

**MEDICAL UNIVERSITY OF SOUTH CAROLINA (MUSC)  
FOR PREVENTION OF TRANSMISSION OF TUBERCULOSIS**

**Revised: 9/2007**

## **Purpose and Objective**

This Tuberculosis Control Policy is intended to establish a comprehensive system for preventing transmission of Mycobacterium tuberculosis (MTB) from patient to employee, student or other patients, and from employee, student to patients or other employees or student. An additional purpose of this policy is to establish procedures to ensure uniform compliance with OSHA's Enforcement for Occupational Exposure to Tuberculosis directive. The MUSC policy will ensure employee safety, and will seek to satisfy the regulatory requirements in a manner, which will be minimally disruptive to patient care, as well as be cost effective.

## **Responsibility**

The Administration of the TB control plan will be overseen by the Hospital Epidemiologist and enforced by the Director of Occupational Safety and Health and the Coordinator of Infection Control.

## **Introduction**

From 1985 - 1993, the rate of new cases of TB in the general US population has increased. Rates have been declining since 1993 due to enhanced vigilance. Recently, drug resistant strains of Mycobacterium tuberculosis have become a serious concern and cases of multi-drug resistant tuberculosis (MDR-TB) have occurred. When organisms are resistant to the two most effective drugs available, the course of treatment increases from 6 months to 18-24 months, and the cure rate decreases from 100 to 60 percent or less. Approximately ten percent of normally healthy people who are infected will develop active TB disease within their lifetime.

Mycobacterium tuberculosis is carried through the air in droplet nuclei of 1 to 5 microns in size. These droplet nuclei may be generated when a person with infectious TB disease coughs, speaks, sings, or spits. In an occupational setting, workers in close contact with persons with infectious tuberculosis disease are at increased risk of infection with TB. Certain high hazard

medical procedures, which are cough inducing, may further increase the risk of infection of health care workers.

Occupational exposure to TB is a serious and recognized hazard and certain feasible abatement methods exist. Therefore, OSHA has elected to enforce their General Duty Clause, which states in part:

Each employer shall furnish to each employee employment in a place free from recognized hazards that are causing or likely to cause death or serious physical harm.

### **Implementation**

In order to ensure uniform compliance the following preventative methods are required:

1. Implementation of a protocol for the early identification of individuals with active tuberculosis.
2. Medical surveillance (at no cost to employees) including Employee Health preplacement and two (2)-step TST (Tuberculin skin test) screening, administration and interpretation of TST, and periodic evaluations shall be performed on employees as follows: An initial baseline and two (2)-step TST (Tuberculin skin test) screening at the time of employment for all paid and nonpaid healthcare personnel; all enrolled students to have documentation of TST within 3 months prior to matriculation; at least annually for all healthcare personnel, and enrolled students; annually for all Level I healthcare personnel and Level II personnel who work in low risk areas. Semi-annual testing will be conducted for Level II personnel and students who work in intermediate risk areas. More frequent testing will be conducted if the risk level changes to high risk as defined by the Centers for Disease Control Recommendation. Determination of the "level of risk" and frequency of re-

testing for Level II employees will be determined by a risk assessment performed by Infection Control and Employee Health Services.

3. Evaluation and management shall be provided (at no cost to employees) to personnel with a positive initial skin test, or with skin test conversion on repeat testing, or who are exhibiting symptoms of TB, which will include work restrictions for infectious personnel.
4. Individuals with suspected or confirmed TB disease are to be placed in an AFB (acid-fast bacilli) isolation room. Infection Control will evaluate isolation needs. AFB isolation rooms are to be provided for individuals with suspected or confirmed infectious TB and in areas where high hazard procedures are performed.
5. Identification
  - a. Healthcare personnel and students and/or job classifications having potential exposure to exhaled air of an individual with suspected or confirmed TB disease will be identified by Infection Control and Employee Health. Administration, management and Deans are to identify and provide information to Employee/Student Health, Infection Control and Occupational Safety for occupational exposure and monitoring efforts.
  - b. All Healthcare Workers (HCWs) should receive baseline TB screening upon hire, using two-step TST or a single BAMT to test for infection with M. tuberculosis. After baseline testing for infection with M. tuberculosis, HCWs should receive TB screening annually (i.e., symptom screen for all HCWs and testing for infection with M. tuberculosis for HCWs with baseline negative test results). HCWs with a baseline positive or newly positive test result for M. tuberculosis infection or documentation of previous treatment for LTBI

or TB disease should receive one chest radiograph result to exclude TB disease. Instead of participating in serial testing, HCWs should receive a symptom screen annually. This screen should be accomplished by educating the HCW about symptoms of TB disease and instructing the HCW to report any such symptoms immediately to Employee Health Services/Student Health Services (EHS/SHS). Treatment for LTBI should be considered in accordance with CDC guidelines (39).

