

# Appendix A: Disease-Specific Chapters

Chapter: Tuberculosis

## Tuberculosis

- Communicable
- Virulent

### Health Protection and Promotion Act, Section 1 (1)

#### Health Protection and Promotion Act: Ontario Regulation 558/91 – Specification of Communicable Diseases

#### Health Protection and Promotion Act: Ontario Regulation 559/91 – Specification of Reportable Diseases

<b>1) Aetiologic Agent:</b>	<p>The infectious agent of tuberculosis infection and disease in humans is the <i>Mycobacterium tuberculosis complex</i>, which consists of <i>M. tuberculosis</i>, and includes <i>M. tuberculosis</i> subsp. <i>canetti</i>, <i>M. africanum</i>, <i>M. caprae</i>, <i>M. microti</i>, <i>M. pinnipedii</i>, and <i>M. bovis</i> (1). <i>M. bovis</i> includes the vaccine strain <i>M. bovis</i> BCG however, <i>M. bovis</i> BCG is not in the Canadian case definition of TB.</p> <p>Mycobacteria are aerobic, non-spore forming and non-motile bacteria (1).</p> <p>Other nontuberculous mycobacteria causing disease in humans are not communicable and not reportable in Ontario, with the exception of leprosy (1).</p>
<b>2) Case Definition:</b>	
Surveillance Case Definition	<a href="#">See Appendix B</a>
Outbreak Case Definition	<p>The outbreak case definition varies with the outbreak under investigation. Consideration should be given to the following in establishing a tuberculosis outbreak case definition:</p> <ol style="list-style-type: none"><li>1. Clinical, laboratory and/or epidemiological criteria</li><li>2. Time frame for occurrence</li><li>3. Geographic location(s) or place(s) where cases live or became ill/exposed</li><li>4. Special attributes of cases (e.g. age, underlying conditions)</li></ol> <p>Cases should also be classified by levels of probability (i.e. confirmed, probable or suspect).</p>
<b>3) Identification:</b>	
Clinical Presentation	The initial infection usually goes unnoticed; tuberculin skin test

	<p>sensitivity may appear 3-8 weeks following infection (1). Early lung lesions commonly heal, leaving no residual changes except occasional pulmonary lesions suggestive of granulomas that may or may not be calcified, hilar lymph node calcifications, or scarring. About 10% of these latent TB infections (LTBI), who don't have other risk factors, will eventually develop active disease, 5% of them during the first 2 years; 90% of untreated infected persons will never develop active TB. If HIV co-infection, risk is 10% per year (1). Appropriate completion of treatment for LTBI can considerably reduce the lifetime risk of clinical TB disease and is effective in persons with HIV co-infection (1).</p> <p>Pulmonary symptoms may include:</p> <ul style="list-style-type: none"> <li>• Persistent cough (of more than 3 weeks)</li> <li>• Sputum production, sometimes with hemoptysis</li> <li>• Chest pain</li> <li>• Shortness of breath</li> </ul> <p>Systemic symptoms consistent with TB include:</p> <ul style="list-style-type: none"> <li>• Fever, chills and night sweats</li> <li>• Loss of appetite and weight loss and</li> <li>• Fatigue</li> </ul> <p>Extrapulmonary symptoms are dependent on the site affected, for example, TB of the spine might produce backache; TB of the kidney may cause flank pain, frequency and dysuria and TB involving lymph nodes presents with swelling in the affected lymph nodes. Extrapulmonary TB should be suspected in anyone with systemic symptoms who is at high risk for TB (1).</p>
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Diagnosis	<a href="#">See Appendix B</a>
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#### 4) Epidemiology:

