

**LAC+USC MEDICAL CENTER
DEPARTMENT OF INFECTION PREVENTION & CONTROL
POLICIES AND PROCEDURES**

Subject: Tuberculosis (TB) Exposure Control Plan	Original Issue Date: 08/1994	Effective Date: Nov 2022
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Departments Consulted: Respiratory Therapy Employee Health Services Microbiology Lab LAC Public Health TB Control Division	Reviewed & Approved By: Paul Holtom MD, Hospital Epidemiologist Noah Wald-Dickler MD, Associate Hospital Epidemiologist Chair and Vice-Chair, Infection Control Committee	Approved By: Brad Spellberg, MD Chief Medical Officer

PURPOSE

To reduce the risk of exposure to, and prevent the transmission of, *Mycobacterium tuberculosis* (MTB) to patients, visitors, and healthcare workers (HCWs) at LAC+USC Medical Center.

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I. POLICY OVERVIEW & REFERENCES

The provisions in this policy are based on a multi-level hierarchy of prevention and control measures which include administrative, environmental, and respiratory protective measures. In conjunction with separately outlined LAC+USC Medical Center’s “Respiratory Protection Plan” (IC Policy #46) and “Airborne Transmissible Disease Exposure Control Plan” (IC Policy #50), the TB Exposure Plan aims to 1) meet legal and regulatory requirements related to the control, surveillance, and protection of persons against tuberculosis and 2) to provide a high level of protection to all HCWs in the medical center who may come into contact with patients with communicable TB.

The measures outlined in the TB Exposure Plan are based on several local, state, and federal regulations and standards related to the control of tuberculosis (and other ATD’s) in public and healthcare settings. These include:

1. National Occupational Safety & Health Administration (OSHA) Directive CPL 02-02-078: Enforcement Procedures and Scheduling for Occupational Exposures to Tuberculosis. Effective 6.30.15. www.osha.gov/tuberculosis
2. Centers for Disease Control (CDC) Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* Health-Care Settings. *MMWR* Dec 30, 2005 / Vol 54 / No. RR-17.
3. California Code of Regulations Title 8: CCR §5144 and §5199. Aerosol Transmissible Diseases.
4. California State Assembly Bill (AB) 803 of 1993 (“Gotch Bill”)

For additional sources related to TB regulations & procedures, see References at the end of this document.

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II. BACKGROUND & DEFINITIONS

Tuberculosis (TB) is primarily an airborne communicable disease caused by the group of bacteria known as the *Mycobacterium tuberculosis* (MTB) complex. While *M. tuberculosis* is itself a member of the MTB complex, *M. africanum* and *M. bovis* are also members of the group. Hereafter, "MTB" or "TB" shall refer to all members of the MTB complex. MTB is spread by aerosolized particles expelled (through coughing, sneezing or other aerosol generating procedure or activity) by a person with pulmonary or laryngeal TB disease. Infection occurs when a susceptible person inhales respiratory particles containing MTB, with infectious particles then travelling through the bronchi to reach the alveoli in the lungs. Although the lungs are the most commonly affected organs in active tuberculosis, virtually any part of the body can be affected by MTB, with clinical disease apparent.

Acid Fast Bacilli (AFB) Smear: microscopic examination of a clinical specimen, often sputum, to detect mycobacteria. "Acid fast" organisms are those that can be seen with special stains. Patients with "smear-positive" pulmonary tuberculosis are considered highly contagious due to high organism burden.

Latent Tuberculosis Infection (LTBI): infection with *M. tuberculosis* but **without** signs or symptoms of disease. This form of tuberculosis is not communicable to others. But people with LTBI may develop TB disease later without appropriate treatment.

MTB PCR: a rapid, automated, molecular-based test to detect the presence of MTB complex DNA. With some assays, including the Xpert MTB/rif assay used at LAC+USC, the test may also detect the presence of gene mutations associated with anti-tuberculous drug resistance (e.g., rifampin). In initial evaluation for suspected pulmonary TB, to increase test sensitivity, **two** sputum MTB PCRs should be collected (at least 8 hours apart) unless the first is positive.

Non-Tuberculous Mycobacteria: not all mycobacteria are *M. tuberculosis*. Sometimes referred to as "NTMs" these nontuberculous mycobacterial organisms are related to and have properties similar to *M. tuberculosis* but are distinct, separate bacteria. NTMs are quite common in the environment and often found as incidental colonizers in human airways. Unlike *M. tuberculosis*, however, NTMs are **not** transmissible from person to person and often do not cause disease or require treatment. Because they share similar acid fast staining properties, an "acid fast bacillus" growing in culture must be identified by additional testing methods in order to distinguish an NTM from TB.

Sputum Induction: the process (typically performed by Respiratory Therapists) of collecting sputum – often by inhalation of nebulized hypertonic saline solution – by promoting coughing and allowing expectoration and collection of respiratory secretions for molecular and microbiologic testing. Sputum induction (which is considered an aerosol generating procedure) for AFB smear, culture, and MTB PCR **must** be performed in an airborne infection isolation room (AIIR) with negative pressure with staff wearing appropriate respiratory protection (e.g., an N95 or equivalent).

Interferon Gamma Release Assay: abbreviated "IGRA" and often referred to by the proprietary assay used at LAC+USC, the QuantiFERON®, these are blood tests used to screen patients or employees for evidence of prior exposure to *M. tuberculosis*. Like PPDs, IGRA's should **NOT** be used in the evaluation of suspected active disease due to tuberculosis as they are insensitive in the setting of active tuberculosis. One advantage IGRAs offer over traditional PPDs is they can be used in people with previous false-positive PPDs due to prior BCG vaccine receipt. Employee Health Services will determine whether you require an IGRA or a PPD for annual TB screening.

