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Tuberculosis Control Plan

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I. Description

Describes the policies and procedures to prevent staff, patient, and visitor exposure to tuberculosis (TB). Occupational Safety and Health Administration (OSHA) regulations require the employer to provide a written exposure control plan that covers the facilities' policies and procedures to prevent transmission of TB in the workplace.

II. Policy

A. Management of Patients with Known or Suspected Tuberculosis

1. Identifying Patients with Potential Tuberculosis

    a. A diagnosis of TB should be considered in patients of any age with persistent unexplained productive cough (>3 weeks duration) or other signs and symptoms compatible with TB, such as complaints of hemoptysis, night sweats, unexplained weight loss, anorexia, or fever. **All patients who have TB in their differential diagnosis should be placed on Airborne Precautions until active pulmonary, laryngeal, miliary, or pleural TB is excluded**.

    b. Groups at high risk for TB include the following: persons with HIV infections, immigrants from countries with high endemic rates of TB, persons who have been incarcerated, residents of congregate living situations (i.e., shelters, group homes), immunocompromised persons (e.g., solid organ transplant,

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persons on TNF-inhibitors), persons with a history of a positive Tuberculin Skin Test (TST) or positive Interferon-Gamma Release Assays (IGRA), close contacts of persons who have had active TB including infants born to mothers with active TB disease, and homeless persons.

c. All patients with a positive TST or IGRA **and** either symptoms/signs suggestive of active pulmonary TB, or chest radiography suggestive of infectious TB should be evaluated for active TB and immediately placed on Airborne Precautions in an airborne infection isolation room (AIIR) if available (please refer to the Airborne Isolation Rooms, this list of rooms meet CDC recommendations for AIIRs). If AIIR is not available, place the patient in a private room, ideally with a HEPA filter and expedite transfer to an AIIR. It is the responsibility of all Clinic Directors, the Director of Emergency Medicine, and inpatient Clinical/Medical Directors to develop a mechanism for screening patients for active TB in their respective areas.

2. Diagnosing Tuberculosis

a. Appropriate diagnostic studies should be conducted on all patients with signs or symptoms consistent with TB. Such studies may include TST, IGRA, sputum for acid fast bacilli (AFB) smears and cultures, chest radiography, chest tomography (CT), and/or chest magnetic resonance imaging (MRI). Additional tests may also be necessary, including bronchoscopy, induced sputum for AFB smear and culture, gastric aspirate for AFB smear and culture (pediatric patients), bone marrow biopsy, or biopsy of other potentially infected sites (e.g., lymph node, pleura, peritoneum). The UNC Hospitals Clinical Microbiology Laboratory will utilize the most sensitive methods available for detecting and identifying mycobacteria (e.g., fluorescent microscopy for AFB smears).

b. The two types of tests that can be used to help detect TB infection are the TST and the IGRA TB blood test. Per the NC Health Department, an IGRA is the preferred test for all persons aged 2 years or older. A positive IGRA/TST may support the diagnosis of TB disease but does not distinguish latent TB infection (LTBI) from active TB disease. A negative IGRA/TST does not exclude the possibility of disease. Other tests, such as a chest x-ray (CXR) and sputum cultures for AFB are needed to further evaluate whether the person has active TB disease.

c. A TB blood test (IGRA) collected through Occupational Health Services (OHS) or by Phlebotomy Service will be processed by McLendon Lab services Monday-Friday.

d. TST will be read by a trained staff member 48-72 hours after placement, preferably at 72 hours. Refer to Nursing policy: Intradermal Injections.

e. When collecting AFB cultures and smears, three sputum samples should be

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collected at an interval of at least eight hours between specimen collections. At least one of the three should be an early morning specimen. The laboratory does not process smears on stools. Smears will be performed on all gastric aspirate samples that are sent for AFB culture; however, the smears have low sensitivity and specificity in a low prevalence setting, so a negative result may not be used to rule out TB, and a positive smear result may indicate the presence of non-tuberculous mycobacteria. Gastric aspirates should be collected on three separate mornings.

f. AFB cultures/smears sent to the UNC Hospitals Clinical Microbiology Laboratory will be processed according to lab policy. For specific lab procedures, see Attachment 1 - UNC Hospitals AFB Laboratory Procedures.

g. BCG, or Bacille Calmette-Guérin, is a live attenuated vaccine for TB disease that is administered by intradermal inoculation or scarification. Many persons born outside of the United States have been vaccinated with BCG. BCG vaccination may cause a positive reaction to the TB skin test, which may complicate decisions about prescribing treatment for LTBI. Unlike TB skin tests, IGRA is not affected by prior BCG vaccination and are not expected to give false-positive results in persons who have received prior BCG vaccination.

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3. Inpatients Requiring Airborne Isolation

   a. All patients with known or suspected pulmonary TB, laryngeal TB, miliary TB, or pleural TB.

   b. Patients with known or suspected TB abscesses that are open/draining or who have wound drains in place (e.g., JP drain). Patients suspected of having TB disease **at any site** should have a chest x-ray and sputum AFB smear/culture to rule out pulmonary involvement.

   c. All patients with a gastric aspirate (pediatric patients) that is smear or culture positive for AFB.

   d. Patients with cystic fibrosis (CF) and a first AFB positive isolate (smear or culture) must be placed on Airborne Precautions until TB is excluded.

   e. Patients with known or suspected multidrug resistant TB (MDR-TB) or extensively drug-resistant TB (XDR-TB) will remain on Airborne Precautions throughout their hospitalization because of the high frequency of treatment failure or relapse. MDR-TB should be considered in the following situations: 1) acquisition likely occurred in country with high prevalence of MDR-TB, 2) Rifampin resistance detected by PCR, 3) if source of exposure is to a patient with known MDR-TB, and 4) if initial therapy has failed.

   f. Patients with previously diagnosed pulmonary, laryngeal, miliary, or pleural **smear-negative, culture-positive** TB readmitted to UNC Hospitals should be

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placed on Airborne Precautions until they have been on treatment for a minimum of 2 weeks and demonstrate clinical improvement.

g. Patients with previously diagnosed pulmonary, laryngeal, miliary, or pleural smear-positive TB readmitted to UNC Hospitals should be placed on Airborne Precautions until they have met the Discontinuation of Isolation guidelines in this policy.

h. Pediatric patients with suspected or confirmed TB should be evaluated for potential infectiousness, in the same way as adults, based on symptoms, sputum AFB smears, radiographic findings, and provider's clinical evaluation. Those with pulmonary, laryngeal, miliary, or pleural TB will be placed on Airborne Precautions until they are determined to be non-infectious. Consultation with a pediatric infectious disease (ID) specialist is recommended when TB in a child is suspected.

