

## **Session #2 Introduction to TB and TB Control – Part 2**

### **Introduction**

This session continues participants' introduction to TB and TB control by exploring infectiousness and infection control, case management and surveillance, targeted testing, and risk assessment. The basics of contact investigation, patient adherence, and directly observed therapy (DOT) will also be covered.

### **Learning objectives**

Upon completion of this training session, participants will be able to:

1. Name at least three factors that can determine the infectiousness of a TB patient.
2. List and describe the three main types of infection control.
3. Describe the major steps involved in TB case management.
4. Name at least three groups that should receive high priority for targeted testing.
5. Explain the purpose of a contact investigation, and list at least three steps in a CI.
6. Name at least four reasons for non-adherence to TB treatment.
7. Define DOT.
8. List three groups of TB patients that are the highest priority to receive DOT.

Material in this session is adapted from:

- *Core Curriculum on Tuberculosis, 4<sup>th</sup> ed.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2000.
- *DOT Essentials: A Training Curriculum for TB Control Programs.* San Francisco, CA: Francis J. Curry National Tuberculosis Center; 2003.
- *Self-Study Modules on Tuberculosis: Module 6: Contact Investigations for Tuberculosis,* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 1999.
- *Self-Study Modules on Tuberculosis: Module 8: Tuberculosis Surveillance and Case Management in Hospitals and Institutions,* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 1999.
- *Self-Study Modules on Tuberculosis: Module 9: Patient Adherence to Tuberculosis Treatment,* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 1999.
- *Tuberculin Skin Testing: A Model for Trainers.* San Francisco, CA: Francis J. Curry National Tuberculosis Center; 2001.

## Pre-test

1. What are three factors that can determine the infectiousness of a TB patient?
2. Describe each of the following types of infection control:
  - a. Administrative controls
  - b. Engineering controls
  - c. Personal respiratory protection
3. Which of the following is NOT a major step involved in TB case management?
  - a. Contact patient's care provider
  - b. Train staff about infection control
  - c. Home or hospital visit with patient
  - d. Contact investigation
4. Which of the following groups should receive high priority for targeted testing?
  - a. Close contacts of persons known or suspected to have TB
  - b. Foreign-born persons from areas that have high rates of TB
  - c. Residents and employees of high-risk settings (correctional facilities, nursing homes, mental institutions, homeless shelters, etc.)
  - d. All of the above
5. Name three of the nine steps involved in a contact investigation.
6. What are four reasons a patient might be non-adherent to his/her TB treatment?
7. Explain the role of DOT in patient adherence.
8. List three groups of TB patients who are the highest priority to receive DOT.

## **Review of key concepts from Session 1**

1. How does TB spread?
2. How does TB develop in the body?
3. What populations are at risk for TB (in the U.S., California, and local jurisdiction)?
4. How is latent TB infection different from TB disease?
5. How do clinicians diagnose TB when a case of TB is suspected?
6. How is active TB treated?
7. How is LTBI treated?

## Infectiousness and basic infection control

### I. Infectiousness

- A. The number of tubercle bacilli expelled into the air by a TB patient directly determines his/her infectiousness. Factors include:
1. Site of disease (pulmonary or laryngeal TB is infectious; extrapulmonary usually is not)
  2. Severity of disease, such as the presence of cavities on the chest radiograph
  3. If the patient is coughing often, or undergoing a cough-inducing procedure
  4. Presence of acid-fast bacilli (AFB) on the sputum smear
  5. Status of treatment (infectiousness is likely when the patient is not being treated or has just started treatment)
  6. Age: young children are less likely to be infectious than adults
  7. Drug resistance: patients with drug-resistant TB may not respond to the initial drug regimen; thus, TB germs are not being adequately treated
- B. Patients are considered non-infectious when *all* of the following are true:
1. Adequate therapy has been underway for at least 2 weeks.
  2. Therapy has achieved a significant clinical improvement.
  3. 3 consecutive sputum smears collected on different days are negative.
- C. Monitoring patients during treatment is important.
1. Many patients become non-infectious within 2-4 weeks of starting treatment, but patients respond at different rates.
  2. A patient who is not clinically improving may not be taking all the drugs prescribed or may have a drug-resistant strain of TB.

