

FACT SHEET

Information for Health Professionals

DIPHTHERIA (Respiratory)

What is diphtheria?

Diphtheria is an acute, toxin-mediated disease caused by *Corynebacterium diphtheriae*, which usually presents in two forms: respiratory and cutaneous.

Who gets respiratory diphtheria?

Diphtheria is a rare disease in the United States, primarily because children are usually vaccinated, and because of the apparently low circulation of toxigenic strains of *Corynebacterium diphtheriae*. Most cases occur among unvaccinated or inadequately-vaccinated persons. The age distribution of recent cases and results of serosurveys indicate that many adults in the United States are not protected against diphtheria.

How is respiratory diphtheria spread?

Diphtheria is transmitted person-to-person by droplet or direct contact with nasopharyngeal secretions of an infected person. Contact with articles soiled with discharges from cutaneous lesions of infected people can be a source, but this has rarely been documented. Raw milk has served as a vehicle for transmission.

What are the symptoms of respiratory diphtheria?

Initial symptoms of illness include a sore throat and low-grade fever; Persons may die from asphyxiation when the membrane obstructs breathing. Swelling of the neck ("bull neck") from inflammation can develop and is a sign of severe disease. Remote effects of the diphtheria toxin may cause other complications, including myocarditis (inflammation of the heart), and nerve paralysis. The respiratory form of diphtheria usually lasts several days; complications can persist for months.

How soon do the symptoms appear?

Respiratory diphtheria begins 2 - 5 days after infection.

How long can an infected person spread the virus?

The infectious period typically lasts 2 - 4 weeks after infection. If patients are treated with antibiotics, communicability usually lasts less than 4 days, but chronic carriage may occur, even after antimicrobial therapy. Patients are considered infectious until 2 successive pairs of nose and throat cultures (and cultures of skin lesions in cutaneous diphtheria), obtained not <24 hours after completion of antimicrobial therapy and taken at least 24 hours apart, are negative. Asymptomatic carriers are important in sustaining transmission. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance.

How are susceptible staff members impacted after significant exposure to diphtheria?

If the exposure was significant, the exposed susceptible staff member should not provide direct patient care. The person may be reassigned to work with others that are immune, or be relieved from duty until antimicrobial therapy is completed and 2 nasopharyngeal cultures, obtained at least 24 hours apart taken not <24 hours after completion of antimicrobial therapy, are negative. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance.

What are the criteria for significant exposure to diphtheria?

Close contacts are defined as those who sleep in the same house, share food, drink, or eating/drinking utensils with the case, child care contacts, and healthcare workers in contact with the

case's oral or respiratory secretions. Persons who had brief contact with the case, but do not meet the definition of a close contact, are not considered significant contacts.

What are diphtheria isolation guidelines?

Maintain isolation until two successive pairs of nose and throat cultures (and cultures of skin lesions in cutaneous diphtheria), obtained not <24 hours after completion of antimicrobial therapy and \geq 24 hours apart, are negative. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance.

If there was no antimicrobial therapy, these two sequential pairs of cultures should be taken after symptoms resolve, and \geq 2 weeks after their onset. If cultures remain positive, contact IDPH, CADE at (800)362-2736. If an avirulent (nontoxigenic) strain is documented, isolation is not necessary.

Can a person get diphtheria again?

Lifelong immunity is usually, but not always, acquired after disease or inapparent infection.

What is the treatment for diphtheria?

After collection of specimens, cases and symptomatic close contacts should begin antibiotic treatment as follows:

- if diphtheria is strongly suspected on the basis of clinical findings, antitoxin should be given immediately after bacteriologic specimens are taken, without waiting for results. Diphtheria antitoxin is available from CDC. Contact the Iowa Department of Public Health, Center for Acute Disease Epidemiology (CADE) at (800) 362-2736 for assistance.
- erythromycin parenterally (40 to 50 mg/kg/day, maximum 2 g/day) until patient can swallow comfortably, at which point either oral erythromycin in 4 divided doses or oral penicillin V, 125–250 mg 4 times a day, may be substituted, for a total treatment period of 14 days; **or**
- aqueous crystalline penicillin G intramuscularly (100,000 to 150,000 U/kg/day, in four divided doses) for 14 days; **or**
- aqueous procaine penicillin intramuscularly (25,000 to 50,000 U/kg/day, maximum 1.2 million U, in two divided doses for children and 1.2 million U for adults) for 14 days.

Is there a vaccine to prevent diphtheria?

Yes, there is a vaccine to protect against diphtheria.

Vaccination, including routine childhood vaccination and Td boosters beginning at age 11–12 years and continuing every 10 years thereafter, is the best preventive measure against diphtheria. Tetanus toxoid-containing formulations should always be used. The Advisory Committee on Immunization Practices (ACIP) recommends that all children receive a routine series of five doses of diphtheria vaccine combined with other antigens (such as DTaP, Hib, IPV) at ages 2, 4, 6, 15–18 months, and 4–6 years. Booster doses of diphtheria and tetanus toxoids should be administered beginning at age 11–12 years (provided at least 5 years have passed since the last dose) and every 10 years thereafter. DTaP should be used in persons < 7 years of age, whereas Td is the preferred preparation for persons \geq 7 years of age, although a one-time dose of Tdap is recommended at 11–18 years of age. See the current CDC recommended immunization schedules for more information: www.cdc.gov/vaccines/

The Td schedule for those beginning immunization at \geq 7 years of age consists of 3 doses. The second dose is usually given 1–2 months after the 1st dose and the 3rd dose 6 months after the 2nd dose.

Due to the presence of diphtheria worldwide, it is important for all international travelers to be up to date with DTaP/DT/Td/Tdap vaccination. Good personal hygiene (which consists of proper handwashing, disposal of used tissues, not sharing eating utensils) and avoiding sick people is important in prevention.