PPD or Tuberculin Skin Test (TST): a skin test used to detect prior exposure to *M. tuberculosis*. PPD stands for *Purified Protein Derivative* which is a small injection placed into the skin to create a small wheal. Between 48 and 72 hours after PPD placement, a trained provider will assess the injection site for induration and interpret the results. Importantly, PPDs may be falsely positive in a number of circumstances, including a prior childhood BCG vaccine.

PPD Skin Test Cutoffs for Positivity	
Induration ≥ 5 mm	<ul style="list-style-type: none"> ● Immunosuppressed (HIV, organ transplant) ● Recent exposure to known, active TB case
Induration ≥ 10 mm	<ul style="list-style-type: none"> ● Recent immigrant from TB endemic country ● Injection drug use ● Employee or resident in high-risk setting including: <i>Hospitals, nursing homes, jails, homeless shelters etc.</i>
Induration ≥ 15 mm	<ul style="list-style-type: none"> ● General population with no known TB risk factors

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III. DELEGATION OF RESPONSIBILITIES & CONTACT INFORMATION

The TB Exposure Control Plan will be overseen by the Department of Infection Prevention and Control (IPC). Successful implementation of the TB Exposure Control Plan requires collaboration across several departments, including the Safety Office, Facilities Management, Employee Health Services, Respiratory Therapy, Microbiology, and Infectious Disease.

Given the infectious risks that some patients with active tuberculosis pose to the public, cooperation and frequent communication with the LA County Department of Public Health's Division of TB Control is critical in coordinating transitions of care between the LAC+USC Medical Center and other locations.

Specific responsibilities related to the TB Exposure Control Plan include, but are not limited to:

Table 1: Departmental Responsibilities for the Control of TB Exposure

TB Exposure Control Program Component	Responsibility Parties
Maintain & review Respiratory Protection Program-related records & reports	Safety Office, IPC, EHS
Track and monitor regulatory requirements	Safety Office, IPC, EHS
Ensure training requirements are met & maintained	EHS, Area Supervisors
Administration & record keeping of annual HCW latent TB Screening	EHS
Develop, implement & maintain updated the TB Exposure Control Plan policy	IPC
Ensure HCWs pass Medical Screening & Fit Test prior to respiratory PPE issuance	EHS
Maintain accurate records of HCW fit tests & Medical Screening	EHS
Conduct or direct TB exposure assessments	IPC, EHS, Area Managers
Notification of workplace exposures to TB (& other aerosol-transmitted diseases)	EHS
Coordination of direct admissions for TB Therapy & Hospital Discharges	IPC, DPH TB Control
<i>Abbreviations: EHS (Employee Health Services), IPC (Infection Prevention & Control), FM (Facilities Maintenance), HCW (healthcare worker), DPH (LA County Department of Public Health)</i>	

Table 2: Relevant Contact Information

Contact	Number
LAC+USC Infection Prevention & Control	Office Phone: 323-409-6645 Afterhours & Weekends: Operator x94906 (request Epi nurse on call)
LAC+USC ID Consult Line	Voicemail: 323-409-3851 for routine clinical consults On Call: www.amion.com --> login: lacusc --> IM-Infectious Disease
LAC+USC Physician Epidemiologist	Please review AMION carefully to contact the correct ID attending On Call: www.amion.com --> login: lacusc --> IM-Infectious Disease
LAC+USC Employee Health Services	Phone: 323-409-5236 Email: lacusc-ehs@dhs.lacounty.gov
LAC+USC DPH TB Control Liaison	Phone: 323-409-7962
LA County DPH Division of TB Control	Phone: 213-745-0800

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IV. ADMINISTRATIVE CONTROLS

The TB Exposure Control Plan is based on a multi-level hierarchy of prevention and control measures, which include: administrative and environmental controls, an active TB surveillance program for healthcare workers, and the availability and use of appropriate respiratory protection when evaluating patients with suspected or confirmed TB.

A. Administrative Responsibility: Under the direction of the LAC+USC Department of Infection Prevention and Control, administrative responsibility for ensuring adherence to procedures outlined in the TB Exposure Control Plan falls to individual HCWs and their local area/department managers or designees. In instances of continued HCW non-adherence, Risk Management and Human Resources are responsible for appropriate, progressive disciplinary action.

B. Notification of Positive TB Lab Results: Timely notification of positive mycobacterial lab results (including MTB PCR and AFB smear/culture results) and necessary reporting is an important administrative control that enables rapid implementation of appropriate control measures to mitigate exposure risks.

The detection of confirmed or possible *M. tuberculosis* in the Microbiology Lab in a clinical patient specimen is considered a Critical Lab Value, which requires immediate notification of a) the ordering physician or physician team, b) the TB Liaison Public Health nurse, and c) Infection Prevention & Control. Cases of suspected or confirmed tuberculosis must also be communicated by primary physician team members to the LA County Department of Public Health's Division of TB Control, at LAC+USC this may be done by contacting the TB Liaison at x97962.

C. TB Risk Assessment: all primary medical & surgical services caring for patients will conduct an appropriate medical history and exam, including a social history for relevant risk factors, to ascertain the risk of communicable diseases – including tuberculosis. This ensures prompt implementation of appropriate transmission based precautions, initiation of appropriate diagnostic & microbiologic evaluations, and initiation of appropriate therapy. In many cases, it will be helpful for teams to communicate directly with LA County TB Control in order to obtain additional history and records related to TB which are often not immediately available in patients' Orchid medical records.

