

Current Status: *Active*

PolicyStat ID: 5874053



Origination:	08/2006
Effective:	01/2019
Last Approved:	01/2019
Last Revised:	11/2018
Next Review:	01/2022
Owner:	<i>Sherie Goldbach: Infection Prevention Registrar</i>
Policy Area:	<i>Infection Prevention</i>
Policy Tag Groups:	
Applicability:	<i>UNC Medical Center</i>

Tuberculosis Control Plan

I. Description

Describes the policies and procedures to prevent healthcare personnel (HCP) from exposure to tuberculosis

II. Rationale

OSHA regulations require the employer to provide a written exposure control plan that covers the facilities' policies and procedures to prevent transmission of tuberculosis in the workplace. HCP including healthcare personnel (HCP) of UNC Healthcare may have duties in more than one facility; therefore, this exposure control plan is designed for all HCP including healthcare personnel (HCP) of UNCH, Ambulatory Surgical Center (ASC), Outpatient Care Services, Campus Health Services, School of Dentistry, Wakebrook and Hillsborough Hospital (HBH). The Tuberculosis Control Plan is available on the UNC Health Care intranet (under Infection Control Policies) and on the University's website (under Environment, Health and Safety).

III. Policy

A. Management of Patients with Known or Suspected Tuberculosis

1. Recognition of Patients with Potential Tuberculosis

- a. A diagnosis of tuberculosis should be considered in patients of any age with persistent cough (>3 weeks duration) or other signs and symptoms compatible with tuberculosis such as complaints of hemoptysis, night sweats, weight loss, anorexia, or fever. All patients who have TB in their differential diagnosis should be placed on Airborne Precautions until active tuberculosis is excluded.
- b. Groups at high risk for tuberculosis include the following: HIV-infected persons, immigrants from countries with high endemic rates of tuberculosis, migrant farm workers, persons who have been incarcerated, immunocompromised persons (e.g., solid organ transplant), persons with a history of a positive tuberculin skin test or positive Interferon-Gamma Release Assays (IGRA), close contacts of persons who have had active tuberculosis including infants born to mothers with active TB disease, and homeless persons. In North Carolina, the prevalence of tuberculosis increases with age (especially high with persons over age 60) and is higher in non-whites and males.

- c. Appropriate diagnostic studies should be conducted on all patients with signs or symptoms consistent with tuberculosis. Such studies may include a tuberculin skin test, IGRA, sputum for mycobacterial smears and cultures, chest radiography, and chest tomography and/or chest MRI. Additional tests may also be required including: bronchoscopy, induced sputum for AFB smear and culture, gastric aspirate for AFB (pediatric patients), and/or bone marrow biopsy.
- d. All patients with a positive tuberculin test, IGRA or chest radiography suggestive of infectious tuberculosis should be evaluated for active tuberculosis (and placed immediately on airborne precautions). It will be the responsibility of all Clinic Directors, the Director of Emergency Medicine, and inpatient Clinical/Medical Directors to develop a mechanism for screening of all such patients for active tuberculosis.

2. Laboratory Diagnostic Studies

- a. The UNCMC Clinical Microbiology Laboratory will utilize the most rapid or sensitive methods available for the detection and identification of mycobacteria (e.g., fluorescent microscopy for AFB smears).
- b. Smears sent to the UNCMC Clinical Microbiology Laboratory will be processed according to lab policy. Smears are available Monday-Friday. Specimens received after 8:00am are processed the following day. When collecting AFB smears, 3 samples should be collected 8 hours apart. The laboratory does not routinely 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, so a negative result may not be used to rule out TB. Aspirates should be collected on 3 separate mornings.
- c. All first time positive smears and positive cultures for *M. tuberculosis* will be reported immediately to the requesting physician and to Hospital Epidemiology via their electronic surveillance system.
- d. All patients with *M. tuberculosis* will have their isolate tested by the UNCMC Clinical Microbiology Laboratory for first-line drug susceptibilities. (INH, Rifampin, PZA, and Ethambutol). Results are generally available 2-3 weeks after an isolate is obtained. Any resistant isolate is sent to the NC State Laboratory of Public Health for confirmation and testing of second line drugs.
- e. PCR testing is routinely performed on all first time smear-positive respiratory specimens, including specimens from patients with cystic fibrosis (CF). PCR is NOT routinely performed on smear-negative respiratory specimens or extra-pulmonary specimens independent of smear results, but can be requested by clinician or Infection Preventionist (IP)
- f. TB PCR is performed by the UNCMC Clinical Microbiology Laboratory Monday – Friday. Results are generally available the same evening as the smear result. The sensitivity of TB PCR for smear-positive respiratory specimens is 97-100% whereas the sensitivity for one smear negative respiratory specimen is 72%. The sensitivity increases to 86% when testing two smear negative respiratory specimens.

3. Inpatients Requiring Airborne Isolation

- a. All patients with known or suspected pulmonary tuberculosis, laryngeal TB, or miliary TB.
- b. Patients with known or suspected TB abscesses that are open/draining or who have wound drains in place (e.g., JP).
- c. All patients with a gastric aspirate that is smear or culture positive for AFB.
- d. Patients with cystic fibrosis (CF) or known chronic pulmonary disease and a first AFB positive isolate (smear or culture) must be placed on Airborne Precautions until TB is excluded.
- e. Patients with MDR-TB or XDR-TB will remain on Airborne Precautions throughout their hospitalization because of their tendency for treatment failure or relapse.
- f. Patients with previously diagnosed pulmonary or laryngeal **smear-negative** TB readmitted to UNCH should be placed on Airborne Precautions until they have been on treatment for a minimum of 2 weeks **and** demonstrated clinical improvement.
- g. Patients with previously diagnosed pulmonary or laryngeal **smear-positive** TB readmitted to UNCH should be placed on Airborne Precautions until:
 - i. They have two consecutive sputa collected at least 8 hours apart which are smear negative and at least seven days since the last positive sputum smear; and
 - ii. They have been compliant for 2 weeks on tuberculosis medications to which the organism is judged to be susceptible; and
 - iii. There is evidence of clinical response to tuberculosis treatment. (From NCAC41A)
- h. Pediatric patients with suspected or confirmed TB should be evaluated for potential infectiousness as are adults on the basis of symptoms, sputum AFB smears, radiographic findings, and other criteria. Those with pulmonary or laryngeal TB will be placed on Airborne Precautions until they are determined to be non-infectious. Consultation with a pediatric infectious disease specialist is recommended when TB in a child is suspected.

