff can help provide this kind of tracking information. Suggest that classification staff can work with medical personnel to:
  - identify tracking mechanism for any TB patient on medication, and

- discuss inmate release information with medical personnel, prior to release.
- Mention to participants that if there is no mechanism for ensuring continuity of medications/treatment for a TB patient or contact after they are released, this is a good time to begin discussions for one with the local health department.

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**Slide 28**

Time: 1 minute

**Visit Exposure Site(s)**

Examine the environments where the TB patient spent time during the infectious period. Assess what areas are more likely to be conducive to the transmission of TB by determining the following:

- number of inmates who are housed together at one time
- housing arrangement (e.g., cells versus dorms, court and court holding sites, classrooms)
- general size of the air space

**Enabling Objective:**

**List at least 3 pieces of information to collect during a visit of the exposure site(s)**

- The goal of the visit is to conduct an environmental assessment of the areas where the TB patient spent time during the infectious period. Remind participants to check the exposure site(s) to evaluate the risk of exposure.
- Examine and assess each place the TB patient frequented, lived, worked, or went to class during the infectious period. In addition, obtain information regarding any other correctional facility that may have housed the TB patient during the infectious period, including: 1) the number of inmates who were housed together at one time; 2) the housing arrangement (e.g., cells versus dorms); and 3) the general size of the air space.

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Slide 29

Time: 1 minute

**Visit Exposure Sites (2)**

Assess which areas are more likely to be conducive to the transmission of TB by determining the following:

- basics of the ventilation system (e.g., whether air is re-circulated, or if isolation room is in negative air pressure)
- pattern of daily inmate movement (e.g., when eating, working) and recreation schedule
- availability of data on other inmates housed at the same time as the TB patient

- Enlist the assistance of a facility engineer to help characterize the infection control measures in the jail facility (e.g., ventilation system, airflow direction, ultra-violet light, etc.). Evaluate the air flow, ventilation, size of room, the number of people in a room, and placement of these people in proximity to the TB patient to help determine the risk of exposure.
- If no engineer is available, inform participants that they may use an incense stick or some other smoke producer to check the airflow from the TB patient’s cell to other sections of the facility. For more information on practical, low cost infection control practices like this, please see CNTC’s *TB Infection Control: A Practical Manual for Preventing TB* available at: [http://tbweb01/products/product\\_details.cfm?productID=WPT-12CD](http://tbweb01/products/product_details.cfm?productID=WPT-12CD)

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Slide 30

Time: 1-2 minutes

**Question**

How might you determine proper airflow in a defined area in your jail?

- Ask participants this question.
- The reason for asking this question is to get participants to think about TB transmission in their own jail environment. Clarify that the concern is about negative air pressure in relation to isolation of the TB patient rather than for the contacts.

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**Slide 31**

Time: 1 minute

**Prioritizing Contacts**

Prioritize contacts on a scale of “high”, “medium”, or “low” according to duration and intensity of exposure and risk factors for becoming infected with TB and progressing to TB disease

**Enabling Objective:**

**Describe how to prioritize contacts as high, medium, or low**

- Explain to participants that they prioritize contacts on a scale of “high”, “medium”, or “low” according to duration and intensity of exposure and risk factors for becoming infected with TB and progressing to TB disease.
- Reinforce that because priority assignments are practical approximations derived from imperfect information, priority classifications should be reconsidered throughout the investigation as findings are analyzed.

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Slide 32

Time: 1 minute

#### Prioritizing Contacts (2)

These persons are considered high-priority:

- contacts with most exposure to TB patient
- HIV-infected or other immunosuppressed contacts (regardless of duration of exposure)

- Impress upon participants that HIV-infected persons are considered high-priority because progression from exposure to death can be rapid among HIV-infected persons. If HIV-infected persons are housed or congregated separately in the jail, the entire group should be given a high priority.
- Certain correctional populations have a high prevalence of HIV infection, therefore reviewing the HIV testing policies, procedures, and aggregate statistics is recommended.
- HIV infection can affect the progression of TB in two ways:
  - **Reactivation of LTBI to TB disease.** This is the main driving force behind today's rising TB rates in HIV-infected individuals. This reactivation is preventable through the use of LTBI therapy.
  - **Rapid progression from TB infection to TB disease.** If an immune-compromised person is infected with TB bacilli from a patient with infectious pulmonary TB, TB disease can develop within a number of weeks.
- In the absence of HIV infection, the lifetime risk of a person with LTBI developing TB disease is approximately 10%. However, a person with both LTBI and HIV infection has a 5 to 10% risk *per year* of developing TB disease.
- TB is one of the leading causes of death in persons with HIV/AIDS. Failure to diagnose and treat TB disease promptly in HIV infected persons contributes to premature mortality in AIDS patients and increased TB transmission in the community.
- TB disease can spread quickly in congregate settings (like jails) where persons living with HIV infection and AIDS reside. Diagnosing TB at intake is the best strategy to avoid these outbreaks.
- In 2006, the CDC issued new guidelines recommending that all patients initiating treatment for TB be screened routinely for HIV infection (*MMWR* vol. 56/No.11).
- Remind participants that it is recommended that contacts who do not know their HIV infection status should be offered voluntary HIV counseling, testing, and referral. This is an important part of the contact investigation process.

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**Slide 33**

Time: 2-3 minutes

**Factors for Assigning Contact Priorities**

- Characteristics of TB contacts
  - age (<5 years)
  - immune status (e.g., autoimmune disorders)
  - other medical conditions (silicosis, diabetes mellitus, and status after gastrectomy or jejunioileal bypass surgery)

- Assigning priorities to contacts depends on the factors that predict likely transmission of TB such as the characteristics of the TB patient, susceptibility and vulnerability of contacts, and the circumstances (the frequency and duration) of the exposures. Note that the characteristics that predict likely transmission of TB were also discussed in Session One. For a full description of the characteristics of TB patients that can help assign priorities, please see *Facilitator Materials (Slide 10, page 25)*
- Contacts of a more infectious TB patient (e.g., one with AFB sputum smear-positive TB) should be assigned a higher priority than those of a less infectious one, as they are more likely to have TB infection or disease.

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Slide 34

Time: 2-3 minutes

**Factors for Assigning Contact Priorities (2)**

- Exposure – air circulation patterns
  - air volume, ventilation, duration
  - intensity and frequency of duration
- Characterize Exposure Site
  - "1" = size of a single cell (most likely transmission)
  - "2" = size of a 2 or 4 man cell
  - "3" = size of an open dorm
  - "4" = size of a community hall or larger (least likely transmission)

- For a full explanation of exposure characteristics and grading exposure settings by size, see *Facilitator Materials (Slide 12, page 28)*.

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Slide 35

Time: 1 minute

**Classification of Contacts**

- Any contacts who are not classified as high- or medium-priority are assigned as low-priority
- Priority classifications should be reconsidered throughout the investigation as findings are analyzed

- In classifying contacts, any contacts who are not classified as high- or medium-priority are assigned as low-priority. Again, remind participants that because priority assignments are practical approximations derived from imperfect information, priority classifications should be reconsidered throughout the investigation as findings are further analyzed.

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Slide 36 Time: 5-10 minutes

**Exercise 2**

Given the following information, prioritize which contacts are “high”, “medium” or “low”

- Refer to “Instructions for asking questions, conducting exercises and case studies” on **page 49** of your *Facilitator Materials*. Specific instructions for this exercise can be found at the end of this session (**page 107**).

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Slide 37 Time: 1-2 minutes

**Time Frames for Initial Follow-up of Contacts of Persons Exposed to TB**

Type of contact	Business days from listing of a contact to initial encounter*	Business days from initial encounter to completion of medical evaluation†
High-priority contact: index case AFB§ sputum smear positive or cavitary disease on chest radiograph (see Figure 2)	7	5
High-priority contact: index case AFB sputum smear negative (see Figure 3)	7	10
Medium-priority contact: regardless of AFB sputum smear or culture result (see Figures 2–4)	14	10

SOURCE: California Department of Health Services Tuberculosis Control Branch; California Tuberculosis Controllers Association; Contact Investigation guidelines, Berkeley, CA; California Department of Health Services; 1998.  
\*A face-to-face meeting that allows the public-health worker to assess the overall health of the contact, administer a tuberculin skin test, and schedule further evaluation.  
†The medical evaluation is complete when the contact's status with respect to Mycobacterium tuberculosis infection or TB disease has been determined. An normal exception to this schedule is the delay in waiting for final mycobacteriologic results, but this applies to relatively few contacts.  
§Acid-fast bacilli.

Centers for Disease Control and Prevention. Guidelines for the investigation of contacts of persons with infectious tuberculosis; recommendations from the National Tuberculosis Controllers Association and CDC, and the Guidelines for using the IGRA®-TB Gold test for detecting *Mycobacterium tuberculosis* infection, United States. *MMWR* 2005; 54(No.RR-15): [page 11].

- Review the chart with participants. Inform participants that they can find a larger copy of this chart in their *Participant Materials* (**page 152**).

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Slide 38

Time: 1 minute

**Locate and Assess Contacts**

- Develop contact lists and documentation
  - identify inmate (and staff) contacts from each location where the TB patient spent time
  - document exposed contacts according to current status (e.g., still incarcerated, released, or transferred)
- Interview contacts within 1-3 days of identification
- Gather background health information

**Enabling Objective:**

**Describe at least 2 pieces of information to include on documentation of exposed contacts**

- The rosters of inmate and employee contacts from each location should be obtained and a visit of the site(s) conducted. Documentation of exposed contacts should be generated and grouped according to current incarceration status (i.e., still incarcerated, released, or transferred).
- Contacts should also be prioritized according to duration of exposure and immune status.
- Classification staff can help assist with accessing the following information:
  - tracking the movement of inmates
  - identifying contacts at intake/booking, cells, common areas in jail, courtrooms, and transport vehicles
  - locating inmate contacts who were released or are about to be released.
- Participants should develop documentation of exposure for each inmate on an individual form. Simple lists do not necessarily allow for the intricate back and forth referencing and notation per contact that is required when tracking exposed inmates.

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**Slide 39**

Time: 1-2 minutes

**Locate and Assess Contacts (2)**

- Perform in-person assessment of patient's health (conduct symptom review)
  - for incarcerated contacts, may be able to conduct review of medical records
- Administer TB test on contacts (interpretation of skin test reaction: an induration transverse diameter of  $\geq 5$  mm is positive) or IGRA
- Prioritize contacts

- Explain to participants that the contact investigation team will need to review medical records for each high-priority contact.
- Priority assignments should be reassessed for each contact after the initial information has been collected, and a medical plan for diagnostic tests and possible treatment can be formulated for high- and medium-priority contacts. Low-priority contacts should not be included unless resources permit.
- All contacts classified as having high- or medium-priority who do not have a documented previous positive tuberculin skin test (TST) result, positive IGRA result, or a history of previous TB disease should receive a TB test at the initial interview. If that is not possible, then the test should be administered  $\leq 7$  working days of being assessed for high-priority contacts and  $\leq 14$  days of being assessed for medium-priority contacts. For interpreting the skin test reaction, an induration transverse diameter of  $\geq 5$  mm is positive for any contact.

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**Slide 40**

Time: 1 minute

**Review Medical Records for Each High- and Medium-Priority Contact**

Record dates carefully for:

- previous *M. tuberculosis* infection or disease and related treatment
- contact's verbal report and documentation of previous TST/IGRA results
- current symptoms of TB illness (e.g., cough, chest pain, hemoptysis, fever, chills, night sweats, appetite loss, weight loss, malaise, or exhaustion)

**Enabling Objective:**  
**Identify at least 3 pieces of information to collect when reviewing medical record  
for a high- and medium-priority contact**

- Participants should obtain this data when reviewing each high- and medium-priority contact's medical record. Remind participants to carefully record dates. Participants are specifically looking for contacts with a history of negative TSTs/IGRAs. When high- and medium-priority contacts are given their tuberculin skin tests or IGRAs at during the CI and the results are positive, this indicates that they have been recently infected with TB.

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**Slide 41**

Time: 1 minute

**Review Medical Records for Each High- and  
Medium-Priority Contact (2)**

Record carefully (and get dates) for:

- medical conditions or risk factors making TB disease more likely

- Medical conditions that make TB disease more likely include: HIV infection, intravenous drug use/addiction, diabetes mellitus, silicosis, prolonged corticosteroid therapy, other immunosuppressive therapy, head or neck cancer, hematological and reticuloendothelial diseases, end-stage renal disease, intestinal bypass or gastrectomy, chronic malabsorption syndrome, low body weight, other autoimmune disorders, and alcoholism.

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**Slide 42**

Time: 1 minute

- Minimal Data Recommended  
Concerning Each Contact**
- Date admitted to facility
  - Start and end dates for exposure
  - Name and aliases ("street names")
  - Social security number
  - Date of birth
  - Locating information and whom to notify in an emergency
  - Primary language and preferred language

- Participants will need to collect this data for each contact.
- Again, remind participants that data may be lacking due to the rapid movement/relocation of inmates/contacts. Thus, there is a need for a quick response to collect the appropriate data for a contact investigation.

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**Slide 43**

Time: 1 minute

- Minimal Data Recommended  
Concerning Each Contact (2)**
- Frequency, duration, and time frame of interactions with TB patient
  - Previous history of and documentation for TB disease or latent TB infection
  - Medical risk factors for progression of infection to TB disease
  - New TST/IGRA information, chest x-ray

- Recommend that participants collect this data for each contact. Inform participants that a skin test "conversion" is defined by a negative initial TB test result followed by a positive test result (an IGRA conversion is a negative result followed by a positive result).

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**Slide 44**

Time: 1 minute

**Minimal Data Recommended Concerning Each Contact (3)**

For those contacts who tested positive during their evaluation and who have previously been treated for TB:

- dates of treatment
- treatment regimen (medication, dosing schedule, any changes to these)
- methods of supervising treatment (e.g., directly observed treatment)

- Recommend that participants collect this data for each contact.

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**Slide 45**

Time: 1-2 minutes

**Conduct Medical Evaluation of Contacts**

All contacts should:

- have a symptom review completed using standard TB Symptom Review form
- have TST/IGRA test administered
  - in contacts, a TST with an induration diameter  $\geq 5$  mm is considered positive
- if initial TST/IGRA is negative, a second test is needed 10 weeks from the date of initial test
- receive chest x-ray and medical evaluation, if indicated

- Point out that all contacts should be assessed for symptoms of TB disease using a standard TB Symptom Review questionnaire. Participants can find two sample questionnaires in the **Job Aids** section, *Participant Materials*, **pages 182 and 185**. Participants can also check inmates' jail medical records for sick calls or grievances indicating symptoms of TB disease.
- Contacts whose TST/IGRA is positive or who have a positive symptom review need a medical evaluation, including a chest x-ray. Other tests (e.g., lab tests) may be ordered on an individual basis.
- A contact can have a negative symptom review and/or a negative TST/IGRA and still have tuberculosis disease and therefore will need further evaluation.

- It is very important to physically assess the TB patient. If the TB patient appears to have lost weight, appears to be ill, seems to be short of breath, then the TB patient should be seen by the medical personnel for evaluation and referral for a chest x-ray, if indicated. Laboratory testing may also be ordered at that time.

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Slide 46

Time: 1-2 minutes

**Conduct Medical Evaluation of Contacts (2)**

- Contacts who have TB symptoms:
  - symptomatic contacts should be placed immediately in isolation and receive medical evaluation regardless of TST /IGRA status
    - a contact can have active TB even though he/she may have a negative TST/IGRA
  - if symptomatic contact is a staff member, he/she must be excluded from work until evaluated

- Explain that until evaluated, contacts who experience symptoms should immediately be put in isolation in an airborne infection isolation (AII) room. Contacts should receive a chest x-ray and a complete medical evaluation by medical personnel, regardless of TST/IGRA status. Remind participants once again that a contact can have TB disease even though they may have a negative TST/IGRA.
- If these contacts are staff members, they should not be permitted to work until evaluated. Participants should notify the health department since that staff person(s) may need to be placed on home isolation pending the evaluation. For contacts who do not know their HIV status, HIV counseling and testing should be provided as part of the contact evaluation, and referral made for treatment and care if HIV infection is confirmed.

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**Slide 47**

Time: 1-2 minutes

**Conduct Medical Evaluation of Contacts (3)**

- Contacts who have a history of a previous positive TST/IGRA
  - if no documentation of previous positive test, refer for another test (TST if the previous test was TST; IGRA if the previous test was IGRA)
  - if repeat test is positive or there is written documentation of previous test result, conduct symptom review
  - also interview to see if treatment for LTBI was ordered and, if so, completed

- If the symptom review leads you to suspect TB disease, follow the steps as noted on **Slide #45** for contacts who have TB symptoms.
- If the contact does not have any TB symptoms and has not started or did not complete treatment for LTBI, refer contact for evaluation for treatment. Treatment for LTBI should not be started without having a chest x-ray done.
- If the contact does not have any TB symptoms, is healthy, and has completed treatment for LTBI, they need no further follow-up.
- If the contact does not have any TB symptoms and is high-priority (e.g., HIV infected), the contact needs a medical evaluation, including chest x-ray and evaluation for treatment for LTBI. In some instances, a repeat course of treatment for LTBI may be ordered for high-priority contacts if there are concerns about re-infection.

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**Slide 48**

Time: 1-2 minutes

**Evaluate HIV-Infected Contacts Promptly**

- LTBI therapy should be initiated promptly among these contacts once TB disease has been excluded

**Enabling Objective**

**Explain why evaluating HIV-infected contacts should be done promptly**

- HIV infection is the greatest single risk factor for progression to TB disease. Therefore, explain that HIV-infected contacts should be the highest priority for evaluation of TB infection, even if these contacts had shorter duration of exposure than other contacts.
- LTBI treatment should be initiated promptly among HIV-infected contacts once TB disease has been excluded.

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**Slide 49**

Time: 1 minute

**Place and Read Initial TSTs or IGRAs on Eligible Contacts**

- Place an initial TST (or draw blood for an IGRA) of possible contacts when a TB patient is identified
- Referrals should be made for contacts who have been released or transferred before receiving their initial TST or IGRA

**Enabling Objective:**

**Explain the importance of doing an initial TST or IGRA on eligible contacts**

- All contacts classified as high- or medium-priority who do not have a documented previous positive tuberculin skin test (TST) or positive IGRA result, or previous TB disease, should receive a TST/IGRA at the initial encounter. If that is not possible, then the test should be administered within 7 days for high-priority contacts and within 14 days for medium-priority contacts.
- Again, remind participants that for interpreting the skin test reaction, an induration transverse diameter of  $\geq 5$  mm is positive for any contact.

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**Slide 50**

Time: 1-2 minutes

**Questions**

Who places and reads the TST?

Who draws blood for an IGRA?

Who is responsible for getting IGRA sample to the lab?

- Ask participants these questions.
- Explain that the purpose of these questions is to remind participants that a trained health care worker (or someone who has been trained by the health department TB program) is the only person who can place and read the tuberculin skin test (TST). If you are using an IGRA, only a licensed nurse or phlebotomist can draw blood. You will need to determine who is responsible for getting IGRA samples to the processing lab.

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**Slide 51**

Time: 1 minute

**Making Referrals for Contact Evaluation**

Make referrals to the local health department for the following:

- inmate contacts of the infectious TB patient who have been released or transferred to another facility
- family members or frequent visitors of the TB patient

**Enabling Objective:**  
**Describe the referral process for contact evaluation**

- Indicate to participants that referrals should be made to the local health department for inmate contacts of the infectious TB patient who have been released or transferred to another facility. Additionally, remind participants that any family members or frequent visitors of the TB patient should be investigated by the health department.