4. Inpatients that do not Require Airborne Precautions

a. Patients with a recent history of Nontuberculous Mycobacteria (NTM) do not need isolation if the licensed provider does not suspect or is not treating the patient for TB. If TB is suspected or in the differential diagnosis, the patient must be placed on Airborne Precautions until diagnosed or ruled out. This is most commonly seen among HIV positive, immunosuppressed, and chronic lung disease patients.

b. CF patients with a documented history of NTM do not need Airborne Precautions if the licensed provider does not suspect or treat the patient for TB. If TB is suspected or is in the differential diagnosis, the patient must be placed on Airborne Precautions until diagnosed or ruled out. CF patients with a first-time smear or culture positive for AFB must be placed on Airborne Precautions until TB is excluded.

c. For patients that have sputum specimens for AFB lab tests ordered as a component of a procedural protocol (e.g., organ transplantation, CF/thoracic patient bronchoscopy), Airborne Precautions are not required unless TB is suspected or in the differential diagnosis.

d. Patients with pleural TB who have negative sputum/respiratory AFB smears are considered to have extrapulmonary TB, and Airborne Precautions are not needed unless the patient has a pleural drain in place.

e. Patients with extrapulmonary TB that do not have any pulmonary involvement (i.e., ruled out by 3 negative sputum smears collected at least eight hours apart) and do not have a drain in place.

5. Isolation Guidelines

a. Airborne Precautions may be initiated by any Licensed Practitioner (LP), Registered Nurse (RN), or Infection Preventionist (IP).

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b. The patient care team will educate patients regarding Airborne Precautions, emphasizing the need to adhere to the UNC Hospitals isolation precautions guidelines.

c. Patients who refuse to adhere to Airborne Precautions or refuse treatment will be reported to the Orange County Health Department. When applicable, legal action will be taken to enforce appropriate Airborne Precautions. Hospital Police will aid in enforcing court-ordered isolation. Alternatively, patients refusing to adhere to Airborne Precautions will be transferred to State facilities capable of managing such patients. Psychiatric consultation will be obtained to assist in such transfers.

d. Patients with known or suspected active TB **cannot** ambulate outside the isolation room for therapeutic reasons. Infection Prevention must approve of any exceptions to this policy.

e. Patients with known or suspected TB will be placed in Airborne Infection Isolation Rooms (AIIRs) that meet CDC recommendations. A list of rooms that meet CDC recommendations for AIIRs can be found on the Infection Prevention intranet website: Airborne Isolation Room Locations. Ventilation requirements will include:

    i. Private room

    ii. Negative air pressure (corridor positive with respect to the room), >6 air exchanges per hour (ACH) or ≥12 air exchanges per hour for new construction, and direct out-exhausted air.

    iii. Patient's room must remain closed except when entering or exiting the room.

    iv. Negative pressure should be monitored with a tissue test and recorded at least daily by nursing staff in the electronic medical record while the room (inpatient, outpatient, or procedural areas) is actively being used for a patient on Airborne Precautions. For isolation rooms with an anteroom, check the air pressure at the inner door of the anteroom.

        - A tissue test is performed to assess negative pressure in Airborne Isolation Rooms. The tissue test is performed in the following manner: hold a thin (e.g., 1” x 4”) single-ply strip of tissue along the bottom of the isolation room door at the corridor. If negative pressure is present, the tissue should be drawn under the door toward the patient’s room.

    v. If positive or neutral pressure is detected in an AIIR, the Plant Engineering Department should be notified to correct the problem

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as soon as possible. While awaiting Plant Engineering, a portable high-efficiency particulate air (HEPA) unit should be placed inside the patient's room at the door. Portable HEPA units are available from Patient Equipment.

f. If, in the opinion of the patient's provider, moving the patient to an approved isolation room is medically contraindicated, the Medical Director (or designee) of Infection Prevention must be consulted. Infection Prevention will: 1) notify the appropriate nursing supervisor if moving the patient to a room meeting TB isolation ventilation requirements is medically contraindicated and 2) advise staff regarding appropriate engineering controls such as use of a portable HEPA unit and modification of ventilation in the patient's room to optimize air change rates.

g. If all AIIR are occupied, an approved portable HEPA unit will be placed in a single room when occupied by a patient with known or suspected TB. Staff entering such rooms will wear N95 or powered air-purifying respirators (PAPRs). The patient should be moved to an AIIR as soon as possible.

h. Approved portable HEPA units will be placed in a single room in the following areas when occupied by a patient with known or suspected TB: Operating Room (including Labor and Delivery Operating Rooms) and Diagnostic Procedure Areas. Staff entering such rooms will wear N95 or PAPR. See the Additional Considerations for Selected Areas - Operating Rooms and Procedural Areas section of this policy.

i. Diagnostic procedures on patients with known or suspected active pulmonary TB should be performed in an AIIR whenever possible. If a required diagnostic procedure cannot be done in the AIIR (e.g., MRI):

    i. Efforts should be made to schedule the procedure at a time when it can be performed rapidly and when procedure areas are less crowded.