The following information will help providers in obtaining and documenting a TB Risk Assessment:

Table 3: Tuberculosis Clinical Features & Risk Factors

Suspected TB May be Defined as any of the Following	Additional TB Risk Factors by History
<ul style="list-style-type: none"> ● Known history of tuberculosis & compatible signs of active TB ● Positive sputum AFB smear (prior to AFB identification) ● Persistent cough > 3 months' duration ● Bloody sputum, night sweats, fever, unexplained weight loss ● Abnormal chest x-ray suspicious for pulmonary TB 	<ul style="list-style-type: none"> ● HIV Infection ● History of Exposure to a Known TB Case ● Recent PPD Skin Test Conversion ● IV or other illicit drug use ● Homelessness or recent incarceration ● Recent immigrant from a TB endemic area

D. Inpatient TB Discharge Plan: most hospitalized patients with confirmed or suspected tuberculosis will only complete a small fraction of their required treatment in the LAC+USC inpatient setting. Due to the high risk of relapse and development of drug resistance in persons who do not complete therapy in a safe environment, it is critical that a multimodal TB Discharge Plan be completed ***in conjunction with LA County Department of Public Health's Division of TB Control*** for all patients with confirmed or suspected TB. TB Control must be notified of all patients with suspected tuberculosis and an appropriate TB Discharge Plan must be completed prior to hospital discharge of a patient with suspected tuberculosis.

At a minimum, the TB Discharge Plan must include the following three components:

- i. Discharge disposition (e.g., home isolation, jail, TB housing)
- ii. Discharge TB medication regimen (including drugs & drug doses)
- iii. Discharge follow-up plan (e.g., Dept of Public Health TB Control Clinic or LAC+USC ID Clinic)

See Appendix A for an example TB Discharge Form.

F. Appropriate Signage for Airborne Isolation Precautions: will be used at all times for admitted patients with communicable tuberculosis requiring an Airborne Infection Isolation Room (AIIR). Staff will adhere to all required AIIR precautions including the use of appropriate respiratory personal protective equipment.

G. Visitation for Active Tuberculosis Patient: unless by explicit exception from Infection Prevention & Control, visitors are not permitted in patient rooms of active TB patients until Airborne Precautions have been removed.

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V. ENGINEERING AND ENVIRONMENTAL CONTROLS

Coupled with effective screening and administrative controls, engineering and environmental controls provide additional, complementary layers of protection against the possibility of tuberculosis transmission at LAC+USC.

A. AIRBORNE INFECTION ISOLATION PRECAUTIONS: once suspected of having - or under evaluation for - tuberculosis (or any ATD), patients will be placed in appropriate Airborne Isolation Precautions until and/or unless the IPC Department and/or the LAC DPH TB Control Division determines the precautions are no longer necessary. Patients with suspected or confirmed tuberculosis will be placed in one of the negative pressure, Airborne Infection Isolation Rooms (AIIRs) located on each unit as outlined in the table below.

Floor	Negative Pressure Airborne Infection Isolation Rooms (AIIRs) at LAC+USC
1st Floor	1E 104, 106, 124
2nd Floor	2E 122
3rd Floor	3A 122, 3H218, 3B 124 3C 126, 128
4th Floor	4A 112, 120, 122, 134, 142, 144, 152 4B 112, 120, 122, 134, 142, 144, 152 4C 112, 120, 122, 134, 142, 144, 152 4D 104, 112, 114, 122 4M 126, 128
5th Floor	5A 112, 120, 122 5B 112, 120, 122, 134, 142, 144, 152 5C 112, 120, 122, 130 5D 106, 108 5F 134, 142, 144, 152 5M 128, 130
6th Floor	6A 126, 128, 130, 132, 154, 156, 158, 160 6B 126, 128, 130, 132, 154, 156, 158, 160 6C 126, 128, 130, 132, 154, 156, 158, 160 6D 126, 128, 130, 132, 154, 156, 158, 160
7th Floor	7A 126, 128, 130, 132, 156, 158 7B 156, 158 7C 126, 128, 130, 132, 154, 156, 158, 160 7D 126, 128, 130, 132, 154, 156, 158, 160
8th Floor	8A 134, 136, 138 8B 132, 134 8C 138, 140 8D 112, 120, 122, 130

Please refer to the "Engineering & Process Control Measures" section of Infection Control Policy #IC-50 (ATD Plan) for additional details pertaining to AIIR air exchanges, AIIR quality control, and respiratory PPE,

B. RESPIRATORY PROTECTION FOR AIRBORNE ISOLATION: all staff who enter an AIIR for a patient in airborne precautions for active, communicable tuberculosis must adhere to all required aspects of respiratory PPE, including the use of a properly fitted N-95 or equivalent respirator.

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VI. SOURCE CONTROL MEASURES

Source Control of TB Patients: While engineering methods of local exhaust ventilation – such as the negative pressure of an AIIR - provide one layer of protection, source control at the patient level is also key in preventing TB transmission. When patients with suspected or confirmed communicable tuberculosis leave their negative pressure AIIR (e.g., for a mandatory procedure or operation that cannot occur in the room), he or she should be **masked with a surgical mask** to reduce tuberculous organisms becoming airborne through coughing or breathing.