- Follow-up TST/IGRA results for a substantial percentage of contacts of released inmates have been obtained on re-arrest by matching the list of exposed contacts with the jail intake TST/IGRA registry.

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Slide 52

Time: 2-3 minutes

**Calculating the Infection Rate**

Infection rate =  $\frac{\text{\# of new positives} \times 100}{\text{Total \# of contacts newly tested (per exposure environment)}}$

**Example:**  
 10 contacts were identified: 2 had previously positive TSTs; therefore, 8 were newly tested, and 4 of those were positive

**Enabling Objective:**

**Calculate the infection rate to assess level of TB transmission**

- After the highest-priority group has been evaluated for TB infection and disease, the contact investigation team should evaluate the results of testing for evidence of recent transmission.
- Evidence of recent transmission is provided by any of the following factors:
  - high infection rate among contacts
  - infection in young child (visitor, family member)
  - a TB test conversion in a contact (a conversion is defined by a negative initial TST/IGRA followed by a positive result), and/or
  - a secondary case of TB disease.
- Evaluating this evidence will help determine whether testing should be expanded.
- The percentage of contacts with a similar amount of exposure who have newly identified positive TST test reactions ( $\geq 5$  millimeters of induration) or positive IGRA result is called the “infection rate” for that group of contacts.
- Explain that contacts with a history of a prior positive TST or IGRA should be excluded from both the numerator and the denominator. This infection rate calculation sets the baseline to determine the rate of transmission. The infection rate should be calculated per group and per exposure site.

- Go over the calculation as displayed on the next slide. You may choose to use a flipchart or white board to demonstrate this calculation to participants.

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Slide 53

Time: 1-2 minutes

**Calculating the Infection Rate (2)**

Infection rate =  $\frac{4 \times 100}{8}$  = 50%

- Use only newly identified positive results to calculate
- If previous test results are unknown, any positive result should be considered a newly identified positive reaction

- Demonstrate to participants how they calculate the infection rate:
  - **Step 1:** Take the total number of contacts whose TST/IGRA test results are newly positive.
  - **Step 2:** Divide it by the total number of contacts who had a TST/IGRA newly administered. This will result in your infection rate percentage.
- Remind participants that contacts who have documented previous positive tuberculin skin tests are not included in this calculation.

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**Slide 54** Time: 5-10 minutes

**Exercise 3**

Given the following scenario, calculate the infection rate

- Refer to “Instructions for asking questions, conducting exercises and case studies” on **page 49** of your *Facilitator Materials*. Specific instructions for this exercise can be found at the end of this session (**page 108**).

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**Slide 55** Time: 1-2 minutes

**Place and Read Follow-Up TST/IGRA**

8-10 weeks after “date exposure was broken” (which is the last day contact spent time with the TB patient during the TB patient’s infectious period)

**Enabling Objective:  
Identify when to conduct follow-up TST or IGRAs**

- Explain that follow-up TST/IGRA for contacts who had a negative TST/IGRA result on initial testing should be done 8-10 weeks after the date exposure to the TB patient ended.
- Referrals should be made for contacts who have been released or transferred and need a follow-up TST/IGRA.
- Review “date exposure was broken” (**Session Two, slide 18, page 64**). Remind participants that this is defined as the last day the contact spent time with the TB patient during the TB patient’s infectious period. Emphasize the importance of identifying the “date exposure was broken” because this helps to determine when to do the second TST/IGRA.

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Slide 56

Time: 2-4 minutes

**Calculate Infection/Transmission Rate from  
Second Round of Testing**

**Enabling Objective:**

**Calculate the infection/transmission rate from the second round of testing**

- Remind participants that a conversion is defined by a negative initial TST/IGRA result followed by a positive TST/IGRA result. Explain that persons whose TSTs/IGRAs convert or those with newly documented, positive TST/IGRA results should be offered treatment for LTBI unless medically contraindicated. If inmate contacts refuse LTBI treatment, they should be monitored regularly for symptoms. Certain facilities have chosen to monitor HIV-infected contacts with follow-up chest radiographs.
- The contact investigation team should analyze all data collected before deciding whether to expand the investigation. The decision to expand the contact investigation is a complex one and should be made by supervisory clinical and management staff.
- Explain that contact investigations generally should not be expanded beyond high- and medium-priority contacts. However, if data from an investigation indicates more transmission than anticipated, more contacts might need to be included. In the absence of evidence of recent transmission, an investigation should not be expanded to lower priority contacts. A contact investigation should be expanded only in exceptional circumstances, such as with a highly infectious patient with a high rate of infection among contacts or if there are secondary cases and secondary transmission. Expanding an investigation also must be accompanied by efforts to ensure completion of therapy.
- Call attention to the evaluation of data collected from contact investigations. This is a complex process requiring careful interpretation and consideration of available evidence. The particular circumstances of each case (e.g., number of contacts involved, their age, and their susceptibility to TB disease) need to be carefully considered in order to expand testing to include all those likely to be at risk.

- The need and importance for a collaborative strategy between the health department and jail should be emphasized to participants.

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Slide 57

Time: 1 minute

**Writing a Summary Report**

Report will include:

- why contact investigation was started
- number of contacts
- number of high- and medium-priority contacts
- transmission rates
- number of contacts started on treatment

**Enabling Objective:**

**Describe what information to include in a summary report**

- One of the final steps in a contact investigation is writing a summary report. This report should be placed in inmate's file and possibly forwarded to the inmate's local health department (or the facility to which they were transferred) as a tool for follow-up. The summary report should briefly describe the circumstances of the investigation, how it was conducted, the results of the investigation (e.g., the number of cases identified, the infection and transmission rates), and any special interventions required (including follow-up plans). The report may also include the number of contacts/cases transferred, lost to follow-up, and/or referred to the health department.

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Slide 58

Time: 1 minute

**Writing a Summary Report (2)**

Report will include (cont'd):

- number of community contacts (outside the jail) referred for evaluation to public health department
- number of new cases found
- problems encountered

**Enabling Objective:**

**Describe what information to include in a summary report**

- Read the slide aloud and inform participants that the report should be distributed to jail administrators and the local health department.

Notes:

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Slide 59

Time: 5-15 minutes per case study

Case Studies

- Refer to “Instructions for asking questions, conducting exercises and case studies” on **page 49** of your *Facilitator Materials*. Specific instructions for the three case studies can be found at the end of this session (**page 111**).

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Slide 60

Time: 1 minute

**Post-Contact Investigation Steps**

- Continuity of care: discharge planning
  - ensure follow-up care and treatment when contacts are transferred to another facility or released to community

- Continuity of care in the discharge planning of a contact is an important part of TB control and should be implemented to prevent TB transmission in the community and/or possibly at other correctional facilities. Completion of treatment for contacts justifies all the effort put into the contact investigation.
- When jail staff issue an alert to the health department or the receiving correctional facilities, they can help by providing follow-up plans for the following inmate contacts:
  - Suspected or confirmed contacts who have not been tested need evaluation (i.e., TST/IGRA, symptom review)
  - High-risk or high- and medium-priority contacts need evaluation
  - Contacts on treatment for latent tuberculosis infection need continuity of care to get treatment started and/or completed and to be monitored for adverse reactions to these medications
- Remind participants that contacts have become TB patients when these follow up steps were not accomplished.

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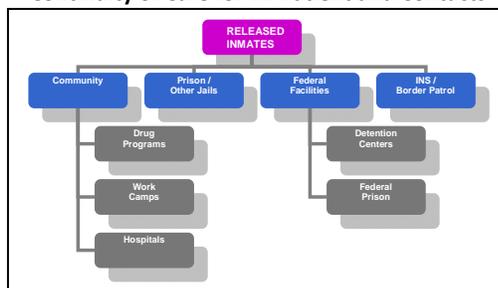
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Slide 61

Time: 1 minute

**Continuity of Care for TB Patient and Contacts**



- Participants can find an enlarged version of this chart on **Page 153**.

- Contacts who are released go to many areas and not just to other correctional facilities or the community. Go over the chart on this slide. Suggest that jail classifications staff can help identify and track where contacts go.
- Remind participants that classifications staff can help provide this tracking information and work with medical personnel to help:
  - Identify tracking mechanisms for any TB patient on medication, and
  - Discuss inmate release information with medical personnel, prior to release.
- In certain settings, medical staff are not notified of tracking information for security reasons.
- Encourage participants to develop a transition plan which documents the details that can help facilitate the continuation of treatment for latent tuberculosis infection once the contact is released.

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**Slide 62**

Time: 1 minute

<p><b>Conclusion: Key Points</b></p> <ul style="list-style-type: none"> <li>• Diagnose TB before inmates and staff are exposed</li> <li>• Establish formal collaboration between jail and public health officials BEFORE a contact investigation is needed</li> <li>• Notify jail officials when TB is suspected</li> <li>• Notify public health department</li> <li>• Set up data management and collection system</li> </ul>
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- As this session comes to a close, briefly remind participants about the key points of a TB contact investigation. Review the points on the slide. The most effective strategy for TB control in jail is to diagnose TB before inmates and staff are exposed.
- Explain that contact investigations protect inmates and staff from contagious disease and other health hazards. Contact investigations are time consuming and resource-intensive. If TB is not diagnosed and it is discovered that inmates and staff have been exposed to TB, then this training can help explain the steps for conducting a contact investigation.

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**Slide 63**

Time: 2-5 minutes

**Conclusion: Key Points (2)**

- Review TB patient's medical record:
  - onset of symptoms
  - infectiousness (how infectious)
  - infectious period
  - date no longer infectious
  - sites where transmission may have occurred in jail
  - individuals whom the TB patient or jail classifications staff can identify as contacts

- Information is your best tool when it comes to conducting an effective contact investigation. By reviewing your TB patient's medical record you can begin to get a picture of when TB was initially diagnosed, when the infectious period was completed, and who may have come into contact with the patient during the infectious period.

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**Slide 64**

Time: 2-5 minutes

**Conclusion: Key Points (3)**

- Identify and locate high-and medium-priority contacts
  - educate contacts about TB
  - evaluate contacts (i.e., symptom review, TST/IGRA)
  - treatment, if needed

- In addition to contacts identified by the TB patient, classifications staff can also help list the names of those incarcerated with the TB patient (e.g., cellmates, co-workers, lawyers, family, and others who spent time and shared space with the TB patient).

- Ask participants if they believe they achieved the learning objective for this session (“describe the steps in a contact investigation in jail”). And as time permits, you may do a brief review to assure that the major points of this training were covered by doing one of the following:
  - Ask participants to list the primary steps for conducting a contact investigation:
    - Establish formal collaboration between jail and public health officials BEFORE a contact investigation is needed
    - Notify jail management officials if TB is suspected
    - Notify public health department
    - Convene the contact investigation team
    - Review TB patient’s medical record
    - Interview TB patient
    - Define the infectious period
    - Determine the exposure period
    - Update jail management officials
    - Obtain housing and movement history for TB patient
    - Visit exposure sites
    - Prioritize contacts
    - Develop contact documentation to locate, assess, and review medical record for high- and medium-priority contacts
    - Evaluate HIV-infected contacts for TB disease and LTBI promptly
    - Place and read initial TSTs or administer IGRAs on eligible contacts
    - Make referrals for contact evaluation
    - Calculate the infection rate to determine evidence of transmission
    - Place and read follow-up TSTs or perform follow-up IGRAs
    - Determine the infection/transmission rate from second round of testing
    - Write summary report
  - Review the list of Enabling Objectives that was distributed to participants at the beginning of the session. Ask participants to review this list and to assess if all objectives were met in this training. You can refer participants back to their learning materials if they have specific questions about the steps in a contact investigation. The enabling objectives are listed here with the slides from Session Two that they are associated with):
    - Identify the jail management officials to notify when TB is suspected (see **Slide #4** for review)
    - Describe at least 3 pieces of information to collect when reviewing a TB patient’s medical records (see **Slide #6-8** for review)
    - Define the infectious period (see **Slides #14 and 15** for review)
    - Determine the exposure period (see **Slides #16 and 17** for review)
    - List at least 3 pieces of information to collect during an interview with a TB patient (see **Slides #19 and 20** for review)
    - List at least 3 types of information to share when updating correctional management officials about a contact investigation (see **Slide #13** for review)
    - List at least 2 pieces of information to obtain from reviewing a TB patient’s housing and movement history (see **Slides #24-26** for review)
    - List at least 3 pieces of information to collect during a visit of the exposure site(s) (see **Slides #28 and 29** for review)

- Describe how to prioritize contacts as “high”, “medium”, or “low” (see **Slides #31-35** for review)
- Describe at least 2 pieces of information to include on documentation for exposed contacts (see **Slides #38 and 39** for review)
- Identify at least 3 pieces of information to collect when reviewing the medical record for a high- and/or medium-priority contact (see **Slides #40 and 41** for review)
- Explain why evaluation of HIV-infected contacts should be done promptly (see **Slide #48** for review)
- Explain the importance of conducting initial tuberculin skin tests (TST) or IGRA tests on eligible contacts (see **Slide #49** for review)
- Describe the referral process for contact evaluation (see **Slide #51** for review)
- Calculate the infection rate to assess the level of transmission (see **Slides #52 and 53** for review)
- Identify when to conduct follow-up TST or IGRA tests (see **Slide #55** for review)
- Calculate the infection/transmission rate from the second round of testing (see **Slide #56** for review)
- Describe what information to include in a summary report (see **Slides #57 and 58** for review)

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**Slide 65**

Time: 1 minute

**Remember: Think TB!**

Screen for TB during intake – diagnose TB before inmates and staff are exposed. Protect your jail facility from contagious disease and other hazards

- In conclusion, remind participants about the importance of keeping TB in mind. Remember: every case was once a contact!

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Slide 66

Time: 2-3 minutes

Any Questions??

- Finally, conclude this session by asking participants what questions they may have. Spend a few minutes responding if you are able. If your participants request further guidance, refer them to the resources listed in their participant guides.
- Thank your participants for their time and attendance. If you wish to share your contact information with participants for any follow up questions, you can provide the information at this time. The following two slides provide some resources that your participants may find valuable.



Slide 67

Time: 1 minute

**Centers for Disease Control and Prevention**

- The Centers for Disease Control and Prevention (CDC) Division of Tuberculosis Elimination (DTBE) <http://www.cdc.gov/tb>

**Guidelines available online:**

- CDC's Morbidity and Mortality Weekly Report <http://www.cdc.gov/mmwr>
- Questions and Answers About TB <http://www.cdc.gov/tb/faqs/>
- TB Education & Training Resources Website [www.findtbresources.org](http://www.findtbresources.org)

- Inform participants about the Centers for Disease Control and Prevention (CDC) Division of Tuberculosis Elimination (DTBE) Website for additional information about TB.

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Slide 68

Time: 1 minute

Regional Training and Medical Consultation Centers

- Francis J. Curry National Tuberculosis Center, San Francisco, CA [www.nationaltbcenter.edu](http://www.nationaltbcenter.edu)
- Heartland National TB Center, San Antonio, TX [www.heartlandntbc.org](http://www.heartlandntbc.org)
- New Jersey Medical School Global TB Institute, Newark, NJ [www.umdnj.edu/ntbcweb](http://www.umdnj.edu/ntbcweb)
- Southeastern National TB Center, Gainesville, FL <http://sntc.medicine.ufl.edu/>

- Tell participants about the four Regional Training and Medical TB Consultation Centers that they may contact for more TB training and resources.

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**Facilitator Evaluation**

Please remember to complete the *Evaluation Form for Facilitators* that accompanies this *Facilitator Guide* (page 187). Your feedback is important because it helps us improve and develop our future trainings. Mail the facilitator evaluation to:

*Francis J. Curry National Tuberculosis Center  
3180-18<sup>th</sup> Street, Suite 101  
San Francisco, CA 94110-2028  
Fax: 415/502-4620*



## **SESSION TWO:**

### **Instructions for Conducting Exercises #1-3**

# SESSION TWO

## EXERCISE 1

(activity occurs on **Slide #22**)

### Instructions for Facilitator

Prepare copies of “Exercise 1—Participant Worksheet” (**page 155**) and a blank calendar (**pages 156-159**) to distribute to participants. Participant worksheet can be found in the *Participant Materials* section. Explain to participants that their worksheets include a description of a case scenario and a blank calendar.

Read the case scenario aloud and ask participants to determine the following:

- 1) infectious period for the TB patient
- 2) contacts who were exposed to the TB patient during the TB patient’s infectious period.

The purpose of this exercise is to find the contacts who have been exposed to an infectious TB patient.

Suggest to participants that they can make notes on the blank calendar. Give participants 5-10 minutes to do this exercise and then ask participants to share their answers. Depending on class size, participants can work in groups or individually. You may wish to use a large calendar at the front of the room to work through the timeline with your participants. Use your answer key to identify answers or recommendations if participants are unaware of the correct response.

### Participant Worksheet Materials

- Description of exercise scenario (**page 155**)
- Calendar (**pages 156-159**)

## **Exercise Scenario: Determining the Infectious Period**

Inmate A was booked into the jail on Monday, May 1<sup>st</sup> at 12 noon. The initial booking took place in a small open room to the side of the main booking area. The screening officer completed an initial screening form to obtain general health information, including whether or not Inmate A has a cough. No coughing was noted at the booking.

Inmate A was then routed to the main booking area, which is a large room with chairs along the walls where inmates can sit. There were 10 other inmates in the booking area at the time of Inmate A's booking process. Inmate A kept to himself, watching TV. Inmate A remained in booking until Tuesday, May 2<sup>nd</sup> at 2 p.m. Earlier in the day the correctional nurse did a health screening on Inmate A in a small exam room with the door closed. The screening took about 30 minutes. Inmate A coughed during the screening and said he had recently had a cold and had been coughing for 5 or 6 days. The nurse placed a TB skin test.

Inmate A was placed in his housing unit, B13, after leaving the booking area. The housing unit is a large 22 bed unit, with 11 rooms and a large central core, with a TV, chairs, and tables. Each room has a set of bunk beds, with 2 inmates per room. Inmate A slept on the bottom bunk and initially had no roommate. The next day he was assigned a roommate. The roommate spent most of his time in the room, sleeping and reading. Inmate A spent 4-5 hours during the day in the central core, sitting at a small, round table, playing cards and talking with 3 other inmates. They noticed him coughing and asked him if he was sick. He said he had been coughing for about a month. He thought he had a cold that had not gone away.

On May 3<sup>rd</sup>, Inmate A and 8 other inmates were transported to the County Courthouse for a court appearance. They were transported on a correctional bus, with a bus driver and 2 guards. Inmate A sat at the back of the bus, sitting right behind 2 other inmates. The rest of the inmates (5) all sat toward the middle or front of the bus. When they got to the Courthouse they were escorted to the holding cell. The holding cell is an enclosed area, medium sized, with no windows. The guards sit in an area the size of a family room that adjoins the holding cell. Inmate A was coughing on and off for the 2 hours he was in the holding cell with the 8 other inmates. After a short court appearance, the inmates were routed back to the bus and returned to the jail.

On May 4<sup>th</sup>, in the late afternoon, the correctional health nurse read Inmate A's TB skin test as an induration of 25 millimeters (I=25mm). The nurse noticed the cough and further screened Inmate A for symptoms of TB. Inmate A complained again of a cold that was not going away. The nurse arranged for a chest x-ray to be done the next day.

On May 5<sup>th</sup>, Inmate A received a chest x-ray. On May 6<sup>th</sup>, the chest x-ray report was received by the correctional health nurse. The chest x-ray showed a right-side infiltrate. Inmate A was placed in respiratory isolation.