Occurrence	<p>Occurrence is worldwide. Tuberculosis (TB) cases in Ontario account for approximately half of the cases of tuberculosis reported in Canada each year.</p> <p>In Ontario, the highest incidence of TB is seen in the city of Toronto. Provincially, upwards of 90% of TB cases occur among the foreign born. Persons at greater risk of developing active TB after being infected include: persons with immunosuppressive conditions (such as HIV), homeless individuals, Aboriginal persons and children under 5 years old.</p> <p>The incidence of multi-drug resistant TB (MDR-TB) in the province has fluctuated around approximately 10 cases per year. To date,</p>
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	<p>Ontario and Alberta are the only provinces in Canada that have had cases of extensively drug resistant TB (XDR-TB).</p>
Reservoir	<p>The reservoir for <i>M. tuberculosis</i> is humans. Animals may be infected but are rarely a source of infection. Sporadic cases may result from inadvertent exposure of abattoir workers, veterinarians and wild game handlers to infected animals (1).</p>
Modes of Transmission	<p>Transmission of tubercle bacilli in airborne droplet nuclei (1 to 5 microns in diameter) occurs via respiratory efforts such as coughing, sneezing, singing or speaking (1).</p> <p>This generally requires prolonged or repeated exposure to an infectious case. Laryngeal tuberculosis is rare however it is highly infectious. Health care workers may potentially be exposed during bronchoscopy, intubation and autopsy (1).</p> <p>Bovine tuberculosis results from exposure to cattle infected with <i>M. bovis</i>, usually through ingestion of unpasteurized milk or dairy products, and sometimes through airborne droplet nuclei that can be spread to farmers and animal handlers.</p> <p>Extrapulmonary TB is generally not communicable (1). Concurrent pulmonary involvement, however, should always be ruled out in any case of extrapulmonary TB.</p>
Incubation Period	<p>Variable. 5% of infected individuals develop primary or progressive primary active disease within 18-24 months after infection, and 5% develop post primary disease over the remainder of their lifetime. While the subsequent risk of active pulmonary or extrapulmonary TB is greatest within the first two years after infection, latent infection will persist for a lifetime. HIV co-infection and other immunocompromising conditions as well as age under 5 years, increases the risk for the development of TB disease following infection (1).</p>
Period of Communicability	<p>Is variable; in theory as long as viable tubercle bacilli are discharged in the sputum. Some untreated or inadequately treated patients may be intermittently sputum-positive for years. The degree of communicability depends on the number of bacilli discharged, virulence of the bacilli, adequacy of ventilation, exposure of bacilli to sun or UV light and opportunities for aerosolization through coughing, sneezing, talking, singing or during procedures such as intubations, bronchoscopes and autopsy (1).</p> <p>For smear positive or symptomatic infections the period of communicability may be 3 months before symptom onset; asymptomatic smear negative with no evidence of cavities are infectious 4 weeks prior to date of diagnosis.</p>

	<p>Effective antibiotic treatment for a fully susceptible organism generally eliminates communicability within 2 – 4 weeks. Effective treatment is measured by negative smears and clinical improvement.</p> <p>Children with primary TB are generally not infectious (1).</p>
Susceptibility and Resistance	<p>Susceptibility is essentially universal. The risk of acquiring progressive disease due to infection with the tubercle bacillus is related to multiple factors including degree of exposure, nutritional and immune status of the host, and other factors including genetic factors.</p> <p>The first 12-24 months after infection constitutes the most hazardous period for the development of clinical disease (1).</p> <p>The risk of developing disease is highest in children under 5 years of age, lowest in later childhood and high again among young adults, the very old and persons who are immunosuppressed, particularly those who are HIV positive, have diabetes, certain types of cancer, and other conditions (1).</p>

### 5) Reporting Requirements:

To local Board of Health	<p>Clinical and or laboratory confirmed cases shall be reported to the medical officer of health by persons required to do so under the <i>Health Protection and Promotion Act</i>, R.S.O. 1990 (2).</p> <p>Refer to the <i>Tuberculosis Prevention and Control Protocol, 2008</i> (or as current) (4) for more details on reporting of data elements for cases and suspect cases and contacts.</p>
To Public Health Division (PHD)	<p>Report only case classifications specified in the case definition to PHD.</p> <p>Cases shall be reported using the integrated Public Health Information System (iPHIS), or any other method specified by the ministry <b>within one (1) business day of receipt of initial notification</b> as per <i>iPHIS Bulletin</i> Number 17: Timely Entry of Cases (8).</p> <p>The minimum data elements to be reported for each case is specified in the following:</p> <ul style="list-style-type: none"> <li>• <i>Ontario Regulation 569</i> (Reports) (3) under the Health Protection and Promotion Act (HPPA) (2);</li> <li>• The disease-specific user guides published by the ministry, and</li> <li>• Bulletins and directives issued by the ministry.</li> </ul>

	Refer to the <i>Tuberculosis Prevention and Control Protocol, 2008</i> (or as current) (4) for more details on reporting of data elements for cases and suspect cases and contacts.
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**6) Prevention and Control Measures:**