A. Airborne Infection Isolation Room (AIIR) Practices:

- i. AIIRs are single patient rooms (with an anteroom) providing negative pressure & air exhaust to building's exterior
- ii. Doors of AIIRs must be closed at all times to control air pressures and minimize disease transmission.
- iii. AIIRs used to care for TB or other ATD patients will have an AIRBORNE Precautions sign posted at the door.
- iv. HCWs who enter AIIRs will wear either a fitted N-95 respirator or CAPR they've been issued & trained to use.
- v. Visitors to patients in AIIRs will be limited (according to visitation policies) but will be provided surgical masks.
- vi. All AIIRs have requirements for controlled ventilation, negative pressure, anterooms, and air filtration.
- vii. All AIIRs will receive annual maintenance inspections by Facilities Management
- viii. Facilities Management will provide the Administrative Nursing Office (ANO) with both keys and codes needed for implementing negative pressure in a designated AIIR. The ANO is responsible for distributing codes or keys received from Facilities Management to the appropriate units/wards.

B. HCW Responsibilities Related to Airborne Infection Isolation Rooms

- i. HCW must keep the doors of AIIRs closed at all times except to permit room entry and exit.
- ii. Monitor the direction of airflow (e.g., visually check the ball-in-the-wall) to ensure safety of entry
- iii. At the start of each shift, nursing staff must note evidence of negative pressure for occupied AIIRs (either via electronic controls and/or by noting a visual cue such as the directional "ball-in-the-wall" being sucked into the room indicating negative pressure).
- iv. Educate patients and visitors about TB transmission and the reason for Airborne Isolation precautions
- v. If a patient in Airborne Precautions must be transported to other areas for testing, procedures, or other services, the patient will be masked prior to and during transport, with the door to the room promptly closed upon exit.
- vi. For required procedures for patients with tuberculosis or other ATDs which must be done in non-AIIRs, every attempt should be made to schedule the procedure as the last procedure or case of the day to maximize the time available for removal of airborne contaminants.
- vii. If Negative Pressure is not functioning in an AIIR, the nurse is to:
 - a. Place a surgical mask on the patient
 - b. Keep the door to the patient's room closed
 - c. Contact Facilities Management that there is loss of negative pressure in an Airborne Isolation Room
 - d. Notify the Infection Prevention and Control (IPC) Department of the non-functioning AIIR
 - e. Contact Bed Control to move the patient into another available, functioning AIIR
 - f. Facilities Management will notify unit staff and the ANO when negative pressure has been restored.

VII. TB EVALUATION IN SPECIAL SETTINGS: OUTPATIENT, ED, PEDIATRICS & JAIL

Not all persons with confirmed or suspected tuberculosis require inpatient hospitalization. This section details precautions and logistics for evaluating tuberculosis in ambulatory settings, notably the LAC+USC Rand Schrader Infectious Disease Clinic and the LAC+USC Emergency Department (ED).

In many cases (particularly where TB suspects have stable, non-communal living arrangements), it may be appropriate to complete an evaluation for pulmonary tuberculosis in the outpatient setting in the LAC+USC Rand Schrader Infectious Disease Clinic's 1st Floor Pulmonary Lab (see below).

In such cases where TB suspects are clinically stable, and patients are financially eligible for DHS outpatient follow-up, ED staff should contact the ID Consult Service (on-call fellow/attending on AMION) for assistance in facilitating such follow-up as well as the TB Liaison Nurse at 323-409-7962.

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A. Source Control Measures for Ambulatory TB Cases and Suspects

- a. Patients \geq 12 years old in ambulatory settings with confirmed or suspected TB will be given a surgical mask and placed in an AIIR if available or an individual exam room with an Airborne Precautions sign.
- b. The mask should not be removed unless instructed by the physician or Infection Control.

B. TB Evaluation in the ED Setting

Given the safety net nature of the LAC+USC Medical Center and the high incidence of tuberculosis among several high risk groups in LA County, many patients will either visit or be sent to the LAC+USC ED for evaluation of possible tuberculosis. As above, not all patients with confirmed or suspected tuberculosis require hospitalization and inpatient evaluation and treatment. The following points provide guidance on the approach to TB evaluation in the ED.

- a. A clinical assessment will be performed, considering symptoms, risk factors, immunocompetency, chest x-ray findings, **and social history including current living conditions** (e.g., home vs. communal living settings such as Jail, Shelters, Sober Living etc.)
- b. If active pulmonary TB is considered possible, ED Clinicians should initiate a diagnostic evaluation to include: HIV Ag/Ab screen and 3 induced sputum specimens for AFB culture & smear (separated by 8 hours) and 2 sputum MTB PCRs. If an ED patient is to have induced sputa collected in the ED for TB diagnostics, the ED will call the Respiratory Therapy Department to arrange for sputum collection. Results of these diagnostics will often assist in determining appropriate disposition of TB suspects in the ED.
- c. In all cases, induced sputum specimens for AFB smear/culture **must** be collected at least eight hours apart. A single sputum specimen will not be sufficient to exclude the diagnosis of communicable tuberculosis, and sputum specimens collected fewer than eight hours apart are not considered valid.
- d. In many cases (particularly where TB suspects are clinically stable with non-communal living arrangements), it may be appropriate to complete an evaluation for pulmonary tuberculosis in the outpatient setting. In such cases where TB suspects are clinically stable, and patients are financially eligible for DHS outpatient follow-up, ED staff should contact the ID Consult Service (on-call fellow/attending on AMION) for assistance in facilitating such follow-up as well as the TB Liaison Nurse at 323-409-7962.

C. Special Note Re: TB Evaluation & Precautions in Pediatric Patients

TB may present differently in children than adults. It is also more difficult to diagnose with inherent difficulties in obtaining quality sputum specimens. Gastric aspirates (early AM specimen after \geq 6 hours of NPO sleep) should be obtained by nursing on 3 consecutive mornings via nasogastric aspiration. See reference #8 for details on gastric aspiration procedures.