Three sputum specimens were obtained over the next three days. All three had positive smears (1+).

## SESSION TWO

### EXERCISE 1

### Answer Key

#### 1. Given the case scenario, determine the infectious period for the TB patient.

Refer to the table, “Guidelines for estimating the beginning of persons with TB, by index case characteristics” (page 152). Remind participants that the minimum beginning of likely period of infectiousness is estimated to be 3 months before symptom onset of the first positive finding consistent with TB disease, whichever is longer.

Review the estimates of dates on the calendar with participants. Inmate A told other inmates that he had been coughing for about a month. So Inmate A was coughing 1 month prior to being booked which dates the onset of symptoms at April 2<sup>nd</sup>. Count back 3 months from April 2<sup>nd</sup> and it looks like January 2<sup>nd</sup> was the likely beginning of the infectious period for Inmate A.

**TB symptoms:** Yes, coughing

**AFB sputum smear-positive:** Yes, 1+

**Chest radiograph:** Shows infiltrate

#### 2. Given the case scenario, determine the persons who were exposed to Inmate A during his infectious period—these are the contacts.

The infectious period lasted from January 2<sup>nd</sup>– May 6<sup>th</sup>. During this time, contacts would include the following:

- The people with whom Inmate A spent time prior to the booking in the jail on May 1<sup>st</sup> (e.g., family, friends, community programs)
- The arresting officer(s), jail booking staff, and/or correctional nurse who did the 30 minute screening
- The jail inmates – especially the 3 inmates with whom the patient played cards and staff in the housing unit B13, and roommate. It is questionable as to whether or not those in the cafeteria would all be considered contacts – concentrate on those with whom the patient usually sat and ate
- The bus driver, the 2 guards on the bus, the 2 inmates at the back of the bus, and the 5 inmates in the middle of the bus
- The jail medical staff such as the correctional health nurse
- 10 inmates in booking area are contacts – need to determine if high-, medium-, or low-priority
- Note that the judge and other court staff and visitors to the courtroom probably did not have enough exposure to be considered contacts. Generally courtrooms are large wide open spaces with high ceilings and, hopefully, HVAC systems that work well.

### **3. Determine the date when a contact's exposure with the TB patient is broken and explain its significance.**

*The date for when a contact's exposure with the TB patient is broken is described as the date that the contact is no longer exposed to the TB patient or when the TB patient is placed in isolation. May 6<sup>th</sup> is the date that this TB patient was placed in isolation, thus the date that any contacts' exposure with the TB patient was broken. Explain that the significance of this date is to help determine the date for the follow-up testing that occurs 8-10 weeks after a contact's last date of exposure to the TB patient.*

As time permits, you can ask participants to take part in the following extra "bonus" activity.

### **4. Mark key dates on calendar to help determine Inmate A's period of infectiousness and his potential contacts.**

If participants need extra help in establishing a timeline for Inmate A's infectious period and who he was in contact with during that time, you can use this answer key to identify some important dates. These dates help jail personnel to determine the scope of a contact investigation. You may wish to chart these dates on a large display calendar at the front of the classroom.

As needed, you can go over these dates more specifically to 1) determine the infectious period, and 2) identify the contacts who were exposed to Inmate A during his infectious period:

- **January 2<sup>nd</sup>**
  - *Marks the likely beginning of the infectious period for Inmate A.*
- **May 1<sup>st</sup>**
  - *Inmate A was booked at 12 noon in small open room to side of main booking area – no cough noted.*
- **May 2<sup>nd</sup>**
  - *Inmate A remained in main booking area until 2 p.m. on this day.*
  - *The correctional nurse did health screening in small exam room with door closed for 30 minutes on May 2. Inmate A coughed a lot during screening and RN placed a TST.*
  - *After leaving booking area, Inmate A was placed in housing unit B13 (2 inmates per room). Inmate A had no roommate initially.*
- **May 3<sup>rd</sup>**
  - *Inmate A was assigned a roommate today who slept on top bunk of room.*
  - *Roommate spends most of his time in the room, sleeping and reading.*
  - *Inmate A spends 4-5 hours per day in the central core, sitting at a small, round table, playing cards and talking with 3 other inmates. They notice inmate coughing and Inmate A says he's been sick for about a month.*

- *Inmate A and 8 other inmates are transported to County Courthouse for court appearance via correctional bus (with bus driver and 2 guards). Inmate A sat at back of bus, sitting right behind 2 other inmates. The other 5 inmates all sat toward the middle or the front of the bus.*
- *Upon arriving at Courthouse, the inmates are escorted to a holding cell that is an enclosed area, medium size, with no windows. The guards sit in an area the size of a family room that adjoins the holding cell. Inmate A was coughing on and off for the 2 hours he was in the holding cell with 8 other inmates.*
- *After a short court appearance, the inmates were routed back to the bus and returned to the jail.*
- **May 4<sup>th</sup>**
  - *The correctional nurse reads Inmate A's TST as I=25mm. The nurse noticed the cough and further screened Inmate A for symptoms of TB. Inmate A again complained of a cough that was hanging on. The nurse arranged for a chest x-ray to be done the next day.*
- **May 5<sup>th</sup>**
  - *Inmate A received a chest x-ray.*
- **May 6<sup>th</sup>**
  - *The correctional nurse receives Inmate A's chest x-ray which showed a right-side infiltrate. Inmate A was placed in respiratory isolation on May 6, **this marks the date exposure was broken with any contacts.***
  - *Three sputum specimens were obtained over the next 3 days (with at least one obtained in morning). All 3 were 1+ positive on the smear.*
- **July 1<sup>st</sup>**
  - *Marks the 8-10 weeks follow-up testing for contact, based on Inmate A being placed in isolation on May 6<sup>th</sup>.*

## SESSION TWO

### EXERCISE 2

(activity occurs on **Slide #35**)

#### **Instructions for Facilitator**

Prepare copies of “Exercise 2—Participant Worksheet” to distribute to participants. This worksheet can be found in the *Participant Materials* section, **page 160**.

Read the instructions aloud and explain that their worksheet includes descriptions for four contacts who were exposed to a TB patient. Read aloud each contact’s description from the worksheet. The descriptions include age, gender, and characteristics of contacts’ exposure period with the TB patient.

Ask participants to prioritize each contact as high, medium, or low. Tell participants to write their choices in the space provided on their worksheet. Give participants 5-10 minutes to do this exercise and then ask participants to share their answers. Depending on class size, participants can work in groups or individually. Use your answer key to identify answers or recommendations if participants are unaware of the correct response.

The purpose of this exercise is to prioritize contacts in order to focus the jail’s and health department’s limited resources on finding and treating high-priority contacts who are the most at risk of developing TB disease.

#### **Participant Worksheet Materials**

- Worksheet for Prioritizing Contacts (**page 160**)

## SESSION TWO

### EXERCISE 2

### Answer Key

**Which contact would you rank as a high-priority? medium-priority? low-priority?**

*Please advise that these answers may be open for discussion. They are based on experience and judgment, and not exact science.*

Contact #1	Contact #2	Contact #3	Contact #4
<ul style="list-style-type: none"> <li>• 24-year-old</li> <li>• Positive TST</li> <li>• Coughing</li> <li>• Night sweats</li> <li>• Weight loss</li> </ul>	<ul style="list-style-type: none"> <li>• 35-year-old</li> <li>• Normal immune system</li> <li>• History of positive TSTs</li> </ul>	<ul style="list-style-type: none"> <li>• 20-year -old</li> <li>• Diabetic</li> </ul>	<ul style="list-style-type: none"> <li>• 44-year-old</li> <li>• Correctional health nurse</li> <li>• Healthy immune system</li> <li>• Negative TST</li> </ul>
<p>Exposure period with TB patient:</p> <p>Initially housed in 2 bunk cell (small room) with TB case for 3 days before TB case was put into isolation. TB patient was coughing a lot in this inmate’s face while in 2 bunk cell</p>	<p>Exposure period with TB patient:</p> <p>Sat directly across from TB patient during mealtime in the cafeteria once a day. Also participated in daily exercises on the grounds and talked with TB patient until TB patient was put into isolation.</p>	<p>Exposure period with TB patient:</p> <p>Was in booking when TB patient was diagnosed. They didn’t talk together while in the large booking area. The ventilation was recycled air. Contact was in booking overnight before being sent to housing unit.</p>	<p>Exposure period with TB patient:</p> <p>Conducted initial exam of TB patient in a small exam room with recirculated air. The exam time was 30 minutes. When TB patient was put into housing unit, this nurse practitioner conducted exam in slightly larger room with recycled air. The two sat closely together and TB patient was coughing.</p>
<b>Circle your answers below.</b>			
<p>Priority for Contact #1 is:</p> <p><u>High</u></p> <p>Medium</p> <p>Low</p>	<p>Priority for Contact #1 is:</p> <p>High</p> <p>Medium</p> <p><u>Low</u></p>	<p>Priority for Contact #1 is:</p> <p>High</p> <p>Medium</p> <p><u>Low</u></p>	<p>Priority for Contact #1 is:</p> <p><u>High</u></p> <p>Medium</p> <p>Low</p>
<p>This contact is <b>high-priority</b> because contact is starting to have symptoms.</p>	<p>This contact is <b>low-priority</b> because there was fairly minimal contact. The space was large. The history of a positive TB skin test means the contact’s immune system has some sort of protection.</p>	<p>This contact is <b>low-priority</b> because it was a one-time minimal contact.</p>	<p>This contact is also <b>high-priority</b>. Although the nurse may not be infected due to the brevity of exposure, the nurse definitely needs to be tested based on: the intensity of exposure in a small environment (even though the exposure was brief) and because the TB patient was smear-positive and was coughing during the exam.</p>

## SESSION TWO

### EXERCISE 3

(activity occurs on Slide #53)

#### Instructions for Facilitator

Prepare copies of “Exercise 3 - Participant Worksheet” to distribute to participants. Participant worksheet(s) can be found in the *Participant Materials* section, **page 161**.

Read the instructions aloud to participants and explain that their worksheet provides 3 groups of contacts exposed to the TB patient at the onset of a contact investigation. Ask participants to calculate the infection rate for each group.

Tell participants to write their calculations and answers in the space provided on their worksheet. Give participants 5-10 minutes to do this exercise and then ask participants to share their answers. Depending on class size, participants can work in groups or individually. Use your answer key to identify answers or recommendations if participants are unaware of the correct response.

Go over how to calculate this rate with participants.

$$\text{Infection rate}^* = \frac{\text{\# of new positive TST} \times 100}{\text{Total \# of contacts newly tested}}$$

\*per exposure environment

*Example:*

*10 contacts were identified: 2 had previously positive TSTs; therefore, 8 were newly tested, and 4 of those were positive*

Also mention to participants that the rates for each group will be different because of the different characteristics of their exposure period to the TB patient. The purpose of this exercise is to calculate the infection rate to determine a baseline.

#### Participant Worksheet Materials

- Worksheet for calculating the infection rate (**page 161**)

## SESSION TWO

### EXERCISE 3

### Answer Key

Calculate the infection rate for each group.

#### 1. Group of inmates

10 inmate contacts to Inmate A were given TB skin tests. 1 of the 10 had a positive TST result. They all had negative TST results before spending time with Inmate A.

$$\frac{1 \times 100}{10} = .10 \times 100 = 10\%$$

*This rate of transmission is acceptable. Anything over 25% in a jail setting is high for a conversion rate and should lead to more testing. Action step: Interview and follow-up treatment should be done on the inmate with the positive TST.*

#### 2. Group of inmates and jail staff who were transported to county court house

8 inmates, a bus driver, and 2 guards were contacts to the TB patient and were given TSTs. Inmate A sat at the back of the bus, sitting right behind 2 other inmates. The rest of the inmates all sat toward the middle or front of the bus. 2 of the 8 inmates sitting toward the middle or front of the bus had previously documented positive TST results. 1 of 9 persons (who all previously tested negative) had a positive TST in this round of testing.

$$\frac{1 \times 100}{9} = .111 \times 100 = 11.1\%$$

*The 2 inmates who had previously documented positive TST results are not included in this calculation and were promptly evaluated by the correctional nurse and started on LTBI treatment, if they had not received LTBI treatment already. The inmate with the positive skin test sat in front of Inmate A on the bus and is also HIV-positive. This inmate will start LTBI treatment immediately. Although the rate seems low, the contacts may require close monitoring due to the characteristics of the enclosed bus, holding cell, and also the inmates. The second test would be really important to see if any one of these inmates converts from a negative TB test (TST/IGRA) to a positive TB test result.*

#### 3. Group in courtroom

5 custody officers, 2 lawyers, 3 clerks, and 1 judge were in the holding area and in contact with TB patient for 1 hour. All received TSTs and none had positive skin test results.

$$\frac{0 \times 100}{11} = 0 \times 100 = 0\%$$

*Explain to participants that this group seems to have a very low risk of exposure. It is reasonable that this group would not have anyone with a positive skin test because they were not with the TB patient for a very long time. It was a one-time contact for a short court appearance. Judges and clerks do not*

usually go into holding areas but inmates can sit in court rooms for long periods of time. Usually, court rooms are large, wide open spaces with high ceilings and, hopefully, ventilation systems that work well.

**4. If time permits, you can ask participants the following extra “bonus” question.**

**Calculate the infection rate for all the groups and explain what the overall rate means.**

*The overall rate is the infection rate for the total number of contacts as opposed to the rate for a specific subgroup.*

1. Group of inmates: 1 of 10 tested positive
2. Group of inmates and jail staff who were transported to county court house: 1 of 9 tested positive
3. Group in courtroom: 0 of 11 tested positive = 0%

$$\text{Overall rate: } \frac{1 + 1 + 0 \times 100}{10 + 9 + 11} = \frac{2 \times 100}{30} = 6.6\%$$



**SESSION TWO:**  
**Instructions for Conducting**  
**Case Studies**  
**#1-3**

# Case Studies

(activity occurs on **Slide #58**)

## Instructions for Facilitator

You can download the PowerPoint presentation slides from the CD-ROM that accompanied this guide or by going to CNTC's website at [http://www.nationaltbcenter.ucsf.edu/tbci\\_jail/](http://www.nationaltbcenter.ucsf.edu/tbci_jail/). There are no slide handouts for the case studies.

Explain to participants that these case studies cover important lessons about conducting a contact investigation in jail. Three case studies are outlined. You may discuss one, all, or none of the case studies, as time permits. Spend 5-15 minutes for each case study. Read the case study aloud. Feel free to share a case study from your own experience.

## PowerPoint Presentation Slides (on CD-ROM or [http://www.nationaltbcenter.ucsf.edu/tbci\\_jail/](http://www.nationaltbcenter.ucsf.edu/tbci_jail/))

- Case #1 – 39-year-old male released from jail
- Case #2 – 30-year-old female prostitute
- Case #3 – 38-year-old male TB suspect during routine entry screening

# SESSION TWO

## CASE 1



Slide 1

Time: 1 minute

### Case 1

5/15/07 – a 39-year-old, U.S.-born, Hispanic male visits the emergency room 1 week after release from jail:

- Symptoms: productive cough, fever, weight loss
- Subsequent test and examination results:
  - TST 25mm
  - Bilateral infiltrates on chest x-ray
  - AFB smear +
  - Culture +

Explain that the emergency room staff identified a case of TB. Provide the details of the case as follows:

- On May 15, 2007, one week after his release from jail, a 39-year-old U.S.-born Hispanic male reported to an emergency room with complaints of productive cough, fever, and weight loss
- He was subsequently found to have:
  - Tuberculin skin test (TST) of 25 mm induration
  - Bilateral infiltrates on his chest x-ray
  - Positive acid-fast bacilli (AFB) sputum smear
  - Positive culture for drug-susceptible *M. tb*

Notes:

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**Slide 2**

Time: 1 minute

<p><b>Community Contact Investigation</b></p> <ul style="list-style-type: none"> <li>• The county health department TB control department evaluates the index case's family</li> <li>• All family members have negative TSTs</li> </ul>
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Explain that the county health department TB control program began by investigating the index case's family, and all family members had negative TST results. After the family was investigated, the TB control program began to investigate contacts in the jail.

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**Slide 3**

Time: 1 minute

**Review Jail and Medical Records**

9/06 Intake Screening & Health Assessment	<ul style="list-style-type: none"> <li>• No findings consistent with TB</li> <li>• TST: 0mm</li> </ul>
6-Month Physical	<ul style="list-style-type: none"> <li>• No TST</li> </ul>
Sick Calls 11/23/06 - 5/1/07	<ul style="list-style-type: none"> <li>• 16 medical requests, 8 with complaints of at least cough or fever</li> <li>• Treated for colds or flu</li> <li>• No x-rays</li> </ul>
5/8/07 Released	

**Infectious for approximately 9 months**

**Inform participants that review of the jail medical records showed the following:**

- Routine screening and health assessments were performed:
  - In September 2006, the initial routine medical screening showed all findings objectively and subjectively negative for TB
  - At 7 days of incarceration, a routine health assessment included a tuberculin skin test (TST) read as 0 mm
  - At 6 months of incarceration, a routine physical assessment was conducted that did not include a TST
- November 2006 to May 2007: The inmate made 16 medical requests, half of which involved at least a cough and/or fever:
  - Eight medical requests were made in November to January, and eight were made in February to May
  - Late December 2006/early January 2007 and late April/early May 2007: Most severe symptoms occurred
  - Late December 2006/early January 2007: He had one episode of hemoptysis or hematemesis
  - January 5 to April 20, 2007: He had no medical care request with TB signs and symptoms
  - The medical records showed that the index case was treated for colds, the flu, epigastric pain, rib pain, rashes, athlete's foot, and infestation of lice, but he was not isolated, x-rayed, or given antibiotics

**Explain how the period of infectiousness was determined:**

- Initially, the period of infectiousness was established as February 2 to May 8, 2007, starting three months prior to the TB case's release date
- It was eventually evident, however, that he had been infectious closer to seven months, and the period of infectiousness was lengthened to cover his whole time of incarceration, from September 2006 to May 8, 2007

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**Slide 4**

Time: 1 minute

**Exposure Site(s)**

- The jail housed 1,050 inmates and processes 22,000 inmates/year
- During his incarceration, the index case was housed in:
  - 2 facilities
  - 8 housing units
    - 10-man rooms
    - 12-man cells
    - 85-man barracks

Read this slide to your participants. Information on exposure sites and inmate contacts will be presented after the following slide.

Notes:

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**Slide 5**

Time: 1 minute

**Inmate Contacts**

379 inmates identified as contacts:

- 144 never located
- 235 located and screened
- 50 TST positive
- 29 recent converters

Follow-up:

- 13 county and state prisons
- Inmates released to the community

Go over the transmission settings and contacts with participants:

- Population rosters were used to track inmates exposed to the index case in the jail
- The jail houses 1,050 inmates (in three separate housing facilities), and processes 22,000 inmates annually
- In the nine months of his incarceration, the index case had been housed between two facilities and in eight separate units (including: 10-man rooms, 12-man cells, and 85-man barracks)
- 379 inmate contacts were identified

Notes:

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**Slide 6**

Time: 1 minute

**Secondary Cases**

- DNA fingerprinting linked 2 secondary cases:
  - 1 secondary case was HIV-positive, TST - negative, and located in a state prison 1 ½ years after exposure
  - The 144 inmate contacts who were not located are estimated to have:
    - 24 new converters
    - 2 additional TB cases

Provide the overview of the testing and evaluation for this case as follows:

- Of the 379 inmate contacts,
  - 144 were never located
  - 235 (62% of the 379 inmate contacts) were located and screened
  - 50 (21% of the 235) were TST-positive
  - 29 of those were recent converters
- Some inmate contacts were not scheduled for evaluation until June, by which time many had left the jail
- Follow-up was a huge undertaking that involved as least 13 county and state prisons as well as locating inmates released to the community
- Some custody staff did not complete contact evaluation
- The original TB patient (the first TB case that started all this) was never identified.