### II. Infection control

- A. TB can be spread in homes, worksites, group living facilities (such as homeless shelters and prisons), and health care facilities. High-risk environments for TB transmission include small or crowded rooms and poorly ventilated areas. **Infection control** refers to the procedures and policies in place for monitoring and trying to control the spread of communicable diseases like TB. Early detection, isolation, and treatment of persons with infectious TB are important goals of an infection control program. **Isolation** refers to the physical separation of infectious patients from others to prevent or limit the transmission of disease. An isolation room is a special room designed and equipped to prevent the spread of droplet nuclei expelled by a TB patient.





## Surveillance and case management

- I. Surveillance: the ongoing collection and analysis of health data needed by public health programs and staff. The first step in surveillance is to identify suspected or confirmed TB cases.
  - A. Routine case reporting: whenever a health care provider or institution encounters a suspected or confirmed case of TB, a report to a public health authority (often the local TB program) is required.
  - B. Active case finding: Contact investigation is an important activity for finding TB cases that have not yet been reported. TB program staff also actively search for cases by reviewing records in laboratories and pharmacies. The active search for cases may involve regular networking with staff in other settings serving clients at high risk for TB, such as homeless shelters or agencies that provide care to patients with HIV/AIDS.
  - C. Surveillance data is used by TB programs to keep track of the places and groups that are affected by TB so that appropriate interventions (like targeted testing) can be planned and conducted.
- II. Case management
  - A. Definition of case management
    1. Primary responsibility for the coordination of patient care to ensure that patient's medical, psychological, and social needs are met.
    2. The assignment of an individual or team to be primarily responsible for care of patients with TB disease.
  - B. Goals of a TB case management program
    1. To make the patient non-infectious
    2. To ensure that effective treatment is promptly started
    3. To prevent the disease from getting worse (including drug resistance)
    4. To identify and remove barriers to adherence
    5. To provide the patient with information on TB and its treatment
    6. To identify those individuals who may have been exposed to the case and are at risk for TB infection
    7. To identify and address other health and/or related needs
  - C. The role and primary responsibility of the case manager or team is to assure that:
    1. Each newly diagnosed patient is educated about TB and its treatment.
    2. Therapy is appropriate, continuous, and completed.
    3. The patient's ongoing status and response to therapy is monitored until treatment is complete.
    4. Contacts are identified, evaluated, referred, and monitored.

5. Other urgent health and social needs of the patient are addressed.
  6. All staff involved with the patient have adequate knowledge and skills, and a professional, caring attitude.
  7. Communication is maintained among all health and social service providers.
- D. Steps in case management (including preferred timelines)
1. Receive case report (standard: review and decide on urgency within 1 working day of receipt of report)
  2. Contact care provider (standard: within 1-3 working days of receipt of report)
  3. Initial contact with patient by home visit, or in hospital (standard: within 3-7 days of receipt of report, depending on risk of transmission)
  4. Ongoing visits during patient's treatment (standard: assess TB patient and review cases with other involved health workers at least monthly)
  5. Follow-up on completion of treatment activities (standard: chest x-ray, sputum, evaluate if adequate course of treatment by dose and duration)
  6. Conduct contact investigation to prevent the spread of TB disease (contact investigation will be covered in greater detail later in this session)

## Targeted testing and risk assessment

### I. Targeted testing

- A. Universal screening and skin testing of the general population for TB infection or disease is not practical, effective, or possible for most TB control programs. Current CDC recommendations call for targeted testing of the groups most at risk for TB infection or disease. Using this approach, a decision to test is a decision to treat.
- B. Session 1 covered the groups most at risk for being exposed to or infected by *M. tb*. What groups do you remember?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

C. Also discussed in Session 1 were the persons at higher risk of **developing TB** once infected with *M. tb*. What groups do you remember?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

## II. Risk Assessment

As discussed in Session 1, three main factors affect the risk of TB transmission. TB control staff must weigh these factors when deciding which contacts should be given high priority for testing and evaluation.