6. Training

- a. Training and information will be provided to ensure knowledge of such issues as the hazard of TB transmission, signs and symptoms, medical surveillance and therapy, site-specific protocols including the purpose and proper use of preventive measures.
- b. Training and information will be provided to identified healthcare personnel and students requiring the respiratory protection program as cited in 29 CFR 1910.134.

7. Documentation and recordkeeping for healthcare personnel and students will include tuberculin skin tests, medical surveillance, and evaluation and management of employee exposure and training. Post-employment skin test conversions are recorded on OSHA 300 log.

8. Contract Controls: The following paragraph will be inserted in service contracts, which require the use of contract employees within the Medical Center: “The contractor shall comply with local, county, state and federal health regulations in the conduct of operations. Employees of the contractor must have pre-employment physical evaluations and OSHA training including TB screening which mirror MUSC

evaluations to be conducted prior to the employee's start date at the Medical Center. Follow-up physical evaluations shall be necessary by specific job requirements or law. Employee health records must be maintained on-premise and made available for review by appropriate MUSC Medical Center personnel. Contractors shall abide by MUSC Medical Center Policy as to frequency of employee tuberculin skin testing, and Employee Health Screening criteria and exposure treatment recommendations. The contractor may elect to use the MUSC Employee Health Service provider to provide these services for contract employees at contractor's expense, based upon direct arrangements between the contractor and the MUSC Employee Health Service."

### **TB Exposure Control Plan**

#### I. Identification of healthcare personnel and patients with potential TB exposure:

##### A. Classification of Exposure Levels

##### 1. Level I

All of the following job classifications are considered to have potential exposure to exhaled air of an individual with suspected or confirmed TB disease:

Admitting Personnel

Anesthesia Technicians

Aphoresis Personnel

Autopsy Personnel

Biomedical Equipment Technicians

Chaplains

Child Life

Clinical Associates  
Dental Technicians  
Dentists  
Dieticians  
Dialysis Technicians  
Environmental Services Personnel  
Extracorporeal Technicians  
Medical Examiners  
Microbiology Lab Employees  
Nuclear Medicine Technologists  
Nurses  
Nursing Unit Secretaries  
Occupational Therapists  
Operating Room Technicians  
Paramedics  
Pathologists  
Patient Care Assistants/Technicians  
Patient Focused Care Associates  
Phlebotomists  
Physical Therapists  
Engineering and Facilities Employees  
Physicians  
Physicians Assistants  
Public Safety Officers

Radiologic Technologists

Radiation Therapists

Radiation Dosimetrists

Respiratory Therapists

Researchers

Research Technicians

Social Workers

Student Professional Associates

Students

Transporters

Volunteers

2. Level II

A. Healthcare personnel identified as Level I job classifications who perform the following high hazard procedure (but not limited to these procedures) on an individual with suspected or confirmed TB disease and which has the potential to generate potentially infectious airborne respiratory secretions:

Aerosolized Medication Treatment

Bronchoscopy

Sputum Induction

Endotracheal Intubation

Suctioning Procedures

Autopsies

3. Employees and students who enter rooms housing individuals with suspected or confirmed infectious TB disease.
  4. Emergency medical response personnel or others who transport in a closed vehicle an individual with suspected or confirmed TB disease.
- II. The Hospital Epidemiologist, Clinical Services, the physician professional staff and the Infection Control Department will ensure implementation of methods for early identification of individuals with active tuberculosis. These methods define placement of individuals with suspected or confirmed TB Disease in an AFB (acid-fast bacilli) isolation room (airborne precautions). The AFB isolation room is identified in this plan under engineering controls.
- III. The MUSC Occupational Safety and Health Program in conjunction with MUSC Employee/Student Health Services (EHS/SHS) provider will ensure medical surveillance at no cost to students/employees (refer to Appendix II). This surveillance includes preplacement evaluation, administration and interpretation of TB mantoux skin test. Periodic evaluations will be offered to employees as follows: An initial baseline screening before placement for all MUSC employees, students and volunteers and annually for all healthcare workers; re-testing every six months for employees and students with exposure in high hazard procedure areas as identified as Level II (section I.B.1) and who work in an “intermediate risk” setting (6 or more TB patients per year); re-testing yearly for healthcare personnel identified as Level I and II who work in “low risk” settings (less than 6 TB patients per year). The level of risk will be evaluated by the Infection Control Department and the Employee Health Services for departments and staffs cohorts on a periodic basis (but not less than annually). Records of these risk determinations will be maintained and updated

by EHS and Infection Control and relevant information will be sent to the department managers. Evaluation and management provided at no cost to MUSC employees and students with a positive skin test, or with skin test conversion on repeat testing, or who are exhibiting symptoms of TB, or who have a known unprotected TB exposure which will work restrictions for infectious employees, students and volunteers.

#### IV. **Engineering Controls**

- A. Individuals (patients) with suspected or confirmed TB disease are to be placed in an Airborne Infection Isolation (AII) room. (AII) rooms are to be provided for persons with suspected or confirmed infectious TB and in areas in which high hazard procedures are performed. These rooms must be maintained with:
1. Negative pressure.
  2. At least twelve air exchanges per hour, at least two of which are outside air and are vented to the outside or through a HEPA filter if outside ventilation cannot be achieved. Rooms certified before 2001 are required to have six (6) air changes per hours.
  3. Occupational Safety and Health will check each (AII) isolation room before it houses a patient. Once the room is certified it will be tested daily. Nurses admitting patients will call OSHP (2-3604) when an (AII) isolation patient is placed in the room. OSHP will check room(s) until patient is released from isolation. If these rooms are not being used for AFB isolation, but potentially could be used for such patients, OSHP will check for negative pressure on a monthly basis. A warning sign must be posted outside areas in use for Airborne Precautions.

- B. Use of properly engineered booths is an acceptable alternative to negative pressure rooms in clinic sites and exam rooms.
- C. Treatment room in which patients at high risk for active TB will be evaluated to ensure at least 12 air exchanges per hour are maintained in these rooms.
- D. Common areas in the Radiology Department will have single pass ventilation that exhausts directly to the outside.
- E. Emergency Services waiting areas has single pass ventilation that exhausts directly to the outside. Room 17 is a Negative Pressure Room.
- F. Waiting areas for departments likely to serve patients at high risk for TB (e.g., Radiology, clinic, etc.) must have at least 12 air exchanges and have HEPA filtration for recirculated air if recirculation is unavoidable.
- G. Autopsy areas should have at least twelve air exchanges per hour and be at negative pressure to adjoining areas. Air must be exhausted directly to the outside.
- H. Infection Control, Engineering and Occupational Safety and Health will evaluate the number and location of required facilities and communicate this need to Administration.
- I. New technology (e.g., window unit or portable exhaust systems) should be evaluated to meet specific needs.

**V. Work Practice Controls**

- A. Early assessment and identification of individuals with suspected or active tuberculosis will be accomplished by the history and physical or other admitting assessment performed by the physicians, nurses, or other healthcare personnel. The following information will be obtained;

1. Inclusion in a “high risk group” as defined by the CDC (i.e., homeless; previously incarcerated; drug/alcohol abusers; persons from high rate endemic areas; AIDS or other immune suppressed individuals).
  2. Presence of symptoms as:
    - a. Coughing for more than two weeks
    - b. Fever, night sweats
    - c. Weakness/lethargy
    - d. Unexplained weight loss
- B. Infection control practitioners and patient care personnel will be responsible for placement of individuals with suspected or confirmed TB disease in an AFB isolation room (airborne precautions) when isolation is indicated by the above symptoms and/or such isolation is ordered by the physician.
- C. AFB isolation (airborne precautions) will be indicated when the above symptoms are present and/or when a diagnosis of pneumonia of undetermined etiology is suspected in an AIDS (or otherwise immune suppressed patient) or in a patient without AIDS who has pulmonary infiltrate where TB is considered in the differential diagnosis based on data available at initial evaluation.
- D. AFB isolation (airborne precautions) can be discontinued if TB is ruled out. Otherwise isolation may be discontinued only when the patient is on effective therapy, is improving clinically, or has had three consecutive negative sputum AFB smears collected on different days.
- E. Personnel who are the first point of contact for patients at risk for TB will be instructed to recognize and bring to the attention of the appropriate person, any