4. Inpatients that do not Require Airborne Precautions

- a. If a patient has a recent history (<1yr) of Nontuberculous Mycobacteria (NTM), isolation is not needed if the attending physician does not suspect or treating the patient for TB. If MTB 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 and chronic lung disease patients.
- b. For CF patients with a history of NTM, airborne precautions are not needed if the attending physician does not suspect or treat the patient for TB. If MTB is suspected or in the differential diagnosis the patient must be placed on airborne precautions until diagnosed or ruled out.
- c. For patients that have 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. For patients with pleural TB who have negative sputum/respiratory smears, it is considered extrapulmonary and Airborne Precautions are not needed unless the patient has a drain in place.
- e. For patients with extrapulmonary TB that do not have any pulmonary involvement (i.e., ruled out by 3 negative respiratory specimens) and do not have a drain in place.

5. Isolation Guidelines

- a. Airborne Precautions may be initiated by any physician or an Infection Preventionist (IP Department of Hospital Epidemiology). In addition, Airborne Precautions may be initiated by a triage nurse, any inpatient nurse, a physician's assistant or nurse practitioner (such isolation orders shall be valid for 24 hours during which time a physician must co-sign the orders or enter an order for discontinuing isolation).
- b. Medical care providers ordering Airborne Precautions and nursing staff will educate all patients placed on Airborne Precautions emphasizing the need to adhere to the UNCH Isolation Precautions guidelines.
- c. Patients who refuse to adhere to Airborne Precautions will be reported to the Orange County Health Department. When applicable, legal action will be taken to enforce appropriate Airborne Precautions. UNCH Security 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 tuberculosis should not ambulate outside the isolation room for therapeutic reasons. Hospital Epidemiology must approve any exceptions to this policy.
- e. Patients with known or suspected TB will be placed in Airborne Isolation rooms that meet the CDC recommendations. A list of rooms that meet CDC recommendations for Airborne Isolation rooms can be found on the Infection Control Website: **Airborne Isolation Room Locations** (Refer to Appendix 10: Airborne Isolation Rooms that Meet CDC Recommendations.) Ventilation requirements will include: private room, negative air pressure (corridor positive with respect to the room), >6 air changes per hour (≥ 12 air changes per hour for new construction), and direct out-exhausted air. The corridor door must remain closed except when entering or exiting the room. Negative pressure should be monitored with a tissue test and recorded at least daily by nursing personnel in EPIC while the room (inpatient, outpatient or procedural areas) is being used for Airborne Precautions. For isolation rooms with an anteroom, check the air pressure at the inner door of the anteroom. If positive or neutral pressure is detected in an Airborne Isolation Room, Maintenance will be notified to correct the problem as soon as possible. While waiting, a portable 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 attending physician, moving the patient to an approved isolation room is medically contraindicated, the Medical Director (or designee) of Hospital Epidemiology must be consulted. Hospital Epidemiology 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. An approved portable HEPA filter unit will be placed in a single room in the following areas when occupied by a patient with known or suspected tuberculosis: certain Intensive Care Unit rooms (when all TB isolation rooms are occupied by patients requiring Airborne Precautions). Personnel entering such rooms will wear personal respiratory protection devices.
- h. Approved portable HEPA filter units will be placed in a single room in the following areas when occupied by a patient with known or suspected tuberculosis: Operating Room (including Labor and Delivery Operating Rooms), Diagnostic Procedure Areas . Personnel entering such rooms will wear personal respiratory protection devices. See special considerations for Operating Rooms and Procedural rooms.
- i. Diagnostic procedures should be performed in the Airborne Precautions room whenever possible. If a required diagnostic procedure cannot be done in the Airborne Precaution room (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. The person(s) transporting the patient does not need to wear respiratory protection outside of the isolation room as long as the patient wears a mask. Notify Hospital Epidemiology if the patient is unable to wear a mask, allowing an IP to assist with planning optimal infection control during the time this 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 en route).
 - iii. If the patient being transported requires mechanical or bag-mask ventilation, a heat moisture exchanger with filter (HME) will be applied to the exhalation port on the ventilator or on the endotracheal tube connector respectively.
 - iv. The receiving area will be notified prior to transport by personnel at the site of the patient's origin that the patient is on Airborne Precautions. Airborne Precautions can be seen in EPIC by viewing the information in the patient header in the "Isolation" field.
 - v. Rooms used by suspect TB patients that are *not* airborne isolation rooms (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 3 ½ hours after the suspect patient leaves. Normal regular cleaning can be performed in this room after the 3 ½ hour closed time.
 - vi. MRI rooms have a minimum of 6 air exchanges per hour (ACH); therefore these MRI rooms need only be closed for a minimum of 70 minutes, or one hour and 10 minutes. Normal cleaning can be performed in the MRI rooms after the 70 minute closed time.
- j. If the patient must temporarily leave the Airborne Precautions room or upon discharge of

the patient from the room, the door must be kept closed for a minimum of 30 minutes prior to anyone entering without wearing a respiratory protection device. The 30 minutes time period will allow the room ventilation system to remove any droplet nuclei.

