

**UNTHSC – Tuberculosis Control Plan**  
**Revised 1/02**  
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## **BACKGROUND**

Transmission of tuberculosis \* (TB) is a recognized risk in health care facilities. Transmission is most likely to occur by contact with patients who have unrecognized pulmonary or laryngeal TB and are not on effective antituberculosis therapy. Increases in TB in many areas are related to the high risk of TB among immunocompromised persons, particularly those infected with the human immunodeficiency virus (HIV). Health care facilities should be alert to the need for preventing TB transmission in settings in which persons with HIV infection receive care or work.

\*Tuberculosis is a bacterial disease caused by *Mycobacterium tuberculosis*.

The bacteria are spread through the air by droplet nuclei when an infected person coughs, speaks, sneezes, sings or during procedures that cause aerosolization of droplets. Droplet nuclei are 1-5 microns in size. Air currents can keep the nuclei airborne for long periods of time. Droplet nuclei must be inhaled and reach the alveoli to cause infection.

### **I. POLICY STATEMENT**

This Tuberculosis Exposure Control Plan applies to all departments of UNTHSC in which exposure to pulmonary or laryngeal tuberculosis may occur. It is intended to prevent transmission of pulmonary *Mycobacterium tuberculosis* (TB) from infected individuals to susceptible hosts. All employees and students must comply with this plan.

No TB precautions are necessary if the patient is on antituberculosis medications (and compliant) and has no symptoms i.e., coughing, night sweats, weight loss, fever.

### **II. RESPONSIBILITY FOR IMPLEMENTATION OF PLAN**

1. Infection Control Committee: responsible for program oversight.
2. Student/Employee Health: responsible for education and training of staff, evaluation of TB skin testing of staff, annual review of program with revisions as necessary.
3. Infection Control Coordinator/Safety Committee: Consultation as needed and environmental surveys for compliance.
4. Department/Clinic Directors: Implementation of the plan, employee TB skin testing, interpretation and follow-up, management of unprotected exposures, reporting skin tests results and exposures to the Student/Employee Health, maintaining records related to skin testing and exposures, monitoring staff compliance with this plan.

5. UNTHSC will provide proper protective equipment (PPE), skin testing and follow-up, education, and training at no cost to employees and students.
6. Employees and students are responsible for the information contained in this plan and are expected to wear proper respiratory protection with all **suspected** and **confirmed** tuberculosis patients if the patient is unable to wear a mask.
7. Employees and students are responsible for properly evaluating suspected and confirmed tuberculosis patients and masking those patients when they are in areas where other employees, students, patients, and visitors are not masked.

### **III. PURPOSE**

To prevent the transmission of tuberculosis based on the recommendations by the Centers for Disease Control (CDC), and the Occupational Safety and Health Administration (OSHA).

To increase employee and student awareness of TB and provide guidelines for patient assessment and evaluation of TB.

To identify engineering controls (masks) and or work practice controls (identification, triage and isolation) to reduce atmospheric contamination.

To provide a means of personal protection for employees and students potentially exposed to suspected and/or confirmed tuberculosis patients.

To provide employees and students with the appropriate type of respiratory protection; to educate in the proper fit and use.

### **IV. EXPOSURE DETERMINATION POTENTIAL**

With respect to potential TB exposure, employees and students will be identified and placed into one of two categories:

Category 0: All job classifications in which the employees/students do not have occupational exposure to tuberculosis.

Category 2: All job classifications in which employees/students do have occupational exposure to tuberculosis, regardless of frequency.

The list of job classifications will be located in the office of Human Resources and Student/Employee Health.

## V. PATIENT ASSESSMENT FOR DETECTION OF TUBERCULOSIS

The first step in preventing exposure is to **identify potentially infectious individuals.**

Triage of patients will include vigorous efforts to detect patients with active TB promptly and to minimize the time spent in contact with other patients, visitors, employees and students. See Policy #96.001.8 *Triage of Patients with Communicable Diseases* in the Infection Control Manual or [www.hsc.unt.edu/policies/qualityassurance/TriagePatientsCommunicableDiseases.pdf](http://www.hsc.unt.edu/policies/qualityassurance/TriagePatientsCommunicableDiseases.pdf)

Patients with the following signs and symptoms will be treated as potential suspects for TB:

- persistent cough (greater than 3 weeks duration)
- coughing up blood
- weight loss
- loss of appetite
- lethargy/weakness
- night sweats
- fever

Medical and social history:

- recent immigrant (especially high-risk e.g., Asia, Africa, or Latin America)
- known immunosuppression
- known previous positive PPD and /or chest xray
- resides in shelter, prison, or long-term care facility
- known exposure to TB
- known history of TB, did not complete therapy
- alcohol or drug use

## VI. ENGINEERING CONTROLS

Whenever possible, place a mask on the patient. The patient may wear a regular surgical mask. If the patient wears a mask employees and students need not wear a mask.

