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# Communicable Disease Control Manual

## Chapter 4: Tuberculosis

# APPENDIX B: INFECTION PREVENTION AND CONTROL



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## APPENDIX B: INFECTION PREVENTION AND CONTROL

Effective TB infection prevention and control within facilities and in the community begins with the prompt identification of individuals with signs or symptoms of active TB disease and initiation of appropriate measures to interrupt or prevent transmission. These measures include airborne precautions and home isolation precautions for those receiving care at home as well as specific guidelines on the collection, handling, transport, and preparation of specimens that could contain TB bacteria (See [Appendix C](#)).

This appendix focuses on general information on airborne precautions and home isolation precautions. Readers should consult facility policies/procedures for additional information, such as room air clearance times.

### GENERAL PRINCIPLES

It should be acknowledged that TB infection and prevention control interventions, such as hospital or home isolation, involve balancing the rights of the individual against the duty to protect the public, as mandated by the BC [Public Health Act](#). In addition to the burden of a serious medical condition, persons diagnosed with infectious TB face substantial psychosocial and economic costs due to isolation. It is the responsibility of the health care team to consider each scenario on an individual basis and implement isolation measures in a compassionate and thoughtful approach to mitigate these indirect and hidden costs of limiting ongoing transmission to the best of their ability.

Current recommendations on infection prevention and control for TB involve a hierarchical approach involving three components:

- 1. Administrative controls:** institutional policies or measures to provide overarching protection for all health care providers, patients and visitors in a facility.
- 2. Environmental (engineering) controls:** environmental measures to reduce likelihood of exposure to aerosolized TB bacteria (e.g., mechanical ventilation systems, ultraviolet germicidal irradiation (UVGI), and high-efficiency particulate air (HEPA) filters).
- 3. Personal protection controls:** measures directed to individual health care providers either to protect against infection with TB bacteria (e.g., use of disposable N95 particulate respirators) or to prevent development of TB disease if infected (e.g., employee TB testing programs).

Additional information on each control type can be found in the [Canadian Tuberculosis Standards, 7<sup>th</sup> Edition \(2014\)](#).

Although these components of infection prevention and control are usually considered within the context of health care and other facility-type settings, there is overlap with settings in the community (e.g., within client residences) as infection prevention and control practices in any setting are informed by factors that influence risk of TB transmission (see [Section 7.5](#), Table 7-2 and Table 7-3).



## 1. AIRBORNE PRECAUTIONS

Airborne precautions include:

- Health care providers and others (e.g., facility staff, visitors<sup>1</sup>) wearing fit-checked, disposable N95 particulate respirators during exposure to infectious cases and while in contaminated airspaces.
- Masking cases within facilities (surgical/procedure-type mask) and placing them in an airborne infection isolation room (AIIR). If an AIIR is not available at the facility, the case should remain masked pending and during transport to a facility with an AIIR. **Cases are not required to mask while in an AIIR.** Masking cases in the community (surgical/procedure-type mask) during:
  - Contact with health care providers (e.g., for directly observed treatment).
  - Essential medical appointments (e.g., for diagnostic evaluations, blood tests), and during transport to and from such appointments.

Cases are **not** generally required to mask while inside their place of residence, unless in the presence of a health care provider. However, cases should avoid sharing common indoor airspaces with non-household members, and should cover their mouths and noses when coughing or sneezing. Masking is not usually required during time spent outdoors, but while outdoors, cases should avoid spending time in close proximity to other people.

### 1.1 Indications (1)

Airborne precautions should be maintained for cases with infectious forms of active TB disease (confirmed and clinical cases) until such time as they meet the criteria for discontinuation of airborne precautions (see [Discontinuation of Airborne Precautions](#)).