- k. **Pregnant patients** with known or suspected pulmonary TB, laryngeal TB, or miliary TB on Airborne Precautions may be allowed to 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, N95 respirators for healthcare personnel (HCP)). As soon as possible 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 tuberculosis who have met the criteria to no longer require Airborne Precautions may breastfeed. Women with tuberculosis 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 a breast abscess, but if a breast abscess caused by *M. tuberculosis* is present, breastfeeding should be discontinued until the mother no longer is contagious.
 - i. Infants born to mothers with known or suspected active pulmonary TB must not be housed or visit with mother, mom may pump milk and baby can be fed pumped breast milk by care giver other than mom. If mom has TB mastitis she may pump to maintain supply but milk must be discarded.
- m. **Prisoners:** When a patient from a prison is on Airborne Precautions, the accompanying Department of Corrections personnel will wear a respirator while they are present in the patient's room. Fit testing is the responsibility of the Department of Corrections.
- n. Refer to Appendix 6 for the "Procedure for Instituting Airborne Precautions When the Patient is housed in a Multi-Bed Room."

6. Isolation: Visitors

- a. Patients with known or suspected TB will be allowed limited visitors. All visitors must be able to comply with Airborne Precautions. All visitors must wear surgical masks. They should be instructed on use of the surgical mask, as well as Airborne Precaution rooms. This includes 24-hour caregivers (persons without recompense and who are not UNCH healthcare personnel (HCP) or volunteers) and other visitors who may stay in adult or pediatric patient rooms for extended periods 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 written evidence that they do not have active TB. A physician or the local health department must provide the verification. Visitors refusing to obtain the TB evaluation and verification of absence of disease will be barred from admittance to all UNCH facilities. UNCH Security 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 (parents or legal guardians who live with the pediatric patient) will be screened for symptoms of TB (e.g. cough for greater than 3 weeks fever, night sweats, hemoptysis, weight loss) and obtain written verification they do not have TB.

- i. Written verification should include: 1) absence of the following symptoms: persistent cough (≥ 3 weeks duration), hemoptysis, night sweats, weight loss and fever; 2) a negative Mantoux TST(Tuberculin Skin Test)/IGRA read by a trained HCP; and 3) a negative chest radiograph if indicated.
- ii. It will be at the discretion of Hospital Epidemiology Medical Director and/or Peds ID Attending if screening will be required for the primary care givers without symptoms if the pediatric patient has unconfirmed TB with a very low likelihood. While ruling out TB on a child, we can assess (with the direct input from pediatric infectious diseases) the likelihood of possible Tuberculosis in the pediatric patient until lab results are available. If a low likelihood, the parent/family may wear a mask and a symptom screen only will be conducted, if a high likelihood or positive symptoms in the parent/family member, then the parent/family would need to have chest x-ray and testing
- iii. If primary caregiver cannot obtain this verification through their own primary care provider or local health department, with the consent of the child's physician, they may register as a UNC Hospitals patient and have the child's physician order a "Quantiferon TB Gold" which can be obtained as a lab check-in test (Main Phlebotomy, 1st floor Main Hospital or Women's and Children's Phlebotomy, Ground floor Children's Hospital). The child's physician 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.
- iv. Primary caregivers (e.g., legal guardians/parents who live with the child) may visit before the evaluation has been done but they must wear a surgical mask at all times when outside the child's room until they have documentation that they do not have active TB. The primary care giver must initiate their TB evaluation within 3 working days of the child's admission.
- v. The primary caregivers (e.g., legal guardians/parents who live with the child) will not be required to wear a mask in the patient's room for the duration of the patient's admission.
- vi. If a primary care giver, household member, or other close contact is found to have active TB, they may not visit until they have written documentation that they are no longer infectious. Their local health department or an attending physician of UNCH must provide the verification. If the primary care giver 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 care giver's local health department contact the Orange County Health Department.

7. Discontinuation of Isolation

- a. Discontinuing isolation using these criteria requires the approval of the patient's attending physician.
- b. For patients with suspected tuberculosis, Airborne Precautions may be discontinued: when a diagnosis other than pulmonary tuberculosis is confirmed **AND** tuberculosis is no longer considered in the differential diagnosis OR when three sputum smears obtained ≥ 8 hours apart and are all reported as negative by the Microbiology Laboratory **AND** tuberculosis is no longer considered in the differential diagnosis. Each failed sputum induction equals one negative smear. The sputum inductions must be done at least 8 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. Also with patients \leq age 3, Airborne Precautions can be discontinued if a BAL is negative for AFB by smear **AND** TB is no longer in the differential diagnosis list.
- c. For persons with suspected or known active pulmonary or laryngeal tuberculosis who are initially sputum smear negative, Airborne Precautions may be discontinued once the patient has been treated for a minimum of 2 weeks and has demonstrated clinical improvement.
- d. For patients with an AFB positive smear or a culture positive for AFB/mycobacteria, Airborne Precautions may be discontinued when the cultures are finalized as negative for *M. tuberculosis*.
- e. Airborne Precautions may be discontinued if the TB PCR is negative for MTB on smear positive respiratory samples providing the clinical picture and chest radiographs are not highly suggestive of TB **AND** 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.
- f. Patients with previously diagnosed pulmonary or laryngeal smear-positive TB should remain on Airborne Precautions until:
 - i. They have two consecutive sputum specimens - collected at least 8 hours apart which are smear negative; and
 - ii. They have been compliant for 2 weeks on tuberculosis medications to which the organism is judged to be susceptible; and
 - iii. There is evidence of clinical response to tuberculosis treatment. (From NCAC41A)
- g. For pediatric patients, the specimens may be gastric aspirate when induced sputum cannot be obtained.
- h. For infants the patient should have
 - i. Clinical improvement
 - ii. 2 weeks of appropriate empiric therapy
- i. For persons with suspected or known active pulmonary or laryngeal tuberculosis who are initially sputum smear negative, airborne precautions may be discontinued once the patient

has been treated for a minimum of 2 weeks and has demonstrated clinical improvement.