### A. Infectiousness of the TB patient

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

### B. Environmental characteristics

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

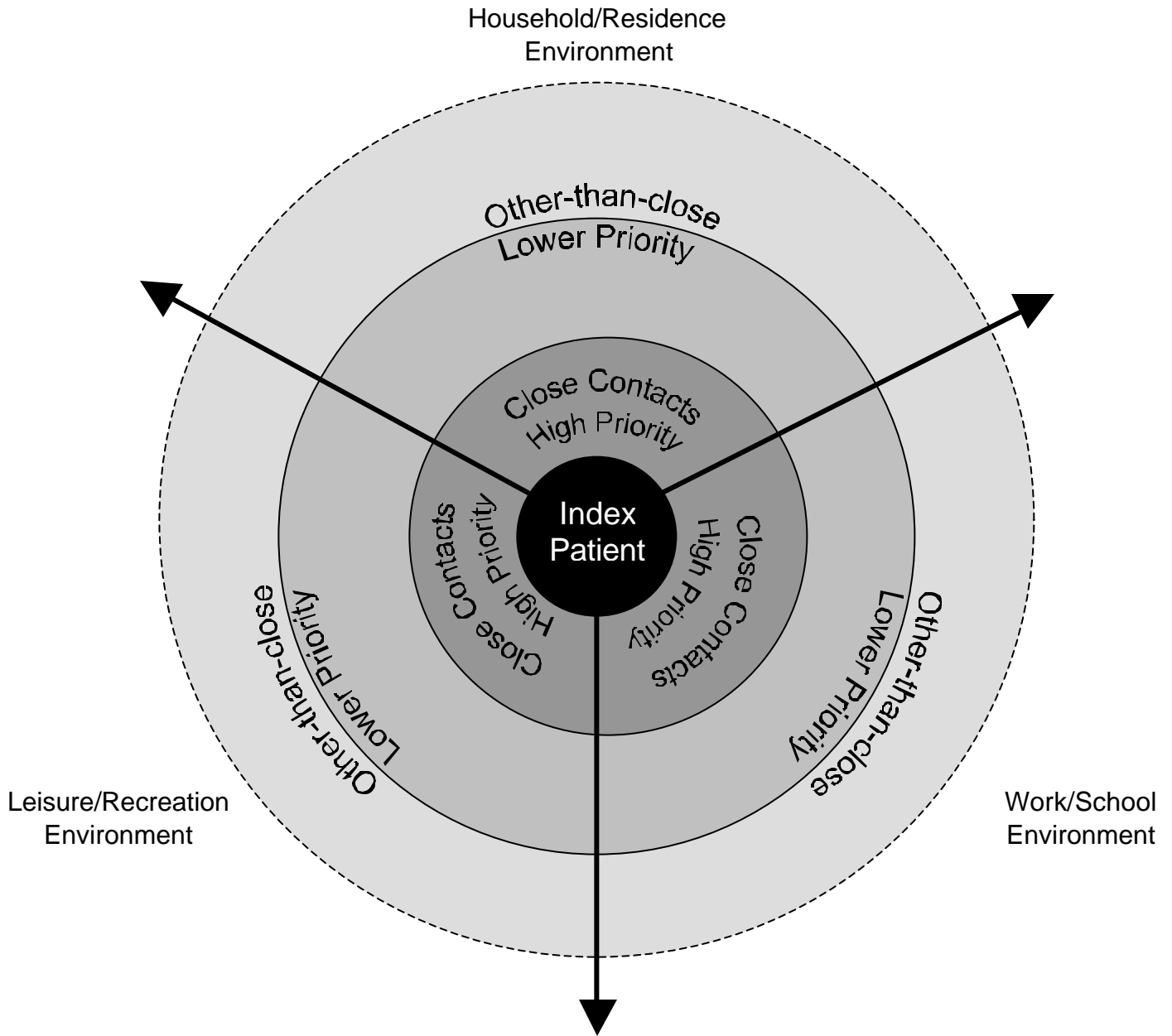
### C. Characteristics of the contact's exposure

