

# Administrative Controls

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The field of airborne infection prevention and control (IPC) requires a comprehensive approach with multiple interventions to prevent transmission of disease.

IPC measures for healthcare and congregate facilities are designed to prevent or minimize transmission of airborne microbes from an infectious person to patients, clients, visitors, or staff. Persons infected by airborne microbes may develop diseases such as tuberculosis (TB), COVID-19, measles, chickenpox, common cold, influenza, etc. This document focuses on airborne *Mycobacterium tuberculosis*, and we will use the term tuberculosis IPC (TB IPC).

The setting can be a healthcare facility, such as an outpatient clinic or emergency room where people come for medical attention with acute symptoms such as fever, cough, vomiting, or diarrhea, or an inpatient setting where patients with these symptoms or other healthcare issues have been admitted. Other congregate settings, such as homeless shelters, long-term care facilities (e.g., skilled nursing facilities, and board and care facilities), or correctional facilities are also sites at inherent risk for spread of communicable airborne microbes. The development and implementation of measures to prevent or minimize transmission of any of these microbes has become increasingly complex, but also more effective, as knowledge about microbes and their transmissibility has increased.

To enable understanding and practical implementation, IPC measures have been divided into separate categories of control interventions.

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**The Centers for Disease Control and Prevention (CDC) uses three such categories:**

- **Administrative controls**
  - **Environmental controls**
  - **Personal Protective Equipment** (respirators and surgical/procedure masks)
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**Administrative controls for TB IPC are interventions through institutional policies, protocols, education, and oversight to reduce or prevent both exposure and transmission of TB within a facility.**

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**Administrative control activities include:**

- Assignment of responsibility for TB IPC to a specific person within the facility
- Conduction of TB IPC facility risk assessments
- Development of a written TB IPC plan
- Training and education in TB IPC for all employees and volunteers
- TB IPC education for patients and visitors
- Establishment of a system for baseline and periodic TB screening and evaluation of employees and volunteers, based on risk of TB exposure
- Implementation of appropriate signage and support for respiratory hygiene throughout the facility
- Application of triage and airborne precaution protocols using epidemiologic principles
  - Including criteria for isolation initiation and discontinuation of isolation for all patients with presumptive and infectious TB
  - Ensuring safe and feasible separation of patients, visitors, and staff
- Ensure proper cleaning, sterilization, or disinfection of equipment
- Ensure access to rapid molecular testing for TB
- Promotion of prompt initiation of effective treatment based on drug susceptibility testing (DST)
- Implementation of organizational measures to ensure effective and sustainable use of environmental controls and personal respiratory protection
- Collection and review of TB data by IPC in coordination with clinical and laboratory services
- Coordination with local and/or state health departments to ensure all TB cases are reported and appropriate actions are taken

# Assigning responsibility for TB IPC

Administrative controls are the most important, least expensive, and often the most difficult measures to implement. Success requires institutional support for a designated IPC program leader with the authority, budget, and human resources to administer an appropriate IPC program (if IPC is assumed to be “everyone’s job,” it often becomes no one’s job). This includes the support and authority to conduct a TB risk assessment for facilities or for individuals, implement and enforce TB infection control policies, and ensure the recommended screening, training, and education of healthcare personnel and other staff are done.

- A healthcare worker who is employed full time, such as a nurse, must be relieved of a portion or all of their clinical work, depending on the size of the institution, so that adequate time is available for IPC including TB. In a small clinic one person may be sufficient for IPC, while in a large hospital several people will likely be needed.
- The person(s) responsible for TB IPC should have clinical experience in order to understand the nature of TB transmission and infectivity, but this may not always be possible. If an individual without any clinical background is appointed to oversee TB IPC, they must be trained in basic TB IPC including the mechanics of airborne transmission and be knowledgeable regarding populations most at risk for TB infection in the facility’s service area. The IPC person(s) should recognize vulnerable populations for TB disease progression, e.g., children or people with HIV, cancer, or other immunocompromising conditions, including those caused by medications they take (e.g., steroids, chemotherapy, immunosuppressive drugs such as infliximab). It is ideal to have a certified Infection Preventionist lead the TB program or consult to develop and train the individual who will oversee the program.
- In addition to an IPC program leader, facilities such as hospitals and outpatient clinics serving a large population may create multidisciplinary IPC committees bringing together key staff members. The committee in a large facility or hospital should include representatives from facility management, microbiology laboratory, multiple clinical disciplines including medicine, nursing, surgery, and pediatrics, as well as occupational health, engineering, and facility maintenance to advise on policy and protocols and to assist with implementation. The key to an effective IPC program is to motivate staff, clients, and visitors to follow airborne IPC procedures and policies.