- j. For patients with soft tissue open/draining lesions with a positive smear for AFB, Airborne Precautions may be discontinued when the cultures are finalized as negative for *M. tuberculosis* or the lesions have closed, any drains have been removed and the lesion is no longer draining.
- k. 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:
 - i. They have two consecutive TB samples collected at least 8 hours apart which are negative; and
 - ii. They have been compliant for 2 weeks on tuberculosis medications to which the organism is judged to be susceptible; and
 - iii. There is evidence of clinical response to tuberculosis treatment **or**
 - iv. The drain is removed and the wound is healed
- l. For patients with soft tissue open/draining lesions culture positive for *M. tuberculosis*, Airborne Precautions may be discontinued when the patient is on 2 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.
- m. For patients with extrapulmonary TB (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: a) a confirmed appointment with the provider (e.g., the local health department) who follows the patient until cure, b) sufficient medication to take until the outpatient appointment (health department provides free medication; patients should not be instructed to purchase any), c) placement into case management of the local health department of the patient's county of residence, and d) evaluation of possible immunocompromised persons or children ≤ 5 years old in the home. (Note: Since appointments at UNC clinics can only be made during normal business hours, patients being discharged on weekends or late shifts 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 tuberculosis isolation capabilities or to home. They should not be discharged to home if there are persons in the household who are at high risk for acquiring active tuberculosis (i.e., children less than or equal to 5 years of age, persons infected with HIV, or persons who are immunocompromised). Patients going home in a public conveyance (e.g., van) 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 will be the responsibility of the physician who writes the discharge orders to adhere to these provisions.

9. Reporting (refer to the Infection Control Policy: "Reporting of Communicable Diseases")

- a. Clinical Settings on the UNC Campus
 - i. Physicians are responsible for completing the **Communicable Disease Report Form** and ensuring that it is sent to Hospital Epidemiology (via tube system #704, CB 7600, or Fax # 984-974-7719). Hospital Epidemiology will send the form to the Health Department. The form is accessible on the **Infection Control Intranet Website**.
 - ii. Hospital Epidemiology personnel will contact the patient's local health department (by telephone) once a patient is known to be infectious with *M. tuberculosis*.
 - iii. All positive cultures and smears for *M. tuberculosis* will be reported by the Clinical Microbiology Laboratory by fax to the North Carolina State Division of Epidemiology on the day of recognition.
- b. Outpatient Care Services
 - i. Physicians are responsible for notifying the health department of the county where the TB patient resides. This should be done by telephone within 24 hours.

10. Management of Patients in Outpatient Care Services

- a. For further details, please follow the link to the [Ambulatory Care Clinical Services policy](#).

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 personnel are present. A patient with known or suspected tuberculosis 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 Airborne Isolation room in PACU. Personnel present when operative procedures are performed on patients who may have infectious TB should wear a respirator rather than a standard surgical mask. 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 OR room).
- b. **Autopsy Room** - The autopsy room should be at negative pressure with respect to adjacent areas, with room air exhausted directly to the outside of the building. Twelve (12) air changes per hour (ACH) are recommended. Respiratory protection devices should be worn by personnel while performing autopsies on patients who were known or suspected to have TB. A tissue test should be done to confirm negative pressure.
- 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 HCP 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 to have 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. Alternatively, personnel will use TB respirators. The ambulance/helicopter windows should be kept down as much as possible to allow for dilution ventilation. 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 skin testing and care of OB patients with suspected/known TB is outlined in the OB algorithms from the **UNC Center for Maternal and Infant Health website**.
- f. **Home Health/Hospice** – Home Health and Hospice 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 (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 who may have active tuberculosis unless absolutely necessary.
- c. All cough-inducing procedures performed on patients who may have infectious tuberculosis must be performed in a room meeting the ventilation requirements for Airborne Precautions. In the outpatient setting, Airborne Isolation rooms are available in the Infectious Disease Clinic, Pediatric Specialty Clinics, Pulmonary Clinic, and ED. Refer to **Airborne Isolation Rooms** for a complete list of Airborne Precaution rooms within UNCH.
- d. Healthcare personnel (HCP) will wear a respirator when present where cough-inducing procedures are being performed on patients with known or suspected infectious tuberculosis.
- e. After completion of cough-inducing procedures, patients with known or suspected infectious tuberculosis (including patients at high risk of tuberculosis such as HIV-infected patients) should remain in the isolation room and not return to common waiting areas. They will be given tissues and instructed to cover the 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 Airborne Isolation room, 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 the patient leaves the room, at least 30 minutes should pass before the room in which a cough-inducing procedure has been performed on a patient with known or suspected infectious tuberculosis is utilized for another patient or entered by staff not wearing N-95 respirators.

B. Risk Assessment and Department Responsibilities

1. Risk Assessment

- a. A retrospective evaluation of a sampling of patients from whom *M. tuberculosis* is isolated will be conducted by Hospital Epidemiology periodically. A written assessment, including an analysis of any nosocomial exposures, review of factors leading to exposures, and recommendations for preventing exposure in the future, will be provided to the Hospital Infection Control Committee.
- b. On an ongoing basis, UNC Health Care Occupational Health Service (OHS) will maintain records of the results of evaluations of all UNCH healthcare personnel (HCP) and UNCH volunteers (except students) with occupational exposure to *M. tuberculosis*. On an annual basis, OHS will provide a report to the Hospital Infection Control Committee that will include the number of UNCH healthcare personnel (HCP) with occupational exposure, number of persons converting their TST/IGRA after a known exposure, and any persons who have acquired active tuberculosis.
- c. On an ongoing basis, OHS will maintain records of the results of all TST/IGRAs placed for screening purposes (new healthcare personnel (HCP), routine screening of current healthcare personnel (HCP)). On a yearly basis, OHS will provide a written breakdown of the TST/IGRA positive rate (positive TSTs/total TSTs) to include TST/IGRA conversion incidence by hospital location of employment or job description (whichever is more appropriate) to the Hospital Infection Control Committee.
- d. For UNC-CH healthcare personnel (HCP), University Employee Occupational Health Clinic (UEOHC) will maintain tuberculosis-screening records.