- i. **VISITATION OF BABIES BORN TO MOTHERS WITH SUSPECTED OR CONFIRMED WITH TB**
 - a. The mother should NOT visit the baby until the mother and baby are receiving anti-TB medications.
 - b. The mother must wear a surgical mask. She does not need to be sputum AFB-negative to visit the baby.
 - c. Full rooming of mother with baby is not permitted until Airborne Precautions have been lifted.
 - d. The mother should not breast feed until she has completed \geq 5 days of anti-TB medications and has been cleared from Airborne Precautions by Infection Prevention & Control.
- ii. **VISITATION OF NON-NEONATAL PEDIATRIC TB PATIENTS:** family members accompanying the child must wear a surgical mask while in the facility. Parents and household contacts should be instructed not to visit common areas (such as waiting rooms & cafeterias) in the facility. Non-adherent family members should be excluded from visitation until evaluation is complete and TB has been excluded or treatment has rendered contacts noncontagious.

D. Special Note Re: TB Evaluation of Incarcerated Jail Patients: Jail settings represent high-risk congregate living settings where TB transmission is of significant concern. When patients are sent from jail for TB evaluation, the above diagnostic evaluation should be initiated; in addition, a serum QuantiFERON Gold assay should be collected immediately upon arrival to facilitate disposition planning. Even with 3 negative sputum AFB smears and 2 negative sputum MTB-PCRs, it may often be necessary to initiate empiric RIPE therapy with successful completion of 5 days of inpatient TB treatment prior to discharge back to jail. Such cases should be discussed with the TB Liaison at x97962.

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VIII. DISCONTINUING AIRBORNE PRECAUTIONS FOR TB SUSPECTS

All patients with confirmed or suspected communicable tuberculosis will remain in Airborne Precautions until the diagnosis of TB is reasonably excluded based on the criteria or, or until a specified duration of antituberculosis therapy has been completed.

Any Attending Physician may discontinue Airborne Precautions in a patient started on an evaluation for pulmonary TB if in his or her clinical judgment the patient does not have active or communicable TB. The Attending Physician must document this in the patient's electronic medical record, or a Resident may enter a note, identifying the Attending by name, and indicating the case was reviewed and that no further isolation is indicated and/or that no further specimens need to be collected. In some cases, TB Control personnel may evaluate such cases and completion of the work-up and/or empiric treatment initiation may still be required prior to discharge.

A. Sputum Criteria for Discontinuing Airborne Precautions

- i. Patients with suspected pulmonary tuberculosis must generally have three negative sputum AFB smears (collected at least eight hours apart) in addition to two negative sputum MTB PCRs before considering discontinuation of Airborne Precautions.
- ii. Patients who are deemed by the primary attending physician or ID Consult Service to be of **low to moderate risk** of communicable TB may have Airborne Precautions discontinued on the basis of **TWO** negative sputum AFB smears and two negative sputum MTB PCRs. A third sputum must still be collected for AFB smear and culture before the isolation is discontinued, but it does not need to have resulted prior to discontinuing Airborne Isolation.
- iii. In some cases, even with negative sputum AFB smears and sputum MTB PCRs, in patients with high pre-test probability, a diagnosis of pulmonary tuberculosis may still be possible and empiric antituberculosis therapy may still be required prior to discontinuation of Airborne Isolation Precautions or discharge back to a communal living setting such as jail. Such cases, with high clinical suspicion despite initial negative sputum studies, should be discussed with the Infectious Disease Consult Service and TB Control Personnel, and empiric antituberculosis therapy should be considered (see below).

B. Antituberculosis Treatment Criteria for Discontinuing TB Suspects

- i. In cases where pulmonary tuberculosis is either:
 - a) confirmed by positive sputum MTB-PCR **with 3 negative sputum AFB smears OR...**
 - b) clinical suspicion for TB is high despite 2 negative sputum MTB-PCR's and 3 negative sputum AFB smears treatment with antituberculosis therapy further reduces the risk of TB transmissibility.
- ii. In either of these scenarios, patients must complete (and tolerate) standard antituberculosis therapy for **5 days** before considering removal of Airborne Isolation precautions or discharge back to a communal living setting.
- iii. Standard antituberculosis therapy consists of isoniazid, rifampin (or rifabutin), pyrazinamide, ethambutol and typically, pyridoxine (Vit B6). Where these medications cannot be tolerated or are contraindicated, the Infectious Disease Consult Service should be contacted for assistance in management.

C. Special Considerations for Smear-Positive Pulmonary TB

- i. These cases are considered extremely contagious due to high organism burden. Extended antituberculosis therapy **and demonstration of smear/culture conversion to negative** is required prior to removal of Airborne Isolation Precautions in such cases.
- ii. The kinetics of conversion of smear-positive sputum to smear-negative in patients with positive initial AFB smears is such that, in most cases, patients require several weeks of effective induction therapy before sputa become AFB smear-negative. Therefore, repeating sputum AFB smears and cultures prior to four weeks of therapy is of low clinical utility. Accordingly, repeating sputum AFB smears/cultures any sooner than four weeks from a prior smear-positive set in patients with smear-positive pulmonary TB requires Physician Epidemiologist approval.

IMPORTANT: as per Section IV.D. above, **all admitted patients** with confirmed or suspected tuberculosis must have a completed TB Discharge Plan submitted & approved by TB Control prior to discharge.

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IX. EMPLOYEE HEALTH TB SURVEILLANCE PROGRAM

LAC+USC Medical Center Employee Health Services (EHS) administers and maintains a robust screening program for all healthcare workers. The program is summarized here; however, please refer to DHS Policy No. 925.510 for further granular details pertaining to employee TB screening by EHS.