    ii. The patient shall wear a surgical mask covering the nose and mouth. Notify Infection Prevention if the patient is unable to wear a mask so IP can assist with planning optimal infection prevention during the time the patient is in the shared air space of the hospital's hallways (e.g., done within hours when people in hospital hallways are at a minimum, determine a route to the procedure that would limit exposing others while enroute).

    iii. If the patient being transported requires mechanical ventilation, a heat moisture exchanger (HME) will be applied to the ventilator circuit, with a filter on both the expiratory and inspiratory side of the ventilator. If a patient is being transported and requires bag mask ventilation, a filter will be placed between the endotracheal

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tube connector and the bag.

iv. The receiving area will be notified prior to transport by staff at the site of the patient's origin that the patient is on Airborne Precautions.

v. Rooms used by suspect TB patients that are *not* AIIRs (i.e., negative pressure) and in which there was *not* a portable HEPA unit in place during the patient's visit should be closed for a minimum of 2 hours after the suspect patient leaves. Cleaning can be performed in this room after the 2-hour closure time. If a hospital-approved portable HEPA unit was in use during the patient's visit, the room should be closed for 30-minutes, and cleaning can be performed after 30-minutes.

vi. MRI rooms have a minimum of 6 air exchanges per hour; therefore, these rooms need only be closed for a minimum of 70-minutes. Cleaning can be performed in the MRI rooms after the 70-minute closure time.

j. If the patient must temporarily leave the AIIR or room with a HEPA unit in use, then upon discharge of the patient from the room, the door must remain closed for a minimum of 30-minutes *prior* to anyone entering *without* wearing an N95 or PAPR. The 30-minute time period will allow the room ventilation system to remove any droplet nuclei.

k. Pregnant patients with known or suspected pulmonary TB, laryngeal TB, pleural TB, or miliary TB on Airborne Precautions may remove their surgical mask when medically necessary during labor and delivery when all others in the room are wearing respiratory protection (e.g., surgical masks for visitors, or N95, or PAPR for staff). As soon as possible after delivery, the patient should don a surgical mask to limit exposure of the newborn to TB in the delivery room. The newborn will be housed in the Nursery/NCCC and may not visit or room-in with the mother until she has met the criteria as no longer infectious.

l. Breastfeeding patients with TB who have met the criteria to discontinue Airborne Precautions may breastfeed. Women with TB disease suspected of being contagious should refrain from breastfeeding or any other close contact with the infant because of potential transmission through respiratory tract droplets. She may pump breast milk that may then be fed to the infant by bottle by a noninfectious person. *Mycobacterium tuberculosis* (MTB) rarely causes mastitis or breast abscess, but if a breast abscess caused by MTB is present, breastfeeding should be discontinued until the mother is no longer contagious. If mother has mastitis caused by MTB, she may pump breast milk to maintain supply, but the milk must be discarded. Please refer to the Infection Prevention policy: Women's Hospital Maternal

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Units (3WH, L&D, 5WH, NBN & NCCC): Recommendations from Infection Prevention for additional information.

m. Incarcerated patients: When a patient from a prison is on Airborne Precautions, the accompanying Department of Corrections staff must wear an N95 or a PAPR while they are in the patient's room. Fit testing is the responsibility of the Department of Corrections. Staff should contact Hospital Police if a Department of Corrections staff member is not compliant with PPE or has questions regarding PPE usage.

n. Shared suites: Refer to Attachment 4 - Procedure for Instituting Airborne Precautions When the Patient is Housed in a Shared Suite.

6. Isolation: Visitors

a. Patients with known or suspected airborne pathogens will be allowed limited visitors. All visitors must be able to comply with Airborne Precautions. All visitors must wear surgical masks and are given the option of wearing an N95. Visitors should be instructed on the use of surgical masks or on how to perform a user seal check for the N95 and should be educated on Airborne Precautions. This includes 24-hour caregivers (people without compensation and who are not UNC Hospitals' employees or volunteers) and other visitors who may stay in an adult or pediatric patient room for an extended period of time.

b. Individuals visiting inpatients on Airborne Precautions for TB who have any symptoms of TB, including a mild non-productive cough ≥3 weeks duration, will be asked to provide documentation or confirmation that they do not have active TB. A licensed provider or the local health department must provide the verification. Written verifications should include: 1) absence of the following symptoms: persistent cough (≥3 weeks duration), hemoptysis, night sweats, unexplained weight loss, and fever; 2) a negative TST read by a trained staff or negative IGRA; and 3) a negative chest radiograph if indicated. Visitors refusing to obtain the TB evaluation and verification of absence of disease will be barred from admittance to all UNC Hospitals facilities. Hospital Police will have authority to enforce this provision.

c. For pediatric patients who have known or suspected TB, *ALL* household members and close contacts must provide written verification of the absence of disease prior to visitation *regardless of signs/symptoms of illness*. Primary caregivers (e.g., legal guardians/parents who live with the child) may visit before the evaluation is complete, but they must always wear a surgical mask both inside and outside the child's room until they have documentation that they do not have active TB. The primary caregiver must initiate their TB evaluation within 3 working days of the child's presumed diagnosis.

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i. If there is a low likelihood of TB in a suspect pediatric patient, the Infection Prevention Medical Director and/or Pediatric ID attending can decide whether screening is required for an asymptomatic primary caregiver. In this case, the caregiver must wear a mask when outside the patient's room, and a symptom screen only will be conducted.

ii. If the primary caregiver cannot obtain verification through their own primary care provider (PCP) or local health department, they may register as a UNC Hospital patient and have the child's licensed provider order an IGRA, which can be obtained as a lab check-in test (with the consent of the child's provider). The child's provider must be willing to place the order for this test, perform a symptom screen, and accept responsibility for any necessary referrals upon receipt of the test results for the primary caregivers. In some circumstances, legal and billing departments may waive the expense of this testing to parents without insurance.

d. If a primary caregiver, household member, or other close contact is found to have active TB or has signs and symptoms of active TB, they may *not* visit until they have written documentation that they are no longer infectious. Their local health department or a licensed provider of UNC Hospitals must provide the verification. If the primary caregiver has been released from home isolation but is still undergoing directly observed therapy (DOT), the Orange County Health Department may assume responsibility for delivering and observing the administration of the antibiotics. This can be arranged by having the primary caregiver's local health department contact the Orange County Health Department.