1. \_\_\_\_\_
2. \_\_\_\_\_

### Contact investigation

- I. What is a contact investigation?
  - A. A contact investigation is a procedure for identifying people who were exposed ("contacts") to someone with infectious TB disease. Once contacts are identified, they are evaluated for LTBI and TB disease, and given treatment, if needed. Contact investigations are very important for stopping the transmission of TB infection and disease.
  - B. The person who is the initial case reported to the health department with suspected or confirmed TB is called the "index patient" or "index case."
  - C. Situations in which a contact investigation is *not* performed:
    1. Extrapulmonary TB, which is not infectious.
    2. The index patient is a young child (young children are rarely infectious).
    3. However, when a young child has TB infection or disease, it means that transmission was recent. In this case, a *source case investigation* is done to find the source of the transmission.
  - D. Contact investigations generally involve 3 types of places where patients spend their time:
    1. Household or residence
    2. Work or school
    3. Leisure or recreational environments
  - E. Contacts in each of the three types of places should be identified and evaluated in order of priority, using the **concentric circle approach**.

# Concentric Circle Approach



- Close contacts (high risk)
- Other-than-close contacts (medium risk)
- Other-than-close contacts (low risk)

## F. Social networking

1. If using the concentric circle approach is not adequate for identifying contacts, another strategy is called **social networking**. This approach focuses on any group with connections in the patient's life that promote disease transmission. These connections could include:
  - a. Drug use
  - b. Common sex partners
  - c. Common gathering places like bars, beauty salons, churches, or clubs
2. Another effective technique in identifying contacts is the **cluster interview**, a planned interview with someone knowledgeable about the index patient's activities (e.g., a close friend or relative). This person may reveal other possible places of transmission that the patient is reluctant to disclose. The cluster interview may widen or narrow the investigation and help to confirm or disprove statements made by the patient. **Confidentiality** is an important element in the interview process. Only the Health Officer or his/her designee is entitled to breach a patient's confidentiality. The cluster interview should only be conducted with **explicit approval** from the index patient to breach his/her confidentiality.

## II. Nine steps in contact investigation

- A. A review of the patient's medical record to **determine the period of infectiousness**.
- B. **Interviewing the patient** to gather important information about symptoms, places, and contacts. Multiple interviews and good communication skills are needed to build trust and rapport with patients so that all appropriate contacts are identified.
- C. A **field investigation**: visiting the patient's home, work, or other places where he/she spent time while infectious to identify contacts and evaluate the environmental characteristics in which exposure occurred.
- D. **Risk assessment** for TB transmission. Analyze information about patient's period of infectiousness, environmental characteristics, and how (and when) the contacts were exposed to determine who is most at risk for TB transmission.
- E. **Decision about priority of contacts**. Close contacts are at higher risk for TB infection than other-than-close contacts, and should be prioritized for testing. Contacts at higher risk of developing TB disease once infected (children < 4 years of age, immunocompromised persons, and contacts with certain medical conditions) should also be prioritized for testing.

#### F. Evaluation of contacts for LTBI and TB disease

1. Minimally, TST and medical histories should be taken from high priority contacts.
2. Immunocompromised persons and children under 4 years of age should also receive a chest radiograph, regardless of TST results.
3. Anyone with symptoms and/or a TST reaction classified as "positive" should receive both a chest radiograph and sputum exam.
4. Contacts who have no TST reaction should be re-tested 10-12 weeks after their exposure to the infectious TB patient was broken. Generally, it takes a "window period" of 10-12 weeks after exposure for the infection to "show up" on the TST.

#### G. Treatment and follow-up for contacts

1. When a contact has a TST reaction classified as "positive" and no evidence of TB disease, treatment for LTBI is usually indicated. (Note: For specific information about how LTBI is treated, see Session 1; for information about TST classification, see Session 3.)
2. When high-risk contacts (immunocompromised persons and young children) initially have no TST reaction, treatment for LTBI should begin until the second TST is taken 10-12 weeks after the break in exposure. If the second TST still shows no reaction, LTBI treatment can be stopped. In some cases, LTBI treatment may continue.
3. When a contact has positive sputum or chest radiograph suggesting active TB, treatment for TB disease should begin immediately.