Review the secondary cases linked to the TB case

- There have been two secondary cases genetically linked by DNA fingerprinting
  - 1 secondary case was HIV-positive, TST-negative, and located in a state prison 1 ½ years after exposure
- The group of 144 inmate contacts who were never located is estimated to have 24 new converters and two additional TB cases

Notes:

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## Slide 7

Time: 1 minute

### Lessons Learned

- Increase the index of suspicion for TB in the jail –THINK TB!!
- Include jail staff in baseline, periodic, and contact investigation TB testing
- Develop a plan with specific written protocols
- Have regular communication between the jail and the local health department (LHD)
- Be aware that recidivism can help a contact investigation

Point out the lessons learned from this case.

- **Increase the index of suspicion for TB in the jail—Think TB!**
  - The most important lesson that jail health care staff can learn is to consider the diagnosis of TB at intake screening
  - Seven months into the investigation, the county TB control program requested further assistance from the state health department TB branch to determine the likelihood that TB had been transmitted in the county jail and to identify missed opportunities for preventing TB among exposed inmates
  - The state health department TB branch found that the most significant missed opportunity was the failure to diagnose an infectious TB case while he was still incarcerated
- **Include jail staff in baseline, periodic, and contact investigation testing**
  - In addition to their annual TST testing, custody staff should be tested as contacts during a contact investigation. Baseline (two-step) testing and periodic TB testing should be routine practices
  - Some custody staff did not complete contact evaluation, and as a result transmission among custody staff was not assessed
- **Develop a plan with specific written protocols**
  - By not conducting concurrent contact investigations, jail medical staff caused contact evaluations to take over 30 days to complete, resulting in many inmates who were no longer accessible (having been being released) and harder to follow-up and/or trace
  - The state TB control branch recommended that the communicable disease plan include
    - Specific written protocols for responding to exposure incidents and other aspects of TB control which require coordination of activities between the jail and the county health department's TB control program
    - Clearly described roles, responsibilities, and division of labor
    - Communication, information needed, and transfer mechanism
    - Relevant timeframes for timely and complete response to TB exposure incidents
- Have regular communication between the jail and the county health department

- Be aware that recidivism (the tendency to relapse into a former pattern of behavior, criminal habits; a return to incarceration) can help a contact investigation in jail
  - During intake screening and initial health assessments in subsequent incarcerations, several inmates commented that they had received the follow-up letters from the local health department

The jail has implemented several changes as a result of the contact investigation:

- Medical pre-screen done at intake will now include specific questions on signs and symptoms of TB
- At intake, HIV-positive inmates are now scheduled for a chest x-ray unless a normal chest x-ray report is on the chart
- Inmates are now given a TST at their 6-month physical
- A tracking sheet is now kept for each incarcerated TB patient. Once it is completed (i.e., all movement/housing history during the infectious period is noted) it is:
  - Faxed to the local health department for continuity of follow-up
  - Kept in all inmate charts on the top left so that it is visible immediately upon opening the chart
- A transfer form is now used to notify local and receiving health officers and receiving facility's jail doctor of an inmate's current treatment plan
- Upon release, an inmate on TB medication is now given a referral form for follow-up with the local health department (TB control program)

# SESSION TWO

## CASE 2



Slide 1

Time: 1 minute

### Case 2

September 2000:

- After an ER examines a 30-year-old female prostitute, her sputa are found to be AFB smear-positive (+)
- The local health department (LHD) cannot locate her in the community

In September 2000, public health staff identified a female prostitute, aged 30, as a TB suspect

- She had been evaluated in a local ER, started on antibiotics, and submitted sputa for AFB testing
- She was released and the local health department was not notified
- When the AFBs were found to be smear-positive, the laboratory notified the local health department
- The local health department staff looked for the TB suspect without success

Notes:

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Slide 2

Time: 1 minute

### Case 2 (2)

Mid-October 2000:

- The local health department notifies the jail staff who locate her in the jail's Honor Farm
- She (TB suspect) had been in the Honor Farm for 3 weeks

In mid-October, the local health department notified the jail medical unit of the TB suspect's name and TB status in case she should be re-arrested:

- The jail staff found the TB suspect in the jail's Honor Farm where she had been for about three weeks
- TB suspect was on antibiotics for pneumonia
- Since the local health department already had positive smear results on her, the TB suspect was immediately put into isolation (the jail staff immediately notified the local health department after they had found and isolated her)
- The TB suspect had no clinical information in her jail record related to TB until the information from the local health department was received
- At this point she had been smear-positive for five weeks, her chest x-ray showed bilateral infiltrates, and she was coughing. She went from being considered a "TB suspect" to being a "TB patient"
- Sputa for AFB smears were still positive
- The TB patient was started on 4-drug anti-tuberculosis therapy
- The TB patient stayed in isolation for almost six weeks, until she finally had three negative smears and showed clinical improvement

Notes:

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Slide 3

Time: 1 minute

#### Review Jail and Medical Records

On entry to jail	<ul style="list-style-type: none"> <li>• Smear+</li> <li>• On antibiotics for pneumonia</li> </ul>
At start of isolation	<ul style="list-style-type: none"> <li>• Coughing</li> <li>• Chest x-ray: bilateral infiltrates</li> </ul>
During 6-week isolation	<ul style="list-style-type: none"> <li>• 4-drug anti-tuberculosis therapy started</li> <li>• 3 negative smears</li> <li>• Clinical improvement</li> </ul>
Released from isolation	

**Infectious from entry into jail**

Review the slide with participants:

- She was smear-positive when she entered the jail
- She was considered to be infectious from the day of incarceration until placed into isolation

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**Slide 4**

Time: 1 minute

Exposure Site(s)
<ul style="list-style-type: none"><li>• Housing unit</li><li>• Transportation vehicle</li><li>• Court holding cell</li></ul>

Go over the exposure sites and the potential contacts as follows:

- Housing unit: The women in the housing unit in the Honor Farm and the custody staff assigned to that unit
- Transport vehicle: The inmates and custody staff in the transport vehicle to court
- Court holding cell: The marshals and inmates in the holding cell at court

Contact prioritization: all of these persons were high-priority for testing

- There were 46 on the contact list—10 were staff and 36 were inmates (some had already been released and new inmates had taken their place, increasing the contact pool in the inmate group)
- All were considered high-priority contacts for purposes of follow-up needed
- All were considered at high risk for infection as a result of the exposure
- The inmates were considered at high risk for progression to active disease if infected as a result of the exposure due to substance abuse, prostitution, and HIV risk in this population group
- The contact investigation focused on the TB patient's time in the jail

Notes:

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**Slide 5**

Time: 1 minute

**High-Priority Contacts  
10 Custody Staff**

- 9 initial TSTs, no positives
- 9 repeat TSTs, no positives

- Read the slide aloud.

Notes:

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**Slide 6**

Time: 1 minute

**High-Priority Contacts (2)  
36 Inmates**

- 24 still incarcerated and given initial TSTs, no positives:
  - 18 second TSTs, 2 positives
  - 6 not found for second TST
  - 24 records flagged, in case re-incarcerated
- 12 released prior to initial TSTs:
  - 3 located and tested
  - 1 returned for reading and was positive
  - 11 records flagged in case re-incarcerated

Go over testing results for the 36 inmates:

- 24 were still incarcerated and received a first TST with no positives
  - 18 of this group were still available for the second TST, with 2 positives
  - Of the six released prior to the second round of testing, none were found and no testing was done
  - All records were flagged to do TB evaluation if re-incarcerated
- Of the 12 who were released prior to the initial TSTs, 3 were found and received a TST, and 1 returned for the reading and was positive
- The records of the 11 who did not receive or complete testing were flagged to do TB evaluation if re-incarcerated

Notes: \_\_\_\_\_  
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Slide 7

Time: 1 minute

**Lessons Learned**

- Local health department immediately notifies jail and flags records of TB suspects with a history/risk of incarceration
- Corrections staff should “think TB”
- Flag jail records in case unevaluated contacts are re-incarcerated

Review the lessons learned from this case and advise participants of the following:

- **Local health department immediately notifies jail and flags records of TB suspects with a history/risk of incarceration:**
  - The local health department, once they learned that this TB suspect was a prostitute, should have immediately notified the jail of her TB status in case she was arrested rather—than doing so only when they became aware that she had been arrested:
    - Immediate notification and flagging the inmate record is now the policy for TB suspects who have a history of incarceration or are at risk of incarceration (e.g., prostitutes)
    - Confidentiality is now maintained by flagging the record “Public Health Follow-Up Needed” as opposed to giving a specific diagnosis
- **Corrections staff should “think TB”:**
  - When this TB suspect was admitted to jail she was coughing and said she had pneumonia and was on antibiotics
  - She (TB suspect) was continued on antibiotics until the local health department notified corrections staff of the AFB smear results and the possible TB diagnosis
- **Flag jail records in case unevaluated contacts are re-incarcerated:**
  - Once inmates are released it is very difficult to locate them—records need to be flagged so that TB status is evaluated if the inmates are re-incarcerated

Notes: \_\_\_\_\_  
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# SESSION TWO

## CASE 3



Slide 1

Time: 1 minute

**Case 3**

2/18/01

- During routine entry screening, jail medical staff identified a 38-year-old male as a TB suspect

Describe that on February 18, 2001, a 38-year-old male inmate was identified as a TB suspect during the jail's routine entry TB screening process:

- No symptoms were noted on the initial screening exam
- 48 hours after admission, the TST was done, and it was positive (22 mm)
- TB suspect gave a history of 6 months of treatment with INH
- TB suspect had some weight loss and minimal cough
- Cultures were taken and were found positive
- A chest x-ray was done two days later and was abnormal
- The clerical coordinator at the jail notified the corrections liaison at the local health department
- When the chest x-ray results were received 6 days after admission, the TB patient (formerly the "TB suspect") was placed in isolation for two weeks, until he had three negative smears and two weeks of medication
- TB patient stayed on medication until culture results were received, and, since they were positive, he remained on treatment for a total of six months until he became culture-negative

Notes:

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**Slide 2**

Time: 1 minute

**Review Jail and Medical Records**

On entry to jail	<ul style="list-style-type: none"> <li>• Weight loss and minimal cough</li> <li>• 6-month history of INH</li> </ul>
Testing and evaluation	<ul style="list-style-type: none"> <li>• TST+</li> <li>• Abnormal chest x-ray</li> <li>• Smear-</li> </ul>
2-week isolation started 6 days after entry into jail	<ul style="list-style-type: none"> <li>• Started medications</li> <li>• 3 negative smears</li> </ul>
Released from isolation	<ul style="list-style-type: none"> <li>• Culture+</li> <li>• Continued medications 6 months (until culture-negative)</li> </ul>

**Potentially infectious from entry into jail**

- Go over period of infectiousness as follows:
  - He was not smear-positive or coughing (although he had minimal abnormal findings on the chest x-ray), so clinically he was not considered to be highly infectious
  - He was considered potentially infectious from the point of incarceration until placed into isolation when the chest x-ray result was received

Notes:

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**Slide 3**

Time: 1 minute

<b>Exposure site(s)</b>
<ul style="list-style-type: none"> <li>• Booking</li> <li>• Health clinic</li> <li>• Holding unit</li> </ul>

- Review the transmission settings and contacts:
  - Booking:
    - The booking area was large:
    - The TB suspect (still a “suspect” at this point) was quickly separated from other inmates
    - No contacts were identified in this area
  - Health clinic:
    - A nurse conducted the initial health assessment and TST in 15 minutes in a small room with the door open
    - This nurse was at low risk of exposure and was offered a TST
    - Both the first and the second TSTs were negative
  - Holding unit:
    - This area is large and open, with individual rooms
    - The TB patient spent most of his time in his room and did not have significant, ongoing contact with other inmates or staff
    - No TB testing was recommended for this area, based upon the length of time on the unit, the minimal contact with others, the airflow on the unit, and the fact that the nurse who conducted the initial health assessment was TST negative

Notes:

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**Slide 4**

Time: 1 minute

**No Testing**

- TB suspect/patient quickly separated from other inmates
- Minimal and insignificant staff and inmate exposure

- Explain that further testing was not indicated because the initial screening process was fast and efficient, the inmate was not coughing and was smear-negative, and staff and inmate exposure was minimal and insignificant



**Slide 5**

Time: 1 minute

**Lessons Learned**

- Have a designated local health department (LHD) contact person
- Work in partnership with the LHD
  - A non-nurse clinic manager can coordinate TB control effectively

Review the lessons learned from this case and advise participants of the following:

- **Have a designated local health department contact person:**
  - The local health department should always have a specific corrections liaison person (identified by name, not just title)
    - There should be a specific person assigned as a backup corrections liaison for the jail to contact
    - If another person takes either of these positions, the local health department should notify the jail immediately
- **Work in partnership with the local health department:**
  - This local health department's person in charge of the clinic is not a nurse, but the system works effectively and shows how smaller jails without a nurse can coordinate TB-related functions:
    - The jail and local health department built a strong partnership to control TB
    - The team involves local health department staff, corrections medical staff, and corrections officers
    - The jail and local health department worked together to write the TB infection control plan
    - Regular face-to-face meetings are important to build working relationships and to build the team's knowledge-base by exchanging new information about TB and changes in the jail's systems
    - All of these stakeholders are involved, take ownership of the responsibility to control TB, and are willing to follow through on TB control activities
    - The local health department/jail partnership goes beyond contact investigations, but the strong partnership is essential in contact investigations



Slide 6

Time: 1 minute

**Conclusion**

- Ongoing partnership and communication between a jail and the local health department are essential
  - Jail staff should “think TB”
  - Inmates are frequently re-incarcerated
    - Flag local health department and jail records
    - Communicate about TB suspects likely to be incarcerated
- Emphasize to participants that ongoing partnership and communication between a jail and the local health department are essential in contact investigations:
    - Raise the index of suspicion—**“think TB”** when symptoms appear
    - Inmates are frequently re-incarcerated:
      - Flag records in the jail and local health department
      - The local health department should communicate with the jail about TB suspects who are likely to be re-incarcerated



# **TUBERCULOSIS CONTACT INVESTIGATION IN JAIL: A FACILITATOR GUIDE**

Participant Materials  
(Slide presentations, tables, and charts)

## **SESSION ONE: TB IN JAIL**

# PARTICIPANT MATERIALS

## INSTRUCTIONS FOR FACILITATOR

To prepare for your training, please make the appropriate number of copies of participant materials to distribute at your training. The following handouts are included in the Participant Materials section. If needed, these documents are also accessible for downloading from the CNTC's website at [http://www.nationaltbcenter.ucsf.edu/tbci\\_jail/](http://www.nationaltbcenter.ucsf.edu/tbci_jail/).

### **Session One: TB in Jail**

#### ***Handouts to distribute to participants***

- Presentation slides handout (6 per page)
- Figure 1: "Decision to initiate a TB contact investigation"
- Table 1: "Characteristics of the index patient and behaviors associated with increased risk for TB transmission"

### **Session Two: The Steps for Conducting a Contact Investigation in Jail**

#### ***Handouts to distribute to participants***

- Presentation slides handout (6 per page)
- Table 2: "Guidelines for estimating the beginning of the period of infectiousness of persons with TB, by index case characteristics"
- Table 3: "Time frames for initial follow-up of contacts of persons exposed to TB"
- Chart: "Continuity of care for TB patient and contacts"
- Participant Handout – Enabling objectives for conducting a TB contact investigation
- Participant Worksheet(s) for Exercise #1
- Participant Worksheet(s) for Exercise #2
- Participant Worksheet(s) for Exercise #3

### **Glossary**

### **Resources List**

### **Job Aid Tool**

# TB CONTACT INVESTIGATION IN JAIL

## SESSION ONE: TB IN JAIL

1



### Objectives

At the end of this session, you will be able to:

- explain why tuberculosis (TB) is a concern for jails
- describe the factors that predict likely transmission of TB
- define a TB contact
- define a contact investigation

2



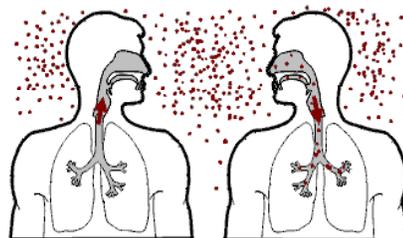
### Objectives (2)

At the end of this session, you will be able to (cont'd):

- describe the factors to consider when initiating a contact investigation
- explain the principles for guiding a contact investigation
- list the members of a contact investigation team

3

### Why is TB a Concern for Your Jail?



4

### Why is TB a Concern for Your Jail? (2)

Jail is a high-risk environment for TB transmission due to:

- crowding
- poor ventilation
- some inmates at increased risk for TB (e.g., immunosuppression)
- frequent relocation of inmates makes disease control more challenging
- health status of new inmates is unknown at time of booking



5

### Importance of TB Infection Control in Jail

TB can affect anyone in a jail:

- inmates and staff
- visitors and family (who can, in turn, infect the community)



6





## Key Term

### TB patient:

A person diagnosed with infectious TB disease (inmate or staff)

7



## Another Key Term

### TB Contact:

A person who is at risk of becoming infected with *M. tuberculosis* due to an exposure to a person with infectious TB disease

8

## Factors That Predict Likely Transmission of TB

- Characteristics of the TB patient
- Environment where exposure occurred and length of exposure



9

## Factors That Predict Likely Transmission of TB (2)

### Characteristics of the TB patient:

- location of TB disease in the body
- lab test results (i.e., sputum bacteriology)
- x-ray findings
- behaviors that increase aerosolization of respiratory secretions
- age
- adherence to an effective course of treatment



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## Factors That Predict Likely Transmission of TB (3)



**TABLE 1. Characteristics of the index patient and behaviors associated with increased risk for tuberculosis (TB) transmission**

Characteristic	Behavior
Pulmonary, laryngeal, or pleural TB	Frequent coughing
AFB* positive sputum smear	Sneezing
Cavitation on chest radiograph	Singing
Adolescent or adult patient	Close social network
No or ineffective treatment of TB disease	

\* Acid-fast bacilli.

Centers for Disease Control and Prevention. Guidelines for the investigation of contacts of persons with infectious tuberculosis: recommendations from the National Tuberculosis Controllers Association and CDC, and the Guidelines for using the QuantiFERON® TB Gold test for detecting *Mycobacterium tuberculosis* infection, United States. MMWR 2005; 54(No.RR-15): [page 4]. 11

## Factors that Predict Likely Transmission of TB (4)

### Environment where exposure occurred and length of exposure:

- amount of time contact shared same air space with TB patient (during TB patient's infectious period)
- exposure characteristics:
  - air volume (size of exposure site)
  - ventilation/circulation
  - duration of exposure
  - exposure settings



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## Factors That Predict Risk of TB Disease

Characteristics of persons who have been identified as contacts:

- immunosuppression (i.e., HIV, prolonged therapy with corticosteroids, chemotherapy for cancer or other immunosuppressive agents, end-stage renal disease, and diabetes mellitus)
- age (i.e., those aged <5 years)

13



## Question

What areas in your jail are most likely to promote transmission of TB?  
Why?