person with these symptoms or history (this may be accomplished by reviewing these symptoms with patients as they enter the waiting areas):

1. productive cough for more than two weeks
  2. coughing up blood
  3. night sweats/fever
  4. exposure to a know cause of tuberculosis
- F. TB precautions in the ambulatory setting should include a) placing these patients in a separate area apart from other patients; b) giving these patients surgical masks to wear; and c) giving these patients tissues and instructing them to cover their mouths and noses when coughing or sneezing.
- G. An AFB isolation room (airborne precautions) or negative pressure booth must be used for individuals with suspected or confirmed infectious TB and in areas where high hazard procedures are performed on patients with suspected or confirmed TB.
- H. Patients assessed to be at high risk for TB who are undergoing diagnostic bronchoscopy will have these procedures performed in an area with AFB isolation airflow (negative pressure, 12 air exchanges per hour, direct exhaust of filtration to the outside, etc.) and be held in AFB isolation airflow for two hours for recovery.
- I. If operative procedures cannot be delayed until the patient is no longer infectious, the physician posting the case will be responsible to notify the appropriate personnel in a timely manner to allow them to make required preparations for AFB isolation. Nursing units sending inpatients who are on AFB isolation (Airborne Precautions) must notify the OR of this requirement. Arrangements will be made on an individual basis for scheduling, admitting, surgery, and recovery of the infectious patient.

- J. Patients on AFB isolation (airborne precautions) should not leave their rooms unless absolutely necessary. All procedures should be performed in the isolation room or, if possible, delayed until the patient is no longer infectious. If patients must be transported, isolation requirements must be communicated and the patient must wear a surgical mask (or ventilator outlet should be filtered).
- K. Assessment and isolation issues may differ when pediatric patients are involved. For this reason, the addendum, “Pediatric TB Policy” has been adopted by the Infection Control Committee to be part of this document. See Addendum IV.

## **VI. Personal Protective Equipment**

- A. A NIOSH approve N95 respirator is the minimum acceptable level of respiratory protection and must be worn under the following circumstances:
  - 1. When employee/student enter rooms of patients with suspected or confirmed infectious TB disease.
  - 2. When employees perform high hazard procedures on individuals who have suspected or confirmed TB disease. Examples of high hazard procedures include aerosolized medication (e.g., pentamidine) treatment, bronchoscopy, sputum induction, endotracheal intubation, suctioning procedures; surgery on TB infected tissue, and autopsies.
  - 3. When emergency medical response personnel or others must transport in a closed vehicle, an individual with suspected or confirmed TB disease.
- B. MUSC Occupational Safety and Health Programs will provide guidelines to determine selection of approved respirators in consultation with Infection Control Practitioners.

- C. All Level II employee/students are required to be enrolled in MUSC's Respiratory Protection Program which is outlined in the Occupational Safety and Health Manual.
1. Employee/Student Health Services will determine if pulmonary function testing is necessary to determine employee's ability to use a respirator as cited in 29 CFR 1910-134.
  2. All employees and students who wear a respirator must be medically approved before receiving a respirator. Every employee/student required to wear a respirator will be required to complete a medical questionnaire to determine if they can wear a respirator. (see Appendix A) If a yes answer is given to any questions OSHP will send the employee to Health Services for further evaluation.
  3. Formal fit testing will be conducted by the MUSC Occupational Safety and Health Program.
  4. Healthcare personnel with facial hair such as sideburns, beard or mustache, which protrudes into the sealing surface of the mask, will be refused initial fitting and prohibited from using a fitted respirator. They will be fitted with a powered air-purifying respirator (PAPR). Supervisors/Deans will be responsible for prohibiting their employees/students from wearing a respirator unless they have satisfactorily completed a formal fit test and continue to meet the facial hair limitations for prohibiting these persons from performing tasks which require use of a respirator. Healthcare personnel will also be offered a PAPR if they have medical conditions that prevent them from wearing a N-95.