7. Discontinuation of Isolation - Discontinuing isolation using these criteria requires the approval of the patient's licensed provider .

    a. For patients with suspected TB, Airborne Precautions may be discontinued:

        i. When a diagnosis other than pulmonary TB is confirmed **and** TB is no longer considered in the differential diagnosis, **or**

        ii. When three sputum smears obtained ≥8 hours apart are all reported as negative by the Microbiology Laboratory **and** TB is no longer considered in the differential diagnosis. For pediatric patients, the specimens may be gastric aspirate when induced sputum cannot be obtained. Collect gastric aspirates on three separate mornings.

        iii. Each failed sputum induction equals one negative smear. Staff conducting the sputum induction must document the negative induction attempt. The sputum inductions must be done at least 8

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hours apart (ideally, one of the three will be an early morning sample). Multiple bronchoscopy specimens obtained in one bronchial procedure count as one sample.

iv. For patients age ≤3, Airborne Precautions can be discontinued if a bronchoalveolar lavage (BAL) is negative for AFB by smear **and** TB is no longer in the differential diagnosis.

v. For patients with a culture positive for AFB/mycobacteria, Airborne Precautions may be discontinued when the cultures are finalized as negative for MTB.

vi. For patients with an AFB positive smear on a respiratory sample, Airborne Precautions may be discontinued if the TB PCR is negative, provided TB is no longer in the differential diagnosis. A negative PCR on a smear-negative or smear-indeterminate respiratory sample may not be used to discontinue Airborne Precautions.

b. For Patients with known or confirmed TB:

i. Patients with known or suspected multidrug resistant TB (MDR-TB) or extensively drug-resistant TB (XDR-TB) will remain on Airborne Precautions throughout their hospitalization due to the high frequency of treatment failure or relapse.

ii. Adult and adolescent patients with previously diagnosed pulmonary, laryngeal, miliary, or pleural smear-positive TB should remain on Airborne Precautions until all the following are met:

- They have two consecutive sputum specimens (induced or natural) - collected at least 8-hours apart which are smear negative, with at least seven days since the last positive sputum smear. Each failed sputum induction equals one negative smear. Staff conducting the sputum induction must document the negative induction attempt; **and**
- They have been compliant for 2-weeks on TB medications to which the organism is judged to be susceptible (or is receiving a standard first-line tuberculosis treatment regimen if susceptibility testing will never be performed for technical reasons); **and**
- There is evidence of clinical response to TB treatment. (From 10A NCAC 41A.0205)

iii. For persons with suspected or known active pulmonary, laryngeal, miliary, or pleural TB who are initially sputum smear negative,

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Airborne Precautions may be discontinued once the patient has been treated for a minimum of 2-weeks and has demonstrated clinical improvement per evaluation and documentation of primary provider.

iv. Infants and pediatric patients being treated for active pulmonary TB should have:

- Clinical improvement, as determined by licensed provider or Health Department
- Two weeks of appropriate empiric therapy

v. Patients with extrapulmonary TB with a drain in place (e.g., TB-positive liver abscess with a JP drain) can have Airborne Precautions discontinued when:

- They have two samples collected at least 8 hours apart from draining wound which are negative for AFB; **and**
- They have been compliant for 2 weeks on TB medications to which the organism is judged to be susceptible; **and**
- There is evidence of clinical response to TB treatment **or**
- The drain is removed, and the wound is healed.

vi. In patients who have soft tissue open/draining lesions with a positive smear for AFB, Airborne Precautions may be discontinued when the cultures are finalized as negative for MTB, or the lesions have closed, any drains have been removed, and the lesion is no longer draining.

vii. Patients with soft tissue open/draining lesions culture positive for MTB, Airborne Precautions may be discontinued when the patient is on two weeks of effective therapy, is improving clinically, and if initially smear-positive, two consecutive samples of wound drainage collected at least 8-hours apart are smear negative or when the wound is closed, no longer draining, and any drains have been removed.

viii. For patients with extrapulmonary TB and no drain in place (e.g., TB meningitis), Airborne Precautions are not required unless they have symptoms of pulmonary or draining soft tissue TB infection.

8. Discharge Planning

a. Will include at a minimum: 1) a confirmed appointment with a provider (e.g., the local health department) who follows the patient until cure, 2) sufficient

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medication to take until the outpatient appointment (health department provides free medication; patients should not be instructed to purchase any), and 3) placement into case management of the local health department of the patient's county of residence. Appointments at UNC Hospitals clinics can only be made during normal business hours, so patients being discharged on weekends or after business hours should have their follow-up appointments made prior to discharge.

b. Patients who may be infectious at the time of discharge should only be discharged to facilities with TB isolation capabilities or to home. They should not be discharged to home if there are people in the household who are at high risk for acquiring active TB (i.e., children less than or equal to 5 years of age, people infected with HIV, or people who are immunocompromised). Patients should use private transport to go home, but if patient must use public transportation (e.g., van), they must be instructed to wear a mask and keep it on for the duration of the trip. They should be instructed to refrain from going to public places prior to consulting with the health department.

c. It is the responsibility of the licensed provider who writes the discharge orders to adhere to these provisions.