A. TB Screening as a condition of Initial & Ongoing Employment: as a condition of employment, all LA County Department of Health Services employees, including LAC+USC employees, must be screened for latent tuberculosis by EHS by either a PPD or IGRA. See Section II "Definitions" for an explanation of these tests and how they are interpreted. All employees are required to undergo annual TB screening with EHS thereafter as part of their annual health clearance. Self-testing is not permitted, and testing must be performed and recorded by EHS staff.

B. Records of Annual TB Screening: records of annual TB Screening will be maintained in the EHS electronic Persinda database. Individual HCWs may access their Employee Health records, including TB Screening results, by logging into the Persinda system from the LAC+USC Intranet homepage.

C. Additional TB Screening Components: those employees with a positive PPD or IGRA must have a negative chest x-ray within the prior 12 months, or a new chest x-ray must be obtained via EHS. In addition to the PPD or IGRA blood test, HCWs will also undergo a symptom review survey during their annual health clearance, particularly for those HCWs with a prior positive PPD or IGRA as these tests are expected to remain positive for life.

D. Follow-up of PPD or IGRA Conversion: for those HCWs with a newly positive PPD or IGRA, suggesting exposure to TB within the timeframe their last negative test, follow-up will be provided by EHS or appropriate referral will be made such that appropriate clinical evaluation may be undertaken & therapy may be initiated if indicated.

E. Annual Respiratory PPE Fit Testing: in addition to a PPD or IGRA and the symptom screen as described above, respirator fit testing will be performed for all HCWs at the time of hiring and annually thereafter for all HCWs who have potential exposure to patients requiring Airborne Precautions. This purpose of this annual Fit Testing is to ensure the availability of ongoing, effective respiratory PPE to all HCWs with potential work-related exposure to TB and other airborne-transmissible diseases (ATDs). For additional information regarding annual respirator fit testing please refer to Infection Control Policies # IC-50 ATD Plan and # IC-46 Respiratory Protection Plan.

X. MANAGEMENT OF HCW TB EXPOSURES

The LAC+USC Medical Center TB Exposure process is summarized here. But for additional details, please refer to the "Exposure Incidents, Evaluations, and Notifications" section of the LAC+USC Infection Control Policy # IC-50: Airborne Transmissible Disease (ATD) Policy.

A. TB Exposure Definition: a "TB Exposure" is defined as an event where all of the following have occurred:

- 1) An employee has been exposed to an individual with a suspected or confirmed communicable* pulmonary or laryngeal tuberculosis
- 2) The exposure occurred **without** applicable exposure controls or respiratory PPE (N-95 or CAPR).
- 3) It reasonably appears from the exposure circumstances that disease transmission is sufficiently likely to require medical evaluation.
- 4) The exposure occurred *prior to* a confirmed or suspect TB patient's successful completion of an appropriate amount of TB-direct therapy to the point where their disease is no longer considered communicable.

REMEMBER: not all patients with tuberculosis or a history of TB have disease that is necessarily *transmissible* to other patients or HCWs. The clinical circumstances and the details surrounding the exposure, both of which are ascertained during the formal Exposure Evaluation, will determine the likelihood of transmissible tuberculosis from source patients to the HCWs.

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B. Employee Responsibilities After a TB Exposure: HCWs who have unprotected contact with a patient or their family member who is suspected or diagnosed with active pulmonary TB must report to their area/department supervisor or manager. It is also the responsibility of affected employees to comply with necessary follow-up and testing through Employee Health.

C. Supervisor & Manager Responsibilities After a TB Exposure: in many cases, the diagnosis of tuberculosis may not be made (or suspicion even raised) until several HCWs may have had an unprotected exposure. In such cases, in order to comply with regulatory requirements and facilitate expeditious HCW evaluation, area supervisors or managers may be asked to provide a line listing of all their employees and/or supervisees who may have worked in a particular area or come in contact with a particular patient. It is crucial that these lists be completed as expeditiously as possible. Area supervisors will be notified by email or via automated emails generated through the Persinda system during the course of a TB Exposure evaluation.

D. Workplace TB Exposures Identified by Infection Control or LA County DPH TB Control: nurse Infection Preventionists in the Epidemiology Department review all hospitalized patients for any confirmed or suspected transmissible diseases, including tuberculosis and other ATDs. They are also notified of any ATDs diagnosed in LAC+USC outpatient clinics and areas, and often in conjunction with LAC DPH TB Control. When new diagnoses of tuberculosis are made, Infection Control will investigate the circumstances of the case, including whether or not appropriate transmission-based precautions were implemented prior to and at the time of the TB diagnosis.

In instances where Infection Control's investigation reveals a potential TB exposure incident to tuberculosis or Covid-19, a formal Exposure (aka "Infection Prevention Record") will be generated in the DHS-wide, electronic, Employee Health Database called "Persinda" (aka Infection Control Module). Each Exposure Case in the Infection Control Module will have a unique, identifying Case Index Number assigned for tracking. Prior, concluded exposure cases are also maintained in the Persinda Employee Health database for record keeping and future review.

During exposure investigations, Infection Preventionists will record several data elements for each Exposure Case to be able to track and identify potential affected personnel. See Appendix F for details of recorded information for each exposure. Given numerous potential affected employees in an area, the final step of each electronic Exposure Case log is the identification of area supervisors and managers who are sent notification of the exposure via automated email notification. As above, area supervisors will conduct an assessment of which employees may have been present and/or exposed during the specified exposure timeframe and log those employees into the case's Persinda log. This then trigger's automated email and text notifications to all potentially exposed, logged employees from the exposure, instructing them to present to Employee Health for a formal intake and evaluation, either in person or by phone at (323) 409-5236. See Appendix F for sample notification.

