

Diphtheria (*Corynebacterium diphtheriae*)

Diphtheria is a serious infection caused by strains of bacteria called *Corynebacterium diphtheriae* that make a toxin. Non-toxin producing strains of *C. diphtheriae* are sometimes isolated from wounds and can cause skin infection. These may be treated with antibiotics but are not considered as dangerous as toxin-producing strains. Diphtheria is prevented through vaccination.

Transmission

Diphtheria bacteria spread from **person to person**, usually through respiratory droplets from coughing or sneezing. People can also get sick from touching infected open sores or ulcers. Those at increased risk of exposure include household contacts of cases.

Symptoms

The bacteria most commonly infect the respiratory system, which includes parts of the body involved in breathing. When the bacteria get into and attach to the lining of the respiratory system, it can cause **muscle weakness, sore throat, mild fever** and **swollen glands** in the neck

The bacteria make a toxin that kills healthy tissues in the respiratory system. Within two to three days, the dead tissue forms a thick, **gray coating that can build up in the throat or nose called a "pseudomembrane."** It can cover tissues in the nose, tonsils, voice box, and throat, making it very hard to breathe and swallow. If the toxin gets into the bloodstream, it can cause heart, nerve, and kidney damage.

Diagnosis

Medical providers may diagnose respiratory diphtheria based on clinical symptoms and confirm diagnosis with a laboratory test of respiratory secretions. Follow-up tests can confirm if the bacteria is toxin-producing. Sometimes laboratory tests will detect the presence of *C. diphtheriae* on skin. These should be referred for further testing to determine if they are toxin-producing.

Treatment

Diphtheria treatment involves using diphtheria antitoxin to stop the bacteria toxin from damaging the body. This treatment is very important for respiratory diphtheria infections, but it is rarely used for diphtheria skin infections. Antibiotics are used to kill and get rid of the bacteria. This is important for diphtheria infections in the respiratory system and on the skin and other parts of the body (e.g., eyes, blood).

People with diphtheria are usually no longer able to infect others 48 hours after they begin taking antibiotics.

Prevention

Diphtheria is prevented through vaccination. Close contacts of diphtheria cases should receive antibiotics to prevent disease, be monitored for illness for the ten days following exposure and given a diphtheria booster if not up to date.

Close contacts are defined as all household members, people with a history of frequent, close contact with the patient, or people directly exposed to secretions from the suspected infection site of the patient.

Cost should not be a barrier to vaccination. The Vaccines for Children (VFC) Program provides all recommended vaccines to children who are American Indian, uninsured or underinsured, and Medicaid-eligible. Many recommended vaccines are also available for uninsured adults. Vaccines are available at your local health care provider, public health department or pharmacy.

Exclusion Guidance

People with diphtheria should be excluded from child care, school, work, or other activities until they have completed their course of antibiotics and are feeling better.

For additional information about Diphtheria, contact the North Dakota Department of Health and Human Services' Public Health Division at 800.427.2180.

Suspected cases should be reported immediately to the North Dakota Department of Health and Human Services.

Resources:

1. Centers for Disease Control and Prevention. (2022, September 9). *CDC Diphtheria*. Centers for Disease Control and Prevention. Retrieved May 4, 2023, from <https://www.cdc.gov/diphtheria/>.
2. Kimberlin, D. W., Barnett, E. D., Lynfield, R., Sawyer, M. H. (2021) Red Book: 2021-2024 Report of the Committee on Infectious Diseases. 32nd ed. American Academy of Pediatrics. [Management and Prevention of Infectious Diseases; Chickenpox] [pages 304-308].