# Conducting a TB IPC facility risk assessment

Once a specific individual (or a group of individuals in a large hospital) has been assigned the job of TB IPC, they must ensure and perform risk assessments of the facility. The ongoing evaluation of the risk assessment will help identify areas of the IPC program that may benefit from changes and/or enhancements.

- TB IPC risk assessments should be reviewed at least annually.
- Additional risk assessment may be warranted under the following circumstances:
  - Construction or renovation
  - Creation of new patient areas
  - Seasonal increases in patient flow and respiratory illnesses
  - Implementation of new TB diagnostic and treatment regimens
  - Staffing shortages
  - Suspicion for TB transmission within the facility
- This process includes updated assessments of community TB incidence, details of facility spaces and utilization (including patient, client, visitor, and staff flow), and types of environmental and personal respiratory protections required by specific persons in specific areas.

**The ongoing evaluation of the risk assessment will help identify areas of the IPC program that may benefit from changes and/or enhancements.**

The routine risk assessment throughout the year is an important IPC monitoring and evaluation process for the facility. It should include the following:

- Assessment of patient flow at various times of day, taking note of areas of patient crowding.
- Routine checks on the control measures of the TB clinic within the facility including location and scheduling (e.g., is it immediately adjacent to the HIV clinic or oncology clinic with potential overflow of waiting patients?).
- Routine checks on the control measures for high-risk procedures such as sputum induction (performed in a negative pressure room). Non-induced sputum collection must be performed away from all other patients in a well-ventilated area.

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CDC provides a **TB risk assessment worksheet** for healthcare and nontraditional facility-based settings in **Appendix B** of the *Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-care Settings, 2005 MMWR* (see full CDC document for more details).

A comprehensive facility risk assessment includes the following key information, as outlined in the CDC worksheet, to inform IPC policy and practice:

1. Local incidence of TB
2. Risk assessment based on utilization of specific areas within facility (e.g., inpatient vs outpatient vs. non-healthcare setting)
3. Screening, testing, and follow-up processes for staff and volunteers\*
4. TB IPC plan
5. Implementation status of TB IPC plan
6. Laboratory processing of TB-related specimens
7. Environmental controls
8. Respiratory protection program
9. Reassessment of facility TB risk

\*Important healthcare worker screening guidance updated in 2019 is not reflected in CDC 2005 worksheet. Refer to *Tuberculosis Screening, Testing, and Treatment of U.S. Health Care Personnel: Recommendations from the National Tuberculosis Controllers Association and CDC, 2019 MMWR* for updated information.

**Note:** While the 2019 NTCA/CDC document updates recommendations for healthcare personnel screening strategies (testing, treatment, and education), the 2019 guidance specifically states that recommendations for “continuing facility risk assessments for guiding infection control policies and procedures” remain unchanged from the 2005 CDC guidelines.

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The facility risk assessment should be done by or with the assistance of knowledgeable facility staff and healthcare providers who work in the institution and are familiar with flow and functional issues (e.g., patient crowding at certain times of day, windows that do not open easily, or problematic heating, ventilating, air-conditioning (HVAC) systems, Ultraviolet-C (UVC) fixtures, and room air cleaners).

- The details of the risk assessment should be documented in a **facility TB IPC risk assessment report** and shared with the IPC committee for review.
- A TB IPC risk assessment report should indicate the date of review, IPC staff who performed the review, and what level of transmission risk is associated with the setting (high, medium, or low).
- The risk assessment should include an evaluation of the effectiveness of and level of implementation of the IPC plan as well as recommendations for change.
- These reports should be filed in an accessible location for both staff and regulatory authorities, whether paper or electronic.