14



## Key Term

### Contact Investigation (CI)

The process of finding, notifying, screening, and treating persons who might have latent TB infection or TB disease as a result of recent contact with a person diagnosed with TB disease. This process is undertaken promptly after a TB patient is identified

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## Key Term (2)



### Contact Investigation (cont'd)

The goal of a CI is to interrupt the transmission of TB

- TB contact investigation in a jail
  - disrupts normal activities
  - is labor/resource intensive
  - can be avoided if the disease is detected at intake, which promptly initiates infection control practices

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## Why Do We Need Contact Investigations in Jails?



Slide courtesy of Zachary Taylor, M.D., CDC, 2003

17

## Why Do We Need Contact Investigation in the Jail Setting? (2)

To protect inmates and staff from contagious disease and other health hazards



18



## Decision to Initiate a Contact Investigation

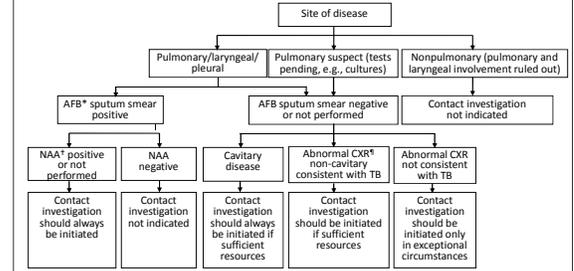
Collaboration between the jail and the health department helps decide whether to start a CI



19

## Decision to Initiate a Contact Investigation (2)

FIGURE 1. Decision to initiate a tuberculosis (TB) contact investigation



\* Acid-fast bacilli.  
 † Nucleic acid assay.  
 ‡ According to CDC guidelines.  
 § Chest radiograph.  
 Centers for Disease Control and Prevention. Guidelines for the investigation of contacts of persons with infectious tuberculosis; recommendations from the National Tuberculosis Controllers Association and CDC, and the Guidelines for using the QuantiFERON®-TB Gold test for detecting *Mycobacterium tuberculosis* infection, United States. MMWR 2005; 54(No. RR-15): [page 5].

## Principles Guiding a Contact Investigation



- determine the TB patient's degree of infectiousness
- determine contacts' duration and intensity of exposure to TB patient
- determine the contacts' susceptibility to getting sick (i.e., HIV status)
- contacts with the greatest risk of infection should be screened immediately

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## Principles Guiding a Contact Investigation (2)

- calculate infection rate to assess the level of TB transmission
- if minimal or no evidence of transmission is observed, do not expand contact investigation
  - determined by both jail facility and health department
- jail and medical staff should be included in the contact investigation depending on their exposure risks

22

## The Contact Investigation Team



- Jail medical personnel
- Correctional staff: officers, custody, classification, booking
- Health department staff: infection control, medical, nursing, outreach

23

## Question

How is your health department notified when symptoms indicative of TB appear in your jail?

When?

By whom?



24



## Contact Investigation Team Roles

Jail staff is responsible for the following:

- identifying and isolating persons suspected of having or diagnosed with TB
- identifying contacts exposed to TB and evaluating them (inmates and staff)\*
- providing appropriate treatment and care for TB case and contacts\*

\* The health department may play a direct role in some communities



## Contact Investigation Team Roles (2)

Jail staff is responsible for the following (cont'd):

- Initiating a timely contact investigation with public health involvement—providing public health department with names and locating information for contacts who are no longer there (i.e., released inmates or staff who have quit or transferred)\*
- providing medical and housing records for TB patient and contacts and identifying inmate and staff contacts to the health department\*

\* The health department may play a direct role in some communities

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## Contact Investigation Team Roles (3)

Jail staff is responsible for the following (cont'd):

- placing and reading TSTs (or drawing blood for IGRAs and sending specimens to the lab) and notifying public health department of positive results\*
- initiating LTBI treatment for staff and inmates still in jail\*
- providing continuity of care (discharge planning) for TB patients and high-priority LTBI patients\*

\* The health department may play a direct role in some communities

27

## Contact Investigation Team Roles (4)

The health department is responsible for the following:

- overseeing and managing all cases of TB (monitoring the treatment and ongoing medical follow-up of inmates with TB disease; providing consultation)



## Contact Investigation Team Roles (5)

The health department is responsible for the following (cont'd):

- assisting the jail to initiate and conduct timely and effective contact investigations with jail involvement; providing consultation, direction for contact investigation activities as needed
- reporting results to the TB control program at the state department of health services, if needed

29

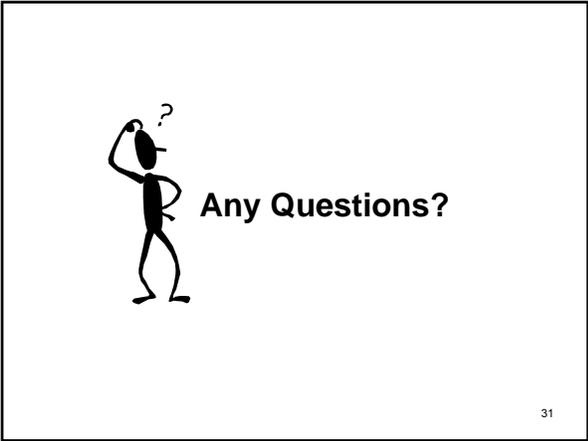
## Contact Investigation Team Roles (6)

The health department is responsible for the following (cont'd):

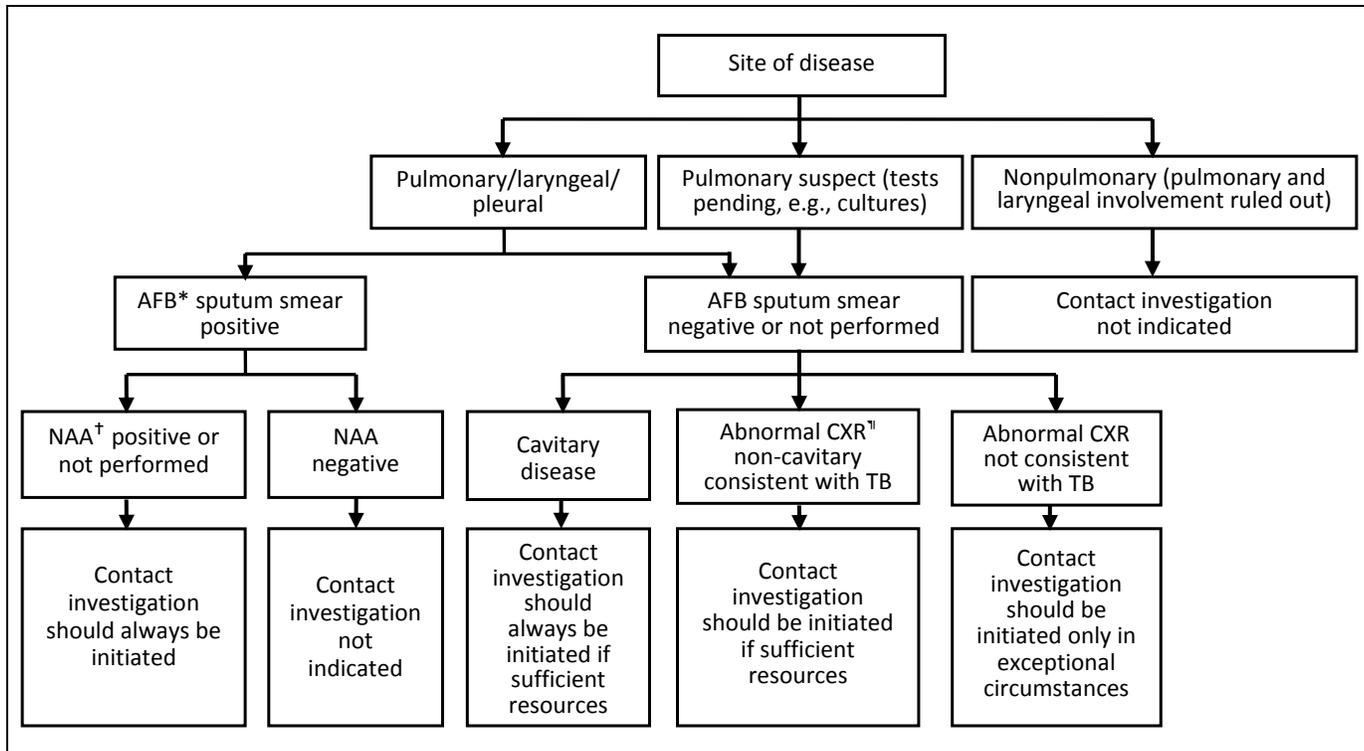
- providing consultation for jails in the treatment of LTBI for contacts whose TST/IGRA is positive
- locating and assessing contacts outside the jails—in the community
- assisting as needed with education for staff and inmates with TB disease or LTBI

30





**FIGURE 1. Decision to initiate a tuberculosis (TB) contact investigation**



\* Acid-fast bacilli.

† Nucleic acid assay.

§ According to CDC guidelines.

‡ Chest radiograph.

Centers for Disease Control and Prevention. Guidelines for the investigation of contacts of persons with infectious tuberculosis; recommendations from the National Tuberculosis Controllers Association and CDC, and the Guidelines for using the QuantiFERON®-TB Gold test for detecting *Mycobacterium tuberculosis* infection, United States. MMWR 2005; 54(No.RR-15): [page 5].

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\* Acid-fast bacilli.

Centers for Disease Control and Prevention. Guidelines for the investigation of contacts of persons with infectious tuberculosis; recommendations from the National Tuberculosis Controllers Association and CDC, and the Guidelines for using the QuantiFERON®-TB Gold test for detecting *Mycobacterium tuberculosis* infection, United States. MMWR 2005; 54(No.RR-15): [page 4].

# **TUBERCULOSIS CONTACT INVESTIGATION IN JAIL: A FACILITATOR GUIDE**

## **Participant Materials**

(Slide presentations, tables, and charts)

## **SESSION TWO: THE STEPS FOR CONDUCTING A CONTACT INVESTIGATION IN JAIL**



# TB CONTACT INVESTIGATION IN JAIL

## SESSION TWO: THE STEPS FOR CONDUCTING A TB CONTACT INVESTIGATION IN JAIL

1



### Objective

At the end of this session, you will be able to:

- describe the steps to performing a contact investigation in a jail



2

### The Steps for Conducting a TB Contact Investigation in Jail: An Overview



3



### Notify Jail Management and Health Department Officials Directly

Know who your point people are  
at the health department

4



### Question

Who is responsible for making notification to the health department when TB is suspected in your jail facility?

5

### Review Medical Record for TB Patient

Collect the following information  
(and dates for):

- previous exposure to TB
- previous diagnosis and treatment of TB
- site of TB disease
- TB symptoms and approximate date symptoms began
- lab test results (e.g., AFB smears, nucleic acid amplification tests), including dates obtained

6



## Review Medical Record for TB Patient (2)

Collect the following information (and dates for):

- chest x-ray results
- TB treatment (medications, dosage, and when treatment was started)
- method of treatment administration (DOT or self-administered)
- TST/IGRA result
- HIV status



7

## Review Medical Record for TB Patient (3)

Collect the following information and dates for other medical conditions that could affect treatment:

- HIV
- diabetes
- end-stage renal disease
- anti-cancer drugs

8

## Minimal Recommended Data to Collect About TB Patient

- when TB patient was first incarcerated
- movement list, including housing locations
- work history within jail setting
- cellmates
- visits to clinic health services/lab draws
- court appearances
- visitors (i.e., lawyers, children, etc.)
- classes/programs attended

9

## Minimal Recommended Data to Collect About TB Patient (2)

- staff who did lab work and chest x-rays



10



## Question

Where are medical records kept in your jail facility?

11

## Data Collection and Management

Two systems critical to the efficient conduct of a contact investigation:

- an inmate medical record system containing TST/IGRA results and other relevant information
- an inmate location tracking system



12



## Updating Jail Management Staff



- Update jail management officials on the extent of the exposure, the strategy, process, and action steps for dealing with, identifying, and assessing contacts

13

## Define the Infectious Period

TABLE 2. Guidelines for estimating the beginning of the period of infectiousness of persons with tuberculosis (TB), by index case characteristic

TB symptoms	Characteristic		Recommended minimum beginning of likely period of infectiousness
	AFB* sputum smear positive	Cavitary chest radiograph	
Yes	No	No	3 months before symptom onset or first positive finding (e.g., abnormal chest radiograph) consistent with TB disease, whichever is longer
Yes	Yes	Yes	3 months before symptom onset or first positive finding consistent with TB disease, whichever is longer
No	No	No	4 weeks before date of suspected diagnosis
No	Yes	Yes	3 months before first positive finding consistent with TB

SOURCE: California Department of Health Services Tuberculosis Control Branch; California Tuberculosis Controllers Association. Contact investigation guidelines. Berkeley, CA: California Department of Health Services; 1998.  
\*Acid-fast bacilli.



Centers for Disease Control and Prevention. Guidelines for the investigation of contacts of persons with infectious tuberculosis; recommendations from the National Tuberculosis Controllers Association and CDC, and the Guidelines for using the QuantiFERON®-TB Gold test for detecting *Mycobacterium tuberculosis* infection, United States. MMWR 2005; 54(No. RR-15): [page 9].

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## Define the Infectious Period (2)

Consider the infectious period “closed” when all of the following has occurred for the TB patient:

- effective/appropriate treatment for  $\geq 2$  weeks
- diminished symptoms
- shows clinical improvement
- shows lab result response



15

## Determine Exposure Period for Contacts

The exposure period for individual contacts is determined by how much time they spent with the TB patient during the infectious period.



16

## Determine Exposure Period for Contacts (2)



- Frequency and duration
  - how often they spent time together
  - length of each time period



17

## Key Term

“Date of last exposure”

or

“Date exposure was broken”

The last day contact spent time with the TB patient during the TB patient’s infectious period.



18



## Interview the TB Patient



### Goals:

- confirm medical review findings
- perform physical assessment
- identify contacts

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## Interview the TB Patient (2)



### Information includes:

- history of prior TB disease or latent tuberculosis infection and treatment history
- TB symptom history and date
- review prior incarceration records for signs and symptoms of TB
- daily activities of the TB patient
- possible jail cell inmate and staff contacts, particularly HIV-infected persons
- community contacts (especially young children) and their locations

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## Keys to an Effective Interview

Jail and/or health department staff interview TB patient within 1-3 working days:

- prepare for interview—plan and be flexible
- address patient concerns and provide TB education

21



## Keys to an Effective Interview (2)

- discuss confidentiality and privacy
- build trust and rapport—this is critical
- ask open-ended questions to get detailed information
- express appreciation
- provide an overview of the CI process
- plan for at least two interviews

22



## Exercise 1

Given the case scenario, determine the following:

- infectious period for the TB patient
- contacts who were exposed during the infectious period

23

## Obtain Housing and Movement History for the TB Patient

Goal: To identify inmates, staff, and volunteers who may have been exposed during the TB patient's infectious period, including visitors and transferred or released inmates



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## Obtain Housing and Movement History for the TB Patient (2)

Identify all locations and the length of time spent in each location:

- cells (single, double, holding, isolation, multiple occupancy, open dorm)
- bunk/cell mates
- general population areas
- court



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## Obtain Housing and Movement History for the TB Patient (3)

Identify all locations and the length of time spent in each location (cont'd):

- programs (e.g., GED, substance abuse)
- Intake/booking/custody department
- clinic, church
- school/classroom
- transportation to other areas



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## Question

Who would you contact at your jail to research a TB patient's movement records?

27

## Visit Exposure Site(s)

Examine the environments where the TB patient spent time during the infectious period. Assess what areas are more likely to be conducive to the transmission of TB by determining the following:

- number of inmates who are housed together at one time
- housing arrangement (e.g., cells versus dorms, court and court holding sites, classrooms)
- general size of the air space

28

## Visit Exposure Site(s) (2)

Assess which areas are more likely to be conducive to the transmission of TB by determining the following:

- basics of the ventilation system (e.g., whether air is re-circulated, or if isolation room is in negative air pressure)
- pattern of daily inmate movement (e.g., when eating, working) and recreation schedule
- availability of data on other inmates housed at the same time as the TB patient



29



## Question

How might you determine airflow in a defined area in your jail?

30





## Prioritizing Contacts

Prioritize contacts on a scale of “high”, “medium”, or “low” according to duration and intensity of exposure and risk factors for becoming infected with TB and progressing to TB disease

31

## Prioritizing Contacts (2)

These persons are considered high-priority:

- contacts with most exposure to TB patient
- HIV-infected or other immunosuppressed contacts (regardless of duration of exposure)

32

## Factors for Assigning Contact Priorities

- Characteristics of TB Contacts

- age (<5 years)
- immune status (e.g., auto-immune disorders)
- other medical conditions (silicosis, diabetes mellitus, and status after gastrectomy or jejunioileal bypass surgery)



33

## Factors for Assigning Contact Priorities (2)

- Exposure–air circulation patterns
  - air volume, ventilation, and duration
  - intensity and frequency of duration



- Characterize grading exposure settings by size
  - “1” = size of a single cell (most likely transmission)
  - “2” = size of a 2 or 4 man cell
  - “3” = size of an open dorm
  - “4” = size of a community hall or larger (less likely transmission)

34

## Classification of Contacts



- Any contacts who are not classified as high- or medium-priority are assigned as low-priority
- Priority classifications should be reconsidered throughout the investigation as findings are analyzed

35



## Exercise 2

Given the following information, prioritize which contacts are “high”, “medium”, or “low”

36



## Time Frames for Initial Follow-Up of Contacts of Persons Exposed to TB

TABLE 3. Time frames for initial follow-up of contacts of persons exposed to tuberculosis (TB)

Type of contact	Business days from listing of a contact to initial encounter*	Business days from initial encounter to completion of medical evaluation†
High-priority contact: index case AFB§ sputum smear positive or cavity disease on chest radiograph (see Figure 2)	7	5
High-priority contact: index case AFB sputum smear negative (see Figure 3)	7	10
Medium-priority contact: regardless of AFB sputum smear or culture result (see Figures 2–4)	14	10

SOURCE: California Department of Health Services Tuberculosis Control Branch; California Tuberculosis Controllers Association. Contact investigation guidelines. Berkeley, CA: California Department of Health Services; 1998.

\*A face-to-face meeting that allows the public-health worker to assess the overall health of the contact, administer a tuberculin skin test, and schedule further evaluation.

†The medical evaluation is complete when the contact's status with respect to *Mycobacterium tuberculosis* infection or TB disease has been determined. A normal exception to this schedule is the delay in waiting for final mycobacteriologic results, but this applies to relatively few contacts.

§Acid-fast bacilli.



Centers for Disease Control and Prevention. Guidelines for the investigation of contacts of persons with infectious tuberculosis; recommendations from the National Tuberculosis Controllers Association and CDC, and the Guidelines for using the QuantiFERON®-TB Gold test for detecting *Mycobacterium tuberculosis* infection, United States. *MMWR* 2005; 54(No.RR-15): [page 11].

