Appendix B: Provincial Case Definitions for Reportable Diseases

Disease: Diphtheria

Revised December 2014
Diphtheria

1.0 Provincial Reporting

Confirmed and probable cases of disease

2.0 Type of Surveillance

Case-by-case

3.0 Case Classification

3.1 Confirmed Case

Clinical illness (see section 5.0) or systemic manifestations compatible with diphtheria in a person with an upper respiratory tract infection or infection at another site (e.g. wound, cutaneous) and at least one of the following:

- Isolation of *Corynebacterium diphtheriae* with confirmation of toxin from an appropriate clinical specimen (e.g. throat, nasal, nasopharyngeal or cutaneous sites, exudate of membrane)

  OR

- Isolation of other toxigenic *Corynebacterium* species (*C. ulcerans* or *C. pseudotuberculosis*) from an appropriate clinical specimen (e.g. throat, nasal, nasopharyngeal or cutaneous sites, exudate of membrane)

  OR

- Histopathologic diagnosis of diphtheria

  OR

- Epidemiological link to a laboratory-confirmed case (contact within two weeks prior to onset of symptoms)

3.2 Probable Case

- Clinically compatible signs and symptoms in the absence of laboratory confirmation or in the absence of an epidemiological link to a laboratory-confirmed case

4.0 Laboratory Evidence

4.1 Laboratory Confirmation

The following will constitute a confirmed case of diphtheria:

- Isolation of *C. diphtheria, C. ulcerans* or *C. pseudotuberculosis* with confirmation of toxin from an appropriate clinical specimen

- Histopathologic diagnosis of diphtheria
4.2 Approved/Validated Tests
- Standard culture for *C. diphtheriae, C. ulcerans* or *C. pseudotuberculosis*
- Elek* test for toxin detection
- Consult with the laboratory prior to testing to discuss specimen collection and testing methodology

4.3 Indications and Limitations
- All positive smears require follow-up testing for confirmation
- Exclusive use of direct-stained smears to diagnose diphtheria is unreliable and not recommended
- Nucleic acid amplification testing (NAAT) for diphtheria toxin gene may be performed. Positive NAAT results must be confirmed by a positive modified Elek test
- Diphtheria serology testing has been discontinued at the Public Health Ontario Laboratories
- Further strain characterization (i.e. biotype testing) may be indicated for epidemiological, public health and control purposes

5.0 Clinical Evidence
Clinical illness is characterized as an upper respiratory tract infection (nasopharyngitis, laryngitis or tonsillitis) with or without an adherent nasal, tonsillar, pharyngeal and/or laryngeal membrane, plus at least one of the following:
- Gradually increasing stridor
- Cardiac (myocarditis) and/or neurologic involvement (motor and/or sensory palsies) one to six weeks after onset
- Death, with no known cause

6.0 ICD Codes(s)

6.1 ICD-10 Code(s)
A36 Diphtheria

6.2 ICD-9/ICD-9CM Code(s)
032 Diphtheria

* The Elek test is an immunoprecipitation-based assay named after the bacteriologist S.D. Elek (1949) that is designed to determine if *Corynebacterium* isolates produce Diphtheria Toxin.
7.0 Comments

Although rare, other toxigenic Corynebacterium species (C. ulcerans or C. pseudotuberculosis) may cause clinical diphtheria. Isolation of other toxigenic Corynebacterium species in addition to clinically compatible illness is reportable.

8.0 Sources


Ontario. Ministry of Health and Long-Term Care. Timely entry of cases and outbreaks. iPHIS Bulletin. Toronto, ON: Queen’s Printer for Ontario; 2014:17


9.0 Additional Resources

10.0 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>December 2014</td>
<td>General</td>
<td>New template.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Title of Section 8.0 changed from “References” to “Sources”.</td>
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<td>Section 9.0 Additional Resources added.</td>
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<td>Section 10.0 Document History added.</td>
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<tr>
<td>December 2014</td>
<td>3.1 Confirmed Case</td>
<td>Deletion of: “Clinically compatible signs and symptoms in a person with an upper respiratory tract infection or infection at another site PLUS at least one of the following”.</td>
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<td></td>
<td></td>
<td>Replaced with: “Clinical illness (see section 5.0) or systemic manifestations compatible with diphtheria in a person with an upper respiratory tract infection or infection at another site (e.g. wound, cutaneous) and at least one of the following”.</td>
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<td>List of examples in the first bullet: “throat” added and nasal moved from after to before “nasopharyngeal”.</td>
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<td></td>
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<td>New bullet added: “Isolation of other toxigenic Corynebacterium species ((C. ulcerans) or (C. pseudotuberculosis)) from an appropriate clinical specimen (e.g. throat, nasal, nasopharyngeal or cutaneous sites, exudate of membrane)”.</td>
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<td>Removal of “i.e.” from brackets in last</td>
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<tr>
<td>Revision Date</td>
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<tr>
<td>December 2014</td>
<td>4.1 Laboratory Confirmation</td>
<td>Addition of “C. ulcerans” and “C. pseudotuberculosis” to first bullet.</td>
</tr>
<tr>
<td>December 2014</td>
<td>4.2 Approved/Validated Tests</td>
<td>Addition of “C. ulcerans” and “C. pseudotuberculosis” to first bullet. Footnote about Elek test added: “The Elek test is an immunoprecipitation-based assay named after the bacteriologist S.D. Elek (1949) that is designed to determine if Corynebacterium isolates produce Diphtheria Toxin.” End of third bullet: “issues” removed and replaced with “methodology”.</td>
</tr>
<tr>
<td>December 2014</td>
<td>4.3 Indications and Limitations</td>
<td>Bullets re-ordered. Deletion of: “Direct-stained smears and fluorescent antibody-stained smears may be unreliable” and replaced with “Exclusive use of direct-stained smears to diagnose diphtheria is unreliable and not recommended”. New bullet: “Diphtheria serology testing has been discontinued at the Public Health Ontario Laboratories”. Deletion of: “NAT positives for diphtheria toxin must be confirmed with the Elek test” and replaced with “Nucleic acid amplification testing (NAAT) for diphtheria toxin gene may be performed. Positive NAAT results must be confirmed by a positive modified Elek test”. Deletion of: “Further strain characterization is indicated…” and replaced with “Further strain characterization (i.e. biotype testing) may be indicated….”</td>
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</table>
| December 2014| 7.0 Comments                  | Deletion of “Mode of transmission is through contact with a case or carrier; more rarely, contact with articles soiled with discharges from lesions of infected people. Raw milk has served as a vehicle.” Addition of “Although rare, other toxigenic
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<tr>
<td>December 2014</td>
<td>8.0 Sources</td>
<td>Updated.</td>
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