

DIPHTHERIA QUICKSHEET

CLINICAL ILLNESS

CLASSIC DIPHTHERIA

An upper respiratory tract illness characterized by:

- sore throat
- low-grade fever, **AND**
- an adherent membrane of the tonsils, pharynx, and/or nose.

The disease can involve almost any mucous membrane. Growth of the adherent membrane can cause a potentially fatal airway obstruction.

Patients with severe disease can develop a “bullneck” appearance caused by edema of the anterior neck.

CUTANEOUS DIPHTHERIA

Either caused by toxigenic or non-toxigenic strains of *Corynebacterium diphtheriae*.

The disease is usually mild, typically consisting of non-distinctive sores or shallow ulcers, and rarely causes toxic complications.

Cutaneous diphtheria is not reportable but should be promptly investigated to determine whether the strain is toxigenic.

COMMUNICABILITY

Untreated individuals generally shed bacteria from the respiratory tract or from skin lesions for 2 to 4 weeks after infection. Infected individuals are infectious for up to 4 days after antibiotic treatment has been initiated. A chronic carrier state is extremely rare, but known to exist, and such a carrier may shed organisms for up to 6 months or longer.

CONTROL MEASURES

The patient should be kept in strict isolation until two cultures from both throat and nose, taken at least 24 hours apart and at least 24 hours after cessation of antimicrobial therapy, are negative for diphtheria bacilli. If cultures are not possible, the patient should be isolated for 14 days following appropriate antibiotic treatment. Treat any confirmed carrier with an adequate course of antibiotics and repeat cultures at a minimum of 2 weeks to ensure eradication of the organism. Persons who continue to harbor the organism after treatment with either penicillin or erythromycin should receive an additional 10-day course of erythromycin and should submit samples for follow-up cultures. Cases should be monitored until hospital discharge, even if all investigation and control measures have been completed.



Kentucky Public Health
Prevent. Promote. Protect.

ETIOLOGIC AGENT

Corynebacterium diphtheriae

TRANSMISSION

- Person-to-person through respiratory droplets
- Exposure to infected skin lesions and fomites

INCUBATION PERIOD

Usually, 2-5 days
(range 1-10 days)

Diphtheria Toxoid-containing Vaccines

- DT
- DTaP (Daptacel and Infanrix)
- Td (Tdvax and Tenivac)
- Tdap (Adacel and Boostrix)
- DTaP-HepB-IPV (Pedarix)
- DTaP-IPV/Hib (Pentacel)
- DTaP-IPV (Kinrix and Quadracel)
- DTaP-IPV-Hib-HepB (Vaxelis)

DIPHTHERIA QUICKSHEET

CASE CLASSIFICATION

CLINICAL CRITERIA

- Upper respiratory tract illness with an adherent membrane of the nose, pharynx, tonsils, or larynx
- OR**
- Infection of a non-respiratory anatomical site (e.g., skin, wound, conjunctiva, ear, genital mucosa)

LABORATORY CRITERIA

- Confirmatory laboratory evidence:
 - Isolation of *C. diphtheriae* from any site **AND**
 - Confirmation of toxin-production by Elek test or by another validated test capable of confirming toxin-production
- Supportive laboratory evidence:
 - Histopathologic diagnosis

*Cases of laboratory-confirmed, non-toxin-producing diphtheriae (respiratory or non-respiratory) should not be reported by state or local health departments .

SUSPECTED CASE

- In the absence of a more likely diagnosis, an upper respiratory tract illness with each of the following:
 - an adherent membrane of the nose, pharynx, tonsils, or larynx **AND**
 - absence of laboratory confirmation **AND**
 - lack of epidemiologic linkage to a laboratory-confirmed case of diphtheria.
- OR**
- Histopathologic diagnosis

CONFIRMED CASE

- An upper respiratory tract illness with an adherent membrane of the nose, pharynx, tonsils, or larynx and any of the following:
 - isolation of toxin-producing *Corynebacterium diphtheriae* from the nose or throat **OR**
 - epidemiologic linkage to a laboratory-confirmed case of diphtheria.
- OR**
- An infection at a non-respiratory anatomical site (e.g., skin, wound, conjunctiva, ear, genital mucosa) with
 - isolation of toxin-producing *C. diphtheriae* from that site

SPECIMEN COLLECTION FOR LABORATORY TESTING

Test Name	Specimens to take	Timing for specimen collection	Transport requirements
Culture <i>*Preferred specimen</i>	Swab of nose, throat, membrane	ASAP, when diphtheria is suspected	<24 hrs: Amies or similar transport medium ≥24 hrs: silica gel sachets
PCR	Swab of nose, throat, membrane, pieces of membrane, biopsy tissue	Take these specimens at same time as those for culture	Swabs, silica gel sachet, or a sterile dry container at 4°C
Toxigenicity testing (Elek test)	Isolate from culture	After <i>C. diphtheriae</i> has been isolated	Transport medium, such as Amies medium, or silica gel sachets
Serology (antibodies to diphtheria toxin) Note: Collect paired sera, taken 2-3 weeks apart.	Serum	Before administration of antitoxin	Frozen (-20°C)

*Use a cotton-tipped or polyester-tipped swab. Swabs should be taken below the membrane, if possible. (A portion of the membrane may be submitted for culture, but does not always yield *C. diphtheriae*)

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CASE INVESTIGATION

1. Confirm that laboratory results meet the case definition
2. Review medical records or speak to an infection preventionist or physician to verify case definition, underlying health conditions, course of illness, vaccination status and travel history
 - a. Request copies of admission and discharge summaries and laboratory results
3. Collect the following:
 - a. Demographics
 - b. Treatment
 - c. Laboratory
 - d. Vaccine information
 - e. Epidemiologic
 - i. Contact with a suspect or confirmed case
 - ii. Contact with a person who was recently (past 6 weeks) in an endemic-disease area
 - iii. Number of contacts cultured
 - iv. Results of contact cultures
 - v. Local or international travel history: the 6-week period before illness onset or date of presentation
 - vi. Contact with domestic pets, horses, or dairy farm animals
4. Identify and follow-up with all close contacts

Diphtheria Surveillance Worksheet

MANAGING CLOSE CONTACTS

Close contacts include household members and other persons directly exposed to oral secretions of a respiratory diphtheria case (laboratory confirmed) or the wound of a cutaneous diphtheria case.

- Should be cultured regardless of their immunization status
- Receive prompt antimicrobial chemoprophylaxis, **AND**
- Be examined daily for seven days for evidence of disease

PROPHYLAXIS FOR CLOSE CONTACTS

Immunization:

- All close contacts who have received fewer than 3 doses of diphtheria toxoid or whose vaccination status is unknown should receive an immediate dose of a diphtheria toxoid-containing preparation appropriate for their age and should complete the primary series according to the recommended schedule
- If more than 5 years have elapsed since administration of diphtheria toxoid-containing vaccine, a booster dose should be given
- If the most recent dose was within 5 years, no booster is required
- Unimmunized contacts should start a course of DTaP/DT/Td vaccine and be monitored closely for symptoms for 7 days

Antimicrobial:

- 7-10-day course of oral erythromycin (children 40 mg/kg/day and adults 1 g/day)
 - Identified carriers of *C. diphtheriae* should be cultured after they complete antimicrobial therapy.
 - Those who continue to carry the organism should receive an additional 10-day course of oral erythromycin and follow-up cultures

*CDC Diphtheria Antitoxin