After placing the patient in the exam room the door will remain closed at all times.

Employees and students will wear respiratory protection (N-95 masks) at all times while in the room if the patient cannot or will not wear a mask.

## VII. WORK PRACTICES

Non-clinical support personnel will be excluded from contact with known or suspected infectious TB patients.

Prompt identification of patients with history or symptoms of TB will be done.

Tissues and instructions for the patient to cough and sneeze into tissues and discard in waste container will be provided.

The patient will be asked to wear a mask (regular surgical) until he/she is placed in a room with door closed.

If the patient cannot wear a mask, employees /students who interview or examine a patient with confirmed or suspected TB will wear a mask (N-95) at all times while in contact with patient or in exam room with patient.

Patients with **active** TB who must come into the clinic will have appointments scheduled to avoid exposing others. Designated times of the day for TB appointments will be observed to avoid interaction with immunocompromised individuals.

OSHA and the CDC have defined the following as “high-hazard procedures” when performed on patients with known TB or those who are at high risk of having infectious TB. These procedures are likely to produce bursts of aerosolized infectious particles or to result in copious coughing or sputum production.

- aerosolized medication treatment (including pentamidine)
- diagnostic sputum induction
- autopsies

## **VIII. PERSONAL PROTECTIVE EQUIPMENT**

Personal protective equipment (PPE) will be provided to Category 2 employees and students at no cost. Masks will be NIOSH- approved N-95 masks. All staff in Category 2 will wear a mask in the following circumstances:

- when entering room occupied by a known or suspected infectious tuberculosis patient.
- while performing high-hazard procedures (section IV).

Category 2 employees and students will be instructed in the correct use and limitations of the N-95 mask in the prevention of exposure to TB.

Employees and students are accountable to evaluate the mask for proper fit and condition at each usage.

Education regarding the type, proper fit and use of the mask will be provided by the

Student/Employee Health during orientation with updates as needed.

## **IX. RESPIRATORY PROTECTION SELECTION**

CDC and OSHA requirements/recommendations state that a NIOSH approved respirator (N-95 is NIOSH approved) is the minimum acceptable level of protection for staff.

## **X. MEDICAL SCREENING OF HEALTH CARE WORKERS**

### **PPD SKIN TESTING**

See Appendix A for testing, reading, and interpretation of PPD skin test results.

At the time of hire, all category 2 staff and entry level students, including those with a history of BCG vaccination, will receive a **two-step** testing tuberculin skin test (PPD) to reduce the likelihood of interpreting a boosted reaction as representing a recent infection. **EXCEPTION:** Individuals who have a history of a positive PPD reaction, documentation of completion of preventive therapy, or documentation of adequate therapy for active disease will not receive a skin test. **Routine chest xray is NOT recommended for those who have tested positive in the past or have received treatment for active TB.** They will, however, be required to fill out the signs and symptoms portion of the PPD Skin Testing Form (appendix B).

**Chest xrays should not be used to screen for TB. CXRs may detect active disease but may not detect latent infection that may be treated to prevent active disease.**

Employees and students will be tested **annually** thereafter. Employees/students with a positive history (+PPD or disease) will address the signs and symptoms portion of the PPD Skin Testing Form – Section III.

Employees/students who have **positive** skin test results will be sent to the health department for further evaluation (CXR, etc.) and treatment. There are no work restrictions for a positive skin test that is not accompanied by symptoms of the disease and/or a positive chest xray.

Employees/students with **active** tuberculosis ( + CXR and symptomatic) will be sent to the local health department immediately for further evaluation and treatment. Work restriction is required. Healthcare provider or health department documentation that infectiousness no longer exists is required prior to return to work/school.

Testing and evaluation will take place in the individual's department or Student/Employee Health using the PPD Skin Testing Form. A copy of the test and results will be given to the employee/student, a copy will be kept in the department file and a copy will be maintained by Student/Employee Health.

The cost of initial and annual testing and follow-up of positive PPDs is the responsibility of the employee's department. Student/Employee Health and the student will share cost of testing and follow-up.