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## Locate and Assess Contacts

- Develop contact lists and documentation
  - identify inmate (and staff) contacts from each location where the TB patient spent time
  - document exposed contacts according to current status (e.g., still incarcerated, released, or transferred)
- Interview contacts within 1-3 days of identification
- Gather background health information



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## Locate and Assess Contacts (2)

- Perform in-person assessment of patient's health (conduct symptom review)
  - for incarcerated contacts, may be able to conduct review of medical records
- Administer TB tests (TST or IGRA) on contacts (interpretation of skin test reaction: an induration transverse diameter of  $\geq 5$ mm is considered positive)
- Prioritize contacts

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## Review Medical Record for Each High- and Medium-Priority Contact



Record dates carefully for:

- previous *M. tuberculosis* infection or disease and related treatment
- contact's verbal report and documentation of previous TST/IGRA results
- current symptoms of TB illness (e.g., cough, chest pain, hemoptysis, fever, chills, night sweats, appetite loss, weight loss, malaise, or exhaustion)

40

## Review Medical Record for Each High- and Medium-Priority Contact (2)

Record carefully (and get dates) for:

- medical conditions or risk factors making TB disease more likely

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## Minimal Data Recommended Concerning Each Contact

- Date admitted to facility
- Start and end dates for exposure
- Name and aliases ("street names")
- Social security number
- Date of birth
- Locating information and whom to notify in an emergency
- Primary language and preferred language



42



### Minimal Data Recommended Concerning Each Contact (2)

- Frequency, duration, and time frame of interactions with TB patient
- Previous history of and documentation for TB disease or latent TB infection
- Medical risk factors for progression of infection to TB disease
- New TST/IGRA information, chest x-ray

43

### Minimal Data Recommended Concerning Each Contact (3)

For those contacts who tested positive during their evaluation, and who have previously been treated for TB:



- dates of treatment
- treatment regimen (medication, dosing schedule, any changes to these)
- methods of supervising treatment (e.g., directly observed treatment)

44

### Conduct Medical Evaluation of Contacts



All contacts should:

- have a symptom review completed using standard TB Symptom Review form
- have TST/IGRA administered
  - in contacts, a TST with an induration diameter  $\geq 5$  mm is considered positive
    - if initial TST/IGRA is negative, a second test is needed 10 weeks from the date of initial test
    - receive chest x-ray and medical evaluation, if indicated

45

### Conduct Medical Evaluation of Contacts (2)

- Contacts who have TB symptoms:
  - symptomatic contacts should be placed immediately in isolation and receive medical evaluation regardless of TST /IGRA status
    - a contact can have active TB even though he/she may have a negative TST/IGRA
  - if symptomatic contact is a staff member, he/she must be excluded from work until evaluated

46

### Conduct Medical Evaluation of Contacts (3)

- Contacts who have a history of a previous positive TST/IGRA
  - if no documentation of previous positive test, refer for another test (TST if the previous test was TST; IGRA if the previous test was IGRA)
  - if repeat test is positive or there is written documentation of previous test result, conduct symptom review
  - also interview to see if treatment for LTBI was ordered and, if so, completed

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### Evaluate HIV-Infected Contacts Promptly

- LTBI therapy should be initiated promptly among these contacts once TB disease has been excluded



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## Place and Read Initial TSTs or IGRAs on Eligible Contacts

- Place an initial TST (or draw blood for an IGRA) on possible contacts when a TB patient is identified
- Referrals should be made for contacts who have been released or transferred before receiving their initial TST or IGRA



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## Questions

- Who places and reads the TST?
- Who draws blood for an IGRA?
- Who is responsible for getting IGRA sample to the lab?

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## Make Referrals for Contact Evaluation

Make referrals to the local health department for the following:

- inmate contacts of the infectious TB patient who have been released or transferred to another facility
- family members or frequent visitors of the TB patient



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## Calculate the Infection Rate

$$\text{Infection rate} = \frac{\text{\# of new positives} \times 100}{\text{Total \# of contacts tested (per exposure environment)}}$$

### Example:

10 contacts were identified: 2 had previously positive TSTs; therefore, 8 were newly tested, and 4 of those were positive

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## Calculate the Infection Rate (2)

$$\text{Infection rate} = \frac{4 \times 100}{8} = 50\%$$

- Use only newly identified positive results to calculate
- If previous skin test results are unknown, any positive result should be considered a newly identified positive reaction

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## Exercise 3

Given the following scenario, calculate the infection rate

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## Place and Read Follow-Up TST/IGRA

8-10 weeks after “date exposure was broken” (which is the last day contact spent time with the TB patient during the TB patient’s infectious period)



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## Calculate Infection Rate from Second Round of Testing



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## Writing a Summary Report

Report will include:

- why contact investigation was started
- number of contacts
- number of high- and medium-priority contacts
- transmission rates
- number of contacts started on treatment



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## Writing a Summary Report (2)

Report will include (cont'd):

- number of community contacts (outside the jail) referred for evaluation to public health department
- number of new cases found
- problems encountered



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## Case Studies

59

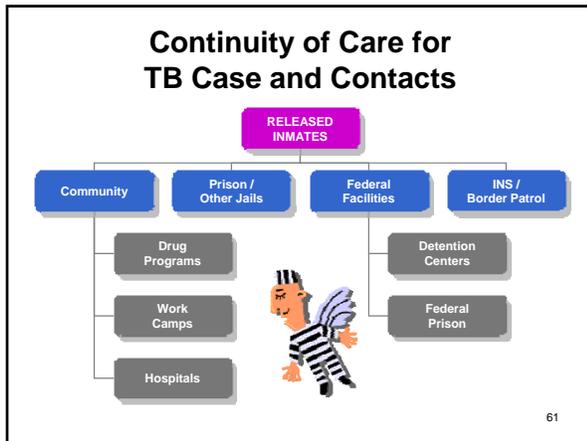
## Post-Contact Investigation Steps

- Continuity of care: discharge planning
  - ensure follow-up care and treatment when contacts are transferred to another facility or released to community



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- 
- ### Conclusion: Key Points
- Diagnose TB before inmates and staff are exposed
  - Establish formal collaboration between jail and public health officials BEFORE a contact investigation is needed
  - Notify jail officials when TB is suspected
  - Notify public health department
  - Set up data management and collection system
- 62

- 
- ### Conclusion: Key Points (2)
- Review TB patient's medical record:
    - onset of symptoms
    - infectiousness (how infectious)
    - infectious period
    - date no longer infectious
    - sites where transmission may have occurred in jail
    - individuals whom the TB patient or jail classifications staff can identify as contacts
- 63

- 
- ### Conclusion: Key Points (3)
- Identify and locate high- and medium-priority contacts
    - educate contacts about TB
    - evaluate contacts (i.e., symptom review, TST/IGRA)
    - treatment, if needed
- 64





### Remember: Think TB!

Screen for TB during intake – diagnose TB before inmates and staff are exposed.  
Protect your jail facility from contagious disease and other hazards

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### Any Questions??



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## Centers for Disease Control and Prevention (CDC)

- The Centers for Disease Control and Prevention (CDC) Division of Tuberculosis Elimination (DTBE) <http://www.cdc.gov/tb>

### Guidelines available online:

- CDC's Morbidity and Mortality Weekly Report <http://www.cdc.gov/mmwr>
- Questions and Answers About TB <http://www.cdc.gov/tb/faqs/>
- TB Education & Training Resources Website [www.findtbresources.org](http://www.findtbresources.org)

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## Regional Training and Medical Consultation Centers

- Francis J. Curry National Tuberculosis Center, San Francisco, CA [www.nationaltbcenter.edu](http://www.nationaltbcenter.edu)
- Heartland National TB Center, San Antonio, TX [www.heartlandntbc.org](http://www.heartlandntbc.org)
- New Jersey Medical School Global TB Institute, Newark, NJ [www.umdnj.edu/ntbcweb](http://www.umdnj.edu/ntbcweb)
- Southeastern National TB Center, Gainesville, FL <http://sntc.medicine.ufl.edu/>

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**TABLE 2. Guidelines for estimating the beginning of the period of infectiousness of persons with tuberculosis (TB), by index case characteristic**

TB symptoms	Characteristic		Recommended minimum beginning of likely period of infectiousness
	AFB* sputum smear positive	Cavitary chest radiograph	
Yes	No	No	3 months before symptom onset or first positive finding (e.g., abnormal chest radiograph) consistent with TB disease, whichever is longer
Yes	Yes	Yes	3 months before symptom onset or first positive finding consistent with TB disease, whichever is longer
No	No	No	4 weeks before date of suspected diagnosis
No	Yes	Yes	3 months before first positive finding consistent with TB

**SOURCE:** California Department of Health Services Tuberculosis Control Branch; California Tuberculosis Controllers Association. Contact investigation guidelines. Berkeley, CA: California Department of Health Services; 1998.

\*Acid-fast bacilli.

*Centers for Disease Control and Prevention. Guidelines for the investigation of contacts of persons with infectious tuberculosis; recommendations from the National Tuberculosis Controllers Association and CDC, and the Guidelines for using the QuantiFERON®-TB Gold test for detecting Mycobacterium tuberculosis infection, United States. MMWR 2005; 54(No. RR-15): [page 9].*

**TABLE 3. Time frames for initial follow-up of contacts of persons exposed to tuberculosis (TB)**

Type of contact	Business days from listing of a contact to initial encounter*	Business days from initial encounter to completion of medical evaluation†
High-priority contact: index case AFB§ sputum smear positive or cavitary disease on chest radiograph (see Figure 2)	7	5
High-priority contact: index case AFB sputum smear negative (see Figure 3)	7	10
Medium-priority contact: regardless of AFB sputum smear or culture result (see Figures 2–4)	14	10

**SOURCE:** California Department of Health Services Tuberculosis Control Branch; California Tuberculosis Controllers Association. Contact investigation guidelines. Berkeley, CA: California Department of Health Services; 1998.

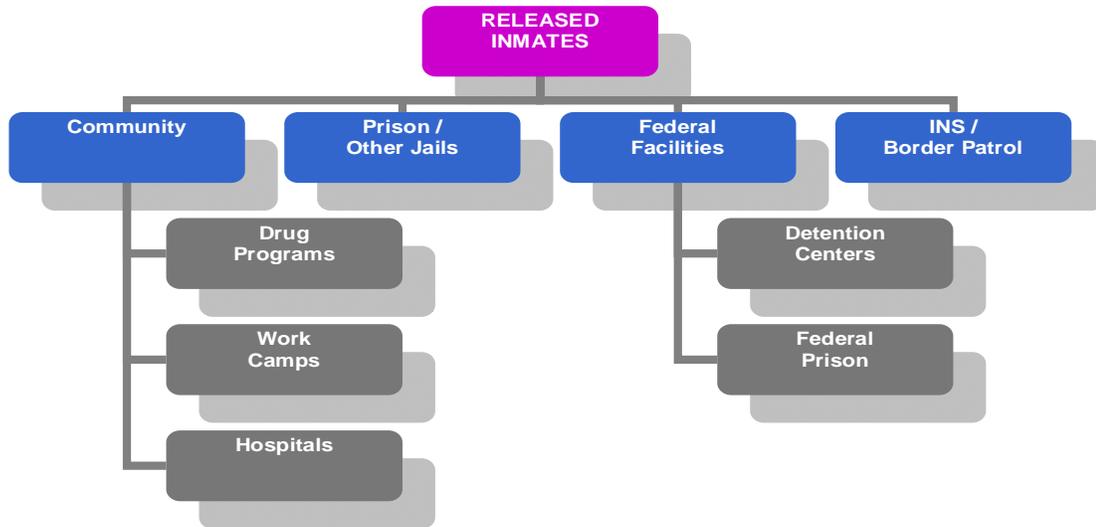
\*A face-to-face meeting that allows the public-health worker to assess the overall health of the contact, administer a tuberculin skin test, and schedule further evaluation.

†The medical evaluation is complete when the contact’s status with respect to Mycobacterium tuberculosis infection or TB disease has been determined. A normal exception to this schedule is the delay in waiting for final mycobacteriologic results, but this applies to relatively few contacts.

§Acid-fast bacilli.

*Centers for Disease Control and Prevention. Guidelines for the investigation of contacts of persons with infectious tuberculosis; recommendations from the National Tuberculosis Controllers Association and CDC, and the Guidelines for using the QuantiFERON®-TB Gold test for detecting Mycobacterium tuberculosis infection, United States. MMWR 2005; 54(No. RR-15): [page 11].*

## Continuity of Care for TB Patient and Contacts



# SESSION TWO

## TB CONTACT INVESTIGATION IN JAIL

### Enabling Objectives (with slide references)

- Identify the jail management officials to notify when TB is suspected (see **Slide #4** for review)
- Describe at least 3 pieces of information to collect when reviewing a TB patient's medical records (see **Slides #6-8** for review)
- Define the infectious period (see **Slides #14 and 15** for review)
- Determine the exposure period (see **Slides #16 and 17** for review)
- List at least 3 pieces of information to collect during an interview with a TB patient (see **Slides #19 and 20** for review)
- List at least 3 types of information to share when updating correctional management officials about a contact investigation (see **Slide #13** for review)
- List at least 2 pieces of information to obtain from reviewing a TB patient's housing and movement history (see **Slides #24-26** for review)
- List at least 3 pieces of information to collect during a visit of the exposure site(s) (see **Slides #28 and 29** for review)
- Describe how to prioritize contacts as "high", "medium", or "low" (see **Slides #31-35** for review)
- Describe at least 2 pieces of information to include on documentation for exposed contacts (see **Slides #38 and 39** for review)
- Identify at least 3 pieces of information to collect when reviewing the medical record for a high- and/or medium- priority contact (see **Slides #40 and 41** for review)
- Explain why evaluation of HIV-infected contacts should be done promptly (see **Slide #48** for review)
- Explain the importance of conducting initial tuberculin skin tests (TST) or IGRA tests on eligible contacts (see **Slide #49** for review)
- Describe the referral process for contact evaluation (see **Slide #51** for review)
- Calculate the infection rate to assess the level of transmission (see **Slides #52 and 53** for review)
- Identify when to conduct follow-up TST or IGRA tests (see **Slide #55** for review)
- Calculate the infection/transmission rate from the second round of testing (see **Slide #56** for review)
- Describe what information to include in a summary report (see **Slides #57 and 58** for review)

## **SESSION TWO**

### **EXERCISE 1—Participant Worksheet**

Read the exercise scenario below and use the calendar to determine the following:

- 1) Infectious period for the TB patient
- 2) Contacts who were exposed to the TB patient during the TB patient's infectious period

#### **Exercise Scenario:**

##### **Determining the Infectious Period**

Inmate A was booked into the jail on Monday, May 1<sup>st</sup> at 12 noon. The initial booking took place in a small open room to the side of the main booking area. The screening officer completed an initial screening form to obtain general health information, including whether or not Inmate A has a cough. No coughing was noted at the booking.

Inmate A was then routed to the main booking area, which is a large room with chairs along the walls where inmates can sit. There were 10 other inmates in the booking area at the time of Inmate A's booking process. Inmate A kept to himself, watching TV. Inmate A remained in booking until Tuesday, May 2<sup>nd</sup> at 2 p.m. Earlier in the day the correctional nurse did a health screening on Inmate A in a small exam room with the door closed. The screening took about 30 minutes. Inmate A coughed during the screening and said he had recently had a cold and had been coughing for 5 or 6 days. The nurse placed a TB skin test.

Inmate A was placed in his housing unit, B13, after leaving the booking area. The housing unit is a large 22 bed unit, with 11 rooms and a large central core, with a TV, chairs, and tables. Each room has a set of bunk beds, with 2 inmates per room. Inmate A slept on the bottom bunk and initially had no roommate. The next day he was assigned a roommate. The roommate spent most of his time in the room, sleeping and reading. Inmate A spent 4-5 hours during the day in the central core, sitting at a small, round table, playing cards and talking with 3 other inmates. They noticed him coughing and asked him if he was sick. He said he had been coughing for about a month. He thought he had a cold that had not gone away.

On May 3<sup>rd</sup>, Inmate A and 8 other inmates were transported to the County Courthouse for a court appearance. They were transported on a correctional bus, with a bus driver and 2 guards. Inmate A sat at the back of the bus, sitting right behind 2 other inmates. The rest of the inmates (5) all sat toward the middle or front of the bus. When they got to the Courthouse they were escorted to the holding cell. The holding cell is an enclosed area, medium sized, with no windows. The guards sit in an area the size of a family room that adjoins the holding cell. Inmate A was coughing on and off for the 2 hours he was in the holding cell with the 8 other inmates. After a short court appearance, the inmates were routed back to the bus and returned to the jail.

On May 4<sup>th</sup>, in the late afternoon, the correctional health nurse read Inmate A's TB skin test as an induration of 25 millimeters (I=25mm). The nurse noticed the cough and further screened Inmate A for symptoms of TB. Inmate A complained again of a cold that was not going away. The nurse arranged for a chest x-ray to be done the next day.

On May 5<sup>th</sup>, Inmate A received a chest x-ray. On May 6<sup>th</sup>, the chest x-ray report was received by the correctional health nurse. The chest x-ray showed a right-side infiltrate. Inmate A was placed in respiratory isolation.

Three sputum specimens were obtained over the next three days. All three had positive smears (1+).

**SESSION TWO**  
**EXERCISE 1**  
**Calendar**

<b>January</b>						
<b>Sunday</b>	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

<b>February</b>						
<b>Sunday</b>	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

**SESSION TWO**  
**EXERCISE 1**  
**Calendar**

<b>March</b>						
<b>Sunday</b>	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

<b>April</b>						
<b>Sunday</b>	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

**SESSION TWO**  
**EXERCISE 1**  
**Calendar**

May						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	24	26
27	28	29	30	31		

June						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

**SESSION TWO**  
**EXERCISE 1**  
**Calendar**

<b>July</b>						
<b>Sunday</b>	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

<b>August</b>						
<b>Sunday</b>	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

## SESSION TWO

### EXERCISE 2—Participant Worksheet

**Which contact would you rank as a high-priority? Medium-priority? Low-priority?**

Contact #1	Contact #2	Contact #3	Contact #4
<ul style="list-style-type: none"> <li>• 24-year-old</li> <li>• Positive TST</li> <li>• Coughing</li> <li>• Night sweats</li> <li>• Weight loss</li> </ul>	<ul style="list-style-type: none"> <li>• 35-year-old</li> <li>• Normal immune system</li> <li>• History of positive TSTs</li> </ul>	<ul style="list-style-type: none"> <li>• 20-year -old</li> <li>• Diabetic</li> </ul>	<ul style="list-style-type: none"> <li>• 44-year-old</li> <li>• Correctional health nurse</li> <li>• Healthy immune system</li> <li>• Negative TST</li> </ul>
<p>Exposure period with TB patient:</p> <p>Initially housed in 2 bunk cell (small room) with TB case for 3 days before TB case was put into isolation. TB patient was coughing a lot in this inmate’s face while in 2 bunk cell</p>	<p>Exposure period with TB patient:</p> <p>Sat directly across from TB patient during mealtime in the cafeteria once a day. Also participated in daily exercises on the grounds and talked with TB patient until TB patient was put into isolation.</p>	<p>Exposure period with TB patient:</p> <p>Was in booking when TB patient was diagnosed. They didn’t talk together while in the large booking area. The ventilation was recycled air. Contact was in booking overnight before being sent to housing unit.</p>	<p>Exposure period with TB patient:</p> <p>Conducted initial exam of TB patient in a small exam room with recirculated air. The exam time was 30 minutes. When TB patient was put into housing unit, this nurse practitioner conducted exam in slightly larger room with recycled air. The two sat closely together and TB patient was coughing.</p>
<b>Circle your answers below</b>			
<p>Priority for Contact #1 is:</p> <p><b>High</b></p> <p><b>Medium</b></p> <p><b>Low</b></p>	<p>Priority for Contact #2 is:</p> <p><b>High</b></p> <p><b>Medium</b></p> <p><b>Low</b></p>	<p>Priority for Contact #3 is:</p> <p><b>High</b></p> <p><b>Medium</b></p> <p><b>Low</b></p>	<p>Priority for Contact #4 is:</p> <p><b>High</b></p> <p><b>Medium</b></p> <p><b>Low</b></p>

## SESSION TWO

### EXERCISE 3—Participant Worksheet

Calculate the infection rate for the following groups of contacts exposed to a TB patient.

$$\text{Infection rate} = \frac{\text{\# of new positive TST} \times 100}{\text{Total \# of contacts tested}}$$

*Example:*

*10 contacts were identified: 2 had previously positive TSTs; therefore, 8 were newly tested, and 4 of those were positive*

$$\frac{4 \times 100}{8} = .50 \times 100 = 50\%$$

For this group, the infection rate is 50%. This is an alarmingly high infection rate. In this case the decision to expand the contact investigation would be very straightforward.