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9. Reporting

    a. Refer to the Infection Prevention policy: Reporting of Communicable Diseases.

    b. Licensed providers are responsible for completing the Communicable Disease Report Form and ensuring that it is sent to Infection Prevention (Fax # 984-974-7719). Infection Prevention will send the form to the health department. The form is accessible on the Infection Prevention intranet website.

    c. Infection Prevention staff will contact the patient's local health department once a patient is known to be infectious with MTB.

    d. All positive cultures and smears for MTB will be reported by the Clinical Microbiology Laboratory to the North Carolina State Division of Public Health on the day of recognition.

10. Management of Patients with known or suspected TB in Outpatient Care Services

    a. Protocol for Early Identification of Patients with Suspected Tuberculosis Outpatient Care Services:

        i. Patient Check-In/Waiting Process

            - Front line staff (front desk, information, and front door staff) should identify patients with symptoms (see

above section A.1. of this policy) that may indicate potential tuberculosis and immediately notify the charge nurse.

- Front line staff should note if there are comments associated with the appointment regarding the patient having symptoms/conditions that indicate that the patient may have tuberculosis. These patients should be brought to the attention of nursing staff for further assessment.
- Front line staff should offer surgical masks and tissues to all patients with coughs and encourage the patient to cover their mouth and nose with a tissue when coughing or sneezing. Nursing staff should be notified of patients who are coughing excessively.
- Patients who have respiratory symptoms and report any of the high-risk situations in section A.2. of this policy should be brought immediately to the attention of the nursing staff for further evaluation.
- Patients with known or suspected active pulmonary tuberculosis should be given a surgical mask to wear and placed in an exam room immediately with the door closed.

ii. Nursing Assessment: Nursing staff (if not available, a licensed provider) are responsible for evaluating patients who display symptoms or signs of active tuberculosis or are at high risk of active tuberculosis.

- Nursing staff should immediately assess patients with symptoms suggestive of tuberculosis when notified by front-line staff. Patients should be removed from the waiting area and placed in an exam room with the door closed (preferably in an AIIR which meets TB isolation requirements of a private room with negative pressure and out-exhausted ventilation).
- If the room does not meet AIIR requirements, then the patient should be provided with a surgical mask and shown how to wear the mask properly (i.e., it must cover the nose and mouth). Staff should don an N95 respirator for which they have been fit-tested or PAPR; otherwise, a surgical mask should be worn. If a HEPA filter is available, it can be placed in the room. However,

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arrangements should be made to transfer the patient **as soon as possible** to the Emergency Department, clinic with an AIIR, or the local health department for further evaluation of active tuberculosis. If the patient leaves the room for any reason (e.g., to obtain a chest radiograph), they must wear a surgical mask.

- Rooms used by suspected TB patients that are **not** Airborne Infection Isolation Rooms (AIIR) (i.e., negative pressure) and in which there was **not** a HEPA filter in place during the patient's visit should be closed for a minimum of 2 hours after the suspect patient leaves. Normal terminal cleaning can be performed in this room *after* the 2 hour closure time.
- Nursing staff should notify the licensed provider as rapidly as feasible that the patient may have active tuberculosis.

iii. Patients waiting for an inpatient bed should not wait in the admitting office but be placed in an appropriate Airborne Isolation room in clinic until a bed becomes available.

11. Additional Considerations for Selected Areas

a. Operating Rooms and Procedural Areas - Elective operative procedures on patients with known or suspected TB should be delayed until the patient is no longer infectious. When emergency cases must be performed, the doors to the operating room should be closed, and traffic in and out of the room should be kept to a minimum. Attempts should be made to perform the procedure at a time when other patients are not present in the operative suite (i.e., end of day) and when a minimum number of staff are present. A patient with known or suspected TB brought for surgery must go directly into an operating room. If the operating room is not ready to receive the patient, the patient must be placed in an AIIR. Staff present when operative procedures are performed on patients who may have infectious TB should wear an N95 or PAPR rather than a standard surgical mask. If PAPR is used, a surgical mask must be worn under the PAPR to protect the patient during surgery. The anesthesia machine should be equipped with a disposable anesthesia filter. Portable HEPA units will be used in the operating room (ideally, one HEPA unit at the patient's head and another HEPA unit at the entrance to the operating room).

b. Autopsy Room - The autopsy room should have negative pressure with respect to adjacent areas, with room air exhausted directly to the outside of the building. A tissue test should be done to confirm negative pressure. Twelve (12) air exchanges per hour are recommended. N95 or PAPR should

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be worn by staff while performing autopsies on patients who were known or suspected of having TB.

c. Dental Clinic and School of Dentistry - No specific dental procedures have been classified as "cough-inducing." However, since aerosols of oral fluids and materials may be generated and, on occasion, coughing may be stimulated by oral manipulations, additional considerations appear prudent in a dental setting. Dental staff should routinely ask all patients about a history of TB disease and symptoms suggestive of TB. Patients with a history and symptoms suggestive of TB should be promptly referred for evaluation for possible infectiousness. Elective dental treatment should be delayed for patients known or suspected of having TB until the patient is no longer infectious. If urgent dental care must be provided for a patient with known or suspected TB, Airborne Precautions practices must be employed.

d. Ground and Air Transport Service - During transport of patients with known or suspected TB, the patient will wear a surgical mask. Staff will use an N95 or PAPR. The ambulance ventilation system should be operated in non-recirculating mode, and the maximum amount of outdoor air should be provided to facilitate dilution. If the vehicle has a rear exhaust fan, use this fan during transport. If the vehicle is equipped with a supplemental recirculating ventilation unit that passes air through HEPA filters before returning it to the vehicle, use this unit to increase the number of ACH. Air should flow from the cab (front of vehicle), over the patient, and out the rear exhaust fan. If an ambulance is not used, the ventilation system for the vehicle should bring in as much outdoor air as possible, and the system should be set to non-recirculating. If possible, physically isolate the cab from the rest of the vehicle and place the patient in the rear seat. If the patient being transported requires mechanical ventilation, a heat moisture exchanger (HME) will be applied to the exhalation port on the ventilator. If the patient requires bag-mask ventilation, the HME will be removed from the exhalation port on the ventilator and placed on the endotracheal tube connector.

e. Obstetrical Patients – TST and care of OB patients with suspected/known TB is outlined in the CDC Tuberculosis Clinical Care and Treatment During Pregnancy resource for healthcare providers.

f. Continuing Care – Continuing Care will be notified of patients with known/ suspected TB at the time of the referral.