#### H. Decision about whether to discontinue or to expand testing

1. Contacts should be tested and evaluated in order of priority, using the concentric circle approach.
2. The next group of contacts should be screened when there is **evidence of recent transmission** among the first group of contacts tested.
  - a. High infection rate (compared to the infection rate of the community)
  - b. TB infection in a young child
  - c. A documented skin test conversion (increasing  $\geq 10$  mm within the previous 2 years)
  - d. A secondary case of TB disease

- I. **Evaluation of contact investigation activities.** TB control staff should analyze the results of the contact investigation to determine if appropriate contacts were identified, located, evaluated, and treated.

## Patient adherence and DOT

### I. Patient adherence

- A. Definition: Adherence to treatment means following the recommended course of treatment by taking all the prescribed medications for the entire length of time necessary.
- B. The consequences of TB patients not adhering to treatment can be severe:
1. Increases the development of drug-resistant TB.
  2. Contributes to ongoing transmission of TB infection.
  3. Leads to prolonged illness, disability, and possibly, death from TB.
- C. Why is adherence so challenging?

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6. \_\_\_\_\_
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8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_

## II. Directly Observed Therapy (DOT)

### A. Definition of DOT

DOT means that a health care worker or other designated individual watches the patient swallow every dose of the prescribed TB drugs ("supervised swallowing"). The American Thoracic Society and the Centers for Disease Control and Prevention recommend that every TB patient be considered for DOT.

### B. DOT tasks:

1. Check for side effects
2. Verify medication
3. Watch patient take pills
4. Document the visit

### C. Who can deliver DOT?

1. Usually delivered by TB program personnel, such as a nurse or other health care worker
2. Staff at other health care settings, such as outpatient treatment centers
3. Other responsible persons (school personnel, employer, clergy)
4. Family members should not be used for DOT

### D. Where is DOT delivered?

1. Clinic or other health care facility
2. Patient's home
3. Patient's workplace
4. A school
5. Public park, restaurant, or other agreed-upon public location

### E. Can we reliably predict who will be non-adherent to their treatment?

No! Anyone can be non-adherent, regardless of social class, educational background, age group, gender, or ethnicity.

### F. Which patients are the highest priority for DOT?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
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6. \_\_\_\_\_
7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

## Review questions or post-test

1. What are three factors that can determine the infectiousness of a TB patient?
2. Describe each of the following types of infection control:
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  - b. Engineering controls
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3. Which of the following is NOT a major step involved in TB case management?
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7. Explain the role of DOT in patient adherence.
8. List three groups of TB patients who are the highest priority to receive DOT.

## Participant evaluation

Your feedback about this training session is important. Please read each statement and circle one number to indicate the level of your agreement/disagreement. Include any comments on the lines provided below.

Name \_\_\_\_\_ Date \_\_\_\_\_

Instructor \_\_\_\_\_ Session # \_\_\_\_\_

1 = Strongly disagree 2 = Disagree 3 = Neither agree nor disagree 4 = Agree 5 = Strongly agree

1. Topics are covered comprehensively. 1 2 3 4 5

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2. Session meets its objectives. 1 2 3 4 5

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3. Session length is appropriate. 1 2 3 4 5

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4. The information is well organized. 1 2 3 4 5

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5. The session maintained my interest. 1 2 3 4 5

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6. The level of the material is appropriate. 1 2 3 4 5

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7. The printed materials are useful. 1 2 3 4 5

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8. The delivery of the material was effective. 1 2 3 4 5

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9. I now feel more prepared to perform my TST duties. 1 2 3 4 5

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10. Overall, the session was excellent. 1 2 3 4 5

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What do you recommend to improve this session? \_\_\_\_\_

What additional training do you need? \_\_\_\_\_

Other comments: \_\_\_\_\_