2. Departmental Responsibilities

- a. Departments with clinical staff have Departmental Safety Coordinators (DSCs) who attend quarterly training from Environmental Health and Safety may include updates/revisions to the TB Control Plan. The DSCs 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 DSCs will receive monthly JC/OSHA compliance reports. The DSC will verify the

accuracy of the report, assign new healthcare personnel (HCP) to the appropriate work unit, and ensure healthcare personnel (HCP) take the University's on-line training. UNC-CH healthcare personnel (HCP) can view their compliance status at any time through the EHS Compliance Portal (<https://itsapps.unc.edu/EHS/>).

- d. Contracted healthcare personnel (HCP) 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.

C. Education

1. Training Requirements

- a. All HCP who have the potential for exposure to *M. tuberculosis* and all healthcare personnel (HCP) located in healthcare facilities will receive education about TB that is appropriate to their job category. Training shall be conducted before initial assignment and annually. Training can be accomplished in a variety of mechanisms. For healthcare personnel (HCP) of UNCH (hospital), this training is provided through the Learning Made Simple (LMS) system.
- b. For UNC-CH (university) healthcare personnel (HCP), training is provided through the University's on-line self-study course. New UNC-CH healthcare personnel (HCP) 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 the education of HCPs:

2. Elements of Education

- a. Education will cover the following topics as outlined in the NC Tuberculosis Control Manual:
 - i. Tuberculosis (TB) transmission, signs and symptoms
 - ii. The purpose and interpretation of the TB skin test (TST)
 - iii. The principles and practices of TB infection control, including airborne precautions
 - iv. Preventive and curative TB treatment
 - v. HIV as a risk factor for developing TB
 - vi. The importance of personal respiratory protection
 - vii. TB reporting and confidentiality requirements

D. Occupational Health Responsibilities

1. Occupational Health Coverage

- a. The following healthcare personnel will be evaluated by the UNC Hospital (UNCH) Occupational Health Service: UNCH healthcare personnel (HCP), house staff (physicians), volunteers and others that UNCH's OHS contracts with to provide these services.

- b. University personnel will receive services from University Employee Occupational Health Clinic (UEOHC).
- c. All UNC students who obtain clinical experience at UNC clinical facilities shall receive their required initial screening through Campus Health Services (CHS) or another approved healthcare facility (e.g., health department or a primary care physician's office). The annual screening for UNC students who have had a positive TST will be conducted at Campus Health Services. UNC students with potential exposures will also be evaluated at Campus Health Services. If the student is on an away clinical rotation, the student will follow the recommendations of the occupational health team at that medical facility. However, the student must still contact the CHS physician on duty to help ensure all the necessary steps are done and if necessary, have the student follow up with Campus Health Services.
- d. HCP who are contracted receive occupational health screening from their agency. All contract personnel 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 Hospital department hiring these healthcare personnel (HCP) to assure compliance with this policy.
- e. 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, annual fit-testing and exposure evaluations. Within the University, this is a joint responsibility of UEOHC and the UNC Department of Environment, Health and Safety.

2. Evaluation of newly hired Health Care Personnel (HCP) for latent and/or active Tuberculosis

- a. All HCP will be evaluated prior to New Employee Orientation (NEO) or by OHS at NEO for symptoms of latent and/or active tuberculosis. The assessment and treatment of latent and active tuberculosis will be guided by the NC Tuberculosis Policy Manual (Tuberculosis Control, Epidemiology, and Communicable Disease Section, HHHS, 2010) and by the ATS/CDC guideline. When the NC and CDC guidelines conflict, the CDC guideline will be followed unless required by Law.
- b. New hire and annual TB screening; prior to New Employee Orientation (NEO) or by OHS at NEO all new healthcare personnel (HCP) will be evaluated for tuberculosis by the following methods:
 - i. Questionnaire regarding symptoms
 - ii. Obtain history of 2 step testing done within a 12 month period of time (may be at any time before employment). Document the year testing was completed.
 - iii. Placement of a tuberculin skin test unless TST or IGRA was obtained within previous 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.
 - iv. If no history of 2 step testing and no TST/IGRA done within 12 months of hire, OHS will perform 2 step TST.
 - v. For foreign born HCP (if applicable), obtain history of BCG vaccine, previous TST

results, CXR documentation and/or treatment for LTBI.

- c. HCPs, who have received BCG vaccine will be tested with a TST and a positive TST will be further tested with an IGRA (interferon-gamma release assays) unless they have documentation of a previous IGRA. The IGRA is the preferred method of testing for HCP who have a known or possible past history of BCG vaccine. However, any HCP who has had BCG and has a negative TST will continue to have TST for TB evaluation.
 - i. Annual TST will be offered to all current healthcare personnel (HCP) upon request.
 - ii. Annual IGRA will be offered to all current healthcare personnel (HCP) with past positive TB history or IGRA done at baseline.
 - iii. Contraindications to TST include the following:
 - Immediate hypersensitivity to a previous TST.
 - Written verification of a previous TST with ≥ 10 mm induration, and history of therapy for LRTI or active tuberculosis
 - Pregnancy is NOT a contraindication to a TST.
 - iv. There are two kinds of tests that can be used to help detect TB infection – the TB Skin Test (TST) and the TB blood test (IGRA - also called Interferon-Gamma Release Assays). A positive TB skin test or TB blood test only indicates that a person has been infected with TB bacteria. It does not indicate whether the person has latent TB infection (LTBI) or has progressed to TB disease. Other tests, such as a chest x-ray and sputum testing are needed to evaluate whether the person has TB disease.
 - v. The TB blood test measures how the immune system reacts to the bacteria that cause TB. Only one visit is required to draw the blood for testing.
 - vi. An IGRA blood test is scheduled and collected through OHS or by Phlebotomy Service and is processed by McClendon Lab services 7 days per week.
 - vii. BCG, or Bacilli Calmette-Guerin, is a vaccine for TB disease. Many persons born outside of the United States have been BCG-vaccinated. 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, TB blood tests are not affected by prior BCG vaccination and are not expected to give false-positive result in persons who have received prior BCG vaccination (Please see Appendix 8 and 9)
 - viii. For University HCP, TSTs are placed and read by UEOHC unless specific arrangements, approved by the UNC Department of Environment, Health and Safety (UNCEHS), are made
 - ix. All HCP will be counseled, at the time of initial evaluation, regarding the need to report all tuberculosis exposures to their Occupational Health Provider (OHP) and if they need to obtain yearly TST. All HCP 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, and unexplained weight loss.
 - x. HCP with a reactive TST of unknown duration, a TST > 5 mm, positive IGRA, past history of INH prophylaxis, or symptomatic for possible TB will be evaluated for the