12. Cough-Inducing Procedures

a. Procedures that involve instrumentation of the lower respiratory tract or induce cough may increase the probability of droplet nuclei being expelled into the air. These cough-inducing procedures include endotracheal intubation and suctioning, diagnostic sputum induction, aerosol treatments

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(including pentamidine therapy), and bronchoscopy. Other procedures that may generate aerosols (e.g., irrigation of tuberculous abscesses, homogenizing or lyophilizing tissue, and autopsy) may increase the probability of droplet nuclei being expelled into the air. In these cases, the guidelines indicated for aerosol-inducing procedures should be followed.

b. Cough-inducing procedures should not be performed on patients with known or suspected active TB unless medically necessary.

c. All cough-inducing procedures performed on patients with known or suspected infectious TB must be performed in an AIIR. Refer to Airborne Isolation Rooms for a complete list of Airborne Precaution rooms within UNC Hospitals.

d. Staff will wear an N95 or PAPR when present where cough-inducing procedures are being performed on patients with known or suspected infectious TB.

e. After completion of cough-inducing procedures, patients with known or suspected infectious TB (including patients at high risk of TB such as patients with HIV) should remain in the AIIR and not return to common waiting areas. They will be given tissues and instructed to cover their mouth and nose when coughing. If they must recover from sedatives or anesthesia following procedures such as bronchoscopy, they must be monitored in a separate AIIR, and not in a common area such as a recovery room. Upon discharge from the hospital, instruct the patient to wear a surgical mask until they exit the hospital.

f. When a patient with known or suspected TB leaves an AIIR where a cough-inducing procedure has been done, at least 30 minutes should pass before the room is utilized for another patient or entered by staff not wearing N95 or PAPR.

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B. Risk Assessment and Department Responsibilities

1. Risk Assessment

a. A retrospective evaluation of a sampling of patients from whom MTB is isolated will be conducted by Infection Prevention every three years. A written assessment, including an analysis of any healthcare-associated exposures, review of factors leading to exposures, and recommendations for preventing exposure in the future, will be provided to the Hospital Infection Control Committee (HICC).

b. On an ongoing basis, the UNC Hospitals Occupational Health Service (OHS) will maintain records of the results of evaluations of all UNC Hospitals staff

(except volunteers, students, and contractors) with occupational exposure to MTB. On an annual basis, OHS will provide a report to the HICC that will include the number of UNC Hospitals staff with occupational exposure, number of people converting their TST/IGRA after a known exposure, and any persons who have acquired active TB.

c. On an ongoing basis, OHS will maintain records of the results of all TST/IGRAs placed for screening purposes (new staff, routine screening of current staff).

d. For UNC-Chapel Hill (UNC-CH) staff, University Employee Occupational Health Clinic (UEOHC) will maintain TB screening records.

2. Departmental Responsibilities

a. Departments with clinical staff have Departmental Safety Coordinators (DSC). The DSC are expected to communicate any updates to the staff in their departments.

b. Annual Learning Made Simple (LMS) training on TB covers topics as suggested by CDC guidelines and OSHA regulations.

c. UNC-CH DSC will receive monthly Joint Commission (JC)/OSHA compliance reports. The DSC will verify the accuracy of the report, assign new staff to the appropriate work unit, and ensure staff take the University's online training. UNC-CH staff can view their compliance status at any time through the EHS Compliance Portal.

d. Contracted staff must comply with all aspects of this TB Control Plan. It is the responsibility of the contracted employee's employer to provide the required elements.

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C. Education

1. Training Requirements

a. All staff who have the potential for exposure to MTB and all staff located in healthcare facilities will receive education about TB that is appropriate to their job category. Training shall be conducted upon initial assignment and annually. Training can be accomplished in a variety of mechanisms. For staff of UNC Hospitals, this training is provided through the LMS system.

b. For UNC-CH staff, training is provided through the University's online self-study course. New UNC-CH staff are required to attend the University's Clinic Environmental Safety Orientation Class.

c. Although the level and detail of this education may vary according to the job description, the following elements should be included in staff education.

2. Elements of Education

a. Education will cover the following topics as outlined in the NC Tuberculosis Control Manual:

    i. TB transmission, signs, and symptoms

    ii. The purpose and interpretation of the TST and IGRA

    iii. The principles and practices of TB infection prevention and control, including Airborne Precautions

    iv. Preventive and curative TB treatment

    v. HIV/TB risk factors

    vi. The importance of personal respiratory protection

    vii. Confidentiality requirements

D. Occupational Health Responsibilities

1. Occupational Health Coverage

    a. The following staff will be evaluated by the UNC Hospitals OHS: UNC Hospitals staff, house staff (residents), and others that UNC Hospitals OHS contracts with to provide these services.

    b. University staff will receive services from University Employee Occupational Health Clinic (UEOHC).

    c. All students who obtain clinical experience at UNC Health facilities shall complete required initial TB screening through their school's Campus Health Services (CHS) or another approved healthcare facility (e.g., health department or a primary care provider's office). Annual screening for students who have had a positive tuberculosis test (either TST or IGRA) shall be conducted through their school's CHS or another approved healthcare facility. Students with potential TB exposures shall follow the recommendations of the occupational health team of the healthcare facility where the exposure occurred. However, the student must still contact their school's CHS to ensure appropriate evaluation and that all necessary steps are taken.