#### **1. Group of inmates**

10 inmate contacts to TB patient were given TB skin tests. 1 of the 10 showed positive TB skin test results. They all had negative TST results before spending time with Inmate A.

#### **2. Group of inmates and jail staff who were transported to county court house**

8 inmates, a bus driver and 2 guards were contacts to the TB patient and were given TB skin tests. Inmate A sat at the back of the bus, sitting right behind two other inmates. The rest of the inmates all sat toward the middle or front of the bus. 2 of the 8 inmates sitting toward the middle or front of the bus had previously documented positive TST results. 1 of 9 persons (who had all previously tested negative) had a positive TST in this round of testing.

#### **3. Group in courtroom**

5 custody officers, 2 lawyers, 3 clerks, and 1 judge were in the holding area and in contact with TB patient for 1 hour. All received TSTs and none had positive skin test results.

# **TUBERCULOSIS CONTACT INVESTIGATION IN JAIL: A FACILITATOR GUIDE**

Supplemental Materials

**Glossary**

**Resources List**

**Job Aids**

**Evaluation Form for Facilitators**



# Glossary

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**acid-fast bacilli (AFB)** – mycobacteria that stay stained even after they have been washed in an acid solution; may be detected under a microscope in a stained smear.

**airborne infection isolation (All) room** – formerly called negative pressure isolation room, an AIIR is a single-occupancy patient-care room used to isolate patients with suspected or confirmed infectious TB case. Environmental factors are controlled in All rooms to minimize the transmission of infectious agents.

**blood assay for *Mycobacterium tuberculosis* (BAMT)** – a general term to refer to *in vitro* tests that assess for the presence of infection with *M. tb*. This term includes, but is not limited to IFN- $\mu$  release assays (IGRA). QuantiFERON®-TB Gold test is the most commonly available as of the time of publication. Also, see **interferon gamma release assay (IGRA)**.

**bronchoscopy** – a procedure used to obtain pulmonary secretions or lung tissue with an instrument called a bronchoscope; used only when patients cannot cough up sputum on their own and an induced specimen cannot be obtained.

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

**cavity** – a hollow space within the lung, visible on a chest x-ray, that may contain many tubercle bacilli; often occurs in people with severe pulmonary TB disease; cavitory disease.

**Centers for Disease Control and Prevention (CDC)** – an agency of the United States Department of Health and Human Services. It works to protect public health and the safety of people, by providing information to enhance health decisions, and promotes health through partnerships with state health departments and other organizations.

**contacts** – people exposed to someone with infectious TB disease by sharing air space with an infectious TB patient, including family members, roommates or housemates, close friends, coworkers, classmates, and others.

**contact investigation** – the process of finding, notifying, testing, and treating persons who might have latent TB infection or TB disease as a result of recent contact with a person diagnosed with TB disease. This process is undertaken promptly after an inmate/TB patient is identified (see **contacts**).

**culture** – organism grown on media (substances containing nutrients) so that they can be identified; a **positive culture** for *M. tuberculosis* contains tubercle bacilli, whereas a **negative culture** contains no detectable tubercle bacilli. This test usually takes 2-4 weeks for TB mycobacteria to grow.

**directly observed therapy/treatment (DOT)** – a strategy for enhancing adherence to therapy in which a health care worker or other trained person watches a patient gulp down each dose of prescribed medication. DOT is the standard of care for all patients with TB disease and is a preferred option for those with LTBI.

**droplet nuclei** – microscopic particles produced when a person coughs, sneezes, shouts, or sings. These particles can remain suspended in the air for prolonged periods and can be carried on normal air currents in a room and beyond to adjacent spaces.

**engineering controls** – engineering systems used to prevent the transmission of TB in health care facilities, including ventilation, high-efficiency particulate air (HEPA) filtration, and ultraviolet germicidal irradiation.

**exposure** – the condition of being subjected to something (e.g., an infectious agent) that could have an effect. A person exposed to *M. tuberculosis* does not necessarily become infected.

**exposure period** – the coincident period when a contact shared the same air space as a person with infectious TB.

**exposure site** – a location that a contact visited during a TB patient’s infectious period.

**extrapulmonary TB** – TB disease that occurs in places other than the lungs, such as the lymph nodes, the pleura, the brain, the kidneys, or the bones; most types of extrapulmonary TB are not infectious.

**false-negative TST or BAMT result** – a TST or BAMT result that is interpreted as negative in a person who is infected with *M. tuberculosis*.

**false-positive TST or BAMT result** – a TST or BAMT result that is interpreted as positive in a person who is *not* infected with *M. tuberculosis*. A false-positive TST result is more likely to occur in persons who have been injected with BCG or who are infected with nontuberculous mycobacteria (NTM).

**gastrectomy** – a partial or full surgical removal of the stomach. Gastrectomies are performed to treat cancer, severe cases of peptic ulcer disease, and perforations of the stomach wall.

**high-efficiency particulate air (HEPA) filter** – this is a filter that is capable of removing 99.97% of particles 0.3 micron in diameter or greater. HEPA filters remove all particles in the size range of TB droplet nuclei.

**high-priority contacts** – the contacts who are at most risk for TB infection of disease; contacts who are most likely to be infected and high-risk contacts.

**human immunodeficiency virus (HIV)** – the virus that causes AIDS. A person with both LTBI and HIV infection is at high risk for developing TB disease.

**IGRA conversion** – a change in an IGRA result from negative to positive between screening intervals

**immune system** – cells and tissues in the body that protect the body from foreign substances.

**immunocompromised and immunosuppressed** – describes conditions in which at least part of the immune system is functioning at less than normal capacity.

**index case** – the first person with TB disease who is identified in a particular setting. This person may be an indicator of a potential public health problem and is not necessarily the source case. See also **source case**.

**induration** – swelling that can be felt around the site of injection after a Mantoux skin test is done; the reaction size is the diameter of the swollen area (excluding any redness), measured across the forearm.

**infection and control procedures** – institutions where people live, such as nursing homes, correctional facilities, or homeless shelters.

**infection rate** – the percentage of contacts with a similar amount of exposure (e.g., high priority contacts) who have a newly identified positive skin test reaction (5 or more millimeters of induration).

**infectious** – capable of spreading infection; a person who has infectious TB disease expels droplets containing *M. tuberculosis* into the air when he or she coughs or sneezes.

**infectious period** – the time when a person with TB disease is capable of transmitting the infection.

**interferon gamma release assay (IGRA)** – this is a type of blood test that detects cell-mediated immune response to this cytokine. In the U.S., QuantiFERON®-TB Gold is a currently available IGRA.

**isolation room** – a room with special characteristics to prevent the spread of droplet nuclei expelled by a TB patient, including negative-pressure ventilation.

**laryngeal TB** – a form of TB disease that involves the larynx and can be highly infectious.

**latent TB infection (LTBI)** – also referred to as TB infection. Person with latent TB infection carry the organism that causes TB but do not have TB disease, are asymptomatic, and are noninfectious. Such persons usually have a positive reaction to the tuberculin skin test.

**Mantoux tuberculin skin test** – the most common method of testing for TB infection at the time of publication; done by using a needle and syringe to inject 0.1 ml of 5 tuberculin units of liquid tuberculin between the layers of the skin (intradermally), usually on the forearm; the reaction to this test, usually a small swollen area (induration), is measured 48 to 72 hours after the injection and is classified as a positive or negative depending on the size of the reaction and the patient’s risk factors for TB.

**mask** – a device worn over the nose and mouth to prevent the spread of infectious particles through breathing, talking, or singing.

**medical evaluation** – an examination to diagnose TB disease or LTBI, to select treatment, and assess response to therapy. A medical evaluation can include medical history and TB symptom screen, clinical or physical examination, screening and diagnostic tests, counseling, and treatment referrals.

**medical history** – the part of a patient’s life history that is important for diagnosing and treating TB infection or disease, including history of exposure, symptoms, diagnosis of TB infection or disease, and risk factors for TB disease.

**miliary TB** – TB disease that occurs when tubercle bacilli enter the bloodstream and are carried to all parts of the body, where they grow and cause disease in multiple sites; the chest x-ray of patients with miliary TB often looks like millet seeds scattered throughout the lung.

**multidrug-resistant TB (MDR TB)** – TB that is resistant to at least isoniazid and rifampin; more difficult to treat than drug-susceptible TB.

**mycobacteria** – a kind of bacteria; mycobacteria can cause a variety of diseases.

***Mycobacterium africanum*** – a type of tuberculous mycobacteria, closely related to *M. tuberculosis*, that can cause a disease similar to TB in humans; it is very rare in the United States.

***Mycobacterium avium complex*** – a common type of non-tuberculous mycobacteria that can cause disease in humans.

***Mycobacterium tuberculosis*** – the namesake member organism of *M. tuberculosis* complex and the most causative infectious agent of TB disease in humans. that causes TB in humans and is sometimes called the tubercle bacillus; belongs to a group of bacteria called mycobacteria.

**NAAT** *nucleic acid amplification test*

**negative pressure** – a ventilation system designed so that air flows from the corridors in to an isolation room, ensuring that contaminated air cannot escape from the isolation room to other parts of the facility.

**PPD skin test** – a tuberculin skin test or TST.

**pathogenesis** – how an infection or disease develops in the body.

**period of infectiousness** – time period during which a person with TB disease is capable to transmitting *M. tuberculosis*; usually estimated by determining the date of onset of the patient’s symptoms (especially coughing).

**pulmonary TB** – TB disease that occurs in the lungs (about 85% of all U.S. cases), typically causing a cough and an abnormal chest x-ray; pulmonary TB is usually infectious if untreated.

**Quantiferon** – an IGRA product created by Cellestis (Australia).

**recidivism** – a tendency to relapse into a former pattern of behavior, criminal habits; a return to incarceration.

**skin test conversion** – a change in a skin test reaction from negative to positive between screening intervals.

**smear** – a specimen that has been smeared into a glass slide, stained, washed in an acid solution, and then placed under the microscope for examination; used to detect acid-fast bacilli in a specimen.

**sputum** – phlegm from deep in the lungs, collected in a sterile container for processing and examination.

**symptoms of TB disease** – conditions caused by TB disease. The symptoms of pulmonary TB disease include coughing, pain in the chest when breathing or coughing, and coughing up sputum or blood. The general symptom of TB disease (pulmonary or extrapulmonary) include weight loss, fatigue, malaise, fever, and night sweats. The symptoms of extrapulmonary TB disease depend on the part of the body that is affected by the disease.

**TB patient** – a person diagnosed with infectious TB disease (inmate or staff).

**TB suspect** – a person who presents to health care worker/intake personnel with symptoms indicative of TB disease (e.g., coughing, reports of weight loss, night sweats, etc.)

**transition plan** – a plan of action to facilitate the continuation of treatment for latent TB infection(LTBI) once the inmate is released.

**transmission** – the spread of an organism, such as *M. tuberculosis*, from one person to another; depends on the contagiousness of the patient, the type of environment, and the length of exposure.

**TST/IGRA** – a term used in this facilitator guide to describe the different types of tests used to detect TB infection. For a definition of TST, see **tuberculin skin test**. For a definition of QFT (the most commonly used IGRA), see **Quantiferon**. For a definition of IGRA, see **interferon gamma release assay**. Also, see **blood assay for *Mycobacterium tuberculosis* (BAMT)**.

**tubercle bacilli** – another name for *Mycobacterium tuberculosis* organisms, which cause TB disease.

**tuberculin skin test** – a test used to detect TB infection (see **Mantoux tuberculin skin test** or **multiple-puncture test** in glossary).

**tuberculous mycobacteria** – mycobacteria that can causes TB disease or other diseases very similar to TB; the tuberculous mycobacteria are *M. tuberculosis*, *M. bovis*, and *M. africanum*.

**ventilation systems** – air systems designed to maintain negative pressure and to exhaust the air properly; designed to minimized the spread to TB in a health care system.

**window period** – the time span between the date of an initial tuberculin skin test with a negative reaction and the date of the follow-up tuberculin skin test that should take place 10 to 12 weeks after exposure; after the window period had ended, a repeat skin test should be administered to each contact who had an initial negative reaction.

# Resources List

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# Additional Resources

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## The Centers for Disease Control and Prevention:

- The Centers for Disease Control and Prevention (CDC) Division of Tuberculosis Elimination (DTBE)  
<http://www.cdc.gov/tb>

Guidelines available online

- CDC's Morbidity and Mortality Weekly Report <http://www.cdc.gov/mmwr>
- Questions and Answers About TB <http://www.cdc.gov/tb/faqs/>
- TB Education & Training Resources Website [www.findtbresources.org](http://www.findtbresources.org)

## Regional Training and Medical Consultation Centers:

- The Francis J. Curry National Tuberculosis Center's website at [www.nationaltbcenter.edu](http://www.nationaltbcenter.edu) for additional TB resources. We also encourage you to view the following online presentations prior to participating:
  - **Medical Management of Tuberculosis:**  
[http://www.nationaltbcenter.edu/courses/course\\_details.cfm?productID=ONL-07](http://www.nationaltbcenter.edu/courses/course_details.cfm?productID=ONL-07)
  - **Targeted Testing and Latent Tuberculosis Infection:**  
[http://www.nationaltbcenter.edu/courses/course\\_details.cfm?productID=ONL-08](http://www.nationaltbcenter.edu/courses/course_details.cfm?productID=ONL-08)
  - **The TB Infection Control Plan – Template for Jails**  
[http://www.nationaltbcenter.edu/products/product\\_details.cfm?productID=WPT-09](http://www.nationaltbcenter.edu/products/product_details.cfm?productID=WPT-09)
- Heartland National Tuberculosis Center, San Antonio, TX  
[www.heartlandntbc.org](http://www.heartlandntbc.org)
- New Jersey Medical School Global Tuberculosis Institute, Newark NJ  
[www.umdnj.edu/ntbcweb](http://www.umdnj.edu/ntbcweb)
- Southeastern National Tuberculosis Center, Gainesville, FL  
<http://sntc.medicine.ufl.edu/>

# Job Aids

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- **A Checklist for Conducting a TB Contact Investigation in Jail (page 171)**
- **Initial TB Screening Questions for Inmates (page 182)**
- **TB Intake Screening Questionnaire (one page) (page 185)**

## A Checklist for Conducting a TB Contact Investigation in Jail

A successful contact investigation requires the careful gathering and evaluation of detailed information, often involving many people. In general, contact investigations follow a process that includes the following steps. Although these steps are presented in sequence for the purposes of this training, it is important to remember that contact investigations do not always follow a predetermined sequence of events. Use this checklist as a general guide.

10 Steps for Conducting a TB Contact Investigation in Jail	Suggested Timeframe (based on CDC guidelines 2005)	Person Responsible	Date Done
<b>1. Collaborate between jail and health department</b>	Ideally, relationship should be established before onset of a contact investigation		
Identify and notify jail management officials and/or health department directly when TB is suspected	As soon as a TB patient is identified		
Convene the members of a contact investigation team (e.g., jail medical personnel, jail staff: officers, custody, classification, booking; health department staff)	Convene the team quickly, after TB is diagnosed/suspected		
Consider factors that predict likely transmission of TB which include: <ul style="list-style-type: none"> <li>• Characteristics of the TB patient               <ul style="list-style-type: none"> <li>– Location of TB disease in the body</li> <li>– Lab test and results (i.e., sputum bacteriology)</li> <li>– X-ray findings</li> <li>– Behaviors that increase aerosolization of respiratory secretions</li> <li>– Age</li> <li>– Adherence to an effective course of treatment</li> </ul> </li> <li>• Environment where the exposure occurred and length of exposure</li> </ul> Factors that predict risk of TB disease <ul style="list-style-type: none"> <li>• Characteristics of the contacts               <ul style="list-style-type: none"> <li>- Immunosuppression (i.e., HIV, prolonged therapy with corticosteroids, chemotherapy for cancer or other immunosuppressive agents, end-stage renal disease, and diabetes mellitus)</li> <li>- Age (i.e., those aged &lt;5 years)</li> </ul> </li> </ul>			

10 Steps for Conducting a TB Contact Investigation in Jail	Suggested Timeframe (based on CDC guidelines 2005)	Person Responsible	Date Done
<b>2. Review medical record of TB patient</b>	Within 1 day for persons with AFB smear-positive respiratory specimens or cavitation on chest x-ray. Within 3 days for all other persons		
Information and dates to collect when reviewing a TB patient's medical record include the following: <ul style="list-style-type: none"> <li>• History of previous exposure to TB, previous diagnosis and treatment of TB disease</li> <li>• Site of TB disease</li> <li>• TB symptoms and approximate date symptoms began</li> <li>• Lab test results (e.g., Acid-fast bacilli smears, Nucleic acid amplification cultures, including dates obtained)</li> <li>• Chest x-ray results and date</li> <li>• TB treatment (medications, dosage, and date treatment was started)</li> <li>• Method of treatment administration (DOT or self-administered)</li> <li>• TB skin test result</li> <li>• HIV status</li> <li>• Other medical conditions that could affect treatment (i.e., diabetes, end stage renal disease, steroids, anti-cancer drugs)</li> </ul>	Information regarding TB patient should be reassessed at least weekly until drug susceptibility results are available for the mycobacteria tuberculosis isolates for 2 months after notification or until infectiousness has diminished, whichever is longer.		
<ul style="list-style-type: none"> <li>• Define the infectious period for TB patient</li> </ul>	See Table 2 "Guidelines for estimating the beginning of the period of infectiousness of persons with tuberculosis (TB) by index case characteristics"		

10 Steps for Conducting a TB Contact Investigation in Jail	Suggested Timeframe (based on CDC guidelines 2005)	Person Responsible	Date Done
<ul style="list-style-type: none"> <li>• Determine the exposure period for contacts The exposure period for individual contacts is determined by how much time contacts spent with the TB patient during the infectious period of the TB patient</li> <li>• Frequency &amp; duration               <ul style="list-style-type: none"> <li>– how often they spent time together</li> <li>– and for how long each time</li> </ul> </li> <li>• Date of last exposure = last day contact spent time with the TB patient during the TB patient's infectious period</li> </ul>			
<p><b>3. Set up system for data management and collection</b> Helps to identify inmates, staff and volunteers who may have been exposed during the TB patient's infectious period, including visitors and transferred or released inmates</p> <p>Minimal recommended data to collect about TB patient includes the following:</p> <ul style="list-style-type: none"> <li>• When TB patient was first incarcerated</li> <li>• Movement list, including housing locations</li> <li>• Work history within jail setting</li> <li>• Cellmates</li> <li>• Visits to health services/lab draws</li> <li>• Court appearances</li> <li>• Visitors (i.e., lawyers)</li> <li>• Classes/programs attended by TB patient</li> <li>• Staff who did lab work and chest x-rays use this information to determine who may have been exposed to the TB patient</li> </ul> <p>Information to collect from reviewing a TB patient's housing and movement history include the following:</p> <ul style="list-style-type: none"> <li>• Identify all locations AND also the length of time spent in each location               <ul style="list-style-type: none"> <li>– Cells (single, double, holding, isolation, multiple occupancy, open dorm)</li> <li>– Bunk/cell mates</li> </ul> </li> </ul>			