E. Non-Workplace TB Exposures: Employees will report **non-workplace-related** exposures to tuberculosis or any other ATD, or outside diagnoses of tuberculosis or other ATD, directly to Employee Health Services and their supervisors within 24 hours or prior to their next shift, whichever comes first. Employees will be evaluated and provided instruction on any applicable work restrictions by Employee Health Services.

F. Employee Health Evaluation Following a TB Exposure: HCWs will be asked a series of questions at their annual exam or when they have reported contact with a known tuberculosis patient. Positive responses to these questions - suggesting potential *active disease in the HCW*- will prompt a physician consultation and a chest x-ray. HCWs suspected or diagnosed with TB will be removed from duty until their medical provider provides a written clearance and documentation of their non-infectiousness. All HCWs characterized as suspected TB must seek follow up evaluation at their primary designated physician within 72 hours.

G. Return to Work After HCW Active TB Diagnosis: HCWs diagnosed with active tuberculosis must

- i. provide documentation of three negative AFB sputum smears collected at least 8 hours apart
- ii. Have responded to (be able to tolerate) prescribed anti-tuberculous medications
- iii. Have documentation of non-infectiousness from a physician experienced in managing TB

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XI. Education & Training:

All new employees will receive training on the medical center's ATD Policy, which includes tuberculosis, and transmission-based precautions during mandatory New Employee Orientation (NEO). Employees will read and attest to Infection Control re-education material including ATD content material and complete a post-test assessment. After their NEO, all employees will also complete formal Infection Prevention education, including ATD and TB-related content, annually with compliance and records to be maintained by employees' department managers. Annual education will also incorporate any new tuberculosis or ATD-related policies, procedures or modifications to current policies and procedures that may affect employees' occupational exposures to tuberculosis or other ATD control measures. Training will also include instructions on how to access a copy of this policy and others from the hospital's intranet homepage.

XI. Personal Protective Equipment for the Care of TB Patients:

For the duration of required Airborne Isolation Precautions, appropriate respiratory personal protective equipment (PPE) will be utilized by all staff members caring for patients with communicable tuberculosis.

For further details on the appropriate use, donning and doffing, fit testing, and other details pertaining to respiratory protection for tuberculosis and other Aerosol-Transmitted Diseases, please refer to Infection Control Policy # IC-50 entitled ATD Policy.

REFERENCES

1. LAC+USC Infection Control Policy #46: Respiratory Protection Program
2. LAC+USC Infection Control Policy #50: Airborne Transmissible Disease Exposure Control Plan
3. DHS Policy No. 925.510: Workforce Member Tuberculosis Screening Surveillance Program
4. CDC Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Settings. *Morbidity and Mortality Weekly Report (MMWR)* Dec 30, 2005 / Vol 54 / No. RR-17.
5. California Code of Regulations: Title VIII §5144 Respiratory Protection
6. California Health and Safety Code §121361: Gotch Legislation (requirement for a written treatment plan approved by the health officer before a hospital can discharge or transfer a patient known or suspected of having TB)
7. California Health and Safety Code §121364: authority of the health officer to order examination for TB infection
8. Pediatric Tuberculosis: A Guide to the Gastric Aspirate Procedure. UCSF Curry TB Center. Available online at: <https://www.currytbcenter.ucsf.edu/products/view/pediatric-tuberculosis-guide-gastric-aspirate-ga-procedure>

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Appendix A: TB Discharge Plan Form H-804



Request for Hospital Discharge/Transfer Approval Form (H-804)

(Please call before faxing)
TEL (213) 745-0800 FAX (213) 749-0926
AFTERHOURS Call (213) 974-1234

Patient Name: _____ Submitted By: _____
D.O.B.: _____ MR#: _____ Phone: _____ Pager: _____
Fax: _____

Pulmonary TB Extrapulmonary TB _____ (specify site)
 High-risk settings (e.g. health care facility, nursing home, congregate living, drug treatment program, homeless shelter, jail, dialysis center, other settings with children ages 3 and younger or persons with compromised immunity). Dates of three (3) consecutive AFB smear negative sputum (collected at least 8 hours apart, one of which should be induced or early morning) ____/____/____ ____/____/____ ____/____/____
Smear positive patient will also need to complete 14 days of TB medication. If smear negative 5 days.
 Low-risk setting, sputum clearance not necessary, home isolation instructions provided (if smear positive)

Discharge to: Home SRO SNF Olive View Inpatient Isolation Unit Other _____
Discharge Address: _____ Phone: _____
City, State Zip Code: _____
Date patient to be discharged: ____/____/____ Follow up Appointment Date: ____/____/____ Time: _____
Physician assuming TB care: _____ Phone: _____
Health Care Facility: _____
Address: _____

Discharge TB medication regimen:
(Indicate total daily dose)
INH _____ mg
Rifampin _____ mg
Rifabutin _____ mg
Rifamate® (INH+RIF)* _____ caps
Ethambutol* _____ mg
Pyrazinamide* _____ mg
Pyridoxine _____ mg
Other _____

*Current CDC/ATS and Los Angeles County TB Control recommendations for treatment of uncomplicated TB for 2 months followed by INH & RIF for 4 months.
of days of medication supply: _____
Must provide patient with sufficient supply of medication (in hand), not a Rx, until follow-up provider appointment

Medical complications (specify):

Potential barriers to TB therapy adherence
 Mental Impairment
 Homeless
 Substance abuse
 Hx of any non-compliant behavior
 HIV
Is patient ambulatory:
 Yes Self With Assist
 No

Tuberculosis Control Program use only:

Problems/Action: _____

Reviewed by: _____ Date reviewed: ____/____/____
Approved by: _____ Date approved: ____/____/____

Discharge Approved

Yes No

____/____/____

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**Los Angeles County Department of Public Health
Tuberculosis Control Program**

Tuberculosis Control Program Headquarters
2615 S. Grand Ave. Room 507
Phone: 213-745-0800 Fax: 213-749-0926

Hospital Discharge Approval Request (H- 804) Instructions

Discharge of a Suspect or Confirmed Tuberculosis Patient

As of January 1, 1994, State Health and Safety Codes mandate that patients suspected or confirmed with tuberculosis may not be discharged or transferred from a health facility (e.g. hospital) without prior approval of the Local Health Officer (i.e., TB Controller).