5. MUSC health care personnel who are required to wear a respirator will be given instructions on how the respirator should be worn, how to adjust it and how to determine proper fit during normal fit testing. This fit testing and instruction will be provided by the MUSC Occupational Safety and Health Program. (Refer to the following training section guidelines). The frequency of fit testing should be guided by a change in risk for transmissions of M. tuberculosis, facial features of the wearer, medical condition that would affect respiratory function, physical characteristics of the respirator and the model or size of the respirator assigned.
6. The proper use of other personal protective equipment, such as PAPRs (powered air-purifying respirators) must be demonstrated by OSH prior to initial use.

VII. **TB Exposure Training**-All supervisors will be responsible for identifying Level I and II personnel; a list of personnel identified as Level II “intermediate” or “high” risk will be provided to the Infection Control Practitioners and the Occupational Safety and Health Division. Appropriate training will be provided by the Infection Control Practitioners, MUSC Occupational Safety and Health Nurses and Industrial Hygienists.

A. Level I Training

All MUSC employees, UMA employees, contract employees, volunteers and students shall receive training and information during orientation to ensure knowledge of such issues as:

Hazards of TB transmission

TB signs and symptoms

Medical surveillance and therapy

Site specific protocols

Purpose and proper use of controls

Risks to immune suppressed individuals

**B. Level II Training**

All MUSC and UMA employees identified as having job classifications as Level II must be enrolled in MUSC's Respiratory Protection Program. All Level II contract employees must comply with MUSC Policy and Procedures:

The respiratory protection training program shall include but is not limited to:

1. Explanation of the respiratory hazard of tuberculosis and outcomes if the respirator is not used properly.
2. Explanation of why engineering and work practice controls are implemented and why respirators are required for protection.
3. Explanation of why a particular type of respirator has been selected.
4. Capabilities and limitations of selected respirators.
5. Explanation of how to wear and how to check for proper fit and operation.
6. Instructions on maintenance.
7. Instructions for fit testing procedure.

**VIII. Documentation and Recordkeeping**

**A. Medical Records**

In accordance with 29 CFR 1910.20 the MUSC Employee and Student Health Services shall establish and maintain accurate records for each employee including but not limited to the following:

1. Evidence of pre-placement administration and reading of the TB Mantoux test.

2. Evidence of TB Mantoux test and reading as mandated according to employee's job classification. Annually for all healthcare employees and every six months for identified high hazard employees.
3. Evidence, tracking, and management of employees with TB exposure, positive conversion, treatments, follow-up and post exposure evaluation as identified in Appendix II of this policy
4. Evidence of TB conversion (positive TB mantoux skin test) and TB disease will be recorded on the OSHA 300 log.
5. The results of testing and a list of the specific locations of all procedure/patient rooms which are tested for AFB airflow criteria will be provided to the Infection Control Committee on a semi-annual basis or more often as areas are modified.

**B. Training Records**

The MUSC Occupational Safety and Health Program will maintain all training records. Each instructor will provide the following information:

1. The names and qualifications of the instructor conducting the training.
2. The dates of the training sessions.
3. The names and employee ID numbers of all employees attending the training sessions.
4. Names and employee ID numbers of all employees registered in the respiratory protection/fit-testing program.

## IX. Evaluation of the Program

- A. Health Care Workers PPD testing program: EHS/SHS should review employee and student records at intervals to ensure continuing compliance and evaluates rates of conversion.
- B. Early identification of infected patients: Infection Control Practitioners will review records of patients diagnosed with tuberculosis to determine if there is a need to modify methods for detecting and isolating infectious patients, (1) laboratory procedures, (2) administrative policies and practices, or (3) patterns of patient management. The Infection Control Committee will review reports on these findings and make recommendations of suitable modifications.
- C. Observation of infection control practices:  
Infection Control Practitioners and trained Management and staff will observe practices: (1) in areas designated as high risk, (2) in areas identified by above mentioned chart review, (3) in areas in which there has been an increase in PPD conversions.
- D. Investigation of clusters of skin test conversions:  
Epidemiologic investigation will be performed for any area or work related group who has more than two skin test conversions (2 or more skin test conversions within a 3-month period). This investigation will be a joint effort of Infection Control, Employee Health, Occupational Safety and Health Programs, and expertise from the local health department will be sought as necessary. Reports of these investigations will be made in a timely manner to the Infection Control Committee.

