Appendix A:
Disease-Specific Chapters

Chapter: Tetanus
Revised January 2014
Tetanus

☐ Communicable
☐ Virulent

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

1.0 Aetiologic Agent

Tetanus (lockjaw) is caused by a neurotoxin produced by the bacterium Clostridium tetani.1, 2

2.0 Case Definition

2.1 Surveillance Case Definition
See Appendix B.

2.2 Outbreak Case Definition
Not applicable.

3.0 Identification

3.1 Clinical Presentation

Tetanus is an acute disease that can manifest in four clinical forms based on presentation: local, cephalic, neonatal and generalized tetanus.3

Local tetanus is an uncommon condition in which persistent muscle contraction is limited to the area of injury but can most often progress to generalized tetanus.3, 4 Cephalic tetanus is rare and involves the cranial nerves or can occur with otitis media.4 Neonatal tetanus is a form of generalized tetanus in newborn infants who do not have passive protective maternal antibodies.3

Generalized tetanus is the most common manifestation of the disease occurring in approximately 80% of reported cases.4 Generalized tetanus is characterized by painful muscle spasms, usually in a descending pattern beginning in the masseter muscle (trismus or lockjaw), followed by stiff and abdominal muscles.1, 2, 4 Abdominal rigidity is a common first presentation of disease in older children and adults.5 Duration of spasms is generally three to four weeks, though recovery may take months.4

With disease progression, generalized prolonged frequent spasms may occur, contributing to serious complications and death unless treatment is provided.1 Case-fatality ratios vary from 10% to over 80% in unvaccinated individuals; highest rates are found in infants and the elderly.1

3.2 Diagnosis

See Appendix B for diagnostic criteria relevant to the Case Definitions.
For further information about human diagnostic testing, contact the Public Health Ontario Laboratories or refer to the Public Health Ontario Laboratory Services webpage: http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/default.aspx

4.0 Epidemiology

4.1 Occurrence
Between 2007 and 2011, an average of one case occurred per year in Ontario. For more information on infectious diseases activity in Ontario, refer to the current versions of the Ontario Annual Infectious Diseases Epidemiology Reports and the Monthly Infectious Diseases Surveillance Report.5, 6

Tetanus occurs worldwide, most commonly in densely populated regions and agricultural regions where contact with animal excreta is more likely and immunization rates are low.1, 2 While eliminated in North America, neonatal tetanus persists globally as a result of inadequate sterile procedures during delivery combined with the lack of protective passive immunity.1, 4

4.2 Reservoir
*C.tetani* spores are widely distributed worldwide in soil or fomites contaminated with animal or human feces. Spores are also detected in the intestines of animals and humans as normal, harmless inhabitants.1, 2

4.3 Modes of Transmission
Spores are introduced into the body through a break in the skin (e.g. puncture wound, animal bites, burns) or contaminated injectable street drugs, that have been contaminated with soil, street dust, or animal or human feces.1, 2

4.4 Incubation Period
Usually three to 21 days (average eight days), with a range from one day to several months, depending on the character, extent and location of the wound; most cases occur within 14 days of exposure.2, 4 In general, shorter incubation periods are associated with more heavily contaminated wounds, more severe disease and a worse prognosis.2 Incubation period for neonatal tetanus ranges from four to 14 days (average seven days) after birth.4

4.5 Period of Communicability
Not applicable; no direct person–to-person transmission.2

4.6 Host Susceptibility and Resistance
Susceptibility is general in unimmunized or inadequately immunized persons; active immunity is induced by the tetanus toxoid and persists for at least ten years after completion of the immunization series.1, 7 Due to waning immunity, booster doses with a tetanus toxoid-containing vaccine are required every ten years after the 4-6 year old booster immunization
to maintain high levels of immunity.\textsuperscript{1} Recovery from tetanus does not result in immunity or prevent recurrence, therefore active immunization is indicated after recovery.\textsuperscript{1,4}

\section*{5.0 Reporting Requirements}

\subsection*{5.1 To local Board of Health}

Individuals who have or may have tetanus shall be reported \textit{immediately} to the Medical Officer of Health (MOH) by persons required to do so under the \textit{Health Protection and Promotion Act}, R.S.O. 1990 (HPPA).\textsuperscript{8}

\subsection*{5.2 To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry}

Report only case classifications specified in the case definition.

Cases shall be reported using the integrated Public Health Information System (iPHIS), or any other method specified by the ministry, \textit{within one business days of receipt of initial notification} as per iPHIS Bulletin #17: Timely Entry of Cases and Outbreaks.\textsuperscript{9}

The minimum data elements to be reported for each case are specified in the following:

- \textit{Ontario Regulation 569} (Reports) under the HPPA;\textsuperscript{10}
- The iPHIS User Guide published by PHO; and
- Bulletins and directives issued by PHO.