# Developing a TB IPC plan

Once a risk assessment has been completed, a TB IPC plan should be written or updated to reflect issues identified. The plan should receive input from the IPC committee, facility staff, and management to ensure appropriate personnel support and financial resources for implementation. It should include remediation steps and assign accountability for completion.

- It may be useful to categorize short-term, medium-term, and long-term plans as well as cost assessments for each remedy recommended.
- If structural changes are required, such as new construction to decrease crowding or improvements to the HVAC system, an engineer will be needed to develop these sections of the TB IPC plan.

In general, the TB IPC plan should include:

## Basic Information

- Contact information of TB IPC responsible person(s) and facility management
- Location, basic information of setting
- Service(s) provided
- Updated TB epidemiology (facility, state/local, people in the community served who are at increased risk for TB, and staff)

## Administrative Controls

- Assignment of TB IPC responsibility
- Annual TB IPC facility risk assessment plan/procedures
- Training and education plan for employees
- Education plan for patients, clients, and visitors
- TB screening and evaluation of employees
- Signage & support for respiratory hygiene
- Triage and airborne precaution protocols as needed
- Policies and protocols ensuring proper cleaning of medical equipment
- Policies and protocols ensuring appropriate communication and collaboration with local or state health departments
- Policies and protocols ensuring appropriate communication and collaboration with clinical and laboratory services

## Environmental Controls

- Evaluation and maintenance plans for environmental controls
  - Mechanical and natural ventilation
  - Upper-room UVC (also referred to as Ultraviolet Germicidal Irradiation, UVGI and Germicidal Ultraviolet, GUV) systems (including air mixing)
  - Room air cleaners (or various other air-cleaning technologies)

## Personal Protective Equipment

- Personal respiratory protection program (respirators) for at-risk employees
  - Training and education
  - Medical clearance
  - Fit testing for N-95 respirators
  - Powered Air-Purifying Respirator (PAPR) or Controlled Air-Purifying Respirator (CAPR)
  - Adequate supply
- Surgical/procedure masks (for potential and confirmed TB patients, clients, and visitors). Masks are primarily used for source control. Some IPC plans will include this under Administrative Controls.
  - Education
  - Adequate supply

## Sustainable TB IPC Implementation Plan and Lifecycle

- Identification of human resources and appropriate linkages to public health program
- Access to funding for IPC program
- Continuous quality improvement cycle: plan implementation -> monitoring and evaluation -> plan revision -> implementation of revisions
- See <https://www.cdc.gov/cancer/crccp/field-guide/phase4.htm> and <https://www.sustaintool.org/> for additional details.

Many examples and templates of TB IPC plans can be found online. Two samples that vary based on setting and extent of detail include:

- Comprehensive medical center version: University of Nebraska Medical Center [https://www.unmc.edu/ehs/safety/TB\\_Exposure\\_Plan.pdf](https://www.unmc.edu/ehs/safety/TB_Exposure_Plan.pdf)
- Two simplified examples shared in the TBCTA, CDC, USAID guide: IMPLEMENTING the WHO Policy on TB Infection Control in Health-Care Facilities, Congregate Settings and Households: *A framework to plan, implement and scale-up TB infection control activities at country, facility and community level*, 2009: pages 111-114  
[https://stoptb.org/wg/tb\\_hiv/assets/documents/tbicimplementationframework1288971813.pdf](https://stoptb.org/wg/tb_hiv/assets/documents/tbicimplementationframework1288971813.pdf)

# Baseline TB screening and evaluation of employees

It is essential that all healthcare personnel are **screened for TB infection and TB disease** prior to employment and after any exposure. In communities with high TB incidence, employees should be screened annually. Baseline evaluation includes screening for *M. tuberculosis* infection (with either Interferon Gamma Release Assay [IGRA] test or Tuberculin Skin Test [TST]), an individual risk assessment, and TB symptom evaluation. More detailed information on 2019 guidance on healthcare personnel screening ([https://www.cdc.gov/mmwr/volumes/68/wr/mm6819a3.htm?s\\_cid=mm6819a3\\_w](https://www.cdc.gov/mmwr/volumes/68/wr/mm6819a3.htm?s_cid=mm6819a3_w)) will be addressed in the updated Clinic Chapter (currently under development).

