

DIPHTHERIA

Case definition

CONFIRMED CASE

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

Laboratory confirmation of infection:

Isolation of *Corynebacterium diphtheria* with confirmation of toxin from an appropriate clinical specimen, including the exudative membrane

OR

Isolation of other toxigenic *Corynebacterium* species [*C. ulcerans* or *C. pseudotuberculosis*] from an appropriate clinical specimen, including the exudative membrane

OR

Histopathologic diagnosis of diphtheria

OR

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

PROBABLE CASE

Clinical illness in the absence of laboratory confirmation or epidemiologic link to a laboratory-confirmed case.

SUSPECT CASE

Upper respiratory tract infection (nasopharyngitis, laryngitis or tonsillitis) with or without an adherent nasal, tonsillar, pharyngeal and/or laryngeal membrane.

Causative agent

Corynebacterium diphtheria (*C. diphtheria*), a gram-positive rod bacterium. These bacteria are capable of producing a potent toxin when infected by corynebacteriophage.

Source

Humans.

Incubation

Usually 2-5 days, sometimes longer.

Transmission

Spread occurs through intimate contact with nasal or oral secretions of an infected individual or through contact with infected skin lesions. Rarely, contact with articles contaminated with discharge from lesions of infected people. Raw milk has served as a vehicle.

Communicability

In untreated individuals, communicability may be from 2 to 4 weeks. Chronic carriers are rare and may shed the bacteria for up to 6 months. Usually communicability will end less than 4 days after the administration of antibiotics.

Symptoms

Diphtheria usually occurs as membranous nasopharyngitis or obstructive laryngotracheitis. These manifestations of the illness begin with a low grade fever, a sore throat and a yellow-white discharge over the tonsils, uvula and throat. This discharge becomes grey, patchy and membranous and may involve the larynx, where it can present as airway obstruction. There may be marked edema of the neck. There may be progression to cardiac [myocarditis] and/or neurologic involvement [motor and/or sensory palsies] 1-6 weeks after onset.

Nasal diphtheria is often a mild form of the disease and is characterized by one-sided nasal secretions. Less commonly, the disease may present as cutaneous vaginal or conjunctival infections.

Diagnostic testing

Swabs of nose, throat, ear or skin for culture (special media required, notify lab).

Treatment

- For pharyngeal or laryngeal diphtheria, early administration of diphtheria antitoxin is recommended. A single dose of diphtheria antitoxin is indicated to neutralize the circulating diphtheria toxin and should be given in the early stages if diphtheria is suspected, without waiting for laboratory confirmation. Dosage is based on the degree of disease involvement.
- Treat with erythromycin for 14 days. Antibiotics are not a replacement for antitoxin. Supportive treatment, in hospital or home, is advised under strict isolation until 2 consecutive throat cultures are negative for diphtheria bacilli. These cultures should be taken not less than 24 hours apart and not less than 24 hours after the completion of the course of antibiotics.
- For cutaneous diphtheria, the skin lesions should be cleaned with soap and water and a course of oral antibiotics should be given for a 10-day period. Antitoxin may be of some use in cutaneous disease, because of toxic sequelae.

To access Diphtheria Anti-toxin, please refer to the directions on the Immunoglobulin/Anti-toxin Release Form.

PUBLIC HEALTH MANAGEMENT & RESPONSE

Case management

Begin follow-up of case immediately upon receipt of the report.

- Contact and educate client or family:
 - Ensure that infected individuals follow prescribed therapy.
 - Strict respiratory isolation of patients with pharyngeal or laryngeal diphtheria in hospital or home is important until 2 consecutive cultures are negative for diphtheria bacilli. Where culture is impractical, isolation may be ended after 14 days of appropriate antibiotic treatment
 - Active immunization against diphtheria should begin during convalescence because there is no guarantee that immunity to diphtheria is necessarily conferred.
 - In the case of cutaneous diphtheria, contact isolation is warranted until 2 negative skin lesion cultures are obtained 24 hours apart and at least 24 hours after antibiotic therapy is completed. Thorough cleaning of the infection site with soap and water is advised.
 - All bedclothes and clothing articles that have been used in the care of any infected individual should be washed with hot soapy water.

Exclusion

Individuals with diagnosed diphtheria are to be excluded from school, child care settings and work until 2 cultures from nose and throat are negative. These cultures must be taken at least 24 hours apart and taken 24 hours after the completion of antibiotic therapy. All close contacts should have cultures taken from the nose and throat and kept under surveillance for 7 days. A single dose of benzathine penicillin or a 7-10 day course of erythromycin is recommended for all persons with household exposure to diphtheria, regardless of their immunization status.

Those who handle food or work with children should be excluded from work until nose/throat swabs demonstrate they are not carriers.

Contact tracing

- All household members should be considered at risk of secondary disease, as well as all those who have had habitual close contact with and/or who may have been directly exposed to oral secretions of the infected individual.
- Schools and child care settings should be visited to determine if there are other ill children. Check immunization records of children in the child care setting for immunization status. Send a letter to parents of attendees to inform them of the case of diphtheria and possible risks to their children. A sample letter is included.

- Worksites of individuals working in the food-handling field should be visited and information circulated among staff regarding follow-up with their family physician.
- The investigator should also be looking for atypical cases and carriers among the contacts. Take cultures where suspected.
- Contacts of the infected individual, regardless of their immune status, should have cultures taken from nose and throat. Keep under surveillance for 7 days.

Prophylaxis

Close contacts of a confirmed case that were previously immunized should receive a booster dose of diphtheria toxoid if more than 5 years have elapsed since their last booster. A primary series should be initiated in previously non-immunized contacts. Treatment with antibiotics for all household contacts regardless of immune status is recommended. Other close contacts of the infected individual who are culture positive should receive treatment with antibiotics.

Immunization

Children who have not begun their primary series of immunization against diphtheria should begin this series and be followed closely by the physician. Children over 7 years of age will be given the adult-type tetanus and diphtheria toxoid in a series of three doses.

Surveillance forms

novascotia.ca/dhw/populationhealth/surveillanceguidelines/NS_Notifiable_Disease_Surveillance_Case_Report_Form.pdf

novascotia.ca/dhw/populationhealth/surveillanceguidelines/Vaccine_Preventable_Case_Report_Form.pdf

General Information Sheet

Sample Letter

REFERENCES

cdha.nshealth.ca/pathology-laboratory-medicine
[Provincial Microbiology Users Manual](#)