\section*{6.0 Prevention and Control Measures}

\subsection*{6.1 Personal Prevention Measures}

Immunize as per the current \textit{Publicly Funded Immunization Schedules for Ontario}.\textsuperscript{11} Completion of the primary series (at least three doses) induces more than 99\% protective antibody levels against tetanus.\textsuperscript{1} The primary series is followed by booster doses at 18 months of age and four to six years of age. Adolescents and adults should receive booster doses with a tetanus toxoid-containing vaccine every ten years thereafter.\textsuperscript{1}

Tetanus toxoid is only available as a combination vaccine. Immunization with a tetanus-containing vaccine is indicated in susceptible pregnant women, infants born prematurely and immunocompromised persons. However, these individuals should be referred to their health care provider for guidance on dose and type of combination vaccine.\textsuperscript{1}

\textit{Post-exposure prophylaxis}

Post-exposure prophylaxis should follow the Canadian Immunization Guide (\texttt{http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-tet-eng.php}).\textsuperscript{1}

Achieving adequate effective neutralizing antibody concentrations at the time of the injury is only possible through prior completion of the tetanus toxoid-containing vaccine series or immediate administration of TIg.\textsuperscript{1} Individuals who present with more than a minor wound and who are unimmunized or incompletely immunized (unknown or less than three doses) should receive both TIg and tetanus toxoid-containing vaccine as appropriate for age and vaccination history.\textsuperscript{1}
6.2 Infection Prevention and Control Strategies

Routine practices are recommended for hospitalized cases. Isolation is not required.

Refer to Public Health Ontario’s website at [www.publichealthononto.ca](http://www.publichealthononto.ca) to search for the most up-to-date Provincial Infectious Diseases Advisory Committee (PIDAC) best practices on Infection Prevention and Control (IPAC). PIDAC best practice documents can be found at: [http://www.publichealthononto.ca/en/BrowseByTopic/InfectiousDiseases/PIDAC/Pages/PIDAC_Documents.aspx](http://www.publichealthononto.ca/en/BrowseByTopic/InfectiousDiseases/PIDAC/Pages/PIDAC_Documents.aspx).

6.3 Management of Cases

Cases should be investigated to determine the source of infection. Refer to Section 5: Reporting Requirements above for relevant data to be collected during case investigation. The following disease specific information should also be obtained during case management:

- **Clinical:**
  - symptoms and date of symptom onset
  - previous medical history (e.g. diabetes)
  - complication(s)
  - hospitalization and duration of stay
  - wound location and management, including receipt of tetanus toxoid-containing vaccine or tetanus immune globulin (TIG)
  - treatment – date started, prophylaxis with tetanus toxoid-containing vaccine or TIG
  - intensive care treatment received
  - outcome
  - date of death if applicable;

- **Laboratory:** N/A;

- **Immunization status:**
  - dates of vaccination with tetanus toxoid-containing vaccine
  - time since last dose of tetanus toxoid-containing vaccine
  - maternal vaccination in neonatal cases; and

- **Epidemiologic:** exposures or risk factors (i.e. recent injury (e.g. puncture, laceration), use of street drugs or other injectables).

The primary goal in managing cases is to remove the source of toxin production and neutralizing toxin that may have been released by:

1. **Timely, thorough cleaning of wound including removal of necrotic tissue and foreign materials,**1,4 and
2. **Ensuring high circulating concentrations of tetanus antibody which inactivate the toxin.**1

Treatment should be administered as per the attending health care provider. For further guidance please refer to the current Canadian Immunization Guide ([http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-tet-eng.php](http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-tet-eng.php)).1
Tetanus disease does not confer immunity since illness can be caused by a very small amount of toxin.\(^4\) The case should begin or continue with tetanus toxoid-containing vaccinations after recovery.\(^4\)

### 6.4 Management of Contacts
Not applicable; no direct person-to-person transmission.\(^2\)

### 6.5 Management of Outbreaks
Not applicable.

### 7.0 References


8.0 Additional Resources


9.0 Document History

Table 1: History of Revisions

<table>
<thead>
<tr>
<th>Revision Date</th>
<th>Document Section</th>
<th>Description of Revisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2014</td>
<td>General</td>
<td>New template.</td>
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<tr>
<td></td>
<td></td>
<td>Title of Section 4.6 changed from “Susceptibility and Resistance” to “Host Susceptibility and Resistance”</td>
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<td>Title of Section 5.2 changed from “To Public Health Division (PHD)” to “To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry”</td>
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<td></td>
<td>3.1 Clinical Presentation</td>
<td>Entire section revised.</td>
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<td></td>
<td>3.2 Diagnosis</td>
<td>Addition of direction to contact Public Health Ontario Laboratories or PHO website for</td>
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<td>Description of Revisions</td>
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<td>additional information on human diagnostic testing.</td>
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<td>4.1 Occurrence</td>
<td>Entire section revised.</td>
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<td>4.3 Modes of Transmission</td>
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<tr>
<td>4.4 Incubation Period</td>
<td>Final sentence, “Incubation period for neonatal tetanus ranges from four to 14 days (average seven days) after birth”, added.</td>
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<tr>
<td>5.2 To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry</td>
<td>“The board of health shall notify the PHD of the MOHLTC immediately by phone upon receiving report” deleted. Reporting timeframe changed from five to one business day of receipt of initial notification.</td>
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<td>6.1 Personal Prevention Measures</td>
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<td></td>
</tr>
<tr>
<td>7.0 References</td>
<td>Updated.</td>
<td></td>
</tr>
<tr>
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