Facilities must maintain a registry of employee screening and results, maintaining appropriate security of private health information (electronic or hardcopy).

## Training and educating employees

Education is a key element of TB IPC administrative controls. All healthcare and facility personnel, whether clinical, laboratory, maintenance, custodial, dietary, office, or other staff (including volunteers) who routinely work in the facility must have regular TB IPC training and education.

The education should be short and simple—less is more—and include an understanding of:

- The TB bacillus and how it causes both latent TB infection (LTBI) and TB disease, including a clear understanding of the difference between infection vs. disease (CDC resources in English and Spanish: <https://www.cdc.gov/tb/publications/factsheets/general/lbtbiandactivetb.htm>).
- Airborne transmission of TB (e.g., through coughing, sneezing, speaking, etc.)
- Infectiousness of TB as compared with other pathogens (e.g., COVID or flu)
- Signs and symptoms of TB disease
- How crowding or environmental factors can influence transmission
- Basic information on how environmental controls work to support safety
- How and when to use appropriate respiratory PPE
- Remember to explain to all personnel the availability and effectiveness of TB treatment for both LTBI and TB disease. Share information about LTBI regimen options that are shorter in duration with improved safety profiles.

In a large institution, it may be appropriate to educate staff separately by job category, to allow open dialogue and the ability to ask questions freely (as some may be less comfortable asking questions in the same setting with clinical or physician staff).

CDC provides basic TB online modules (TB 101 for Healthcare Workers) or visit CDC Centers of Excellence for additional materials ([https://www.cdc.gov/tb/education/tb\\_coe/default.htm](https://www.cdc.gov/tb/education/tb_coe/default.htm)).



# Educating patients, clients, and visitors

Simplified, user-friendly educational material should be made available to patients, clients, and visitors that is appropriate for the setting. This could be through language-appropriate signage or brochures, videos shared in waiting areas, or individual or group educational sessions offered by staff.

- TB educational material developed for patients and the general public can be found online from CDC [https://www.cdc.gov/tb/education/patient\\_educational\\_materials.htm](https://www.cdc.gov/tb/education/patient_educational_materials.htm).

## Using appropriate signage & support for respiratory hygiene

**Signage** is a crucial tool for education and reinforcement for patients, clients, visitors, and staff.

- All waiting areas in a facility should display simple posters in appropriate languages. Posters illustrating cough etiquette (with drawings of coughing patients wearing masks and coughing into their elbows rather than their hands) are available from CDC and many other sites in multiple languages (<https://www.cdc.gov/flu/prevent/actions-prevent-flu.htm>).

**Respiratory hygiene** in crowded, high-risk areas can include giving tissues or surgical masks to patients, clients, and visitors to cover their mouths until TB has been excluded. Staff should wear N95 respirators or a PAPR/CAPR when working with a person with suspected or confirmed TB to prevent infection.

- Administrative control policies should include ensuring that there is a smooth process for procurement and distribution of masks and a person whose responsibility it is to maintain supply and re-order when the stock of masks is low.
- Within specific clinical areas, such as TB or HIV clinics, a trained staff member should educate patients in more detail about potential TB transmission and good respiratory hygiene including IPC practices for use in the home.



# Applying triage and airborne precaution protocols

To minimize TB transmission within any healthcare facility, **effective work practices** must be maintained for managing patients who are identified as having potential or confirmed TB disease.

- Implement protocols to quickly identify and separate from others those who are identified as having potential or confirmed TB disease. In a medical facility, this requires clinical assessment at facility entry to identify coughing patients. They should be separated from other patients immediately and fast-tracked for medical evaluation and diagnostic testing with proper airborne precautions. It is important that healthcare personnel, including providers, have a relatively high level of suspicion for TB based on their knowledge of risk factors, symptoms, community rates, etc.
- Isolate patients with potential infectious TB as rapidly as possible. In a medical facility, if the patient is to be admitted, this requires support from bed control services or other staff if Airborne Infection Isolation Rooms (AIIRs) are scarce. Inpatients occupying an AIIR who do not have TB or any other airborne infection must be moved.
- Require all medical staff caring for potential TB patients to wear N95 respirators or PAPR/CAPRs until it has been proven that the patient is no longer infectious. More detailed discussion on release from isolation for healthcare settings will be addressed in the updated Clinic Chapter (currently under development).
- Instruct healthcare personnel on how to educate family members about TB transmission within the hospital as well as the home if patients are discharged before becoming noninfectious. Care should be taken to reduce potential stigma for the patient, particularly from family or community members.