To facilitate a timely and appropriate discharge, the provider should submit a written discharge plan to Tuberculosis Control Program 1 to 2 business days prior to the anticipated discharge. Tuberculosis Control Program will review the discharge plan for approval or denial.

Health Department Response Plan:

Weekday discharge (Non holiday 8:00 am- 5:00 pm): The written discharge plan should be completed in its entirety and submitted by FAX.

Tuberculosis Control Program staff will review the discharge plan and, **within 24 hours**, notify the provider of approval or request additional information/actions required, before the patient can be discharged or transferred.

All AFB smear positive pulmonary TB suspects require a home evaluation, to determine if the environment is suitable for discharge. A Community Health Services (CHS) Public Health Nurse has three (3) business days to complete an in-person visit to verify discharge address and assess for high risk contacts. Tuberculosis Control Program Liaison will inform the primary team of the status of the home evaluation, once completed.

Weekend and Holiday Discharge: All arrangements for discharge should be made in advance when weekend discharge is anticipated. When unusual circumstances necessitate weekend or holiday discharge, the provider will phone the Los Angeles County Operator at (213) 974-1234 and ask to speak with the **Public Health Administrative Officer of the Day (AOD)**. A response will usually occur within one hour. The process outlined above will be followed. If the discharge cannot be approved, the patient must be held until the next business day until appropriate arrangements can be made.

(NOTE: This form is used for discharge care planning only. Call the Tuberculosis Control Program prior to faxing documents to ensure timely processing.)

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Appendix B: Public Health TB Direct Admission Workflow

On occasion, the LAC+USC Department of Infection Control and Prevention (IPC) will be contacted by the LA County Department of Public Health Division of TB Control to request direct admission for patients with a legal order of detention when such persons pose an infectious risk to the public, most often due to non-adherence to anti-tuberculosis treatment regimens. In accordance with California law (Health & Safety Code, §121361), such orders are within the legal jurisdiction of the Health Officer, here the LA County Dept. of Public Health TB Control.

To reduce risk to staff and other patients in high-traffic areas such as the Emergency Department, patients legally detained by TB Control shall be directly admitted to an appropriate inpatient bed -- **NOT SENT TO THE ED** -- to avoid additional exposure to staff and other patients in the medical center, including in high traffic areas like the ED.

Step 1	The LAC+USC IPC Office at 323-409-6645 will be called directly by LAC DPH TB Control staff, typically the TB Liaison, who will have detailed information about the specific TB patient requiring direct admission. Afterhours when the IPC Office is closed: call the hospital operator at 323-409-4906 and ask for the on-call nurse Infection Preventionist to be paged.
Step 2	Upon receipt of the call from the Public Health nurse/investigator: the LAC+USC nurse Infection Preventionist will obtain as much demographic information as possible but at a minimum to include: Name, Date of Birth, MRUN, <i>gender orientation</i> (required to create an inpatient FIN), and justification for the admission. It's crucial to obtain the Public Health Nurse/Investigator's contact information as they will need to be called back once an inpatient bed has been assigned for the patient.
Step 3	Detained TB patients SHOULD NOT be brought to the hospital until a staffed Airborne Infection Isolation Room (e.g., negative pressure inpatient bed) has been identified and assigned by Patient Flow (x91605). This is to reduce transmission risk AND ensure appropriate and safe nurse staffing. This point should be explained to the Public Health Nurse/Investigator: if no beds are available, detained TB patients will need to be admitted to other hospitals.
Step 4	The LAC+USC nurse Infection Preventionist will call the Patient Flow manager (x91605) to request an inpatient bed (negative pressure room) for a direct admission from TB Control.
Step 5	<u>IF</u> a negative pressure Airborne Infection Isolation Room is available: <ul style="list-style-type: none"> a. Patient Flow calls Med Consult at x91644 to inform of the bed request and TB direct admission b. Patient Flow calls Patient Access Center (PAC) at x92182 to create the patient's pre-admit FIN c. Patient Flow assigns bed, informs Bed Control at x95321, and reserves the bed with the unit d. Patient Flow call the IPC Office x96645 to provide the unit & bed that has been reserved
Step 6	Once a bed has been assigned, the LAC+USC nurse Infection Preventionist will contact the Public Health nurse/investigator to provide the assigned unit & bed number.
Step 7	Only once the bed has been assigned should the detained TB patient be transported to the LAC+USC inpatient tower, and only to the designated unit/room.
Step 8	Unit staff will call Bed Control when the patient arrives to the unit/bed.
Step 9	Bed Control staff admit the patient to the inpatient bed using the Pre-Admit encounter created by PAC.

CONTACT PHONE NUMBERS

Bed Control	323-409-5321	TB Control Liaison	323-409-7962
Patient Access Center (PAC) / Patient Financial Services (PFS)	323-409-2182	Infection Prevention & Control (IPC)	323-409-6645
Patient Flow	323-409-1605	LAC+USC Med Consult VoIP	323-409-1644