- E. The MUSC Occupational Safety and Health Programs and the Infection Control Coordinator will review lesson plans, training records, employee first report of injury and employee health records.

## Appendix I

### EARLY IDENTIFICATION OF PATIENTS AT HIGH RISK OR WILL ACTIVE TUBERCULOSIS

- J. Rationale: Early identification of patients at high risk of, or with active Mycobacterium tuberculosis should occur at the earliest point in the health care encounter. Avoiding delays in such identification will reduce staff and patient exposure to TB. Consideration should be given to maintaining patient confidentiality and satisfaction with the health care encounter and efforts should be coordinated to decrease duplication of routine questions. A sensitive and careful approach must be maintained to avoid patients becoming alarmed or misled regarding the purpose of this assessment.
- II. Methods: Each department/area should identify a plan for early assessment, which will be appropriate to their patient population and services (a description of this plan will be sent to the Infection Control Department):
- A. Identify health care personnel who have early contact with patients.
  - B. Identify types of early encounters.
  - C. Identify systems for early encounter with patients.
  - D. Formulate methods for observing, questioning, and isolating patient with possible TB.
- III. Identification Systems for early encounters:
- A. Clinical encounters
    - 1. Observation for coughing, questioning or interventions to include:
      - a. A system for inquiring about the common four symptoms, findings for tuberculosis:
        - 1) Have you had a cough for more than 2 weeks?

- 2) Have you coughed up any blood?
- 3) Have you had fevers or night sweats?
- 4) Have you been exposed to TB?

IV. In addition to questioning all patients, the following must be included in the plan for early identification:

- A. A professional health care professional (RN, MD, Physical Therapist, etc.) should be alerted to the positive responses to the above questions.
- B. This professional should segregate the patient and further assess the possibility of tuberculosis.
- C. Any actively coughing patient should be asked to wear a mask. If the patient is unable to tolerate a mask, the healthcare providers should mask with appropriate respirators.
- D. All patients who present for “high risk” procedures as described in “Implementation”; section 5 should be screened for TB prior to conducting such procedures.
- E. Consideration should be given to skin testing and periodic symptoms screenings for long term outpatients.

## Appendix II

### EMPLOYEE HEALTH SERVICES

#### MEDICAL SURVEILLANCE FOR TB

- I. New health care providers
  - A. Employee Health Screening:
    - 1. Healthcare provider must be cleared to work by Employee Health Services.
    - 2. Health Clearance must be received in Human Resources before healthcare provider reports to work.
- II. Follow-up PPD program
  - A. All new hires will receive a second skin test or 2-step test.
  - B. Annual PPD for Level I and low risk Level II healthcare workers.
  - C. Semi-annual for Level II employees who are classified as intermediate risk.
- III. Evaluation and Management
  - A. Positive PPD results.
  - B. PPD Conversions.
  - C. Positive TB symptoms.
  - D. TB exposures.
- IV. Respiratory Protection Health Evaluation
  - A. Respiratory Evaluation Form-if indicated by questionnaire.
  - B. Follow-up with Employee Health Services if indicated.
- V. Record Keeping
  - A. Employee Health Service screening.
  - B. Level I and low risk Level II healthcare providers.
  - C. Level II intermediate risk healthcare providers.

- D. PPD conversions
  - 1. Areas of hospital involved
  - 2. Source, if known
  - 3. Disposition
- E. TB exposures
- F. Conversions report to Occupational Safety and Health Division for reporting on OSHA 300 log.