    d. All volunteers will adhere to the OHS policy for TB testing at the initial on-boarding immunization review and as needed thereafter. Oversight of this is the responsibility of Volunteer Services. See Volunteer Services policy: Tuberculosis Testing for Volunteers.

    e. Staff who are contracted receive occupational health screening from their agency. All contract staff who work directly with patients or in patient care areas must meet the screening requirements described in this policy. It is the responsibility of the University or UNC Hospitals department hiring these

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staff to ensure compliance with this policy.

f. It will be the responsibility of each of the different occupational health providers to meet the current OSHA tuberculosis standards of education, record keeping, screening, and exposure evaluations. Within the University, this is a joint responsibility of UEOHC and the UNC Department of Environment, Health and Safety (UNC-EHS).

g. All staff will be counseled at the time of an initial evaluation regarding the need to report all TB exposures to their Occupational Health Provider (OHP) and if they need to obtain further TST or IGRA testing for lab staff working with TB samples. All staff will be counseled regarding the need to report to their OHP the development of signs and symptoms consistent with active tuberculosis, including cough >3 weeks, fever, night sweats, hemoptysis and unexplained weight loss.

2. Evaluation of newly hired staff for latent and/or active TB

   a. All staff will be evaluated prior to the New Employee Orientation (NEO) by OHS for symptoms of latent and/or active TB. The assessment and treatment of latent and active TB will be guided by the NC Tuberculosis Policy Manual (Tuberculosis Control, Infection Control Section, HHHS, last updated 2026) and by the ATS/CDC guideline.

   b. Prior to NEO, all new staff will be evaluated for TB by the following methods:

      i. Questionnaire regarding symptoms

         - Obtain history of BCG vaccine, previous positive TST or IGRA results, CXR documentation, and/or treatment for LTBI.

      ii. Obtain history of two-step skin testing done within a 12-month period (may occur at any time before employment). Document the year testing was completed.

      iii. If there is no history of latent or active TB, test for tuberculosis (TST or IGRA) obtained within 12 months of hire. Must be reported on an official document that is completed and signed by another Occupational Health office or licensed health care provider. If there is no history of two-step testing and no IGRA done within 12 months of hire, OHS will perform two-step TST or IGRA.

   c. Staff who have received BCG vaccine and have no history of positive IGRA or documented TB diagnosis will be tested with an IGRA unless they have documentation of a previous IGRA within the last 12 months. The IGRA is the preferred method of testing for staff who have a known or possible history of BCG vaccine.

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i. TST (also known as PPD):

- Contraindications to TST include the following:
  - Immediate hypersensitivity to a previous TST.
  - Written verification of a previous positive TST.
  - Pregnancy is NOT a contraindication to TST.
  - Vaccination with live viruses - including measles, mumps, rubella, oral polio, varicella, and yellow fever - may interfere with TB skin test reactions. For persons scheduled to receive a TB skin test, testing should be performed either: 1) on the same day as vaccination with live-virus vaccine, or 2) at least one month after the administration of the live-virus vaccine.

ii. For University staff, TST are placed and read by UEOHC unless specific arrangements, approved by UNC-EHS are made.

iii. Staff with a positive TB test will be evaluated for the possibility of active TB through symptom screening and chest radiograph.

iv. Staff with suspected active TB will be relieved from work and immediately referred to their local county health department. They cannot return to work until active disease is ruled out by appropriate medical and microbiologic studies. Staff will be counseled regarding the infectivity of active TB and the risk to others.

v. In accordance with the Environmental Health and Safety policy: Respiratory Protection Program, staff must be assessed for the ability to wear respiratory protective devices. For UNC Hospitals staff, this is the joint responsibility of OHS and the Environmental Health and Safety Department. For University staff, the respiratory protection program is the responsibility of UEOHC and UNC-EHS.

vi. Annual fit testing for N95 respirators is required by Federal OSHA law. Healthcare facilities should be compliant with current OSHA regulations.

3. Screening of Exposed Staff

   a. Identify and notify exposed staff.

      i. Records of all patients from whom MTB is isolated will be reviewed by Infection Prevention to ascertain that proper infection

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prevention procedures were maintained throughout hospitalization and during outpatient visits. If staff or other patients experienced respiratory exposure to an infectious patient or staff, every attempt will be made to notify exposed staff and patients. Infection Prevention will notify supervisors to assist in identifying potentially exposed staff when needed. Infection Prevention will notify the patient's provider if a patient was exposed. It will be the responsibility of an exposed patient's primary UNC Hospitals **provider** to notify the exposed patient and arrange for appropriate follow-up. The local health department will be notified by Infection Prevention of positive TB culture results of staff and source patient information. Evaluation of community exposures will be considered the responsibility of the local health department.

ii. If it is difficult to define precisely those who are potentially exposed (e.g., the source case is an employee who works in an open area), a system of evaluating close contacts may be employed. If close contacts reveal evidence of TST conversion, then progressively wider circles of individuals with lower amounts of exposure will be evaluated until evidence of transmission is not found. The use of this concentric circle approach will be the responsibility of the Medical Directors of Occupational Health and Infection Prevention in collaboration with the local county health department.

iii. Infection Prevention will notify Campus Health Services of a student's possible healthcare exposure. Campus Health Services will notify the designated representative for each health science or allied health science school, who will inform clinical instructors of potential student exposures so follow-up can be arranged.

iv. Infection Prevention will notify University Employee Occupational Health of possible healthcare-associated exposure for university staff (including names, if documented on the medical record).

v. Infection Prevention will notify the Orange County emergency medical service (EMS) of possible healthcare-associated exposure of their staff while performing patient transport to UNC Hospitals. It will be the responsibility of the EMS providers to contact the individuals and arrange appropriate evaluation. EMS staff outside of Orange County will be notified by their local county health department.

vi. Infection Prevention will notify the department employing an outside contractor or outside student agency of possible

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healthcare-associated exposure. The contracting department will notify the outside contractor or student agency. It will be the responsibility of the outside contractor or student agency to contact exposed individuals and arrange appropriate evaluation.