## **XI. FOLLOW UP OF EXPOSURES**

Employees/students exposed to a confirmed or suspected source of TB, will complete an Accident Report form ([www.hsc.unt.edu/Departments/Hrs/wcpacket.cfm](http://www.hsc.unt.edu/Departments/Hrs/wcpacket.cfm)) and the following testing will be done:

- baseline skin test
- monitoring of the individual for development of symptoms of TB
- follow-up skin test at 12 weeks

If follow-up skin test converts to positive or if symptoms develop, the individual will be referred to the local health department for follow-up and treatment. The PPD Skin Test Form will be utilized to record results.

## **XII. TRANSPORT OF PATIENTS WITH TUBERCULOSIS**

The patient with suspected or confirmed infectious TB will wear a mask (surgical mask) if transported or sent to another department outside of the exam room (e.g., lab, hospital, rehab, prison).

## **XIII. EDUCATION AND TRAINING**

Contents for initial training will include:

The basic concepts of TB transmission, pathogenesis, and diagnosis, including the difference between latent TB infection and active disease; the signs and symptoms of TB; and the possibility of re-infection and/or reactivation in persons with a positive TB skin test.

The potential for occupational exposure to persons with infectious TB, including prevalence of TB, and the situations with increased risk of exposure to TB.

The principles and practices of infection control that reduce the risk of transmission of TB, including the hierarchy of TB infection control measures and written policies and procedures. Site-specific control measures will be provided to employees/students in areas needing measures in addition to the basic control program.

The purpose of skin testing, the significance of a positive result and the importance of participation in the skin test program.

The principles of drug therapy for latent or active TB infection; indications, use, and effectiveness, including the potential adverse effect of the drugs.

The responsibility of employees/students to seek medical evaluation promptly if:  
1) symptoms develop that may be indicative of TB, 2) if skin test conversion occurs; to receive appropriate evaluation and therapy to prevent transmission of TB to patients and others.

The necessity of notifying their manager or Student/Employee Health if diagnosed with active TB so that early contact investigation can be instituted.

The responsibilities of employees/students to provide a medical release or a release from the public health department stating that they are noninfectious before returning to duty.

Explanation will be given of the higher risk posed by TB to individuals with specific medical conditions, including; 1) the more frequent and rapid development of clinical TB after infection with *M. tuberculosis*, 2) the difference in the clinical presentation of disease, and 3) the high mortality rate associated with multi-drug resistant tuberculosis (MDR-TB) in such individuals.

#### **XIV. ANNUAL REQUIREMENTS**

- Education: New knowledge; incidence statistics, forum for questions
- TB skin testing

#### **XVI. REFERENCES**

American Thoracic Society, (1993). Control of tuberculosis in the United States, Medical Section, American Lung Association.

Centers for Disease Control (1993). Draft guidelines for preventing the transmission of tuberculosis in healthcare facilities. Federal Register, Part II Second Edition, Notice of Comment Period.

Centers for Disease Control and Prevention (1994), Guidelines for preventing the transmission of *Mycobacterium Tuberculosis* in health-care facilities”, MMWR.

Texas Division of Health, Department of Social Services, “Tuberculosis Disease Fact Sheet”.

U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention (1994), Core Curriculum on Tuberculosis, 3rd edition.

U.S. Department of Labor - Occupational Safety and Health Administration  
(1993), Enforcement Policy and Procedures for Occupational Exposure to Tuberculosis,  
Federal Register.

[www.cdc.gov/nchstp/tb/faqs/qa.htm#Introduction](http://www.cdc.gov/nchstp/tb/faqs/qa.htm#Introduction)

## APPENDIX A

### PPD/Mantoux Test Administration and Interpretation

Equipment: One (1) vial of purified protein derivative (PPD) (5 tuberculin units per 0.1cc)  
Tuberculin syringe