10 Steps for Conducting a TB Contact Investigation in Jail	Suggested Timeframe (based on CDC guidelines 2005)	Person Responsible	Date Done
<ul style="list-style-type: none"> <li>- General population areas</li> <li>- Court, releases</li> <li>- Programs (e.g., GED, substance abuse)</li> <li>- Intake/booking/custody department</li> <li>- Clinic, church</li> <li>- School classroom</li> <li>- Transportation to other areas</li> </ul>			
<p><b>4. Interview TB patient</b></p> <p>Goals:</p> <ul style="list-style-type: none"> <li>• Confirm medical review findings</li> <li>• Perform physical assessment</li> <li>• Identify contacts</li> </ul>	<p><b>1<sup>st</sup> interview:</b> ≤ 1 business day after notification of jail inmate or staff suspected of having infectious TB and ≤ 3 business days for others</p> <p><b>2<sup>nd</sup> interview:</b> at 1-2 weeks after 1<sup>st</sup> interview, TB patient should be interviewed again, as necessary, for clarification and additional information</p> <p>Additional interviews as needed</p>		
<p>Information to collect during an interview with a TB patient include the following:</p> <ul style="list-style-type: none"> <li>• History of prior TB disease or latent tuberculosis infection and treatment history</li> <li>• TB symptom history and date</li> <li>• Review prior incarceration records for signs and symptoms of TB</li> <li>• Daily activities of the TB patient</li> <li>• Potential jail inmates and staff contacts, particularly HIV-infected persons</li> <li>• Also community contacts such as young children and location of those community contacts</li> </ul>			

10 Steps for Conducting a TB Contact Investigation in Jail	Suggested Timeframe (based on CDC guidelines 2005)	Person Responsible	Date Done
<p><b>5. Visit exposure site(s)</b> Examine the environments where the TB patient spent time during the infectious period.</p> <p>Assess what areas are more likely to promote transmission of TB by determining the following:</p> <ul style="list-style-type: none"> <li>• Number of inmates who are housed together at one time</li> <li>• Housing arrangement (e.g., cells versus dorms, court and court holding sites, classrooms)</li> <li>• General size of the air space</li> <li>• Basics of the ventilation system (e.g., whether air is recirculated, or if isolation room is in negative air pressure)</li> <li>• Pattern of daily inmate movement (e.g., when eating, working, and recreation schedule)</li> <li>• Availability of data on other inmates housed at the same time as the TB patient (obtain from Classification)</li> </ul>	<p>Place of residence of TB patient should be visited <math>\leq 3</math> business days of initiating contact investigation. All potential settings for transmission should be visited <math>\leq 5</math> working days of initiating the contact investigation.</p>		
<p><b>6. Prioritize contacts as HIGH, MEDIUM or LOW</b></p>	<p>Each high and medium priority contact should be assessed initially <math>\leq 3</math> days after being listed.</p>		
<p>Factors for assigning priorities as <b>HIGH, MEDIUM or LOW</b> include the following:</p> <ul style="list-style-type: none"> <li>• Characteristics of TB patient</li> <li>• Characteristics of Contacts <ul style="list-style-type: none"> <li>– Age (&lt;5 years)</li> <li>– Immune status (e.g., autoimmune disorders)</li> <li>– Other medical conditions (silicosis, diabetes mellitus, and status after gastrectomy or jejunoileal bypass surgery)</li> </ul> </li> <li>• Exposure (Air volume and air circulation patterns )</li> </ul>			

10 Steps for Conducting a TB Contact Investigation in Jail	Suggested Timeframe (based on CDC guidelines 2005)	Person Responsible	Date Done
<p>These persons are considered <b>highest priority</b>:</p> <ul style="list-style-type: none"> <li>• Contacts with most exposure to TB patient</li> <li>• HIV-infected or other immunosuppressed contacts (regardless of duration of exposure)</li> </ul>			
<ul style="list-style-type: none"> <li>• Evaluation of HIV-infected contacts should be done promptly</li> </ul> <p>LTBI therapy should be initiated promptly among these contacts once TB disease has been excluded</p>			
<p><b>7. Locate and assess contacts</b></p> <ul style="list-style-type: none"> <li>• Interview contacts within 1-3 days of identification</li> <li>• Gather background health information</li> <li>• Make in-person assessment of person's health (conduct symptom review)</li> <li>• Administer skin test in contacts (interpretation of skin test reaction: an induration transverse diameter of <math>\geq 5</math>mm is positive)</li> </ul>	Interview contacts within 1-3 days of identification.		
<p>Develop contact lists and documentation for exposed contacts to include the following:</p> <ul style="list-style-type: none"> <li>• Identify inmate (and staff) contacts from each location where the TB case spent time</li> <li>• Document exposed contacts according to current status (e.g., still incarcerated, released, or transferred)</li> <li>• Locate contacts, assess the risk of exposure, skin test those at high risk, and if positive skin test results – refer for evaluation of status and treatment for LTBI</li> </ul>			

10 Steps for Conducting a TB Contact Investigation in Jail	Suggested Timeframe (based on CDC guidelines 2005)	Person Responsible	Date Done
<p>Information to record when conducting a medical review for each high-priority contact includes the following (record dates carefully for):</p> <ul style="list-style-type: none"> <li>• Previous <i>M. tuberculosis</i> infection or disease and related treatment</li> <li>• Contact's verbal report and documentation of previous TST results</li> <li>• Current symptoms of TB illness (e.g., cough, chest pain, hemoptysis, fever, chills, night sweats, appetite loss, weight loss, malaise, or easy fatigability)</li> <li>• Medical conditions or risk factors making TB disease more likely <ul style="list-style-type: none"> <li>• (e.g., HIV infection, intravenous drug use, diabetes mellitus, silicosis, prolonged corticosteroid therapy, other immunosuppressive therapy, head or neck cancer, hematological and reticuloendothelial diseases, end-stage renal disease, intestinal bypass or gastrectomy, chronic malabsorption syndrome, or low body weight)</li> </ul> </li> </ul> <p>Minimal data recommended concerning each contact:</p> <ul style="list-style-type: none"> <li>• Date admitted to facility</li> <li>• Start and end dates for exposure</li> <li>• Name and aliases</li> <li>• For minors and dependants, guardian information</li> <li>• Social security number</li> <li>• Date of birth</li> <li>• Locating information and emergency contacts (if released)</li> <li>• Primary language and preferred language</li> <li>• Frequency, duration and timeframe of interactions with TB patient</li> <li>• Previous history of TB disease or latent infection and documentation</li> <li>• Medical risk factors for progression of infection to TB disease</li> <li>• New conversion information (TST in millimeters, last TST results, chest x-ray)</li> </ul>			

10 Steps for Conducting a TB Contact Investigation in Jail	Suggested Timeframe (based on CDC guidelines 2005)	Person Responsible	Date Done
<p>And for those contacts who tested positive during their evaluation, treatment information is recommended:</p> <ul style="list-style-type: none"> <li>• Dates of treatment</li> <li>• Treatment regimen (medication, dosing schedule, any changes to these)</li> <li>• Methods of supervising treatment (e.g., directly observed treatment)</li> </ul>			
<p><b>8. Conduct medical evaluation of contacts</b></p> <p><b>All contacts should:</b></p> <ul style="list-style-type: none"> <li>– Have a symptom review completed using standard TB Symptom Review questionnaire</li> <li>– Have TST/IGRA administered <ul style="list-style-type: none"> <li>➢ In contacts, a TST with an induration diameter <math>\geq 5</math> mm is considered positive</li> <li>➢ If initial TST is negative, a second TST is needed 10 weeks from the date of initial test.</li> <li>➢ Receive chest x-ray and medical evaluation if indicated.</li> </ul> </li> </ul> <p><b>Contacts who have TB symptoms:</b></p> <ul style="list-style-type: none"> <li>– Symptomatic contacts should be placed immediately in isolation and receive medical evaluation regardless of TST status <ul style="list-style-type: none"> <li>• A contact can have active TB even though he/she may have a negative TST</li> </ul> </li> <li>– If symptomatic contact is a staff member, he/she must be excluded from work until evaluated</li> </ul> <p><b>Contacts who have a History of a Previous Positive TST/IGRA</b></p> <ul style="list-style-type: none"> <li>– If no documentation of previous positive test, refer for another test (TST if the previous test was TST; IGRA if the previous test was IGRA)</li> <li>– If repeat test is positive or there is written documentation of previous test result, conduct symptom review <ul style="list-style-type: none"> <li>• Also interview to see if treatment for LTBI was ordered and completed</li> </ul> </li> </ul>	<p>High priority contacts should receive a tuberculin skin test <math>\leq 7</math> days after they are listed and medium priority contacts <math>\leq 14</math> days.</p> <p>Contacts who have positive tuberculin skin test result (<math>\leq 5</math> mm) should be medically examined, including chest x-ray, to rule out TB disease.</p> <p>Contacts who have symptoms consistent with TB also should be medically evaluated, including chest x-ray, to rule out TB, regardless of skin test, history of prior positive result, or history of prior TB disease.</p>		

10 Steps for Conducting a TB Contact Investigation in Jail	Suggested Timeframe (based on CDC guidelines 2005)	Person Responsible	Date Done
<p><b>9. Place and read initial TSTs or IGRAs on eligible contacts</b></p> <ul style="list-style-type: none"> <li>• Provide an initial TST or IGRA of possible contacts when a TB patient is identified</li> <li>• Referrals should be made for contacts who have been released or transferred before receiving their initial TST or IGRA test</li> </ul>	<p>During the infectious period, those high- and medium- priority contacts who have a negative skin test result &lt; 8 weeks after their most recent exposure should have a second skin test 8-10 weeks after that exposure.</p>		
	<p>For low-priority contacts, the initial skin test may be delayed until 8-10 weeks after the most recent exposure if the contact does not have symptoms suggestive of TB disease. If the test is administered &lt; 8 weeks after the most recent exposure, the decision to give a second, post exposure skin test can be made on a case-by-case basis.</p> <p>Follow-up TSTs or IGRAs for contacts who had a negative TST or IGRA result on initial testing should be placed 8-10 weeks after exposure to TB patient has ended.</p>		

10 Steps for Conducting a TB Contact Investigation in Jail	Suggested Timeframe (based on CDC guidelines 2005)	Person Responsible	Date Done
<p>Make referrals to the local health department for the following contact evaluations:</p> <ul style="list-style-type: none"> <li>• Inmate contacts of the infectious TB patient who have been released or transferred to another facility</li> <li>• Family members or frequent visitors of the TB patient</li> </ul>			
<p>Calculate the infection rate to assess level of TB transmission:</p> <p><i>Infection rate</i> (per exposure environment) = <math>\frac{\text{\# of new positive TST} \times 100}{\text{Total \# of contacts tested}}</math></p> <p>Example: 10 contacts were identified. 8 were tested, 2 had previously positive TST, and 4 were positive on testing</p>			
<p>Calculate infection rate from the second round of testing.</p>			
<p><b>10. Update jail management officials on the extent of the exposure, the strategy, process and action steps for dealing with, identifying and assessing contacts.</b></p> <p><b>Write summary report and distribute to jail administrators and the local health department</b> that includes the following information:</p> <ul style="list-style-type: none"> <li>• Why contact investigation was started</li> <li>• Number of contacts</li> <li>• Number of high and medium priority contacts</li> <li>• Transmission rates</li> <li>• Number of contacts started on treatment</li> <li>• Number of community contacts referred for evaluation to public health department</li> <li>• Number of new cases found</li> <li>• Problems encountered</li> </ul> <p>Basically, the summary report briefly describes the circumstances of the investigation, how it was conducted, the results of the investigation (e.g., the number of cases identified, the infection and transmission rates), and any special interventions required (including follow-up plans).</p>	<p>Updates occur throughout the contact investigation.</p> <p>A summary report occurs at the end of a TB contact investigation.</p>		

<b>10 Steps for Conducting a TB Contact Investigation in Jail</b>	<b>Suggested Timeframe (based on CDC guidelines 2005)</b>	<b>Person Responsible</b>	<b>Date Done</b>
Basically, the summary report briefly describes the circumstances of the investigation, how it was conducted, the results of the investigation (e.g., the number of cases identified, the infection and transmission rates), and any special interventions required (including follow-up plans).			



## Initial TB Screening Questions for Inmates

<<< These questions may be added to an existing medical intake form or used as a stand-alone TB screening questionnaire. Questions regarding HIV infection, HIV risk factors, and testing are derived from the Centers for Disease Control and Prevention (CDC) Revised Guidelines for HIV Counseling, Testing, and Referral (11/9/01). The CDC recommends that HIV testing be offered to all inmates. In addition, if the inmate answers "yes" to one or more questions in 27a-27e or 28a-28e, HIV prevention counseling should be provided. Screening questions should be discussed in a manner appropriate to the inmate's culture, language, sex, sexual orientation, age, and developmental level. If the jail does not currently offer HIV testing to all inmates, an appropriate first step in meeting CDC guidelines is to offer HIV testing and HIV prevention counseling to inmates who have one or more HIV risk factors and unknown HIV status.>>>

\_\_\_\_\_ Date   /  /    
 Last Name First Name Middle Initial Mo Day Yr  
 \_\_\_\_\_  
 Date of Birth   /  /   Social Security Number \_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_  
 Mo Day Yr  
 AKA \_\_\_\_\_ ID # \_\_\_\_\_

<<< Use the early TB detection questions in **1** and **2a-2e** below to help identify inmates who meet this facility's definition of "suspected infectious TB" so that appropriate precautions can be taken. An individual with one or more symptoms of TB, in addition to a prolonged cough, should be considered a suspected infectious TB case unless this diagnosis has been ruled out by a physician.>>>

1. Do you have a cough that has lasted 3 weeks or longer?       Yes     No     Don't know
2. In the past 3 months
  - a. Have you lost your appetite?       Yes     No     Don't know
  - b. Have you lost weight without dieting?       Yes     No     Don't know
  - c. Have you had fever, chills, or night sweats?       Yes     No     Don't know
  - d. Have you coughed up blood?       Yes     No     Don't know
  - e. Have you been feeling very tired?       Yes     No     Don't know
3. Have you ever had a positive TB skin test?       Yes     No     Don't know
4. Have you ever had an abnormal chest x-ray?       Yes     No     Don't know
5. Have you recently had the mucous you coughed up tested for TB?       Yes     No     Don't know
6. Have you ever been told you had TB?       Yes     No     Don't know
7. Have you ever taken medicine for TB?       Yes     No     Don't know
8. Have you ever lived with or had close contact with someone who had TB?       Yes     No     Don't know

### Tuberculin Skin Testing

9. Have you ever had a TB skin test? (bubble under skin, not four-prong test)

Yes       No       Don't know

10. If tested, when was your last test? \_\_\_\_/\_\_\_\_/\_\_\_\_

11. If tested, what was the test result?

Positive     Negative     Don't know

12. If the test result was positive, what medication(s) did you take?

Isoniazid (INH)       Other \_\_\_\_\_       None       Don't know

### Chest X-rays

13. Have you ever had a chest x-ray?

Yes       No       Don't know

14. If yes, when was your last chest x-ray? \_\_\_\_/\_\_\_\_/\_\_\_\_ Results: \_\_\_\_\_

### Treatment

15. Have you ever been treated for TB disease?

Yes       No       Don't know

16. If treated, in what year did you start treatment? \_\_\_\_\_  Don't know

17. If treated, in what city, state, and country did you receive treatment? \_\_\_\_\_

18. If treated, what medications did you take? \_\_\_\_\_

19. How long did you take these medications? \_\_\_\_\_

### Birthplace

20. Were you born in the United States?       Yes       No

21. If no, in what country were you born? \_\_\_\_\_

22. What year did you move to the United States? \_\_\_\_\_  Don't know

### Immunosuppression

23. Has a health practitioner ever told you that you had a 'weak immune system'?

Yes       No       Don't know

24. Have you ever been tested for HIV infection?

Yes       No       Don't know

25. If yes, what was the date of your most recent test? \_\_\_\_/\_\_\_\_/\_\_\_\_

26. If yes, what were the results of the most recent test?

Positive     Negative     Don't know

**27. If you have never been tested for HIV infection, have you:**

**a. Injected drugs using shared equipment (for example: needles, syringes, cotton, water) with others?**

Yes  No  Don't know

**b. Had unprotected sexual intercourse with someone that you think might have HIV infection (for example: a partner who injected drugs, has been diagnosed or treated for sexually transmitted disease [STD] or hepatitis, has had multiple or anonymous sex partners, or has exchanged sex for drugs or money)?**

Yes  No  Don't know

**c. Had unprotected vaginal or anal intercourse with more than one sex partner?**

Yes  No  Don't know

**d. Been diagnosed or treated for an STD or hepatitis?**

Yes  No  Don't know

**e. Had a fever or illness of unknown cause?**

Yes  No  Don't know

**28. If you have been tested for HIV infection and your most recent result was negative, since this test have you:**

**a. Injected drugs using shared equipment (for example: needles, syringes, cotton, water) with others?**

Yes  No  Don't know

**b. Had unprotected sexual intercourse with someone that you think might have HIV infection (for example: a partner who injected drugs, has been diagnosed or treated for sexually transmitted disease [STD] or hepatitis, has had multiple or anonymous sex partners, or has exchanged sex for drugs or money)?**

Yes  No  Don't know

**c. Had unprotected vaginal or anal intercourse with more than one sex partner?**

Yes  No  Don't know

**d. Been diagnosed or treated for an STD or hepatitis?**

Yes  No  Don't know

**e. Had a fever or illness of unknown cause?**

Yes  No  Don't know

**29. Have you had an organ transplant?**

Yes  No

**30. Are you currently receiving steroid therapy?**

Yes  No  Don't know

**a. If yes, what medication? \_\_\_\_\_**

**b. What is the dose of the medication? \_\_\_\_\_ mg \_\_\_\_\_ unknown**

**c. For how long have you received this medication?**

\_\_\_\_\_ weeks \_\_\_\_\_ unknown

**31. Are you currently receiving cancer chemotherapy?**

Yes  No  Don't know



# Evaluation Form for Facilitators

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**Evaluation Form for Facilitators**  
**TB Contact Investigation in Jail: A Facilitator Guide**

Your feedback will help us develop and improve our trainings. Please complete this facilitator evaluation and mail it to the Francis J. Curry National Tuberculosis Center, 3180 - 18th Street, Suite 101, San Francisco, CA 94110-2028. Or fax to 415-502-4620.

For any questions, please call 415/502-4600.

**Circle the number of your choice.**

**SESSION ONE: TB in Jail**

	Excellent	Good	Fair	Poor	Comments
<b>Facilitator Guide – Organization</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	
<b>Facilitator Guide – Usefulness</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	
<b>Facilitator Guide - Content</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	
<b>Participant Materials</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	
<b>Questions/Exercises/Case Studies</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	

**SESSION TWO: The Steps for Conducting a Contact Investigation in Jail**

	Excellent	Good	Fair	Poor	Comments
<b>Facilitator Guide – Organization</b>	4	3	2	1	
<b>Facilitator Guide – Usefulness</b>	4	3	2	1	
<b>Facilitator Guide - Content</b>	4	3	2	1	
<b>Participant Materials</b>	4	3	2	1	
<b>Questions/Exercises/Case Studies</b>	4	3	2	1	

**Suggestions for how to improve these materials:**

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**Any other final comments:**

If we need any clarification regarding your comments, can we contact you in follow-up? Yes \_\_\_ No \_\_\_

Your name (optional) \_\_\_\_\_ Date \_\_\_\_\_

Organization \_\_\_\_\_

Address: \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_





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