possibility of active tuberculosis. Such an evaluation may include a baseline chest radiograph and the collection of 3 sputa for AFB smear and culture based on the presence of symptoms. Sputa will be collected in the ID Clinic, in the Pulmonary Clinic in the ACC, or any other room meeting airborne isolation standards.

- xi. HCP with reactive TST or positive IGRA will be offered HIV testing.
- xii. HCP with suspected active tuberculosis will be relieved from work until active disease is ruled out by appropriate medical and microbiologic studies. The HCP will be counseled regarding the infectivity of active tuberculosis and the risk to others. Grounds for removing a HCP from work may include, but not be limited to, the development of signs or symptoms suggestive of active tuberculosis and/or a chest radiograph consistent with active tuberculosis.
- xiii. In accordance with the Safety Policy: "**Respiratory Protection Program**", HCP must be assessed for the ability to wear respiratory protective devices. For UNCH personnel, this is the joint responsibility of OHS and the Environmental Health and Safety Department. For University personnel, the respiratory protection program is the responsibility of UEOHC and the UNC Department of Environment, Health and Safety.
- xiv. Annual fit testing for N-95 respirators is required by Federal OSHA law. Healthcare facilities should be compliant with current OSHA regulations.
- xv. Evaluation of the Pregnant Employee
 - TB testing is recommended for all pregnant women
 - Pregnancy is not a contraindication to placement of a TST or a collection of IGRA. The same TST placement guidelines will apply to the pregnant HCP as apply to the non-pregnant HCP.
 - Pregnant healthcare personnel (HCP), if requesting counseling, will be notified that tuberculosis may progress more rapidly in pregnant individuals.
 - HCP who meet the recommendations for therapy of latent tuberculosis infection (LTBI) or require therapy for active tuberculosis will be handled on an individual basis in conjunction with the patient and their primary physician. INH and rifampin have been demonstrated to be safe in pregnancy by large-scale field trials. There is no evidence that these agents cause infertility, fetal loss, or are teratogenic or oncogenic. Therefore, in general, pregnant HCP who meet the criteria for therapy of LTBI will be counseled to undergo such therapy. Pregnant females with active tuberculosis will be counseled to undergo appropriate therapy and cannot work until no longer deemed infectious and cleared by OHS.

3. Screening of Exposed HCP (See Appendix 11)

- a. Identify and notify exposed HCP.
 - i. Records of all patients from whom *M. tuberculosis* (MTB) is isolated will be reviewed by Hospital Epidemiology to ascertain that proper infection control procedures were maintained throughout hospitalization and during outpatient visits. In the event that HCP or other patients experienced respiratory exposure to an infectious patient or

HCP, every attempt will be made to notify exposed HCP and patients. Hospital Epidemiology (HE) will notify supervisors of the potential exposure for their personnel, when help is needed identifying possibly exposed HCP. Hospital Epidemiology will notify the patient's physician if a patient was exposed. It will be the responsibility of an exposed patient's primary UNC physician to notify an exposed patient and arrange for appropriate follow-up. The local health department will be notified by HE of positive TB culture results of HCP and source patient information. Evaluation of community exposures will be considered the responsibility of the local health department.

- ii. In the event that it is difficult to precisely define those who are potentially exposed (e.g., 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 Director of Occupational Health and Hospital Epidemiology.
- iii. Hospital Epidemiology 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. Hospital Epidemiology will notify University Employee Occupational Health of possible nosocomial exposure for University personnel (including names, if documented on the medical record).
- v. Hospital Epidemiology will notify the Orange County emergency medical service of possible nosocomial exposure of their HCP while performing patient transport to UNCH. It will be the responsibility of the EMS providers to contact the individuals and arrange appropriate evaluation. EMS personnel outside of Orange County will be notified by their county Public Health Department.
- vi. Hospital Epidemiology will notify the department employing an outside contractor or outside student agency of possible nosocomial 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 HCP by Occupational Health Services:

a. Post Exposure Evaluation

- i. All HCP (unless concentric circle approach used) who meet the definition of exposure to a person with active TB will be offered evaluation in OHS. Contact of HCP and/or managers will be by Hospital Epidemiology. HCP will be advised to follow-up with their OH provider. Exposure evaluation consists of screening questionnaire, 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 OH Medical Director or designee.
- ii. Anergy testing will not be routinely performed. It may be performed at the discretion of

the OH Medical Director.

* Routine testing with both TST and IGRA is **not** recommended. However, results from both tests might be useful in the following situations:

- When the initial test is **positive**
- Additional evidence of infection is required to encourage acceptance and adherence (e.g. foreign-born HCP who believe their positive TST is due to BCG). A positive IGRA might prompt greater acceptance of treatment for LTBI as compared with a positive TST alone.

* As with TST, live virus vaccines might affect IGRA test results. However, the effect of live virus vaccination on IGRAs 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.