Airborne precautions should be initiated and maintained while diagnosis is being determined for clients with **any** of the following characteristics:

- Risk factors for TB **and signs/symptoms** of active **respiratory** TB disease.
- Chest x-ray findings consistent with active TB disease ([see Section 4.4.3](#)), regardless of whether there are TB signs/symptoms.
- One or more AFB smear-positive sputum specimens.
- Suspected laryngeal involvement (e.g., hoarseness, sore throat).
- Presumed nonrespiratory TB disease with abnormal chest x-ray findings.
- Presumed nonrespiratory TB disease that includes an open abscess or lesion in which the concentration of organisms is high, especially if draining is extensive or if an aerosolization of drainage fluid is performed.
- Presumed nonrespiratory TB disease with normal chest x-ray findings in the presence of immune compromise by disease or treatment

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<sup>1</sup> Visitors should be restricted to immediate family, guardians. Visiting family or guardians of pediatric patients should be screened for active respiratory TB disease. Visits by children under 5 and those with immune compromise should be discouraged (CTS, 2014). Consult facility policies regarding any precautions visitors should take prior entering contaminated airspaces shared by infectious cases.



**NOTE:** Children under 10 years with active TB disease are **not** usually considered infectious. However, airborne precautions should be initiated while diagnosis is being determined for children **of any age** with any of the following characteristics:

- Cavitory chest x-ray findings
- AFB smear-positive respiratory specimen(s)
- Suspected laryngeal involvement
- Extensive pulmonary infection
- Congenital TB and undergoing procedures involving oropharyngeal airway

## 2. HOME ISOLATION

To reduce the risk of TB transmission, cases and suspect cases in the community must adhere to a number of precautions while they are infectious, which include:

- Remaining in the home.
- Adhering to TB treatment.
- Masking (surgical/procedure type) when leaving the home to attend essential medical appointments and when health care providers enter the home.
- Covering their mouths and noses with tissues when coughing, sneezing, or laughing.
- Airing out rooms in the home where they typically spend the most time, for example by opening windows.
- Advising any new health care providers of the TB diagnosis (e.g., emergency room personnel, ambulance paramedics).
- **Not** having visitors to their homes, especially children and those with immune compromise.
- **Not** using buses, trains, taxis, or airplanes.
- **Not** going to public places, including work, school, church, stores, shopping malls, restaurants, or movie theatres.
- **Not** going to non-essential appointments (e.g., dentist, hair dresser).

A HealthLinkBC file on [Home Isolation for Tuberculosis \(TB\)](#) is available in multiple languages for clients.

## 3. DISCHARGE OF INFECTIOUS CASES FROM ACUTE CARE

Decisions on discharging cases from acute care that are sputum AFB smear-positive should be made in consultation with TB Services and/or local Medical Health Officer.

Successful discharge planning requires careful planning and collaboration between hospital and public health care providers (HCPs). For cases being discharged from acute care centres (except VGH TB ward and BC Children's Hospital), ensure that the **TB Nurse Consultants (604-707-5678)** have been notified well in advance of the anticipated discharge date to review the plan of care and ensure a TB clinic appointment is booked. For clients outside of the **Lower Mainland of Vancouver**, ensure Public Health is aware.

**NOTE: Provide enough medications to the client to last until their first clinic appointment in community.**



In general, a person known or expected to have **fully susceptible TB disease** may be considered for discharge regardless of AFB smear status, provided that **advance arrangements have been made for the treatment regimen to be continued** and properly managed after discharge **and they meet all of the following criteria:**

- Receiving and tolerating a TB treatment regimen to which the strain is known or likely to be susceptible.
- Showing clinical improvement (e.g., reduction in fever, resolution or near resolution of cough).
- Agrees to adhere to TB treatment, monitoring, and follow-up requirements after discharge.
- Has been educated on home isolation and agrees to adhere with home isolation requirements for as long as deemed necessary by their primary care provider/TB Services.
- Able to care for self and will **not** need home attendant or visiting nurse services, **other than for DOT**.
- Will be discharged to a stable residence at a verified address:
  - That is **not** a congregate setting such as a shelter, nursing home, or single-room-occupancy hotel.
  - In which household air will **not** be recirculated to other housing units (e.g., certain apartment complexes).
  - Where all household members have been previously exposed to the person. If any household members are TST-negative, they should be informed of and understand potential risks before the client returns to the residence.
  - Where **no** children under 5 years or other persons who are significantly immune compromised are present. An exception would be if such household members are receiving [window period prophylaxis](#), or treatment for LTBI or active TB disease. This situation should be discussed in advance of discharge with TB Services and/or the local Medical Health Officer.