Personal Prevention Measures	<p>Refer to the following ministry documents and the other references listed below for information on prevention and education:</p> <p><i>Tuberculosis Prevention and Control Protocol, 2008</i> (or as current) (4)</p> <p><i>Guidelines to Reduce TB Transmission in Homeless Shelters and Drop-In Centres</i> (5)</p> <p><i>Tuberculosis Prevention and Control Best Practices</i> (formerly called Tuberculosis Protocol 2006) (6)</p>
Infection Prevention and Control Strategies	<p>Refer to the following ministry documents and the other references listed below for information on infection prevention and control strategies:</p> <p><i>Tuberculosis Prevention and Control Protocol, 2008</i> (or as current) (4)</p> <p><i>Guidelines to Reduce TB Transmission in Homeless Shelters and Drop-In Centres</i> (5)</p> <p><i>Tuberculosis Prevention and Control Best Practices</i> (formerly called Tuberculosis Protocol 2006) (6)</p>
Management of Cases	<p>Refer to the following ministry documents and the other references listed below for information on prevention and education:</p> <p><i>Tuberculosis Prevention and Control Protocol, 2008</i> (or as current) (4)</p> <p><i>Guidelines to Reduce TB Transmission in Homeless Shelters and Drop-In Centres</i> (5)</p> <p><i>Tuberculosis Prevention and Control Best Practices</i> (formerly called Tuberculosis Protocol 2006) (6)</p>
Management of Contacts	<p>Refer to the following ministry documents and the other references listed below for information on prevention and education:</p> <p><i>Tuberculosis Prevention and Control Protocol, 2008</i> (or as current) (4)</p> <p><i>Guidelines to Reduce TB Transmission in Homeless Shelters and Drop-In Centres</i> (5)</p> <p><i>Tuberculosis Prevention and Control Best Practices</i> (formerly called</p>

	Tuberculosis Protocol 2006) (6)
Management of Outbreaks	<p>Refer to the following ministry documents and the other references listed below for information on prevention, education and outbreak management:</p> <p><i>Canadian Tuberculosis Standards</i> (1)</p> <p><i>Tuberculosis Prevention and Control Protocol, 2008</i> (or as current) (4)</p> <p><i>Guidelines to Reduce TB Transmission in Homeless Shelters and Drop-In Centres</i> (5)</p>
<b>7) References</b>	<p>(1) Long R &amp; Ellis E, editors. Canadian Tuberculosis standards. 6<sup>th</sup> ed. Ottawa, ON: Her Majesty the Queen in Right of Canada; 2007. Available from <a href="http://www.phac-aspc.gc.ca/tbpc-latb/pubs/pdf/tbstand07_e.pdf">http://www.phac-aspc.gc.ca/tbpc-latb/pubs/pdf/tbstand07_e.pdf</a>.</p> <p>(2) <i>Health Protection and Promotion Act</i>, R.S.O. 1990, c. H.7. Available from <a href="http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm">http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm</a>.</p> <p>(3) O. Reg. 569/90. Available from <a href="http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_900569_e.htm">http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_900569_e.htm</a>.</p> <p>(4) Ministry of Health and Long-Term Care. Tuberculosis prevention and control protocol. Toronto: Queen's Printer for Ontario; 2008. Available from <a href="http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/progstds/protocols/tuberculosis_prevention_control.pdf">http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/progstds/protocols/tuberculosis_prevention_control.pdf</a> . (or as current)</p> <p>(5) Toronto Public Health. Environmental control best practices: Guidelines to reduce TB transmission in homeless shelters and drop-in centres. Toronto, ON: City of Toronto; 2007. Available from <a href="http://www.toronto.ca/health/tb_prevention/pdf/enviro_control_best_practices.pdf">http://www.toronto.ca/health/tb_prevention/pdf/enviro_control_best_practices.pdf</a>.</p> <p>(6) Ministry of Health and Long-Term Care. Tuberculosis prevention and control best practices. Toronto, ON: Queen's Printer for Ontario; 2006. [Draft under revision]. Available from <a href="https://www.publichealthontario.ca/imageserver/content/publichealth/TBPCConsolidated_Sept06.pdf">https://www.publichealthontario.ca/imageserver/content/publichealth/TBPCConsolidated_Sept06.pdf</a>. Accessed Feb 1, 2009.</p> <p>(7) Ministry of Health and Long-Term Care. Infectious diseases protocol. Toronto: Queen's Printer for Ontario; 2009. Available from <a href="http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html">http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html</a> (or as current)</p>

	<p>(8) Ministry of Health and Long-Term Care. Timely entry of cases. <i>iPHIS Bulletin</i>. 2007 May 11;17.</p>
<b>8) Additional Resources</b>	<p>Ministry of Health and Long-Term Care. iPHIS tuberculosis (TB) user guide. Toronto, ON: Queen's Printer for Ontario; 2008.</p> <p>Steering Committee on Infection Control Guidelines. Prevention and control of occupational infections in health care. An infection control guideline. <i>Can Commun Dis Rep</i>. 2002; 28(Suppl 1): 1-264. Available from <a href="http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/02vol28/28s1/index.html">http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/02vol28/28s1/index.html</a></p>