### **Appendix III**

#### **COORDINATION WITH THE PUBLIC HEALTH DEPARTMENT**

- I. Positive MTB test results will be relayed to DHEC by Laboratory Medicine.
- II. Patients discharged on therapy will be referred to the appropriate Health Department by the discharge planning team.
- III. Efforts will be made to coordinate care of patients known or suspected to be non-compliant with their therapy by Infection Control Practitioners, Health Department and the discharge planning team.
- IV. The appropriate Health Department will receive information from the ICPs on discharged patients who were exposed to tuberculosis.
- V. Families and other known contacts will be referred as soon as possible to the Health Department by MUSC healthcare personnel.
- VI. MUSC healthcare providers with skin test conversions will be referred to the Health Department for follow-up and clearance to work. This will be relayed through EHS/SHS to the appropriate manager/dean.
- VII. Coordination with DHEC will occur to provide continuity of current TB therapy for inpatients.

**APPENDIX IV  
CHILDREN'S HOSPITAL ADDENDUM TO  
POLICY AND PROCEDURE FOR PREVENTION OF TRANSMISSION OF  
TUBERCULOSIS**

Early identification and prompt isolation of known or suspected cases of pulmonary or laryngeal tuberculosis is essential in order to reduce the possibility of transmission to other patients, visitors and health care workers.

Identification:

1. On admission of all Children's Hospital patients, nurses will ask the patient and parent (or guardian) if anyone in the household has been diagnosed with tuberculosis (TB) or has exhibited symptoms of chronic cough, bloody sputum, fevers, night sweats or unexplained weight loss. Nursing staff will notify the admitting physician and Infection Control if there is a positive family history of TB or suspicion of TB.
2. All pediatric patients suspect for or known to have tuberculosis will be placed into Airborne Precautions regardless of age. Nursing staff will notify Infection Control about all patients placed in airborne precautions for suspect or confirmed TB.
3. Patients under 10 years old usually are not infectious because they usually have primary tuberculosis (as opposed to reactivation disease). Primary TB is characterized by small numbers of organisms and minimal symptoms; therefore, transmission is uncommon. However, the parent (or guardian) may be the source of tuberculosis for this patient and may be infectious. Visitation/rooming-in of a parent or guardian will be decided on a case-by-case basis by the physician in collaboration with Infection Control.
  - A. Upon admission, the physician, in collaboration with Infection Control and DHEC, will assess the need for skin testing and chest x-ray for household contacts. For any patient in whom TB is suspected or whose family members have a history suggestive of TB (See Section 1 above) only the parent (or guardian) will be allowed in patient care areas until the risk of TB has been assessed. The symptomatic parent (or guardian) who will be in patient care areas should have a chest X-ray as soon as possible (ASAP) after admission of the patient. This can be done by referral to the Department of Health and Environmental Control (DHEC). The parent (or guardian) will be instructed to follow the measures (#1 - 4) identified in 3.B below until tuberculosis is ruled out.
  - B. Family members (other than the parent or guardian) with apparent infectious TB will be asked not to visit the hospital. If the parent's (or guardian's) chest x-ray is positive for TB, Airborne precautions should be continued and the parent (or guardian) will be instructed to:
    1. Go directly to and from the patient's room;
    2. Wear a surgical mask at all times while traveling to and from the patient's room (changing it when it becomes wet or soiled);
    3. Avoid loitering in public areas, and waiting rooms of the Medical Center;

4. Provide documentation of active management and treatment by DHEC for continuation of visiting privileges.
- C. The physician, in collaboration with Infection Control, will report family members who are found to have infectious TB to the state health department (DHEC) as required. They will also be referred to DHEC for appropriate care, as necessary. (The emergency department is not an appropriate setting for the treatment of TB.)
- D. The physician, in collaboration with Infection Control, will instruct family members who are non-compliant with visitor restrictions not to visit the Hospital until appropriate follow-up by DHEC is verified, and will write an order in the patient's chart instructing nursing staff regarding same.

4. Isolation (Airborne Precautions):

The patient with suspect or confirmed tuberculosis who requires Airborne precautions will be admitted to a private room with net negative pressure (with the door kept closed) and direct outside exhausting of air.