Please refer to the following provincial [Hospital Discharge Planning Checklist](#) for TB Clients for detailed information that is useful to consider and share when planning for TB discharges as well as a checklist to ensure appropriate discharge of TB client back into community.

#### 4. ADHERENCE WITH AIRBORNE PRECAUTIONS AND HOME ISOLATION

Non-adherence with airborne precautions and/or home isolation can lead to TB transmission. Follow internal protocols/policy for non-adherent inpatient cases. Consult TB Services and/or the local Medical Health Officer when adherence issues arise with cases in the community.

#### 5. DISCONTINUATION OF AIRBORNE PRECAUTIONS AND HOME ISOLATION

Discontinuation of airborne precautions in acute care and other institutional settings should be made in accordance with internal protocols/policies. Consultation with TB Services is recommended when necessary. Decisions on discontinuation of home isolation should be made in consultation with TB Services.

#### **Practitioner Alert!**

Smear negativity does not rule out infectious TB and should not be used in isolation to determine infectivity. Almost half of the TB cases in BC are smear negative at diagnosis.



## 5.1 Presumed TB Cases

Discontinuation of airborne precautions/home isolation may be considered when three successive sputum specimens (spontaneous or induced) are negative on AFB smear, unless active TB disease is still strongly presumed or treatment initiated, or no other diagnosis has been made.

## 5.2 Confirmed Respiratory TB Cases

**Table B-1: Recommendations on discontinuation of airborne precautions/home isolation**

AFB Smear and Culture Status	Recommendations
AFB Smear-Negative, Culture-Positive, Drug-Susceptible TB Disease  <b>Note:</b> Repeat sputum smears are required at the initiation of treatment to re-confirm smear-negative status and support decision-making around length of isolation.	Discontinuation of airborne precautions/home isolation may be considered when there is clinical evidence of improvement, documented tolerance to first line treatment, and at least <b>2 weeks</b> of effective therapy dosing has been completed. <sup>2</sup>
AFB Smear-Positive, Culture-Positive, Drug – Susceptible TB Disease	Discontinuation of airborne precautions/home isolation may be considered when there is clinical evidence of improvement, at least 2 weeks of effective therapy (based on the known or presumed antibiotics sensitivity of the case’s organism) has been tolerated and completed and there have been three consecutive AFB-negative sputum-smears.  Some patients with continue to produce AFB smear-positive sputum specimens for several weeks into treatment. Home isolation for such cases can usually be discontinued provided there is evidence of clinical improvement, adherence to treatment and three consecutive sputum cultures (not AFB smears) reported as negative after 6 weeks of incubation.

<sup>2</sup> Drug susceptibility test results are usually available within 4 weeks in AFB smear-negative/culture-positive cases and 3 weeks in FB smear-positive cases. Drug susceptibility test results confirm effectiveness of treatment regimen to date.



**Table B-1: Recommendations on discontinuation of airborne precautions/home isolation continued**

AFB Smear and Culture Status	Recommendations
AFB Culture-Positive	If sputum specimens continue to be culture-positive after <b>4 months</b> of treatment or if they become culture-positive after a period of negative results, drug susceptibility testing should be repeated (2). Consultation with TB Services is recommended.
Mono-Resistance to Rifampin and Multi-Drug Resistant (MDR) TB Disease	<p>Airborne precautions should be maintained for the duration of the case's hospital stay or until three consecutive sputum <b>cultures</b> (not AFB smears) are reported as negative <b>after 6 weeks</b> of incubation <b>and</b> the case is on an effective regimen.</p> <p>Home isolation should be maintained until three consecutive sputum <b>cultures</b> (not AFB smears) are reported as negative <b>after six weeks</b> of incubation <b>and</b> the case is on an appropriate regimen.</p> <p>Consultation with TB Services is required in all cases of drug resistant TB disease or cases on second-line treatment regimens (2).</p>





## REFERENCES

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1. Clinical Policies and Protocols (4th edition). Bureau of Tuberculosis Control: New York City Department of Health and Mental Hygiene, 2008;121-136.
2. Ogenremi T, Menzies D, Embil J. Prevention and control of tuberculosis transmission in health care and other settings. In: Menzies D. ed. Canadian Tuberculosis Standards (7th edition). Canada: Canadian Lung Association, 2014;361-404.