## Ensuring proper cleaning of equipment

Administrative controls must ensure that there is a protocol for **cleaning and sterilization or disinfection** of equipment (e.g., endoscopes, bronchoscopes) and protocols for the **safe disposal** of sputum cups or other potentially contaminated equipment.

- Protocols must be written and readily available to staff.
- Responsible person(s) for implementing the protocol should be clearly specified, with routine monitoring and documentation of compliance readily available for review.

# Collaborating with clinical and laboratory services

Because timely diagnosis and appropriate, early, effective treatment initiation are among the most effective means to reduce transmission, TB IPC administrative control responsibilities must include coordination with clinical and laboratory personnel.

Example areas for IPC administrative support include (but are not limited to):

- **Ensuring timely availability of recommended laboratory processing, testing, and reporting of results to the ordering clinician and the infection control team.**
- Provide use of, or prompt access to, rapid diagnostic methods. This includes:
  - Rapid molecular testing for *Mtb* and drug susceptibility testing (DST) included in TB diagnostic algorithms.
  - Rapid DST should at a minimum include testing for rifampin, but ideally should have access to additional molecular testing that includes isoniazid and fluoroquinolones.
- Regular inventory monitoring to ensure that all laboratory supplies are well stocked and re-ordered and replenished when in low supply.
- Ensure effective management of patients with potential or confirmed TB disease are in place, including proper supplies of diagnostic and specimen collection materials (e.g., sputum cups).
- Support coordination of services for timely and expedient access to TB care, such as strong linkages to care or integrated services for people with HIV and those who are at increased risk for infections.

As TB disease is most often diagnosed through sputum examination, IPC administrative controls must address all aspects of **sputum collection and processing** (with similar attention to non-sputum specimens).

- This includes sputum collection within an AIR and/or a ventilated, negative pressure sputum collection booth (or collection outdoors if booth not available within a facility).
- Monitoring of sputum processing time is important and includes tracking the course of the sputum container from collection of sputum to arrival and processing in the laboratory.
- If patients or clients collect sputum at home and bring it to the facility themselves, administrative controls include ensuring they know how to properly collect a sputum sample at home and appropriate signage and instructions to patients and clients as to where in the facility they should drop off their sputum.
- In a small facility, a TB nurse or laboratory technician can be delegated this responsibility, but the TB IPC administration must ensure an assignment is made and activities completed.

# Collaborating with local or state health departments

**Collaborate with the local or state health department to develop administrative controls consistent with health department policies** on management of patients with presumptive or confirmed TB disease (including plan for triage or possibly transfer for those with TB symptoms), health department notification, facility TB risk assessments, healthcare personnel screening, and education policies and priorities.

## **Prompt and ongoing communication of TB diagnoses with Local and State Health Departments includes:**

- For clinical sites, reporting positive test results of smears or nucleic acid amplification tests, such as the Xpert® MTB/RIF (often referred to as Xpert or GeneXpert) or other rapid TB diagnostic tests. Positive pathology and culture results must always be reported as well since rapid tests may not have been performed on biopsy specimens.
  - This is often the responsibility of the facility's laboratory, but as part of IPC administrative controls, the responsibility for reporting to the health department must be clearly assigned and monitored monthly in communities with high TB incidence, or quarterly where TB is less frequent.
  - Reporting rules may differ between states and/or local jurisdictions and the IPC guidance should reflect local requirements.
- Routine monitoring will enable tracking of TB incidence within an institution to identify nosocomial transmission (spread within the facility) as well as any increase in TB within a community. The investigation of unexpected positive test results may uncover possible gaps in IPC practice or procedures or laboratory equipment malfunction that resulted in transmission within a facility.

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**While interventions are presented as separate categories, it is important to keep in mind that there are crucial overlapping features, and the entire “package” of interventions should be thought of as one integrated and coordinated IPC strategy.**

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