- A. At the time the patient is expected to be admitted, nursing staff will notify the Medical Center Occupational Safety department so that the air flow of the room can be tested on the day of admission and daily thereafter for as long as airborne precautions are required for the patient.
- B. All diagnostic or therapeutic interventions will be performed in the patient's room whenever possible. If the patient must be transported out of the room, he will wear a surgical mask at all times. Areas to which the patient is transported will be notified of the patient's isolation status so as to minimize the time the patient is out of his room. All health care personnel and visitors will wear a hospital-approved respirator upon entering the patient's room.
- C. Cough-inducing procedures performed on pediatric patients with suspect or confirmed infectious tuberculosis will be performed in a room with negative ventilation appropriate for airborne precautions.
- D. Airborne precautions may be discontinued by the physician, in consultation with Infection Control, when infectious or transmissible tuberculosis has been ruled out. If infectious tuberculosis is diagnosed, airborne precautions will continue until the patient demonstrates a clinical response to anti-tuberculosis drug therapy and three smear negative AFB specimens have been obtained. It is anticipated that most patients with confirmed infectious respiratory tuberculosis will remain in airborne precautions for their entire hospital stay.

**APPENDIX V**  
**PREVENTION OF TUBERCULOSIS DURING BRONCHOSCOPY**

- I. The bronchoscopy staff will screen all patients for risk factors and tuberculosis symptoms by using the four screening questions:
- A. Presence of a productive cough for more than two weeks
  - B. History of hemoptysis
  - C. Occurrence of night sweats/fever
  - D. Exposure to a known case of tuberculosis

Positive responses will be directed to the attending bronchoscopist for review.

- II. Each physician performing bronchoscopy will define whether patients are high or low risk for having tuberculosis.
- A. Definition of a “high risk tuberculosis patient”:
    - 1. Cavitory pneumonia on chest radiograph
    - 2. Immune suppression with pneumonia of undetermined origin including:
      - a. AIDS patients
      - b. Organ transplant patients
      - c. Patients on large doses of steroids
    - 3. Patients from known high risk groups including:
      - a. Prisoners or a history of incarceration
      - b. Homeless persons
      - c. IV drug addicted or alcoholic patients
      - d. Persons from areas with high endemic TB rates (e.g. Mexico, the Caribbean countries, Central American countries and some Asian and African countries, as well as U.S. cities with high rates and other areas of identified high rates)
    - 4. Patients with a history of positive AFB smear or *Mycobacterium tuberculosis* culture from sputum specimens or positive PPD.
    - 5. Tuberculosis is a plausible diagnosis in the opinion of the bronchoscopist.
  - B. Definition of a “low risk tuberculosis patient”:
    - 1. No “high risk” features may be present
    - 2. One or more of the following features must be present:
      - a. Known alternative diagnosis to tuberculosis
      - b. Negative PPD with positive controls
      - c. Mechanical indication for bronchoscopy (e.g. mucus plug removal, airway stent placement, brachycatheter insertion, pneumothorax occlusion)
      - d. Diffuse non-miliary interstitial lung disease
      - e. Nosocomial pneumonia with normal radiograph during same hospital admission.
      - f. Solid mass > 2 cm. in largest diameter

- III. All high risk tuberculosis patients must have a mask on when they enter any bronchoscopy area until they are moved into one of the negative pressure bronchoscopy rooms. These

patients must remain in negative pressure bronchoscopy rooms or wear a mask for the duration of the stay.

- IV. Patients who are not at high risk for tuberculosis may receive pre-procedure care in any hospital area.
- VI. All bronchoscopies will be performed in negative pressure rooms unless the patient meets the definition of low risk. Low risk patient may be bronchoscoped in any appropriate room.
- VI. All patients in Four Center who have had bronchoscopy performed must remain in a negative pressure room until coughing has decreased for five minutes. Patients who are not at high risk for TB may then be moved to any other room. Patients who are at high risk for TB must remain in a negative pressure room or wear a mask for the duration of their stay in the hospital or until TB is ruled out.
- VII. After a high risk tuberculosis patient has received bronchoscopy, forty-five minutes or time for 6 air exchanges in the negative pressure rooms must elapse before a new patient can be placed in the room.
- VIII. Bronchoscopies performed on patients already ventilated in parts of the hospital that do not have negative pressure capability will be moved to a negative pressure room on the basis of their TB risks independent of the addition of bronchoscopy.
- IX. Any exceptions concerning the above policy requires joint approval of the Infection Control Service (by paging the Infection Control Practitioner on call) and the Pulmonary Division (Pulmonary consult or Pulmonary ward attending physician).