Criteria for Tuberculin Positivity, By Risk Group		
≥5 mm induration positive	≥10 mm induration positive	≥15 mm induration positive
HIV-positive persons	Recent immigrants (i.e., within 5 yrs.) from high prevalence countries	Persons with no risk factors for TB**
Recent contacts of TB case patients	Injection drug users	
Fibrotic changes on Chest X-ray consistent with prior TB	Residents and HCPs of high-risk conjugate settings: hospitals, long-term care facilities, jails	
Patients with organ transplantation and other immunosuppressed patients	Mycobacteriology lab personnel*	

* Includes HCP working at low, intermediate, or high risk locations (e.g., UNC Hospitals). See Evaluation of Reactive TST.

** Includes HCP working at minimal or very low risk locations (e.g., offsite non-clinical offices, new HCP who have not worked in medical facilities) .See Evaluation of Reactive TST.

E. Treatment of Latent tuberculosis (LTBI)

1. Treatment will be guided by the ATS/CDC guidelines and the NC TB Manual.
 - a. Prior to initiating therapy for LTBI the following will be obtained: focused history and physical, review of symptoms for active TB, check of contraindications (adverse reactions to TB drugs, acute or chronic liver disease, pregnancy), Chest X-ray, and, ALT. Treatment for LTBI will be done only with informed consent of the HCP. A monthly ALT will be obtained in the following

circumstances: baseline ALT ≥ 1.5 x normal, regular use of alcohol (>3 drinks per day), Injection drug use, previous adverse drug reaction to TB drugs, chronic liver disease, use of hepatotoxic drugs (i.e. "statin drugs, anticonvulsant drugs, and some Type 2 diabetic drugs"), HIV-positive, pregnant women, and women in the immediate postpartum period (i.e., 3 months of delivery). If signs or symptoms of hepatotoxicity develop (jaundice, abdominal pain, loss of appetite, etc.) stop all TB medicines and obtain AST. Management of persons with no signs and symptoms of hepatotoxicity will depend on the upper limit of normal (ULN) of the ALT as follows:

- i. ALT <3 times ULN, continue INH
- ii. AST 3-5 times ULN, continue INH if HCP asymptomatic (stop INH if HCP is symptomatic) and repeat AST every 2 weeks as long as ALT remains 3-5 times ULN
- iii. ALT is >5 times ULN, stop INH and consult with the Medical Director
- iv. Acceptable regimens are as follows for HIV negative adult >18 years including pregnant women
 - Regimen 1 (preferred): INH 5 mg/kg (maximum 300 mg) PO once daily for 9 months within a 12 month period of time given concomitantly with pyridoxine (vitamin B6) 50 mg PO once daily OR
 - Regimen 2: Rifampin 10 mg/kg (maximum 600 mg) PO once daily for 4 months
 - HCP who are candidates for D.O.T. (directly observed therapy) will be referred to their local health department.

Comments:

 - Obtain baseline CBC with platelets if regimen 2 is used.
 - Provide B6, 50 mg PO once daily or 100 mg twice weekly with regimen 1.
 - Rifampin is associated with various drug interactions. A drug interaction assessment should be performed prior to initiation.
 - The TB Epidemiologic Record (DHHS 1030) should be signed by HCP for verification of understanding.
 - HCP with a recent seroconversion (within 2 years) will strongly be encouraged to accept treatment for latent tuberculosis. HCPs who refuse therapy will be counseled regarding symptoms of active TB. Such HCP may have a follow-up chest radiograph at 1 year.
- b. HCP with possible or documented active tuberculosis will immediately be relieved from all work activities by their OHP. When indicated, hospitalization will be recommended. Leave from work will be handled according to personnel policies.
- c. All HCP with active tuberculosis will be given anti-tuberculosis therapy based on current CDC recommendations. In general, a four-drug regimen will be used, pending susceptibility testing of the infecting strain. The personnel's OHP is responsible to notify the HD in the county where the HCP resides of the positive TB results so that appropriate community exposures can be investigated. * Directly observed therapy will be done or arranged by the Health Department.

- d. HCP refusing therapy will be relieved of all work activities and reported to the Health Department.
 - e. All HCP with active tuberculosis will be counseled regarding the risk of disease among household contacts. Pregnant healthcare personnel (HCP) will be counseled regarding the risks to their fetus.
2. Return to Work for Healthcare Personnel with Active Tuberculosis
- a. All HCP with recent active tuberculosis must be evaluated by their OHS prior to returning to work.
 - b. Prior to returning to work, the HCP must have all of the following documented:
 - i. Appropriate therapy for at least 2 weeks
 - ii. Clinical improvement
 - iii. Sputum smears consecutively negative x 2 for mycobacteria (If smear-positive initially).
 - iv. Stable or improved chest radiograph
 - c. Immunocompromised HCP
 - i. Counseling via the OHS will be available for immunocompromised healthcare personnel regarding their risks for acquiring tuberculosis.
 - ii. Immunocompromised healthcare personnel will be offered reassignment from areas where patients with *M. tuberculosis* frequently receive care (ID Clinic/Pulmonary units).

F. Engineering Controls

1. Isolation Rooms that Meet CDC Recommendations
- a. Refer to **Airborne Isolation Rooms** for a complete list of Airborne Precaution rooms within UNCH, which is kept by Bed Management, Plant Engineering, and Hospital Epidemiology. Plant Engineering will evaluate the isolation rooms every 12 months to verify ventilation meets the CDC recommendations.
2. Use of Portable HEPA Units / Local Exhaust Ventilation Devices
- a. All cough inducing procedures 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 Precautions two portable HEPA units will be used for cases having known or suspected pulmonary tuberculosis or when a body cavity infected with *M. tuberculosis* is entered or disrupted. The unit will be turned on (highest setting) prior to initiating the procedure. One unit will be placed near the patient's head and one unit will be placed near the entrance door. The unit should be run for 30 minutes following the patient leaving the room.

G. Respiratory Protection

1. All HCP entering an enclosed area of a patient who has known or suspected tuberculosis 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. Such a device should be placed prior to entering the room and removed only after leaving the room. HCP 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.