26g-3/8 inch needle  
2X2 gauze swab or cotton swab  
Alcohol swab

## SECTION I: ADMINISTRATION

1. Have individual read and sign consent form.
2. Obtain medical history PRIOR to testing. History should include signs and symptoms of TB and socioeconomic history.
  - hemoptysis, coughing >3 weeks, night sweats, unintentional weight loss, loss of appetite, malaise, weakness.
  - close contact with anyone with active TB
  - nationality (foreign-born persons from areas where TB is endemic)
  - drug use
  - medical conditions that may cause immunosuppression (AIDS, cancer, prolonged steroid use, etc).
  - medically underserved (migrant farm workers, homeless, etc.)
  - members of a high risk racial group (e.g., Asians, Pacific Islanders, African Americans, Hispanics, and Native Americans).
3. If individual has had a PPD before determine:
  - why the test was done
  - what were the results
  - has the individual taken TB medications in the past. (If TB medications have been taken in the past DO NOT GIVE PPD. Serious local reactions can occur.)
  - has individual had BCG (bacille Callmette-Guerin) vaccine in the past. Note on record, BCG is not a contraindication for PPD and individual should be tested.
4. If the individual has had a reactive skin test in the past or has received anti-TB drugs for prevention or treatment, review and fill out history and signs and symptoms section of the PPD Skin Testing Form (section III). If individual is symptomatic, fill out required areas of the form and send employee or student to Student/Employee Health immediately. If not symptomatic, fill out required areas of form and dispense copies as previously described.
5. Wash your hands.
6. Using aseptic technique, draw up 0.1cc of PPD solution in a tuberculin syringe. Remove any air bubbles.
7. With an alcohol swab, cleanse the skin on the inner aspect of the forearm about four (4)

inches below the bend of the elbow. Allow the alcohol to dry to prevent increased bleeding at the injection site.

8. Pull the skin of the forearm taut with your thumb and forefinger and insert the needle with the bevel pointing upward at an angle (10-15 degrees) almost parallel to the skin (intradermally). Insert the needle so that only the bevel penetrates the skin. **DO NOT INSERT ON TOP OF A VISIBLE VEIN.**
9. **DO NOT aspirate (causes bruising).** Inject the tuberculin slowly. A tense, white wheal should appear at the injection site. **IF A WHEEL DOES NOT APPEAR REPEAT THE TEST ON THE OTHER ARM.** Instruct the individual that the wheal will disappear within minutes and not to scratch or rub the injection area since it will disperse the tuberculin and may cause an inaccurate reading. Do not apply a dressing (reaction to tape or bandaid may cause an inaccurate reading.)
10. If bleeding occurs, blot area lightly with a dry gauze sponge or cotton ball (alcohol pad may increase bleeding).
11. Discard needle in sharps container. Do not recap.
12. Wash hands.
13. Fill in required areas of PPD Skin Testing Form.
14. Instruct individual to return in 48 - 72 hours to have test read. If the test is not read within 48-72 hours it must be repeated.
15. Store tuberculin in medication refrigerator. Discard opened vials **after one (1) month** or if tuberculin is turbid or contains particulates.

## SECTION II: TWO-STEP TESTING FOR NEW EMPLOYEES/STUDENTS

1. Perform steps 1 - 14 in section I.
2. Read test at 48 - 72 hours.
3. If first step skin test is negative, give the second test (repeat 1 - 14 in section I) in 7-14 days.
4. Read test in 48 - 72 hours.

## SECTION III: TEST INTERPRETATION

1. A PPD should be read within 48 -72 hours. A ruler with mm markings should be used. If test is not read with 48 - 72 hours it should be repeated at another site.
2. Measure the widest diameter of the **induration**. Reaction is indicated by induration, not the erythema that may be present. Presence of edema or necrosis at the site should be recorded and the physician notified.
3. If induration is present, **record in mm** not “positive” or “negative”. The size of the induration is necessary in determining the positivity of the test (see below).
4. Reactions should be classified as follows:

**≥5mm** is positive in:

- persons known to have or suspected of having HIV infection.
- close contacts of a person with active TB,
- persons who have a CXR suggestive
- of previous TB, and
- persons who inject drugs (if HIV status is unknown).

**≥10 mm** is positive in:

- persons with certain medical conditions\*, excluding HIV,
- persons who inject drugs (if HIV is negative),
- foreign born persons from areas where TB is common,
- medically underserved, low-income populations, including high-risk racial and ethnic groups,
- residents of long-term care facilities,
- children younger than four (4) years of age,
- locally identified high-prevalence groups (e.g., migrant farm workers or homeless persons), and
- healthcare workers.

**≥15mm** is positive in all persons with no known risk factors for TB.

5. Record results on the PPD Skin Testing Form. Give one copy to the individual being tested, send one copy to Student/Employee Health, and retain one copy for the department/school record.

\*Cancer of the head and neck  
 Intestinal bypass of gastrectomy  
 Prolonged corticosteroid therapy

End-stage renal disease  
 Chronic malabsorption syndromes  
 Other immunosuppressive therapy

Hematologic & reticuloendothelial  
diseases

## APPENDIX B

### PPD SKIN TESTING FORM

Scan in form