4. Assessment of staff by Occupational Health Services:
    a. Post Exposure Evaluation
        i. All staff (unless the concentric circle approach used) who meet the definition of exposure to a person with active TB will be offered an evaluation in OHS. Contact of staff and/or managers will be by Infection Prevention. Staff will be advised to follow up with their OHS provider. Exposure evaluation for staff not already known to have history of untreated latent TB consists of screening questionnaires, baseline TST/IGRA placed, and follow-up TST/IGRA placed within 8-10 weeks post-exposure. A screening chest x-ray will be performed as deemed necessary by OHS Medical Director or designee.
        ii. As with TST, live virus vaccines might affect IGRA test results. However, the effect of live virus vaccination on IGRA has not been studied. IGRA testing should be done on the same day as live virus vaccination or 4-6 weeks after the administration of live virus vaccines.

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E. Staff with Active Tuberculosis

1. All staff with possible or documented active TB will be referred to their local health department by OHS for treatment.
    a. The staff will immediately be relieved from all work activities by their OHS provider. Leave from work will be handled according to personnel policies.
2. Return to Work for Staff with Active Tuberculosis
    a. All staff with recent active TB must be cleared by their local health department and evaluated by their OHS prior to returning to work.

F. Engineering Controls

1. Isolation Rooms that Meet CDC Recommendations
    a. Refer to Airborne Isolation Rooms for a complete list of Airborne Infection Isolation Rooms (AIIR) within UNC Hospitals, which is kept by the Patient Logistics Center, Plant Engineering, and Infection Prevention. Plant Engineering will evaluate the AIIR annually to verify ventilation meets the CDC recommendations.

2. Use of Portable HEPA Units / Local Exhaust Ventilation Devices

    a. All cough-inducing procedures on patients with suspected or known pulmonary TB should ideally be performed in rooms that meet the ventilation requirements for Airborne Precautions.

    b. For rooms that do not meet the ventilation requirements for Airborne Isolation, portable HEPA units will be used for cases having known or suspected pulmonary TB or when a body cavity infected with MTB is entered or disrupted. The units will be turned on to the highest setting prior to initiating the procedure. Ideally, one unit will be placed near the patient's head, and one unit will be placed near the entrance door. The unit should run for 30-minutes following the patient leaving the room prior to staff entering without proper respiratory protection.

G. Respiratory Protection

1. All staff entering an enclosed area of a patient who has known or suspected TB or who are present when cough-inducing procedures are performed on patients with known or suspected TB will wear a respiratory protective device (respirator) meeting OSHA recommended performance criteria (e.g., N95 or PAPR). Such a device should be donned prior to entering the room and removed only after leaving the room. Staff who must wear a respirator will be included in the Respiratory Protection Program and complete annual fit testing and training.
2. Policies and procedures regarding the use of respirators are incorporated in the Respiratory Protection Program.
3. Assignment of responsibility: UNC Hospitals Industrial Hygienist, Department of Environmental Health and Safety will manage the UNC Hospitals – Environmental Health and Safety policy: Respiratory Protection Program. The Respiratory Protection Program for UNC-CH staff is managed by UNC-EHS.
4. N95 respirators should be disposed of following each use immediately upon leaving the patient room. The reusable respirator equipment (i.e., PAPR) shall be cleaned and disinfected with an EPA-registered disinfectant after each use and per the manufacturer's instructions for use (MIFU). Disposable PAPR head covers/cuffs should be immediately disposed of following each use upon leaving the patient room.
5. During an emergency (e.g., shortage caused by pandemic), respirators may be allowed to have extended or limited use per CDC recommendations and with consultation from Infection Prevention.

III. References

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A. General References

NC TB Policy Manual. https://epi.dph.ncdhhs.gov/cd/lhds/manuals/tb/toc.html. Latest revision, October 2020.

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B. Prevention and Control Guidelines

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C. Diagnosis and Treatment

Kimberlin et al. Red Book 2024-2027: Report of the Committee on Infectious Diseases, 33rd edition; American Academy of Pediatrics.

Official American Thoracic Society/Infectious Diseases Society of America/Centers for Disease Control and Prevention Clinical Practice Guidelines: Diagnosis of Tuberculosis in Adults and Children. CID 2017:64 (15 January, 2017).

CDC. Tuberculosis Clinical Care and Treatment During Pregnancy. Available at: https://www.cdc.gov/tb/hcp/clinical-care/pregnancy.html

IV. Related Policies

Environmental Health and Safety Policy: Respiratory Protection Program

Infection Prevention Policy: Infection Prevention Guidelines for Safe Patient Care

Infection Prevention Policy: Reporting of Communicable Diseases

Infection Prevention Policy: Women's Hospital Maternal Units (3WH, L&D, 5WH, NBN & NCCC):

Recommendations from Infection Prevention

Nursing Policy: Intradermal Injections

Respiratory Care Policy: Sputum Induction

Volunteer Services Policy: Tuberculosis Testing for Volunteers

V. Responsible for Content

Infection Prevention, Environmental Health and Safety, Microbiology, Occupational Health Services

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Attachments

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01: UNC Hospitals AFB Laboratory Procedures

02: Summary of Interpretation of Skin Tests

03: Protocol for Early Identification of Patients with Suspected Tuberculosis - Outpatient Care Services

04: Procedure for Instituting Airborne Precautions When the Patient is Housed in a Shared Suite

Approval Signatures

Step Description	Approver	Date
Policy Stat Administrator	Judith Strubin: Mgr Program-IP	08/2026
	Emily Vavalle: HCS Exec Dir Infection Prevention	08/2026
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Applicability

UNC Medical Center

Standards

No standards are associated with this document

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