H. Respiratory Protection Program

1. Assignment of responsibility: UNCH Industrial Hygienist, Department of Environmental Health and Safety will manage the UNCH program. The respiratory protection program for UNC-CH healthcare personnel (HCP) is managed by the UNC Department of Environment, Health and Safety.
2. For UNCH healthcare personnel (HCP), Departmental Safety Coordinators (DSC) will be trained by the Industrial Hygienist to fit test designated healthcare personnel (HCP) within their departments. "Saccharin Taste Test" fit testing will be utilized. Respirator fit testing of UNC-CH healthcare personnel (HCP) will be performed by UEOHC and the UNC Department of Environment, Health and Safety. A quantitative fit-testing method will be utilized for University healthcare personnel (HCP).
3. Fit testing will be limited to personnel who require the use of respirators (e.g., staff who work in an area with airborne isolation rooms). These personnel will be limited to locations where known or suspected patients with TB are most concentrated (Pulmonary/Infectious Disease Service, nursing units and all Bronchoscopy suites). Staff in these areas will be fit-tested annually for an N95 respirator.
4. Medical Screening: HCP will be evaluated to determine whether fit testing is safe. The screening process will be performed utilizing a general screening questionnaire for medical conditions that may compromise the safety of fit testing or respirator use. The questionnaire will be given to all healthcare personnel (HCP) at the time of employment and will be reviewed by the Medical Director of the Occupational Health Provider or his designee. The Medical Director or his designee will identify healthcare personnel (HCP) who need further evaluation, which may include a physical examination, using the Respirator Medical Evaluation and Respiratory Protection Data forms available from OHS. If you are required to use a respirator in your workplace, a medical screening/evaluation is required once, prior to initial fit testing and use. However, the medical evaluation may need to be repeated if you, your supervisor, or your respiratory program administrator recognizes signs or symptoms that may affect your ability to use the assigned respirator. Additionally, if a physician or other licensed healthcare professional (PLHCP), determines that a condition exists you may need another medical evaluation.
5. Fit testing: A fit test is used to determine whether a respiratory protective device adequately fits a particular HCP. Fit tests can detect only the face seal leakage that exists at the time of the fit testing. Face seal leakage can result from factors such as incorrect face-piece size or shape, incorrect or defective face piece sealing-lip, beard growth on a wearer, perspiration or facial oils that can result in face-piece slippage, failure to use all the head-straps, incorrect positioning of a face-piece on a wearer's face, incorrect head-strap tension or position, improper mask maintenance, and mask damage. HCP who fail the fit test will be re-fitted using another type of respirator that meets OSHA requirements. Healthcare personnel (HCP) using N95 respirators for

protection against *M. tuberculosis* are fit-tested initially upon hiring, annually, and as specified by the UNCH Respiratory Protection Program, Policy Number 55, located on the Environmental Health and Safety intranet website.

6. Respirator training shall include: an explanation of the operation, capabilities and limitations of the respirator provided; instruction in how the respirator wearer should inspect, don, fit check, and correctly wear their provided respirator; an opportunity for each wearer to handle the respirator, learn how to don and wear it properly (i.e., achieve a proper face-seal fit on the wearer's face) and check important parts; explanation of why a particular type of respirator was chosen, the need for re-evaluation when there is a change in facial hair or facial structure, how the respirator is properly maintained and stored, and the capabilities and limitations of the respirator provided; and instruction in how to recognize an inadequately functioning respirator.
7. HCP may use either reusable or disposable TB respirators when entering Airborne Precautions rooms. Environmental Health and Safety and the UNC Department of Environment, Health and Safety will provide a list of approved reusable TB respirators for use by HCP. The manufacturer's recommendations regarding care and timing of filter replacements should be followed for reusable respirators. It will be the responsibility of the person using the reusable respirator to adhere to the appropriate maintenance program. In general, reusable respirators should be cleaned after use in a Contact Precaution room, daily or when visibly soiled with an EPA registered hospital disinfectant.
8. Respirator inspection, cleaning maintenance, and storage: Manufacturer's instructions for inspection, cleaning, and maintenance of respirators should be followed to ensure that the respirator continues to function properly. Replacement filters for reusable respirators, that is, Powered Air Purifying Respirators or PAPR will be changed by Environmental Health & Safety (EH&S).
9. Disposable TB respirators may be used as long as the respirator continues to pass the fit check and the exterior surface has not become contaminated. Damaged or visibly soiled respirators should be immediately disposed of in a regular waste receptacle. Respirators should be immediately disposed of following each use when the patient is on Contact Precautions.
10. The Respiratory Protection Program will be evaluated at least annually. Elements of the program that should be evaluated include work practices and acceptance of respirators, including comfort and interference with duties.

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V. Related Policies

[Ambulatory Care Clinical Services policy](#)

Attachments:

- 01: Abbreviations and Definitions
- 02: UNC Medical Center AFB Laboratory Procedures
- 03: Summary of Interpretation of Skin Tests
- 04: Protocol for Early Identification of Patients with Suspected Tuberculosis - Outpatient Care Services
- 05: UNC Health Care Occupational Health Service Respiratory Protection Data Form

- 06: Procedure for Instituting Airborne Precautions When the Patient is Housed in a Multi-Bed Room
- 07: UNCH Occupational Health New Employee TB Screening
- 08: UNCH Occupational Health New Employee Positive TB Screening
- 09: Airborne Isolation Rooms - UNCH Health Care System
- 10: Recommendations for Testing for Latent Mycobacterium Tuberculosis Infection (LTBI)

Approval Signatures

Step Description	Approver	Date
Policy Stat Administrator	Patricia Ness: Nurse Educator	01/2019
	Thomas Ivester: CMO/VP Medical Affairs	01/2019
	Emily Vavalle: Director, Epidemiology	01/2019
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Applicability

UNC Medical Center

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