Diphtheria

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Outline…….

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- Definition
- Causes
- Signs and symptoms
- Complication
- Transmission
- Prevention
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- Conclusion

Objectives

- **At the end of this seminar, the student will be able to:**

- Identify the definition, causes, sign and symptoms of diphtheria.
- Identify How the disease is transmitted and how to prevent it.
- Diagnose the disease.

Introduction

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- Diphtheria takes its name from the Greek word dipthera meaning leather and was named in 1826 by French physician **Pierre Bretonneau.**
- This is because it refers to the leathery, sheath-like membrane that grows on the tonsils, throat and in the nose.

•In the past its name(general disease, killer disease)because no treatment in the past and it was lead high mortality between children

- It was said that the disease killed as many as 80% of the children below 10 years

Introduction

Diphtheria in Jordan

- Twenty-seven cases of diphtheria (15 male, 12 female) admitted over a 2-year period, 1977-1978, at the Jordan University Hospital were reviewed. The majority were admitted during autumn and were in the 2-9-year age group. Eleven patients were **not** vaccinated and six were questionably vaccinated .

- **One** patient died with upper airway obstruction, **four** died with myocarditis, and **three** patients died with the respiratory complications of polyneuritis ,In 10 patients who were partially or completely vaccinated, only **one** died.

Khuri-Bulos N.

Diphtheria in Jordan for 2011

للسنة: 2011

البيان / الشهر	كانون الثاني	شباط	اذار	نيسان	أيار	حزيران	تموز	اب	أيلول	تشرين الاول	تشرين الثاني	كانون الثاني	المجموع
تلل رخو حاد	0	0	0	0	0	0	0	0	0	0	0	0	**0**
دفتيريا	0	0	0	0	0	0	0	0	0	0	0	0	**0**
سعال ديكي	0	0	0	0	0	0	0	0	0	0	0	0	**0**

History

- Joseph O'Dwyer 1880 developed tubes that were inserted into the throat, to prevented suffocating and obstructs airways.
- In 1884, Friedrich Loeffler discovered the causative organism .
- 1890s, the physician Emil von Behring developed an antitoxin that did not kill the bacterium, but neutralized the toxic poisons the bacterium releases into the body
- The first successful vaccine for diphtheria was developed in 1913 by Behring.

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Definition

- Diphtheria is an acute infectious disease that typically strikes the upper respiratory tract including the throat. It is caused by infection with the bacteria **Corynebacterium diphtheria**. It's characterized by sore throat and mild fever at first. As the disease progresses, a membranous substance forms in the throat that makes it difficult to breathe and swallow.

Causes,,,,

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Corynebacterium diphtheriae causes diphtheria. Usually the bacteria multiply on or near the surface of the mucous membranes of the throat, where they cause inflammation.

Cont'd…Causes

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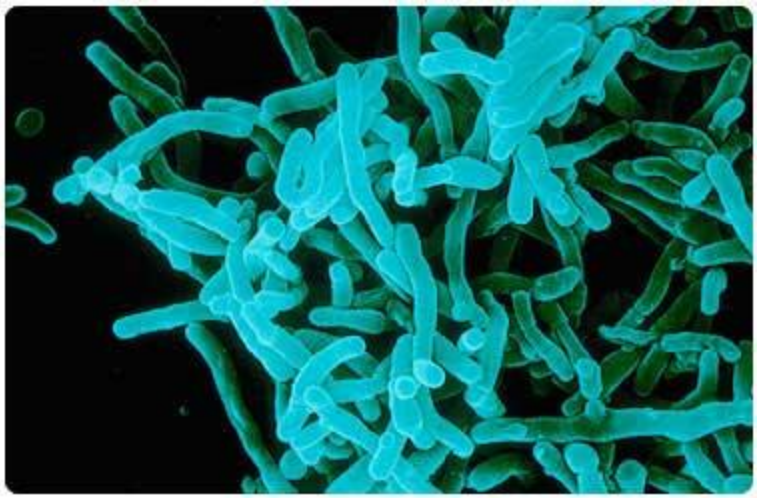
• The inflammation may spread to the voice box (larynx) and may make your throat swell, narrowing your airway. Disease-causing strains of C. diphtheriae release a damaging substance (toxin), which can also involve the heart, brain and nerves.



Signs and symptoms

Signs and symptoms usually begin two to five days after a person becomes infected.

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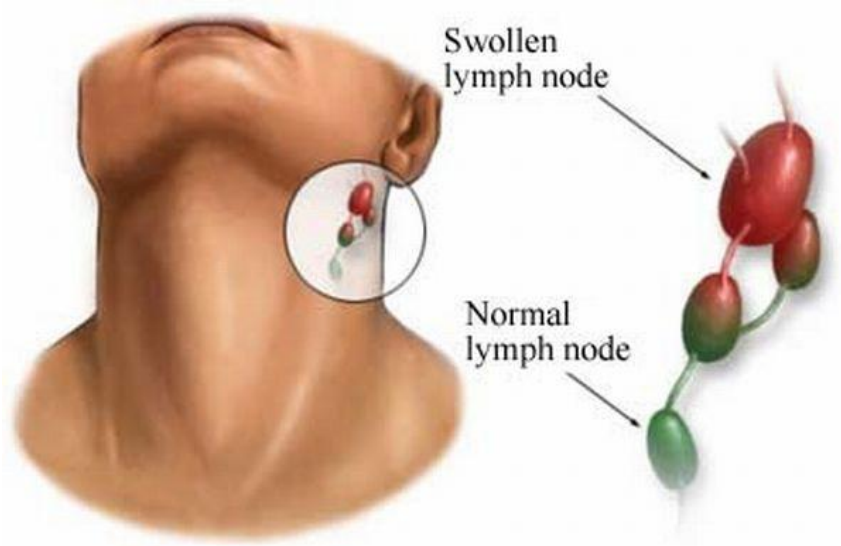
- A sore throat and hoarseness
- Painful swallowing
- Swollen glands (enlarged lymph nodes) in your neck



Cont'd…Signs and symptoms

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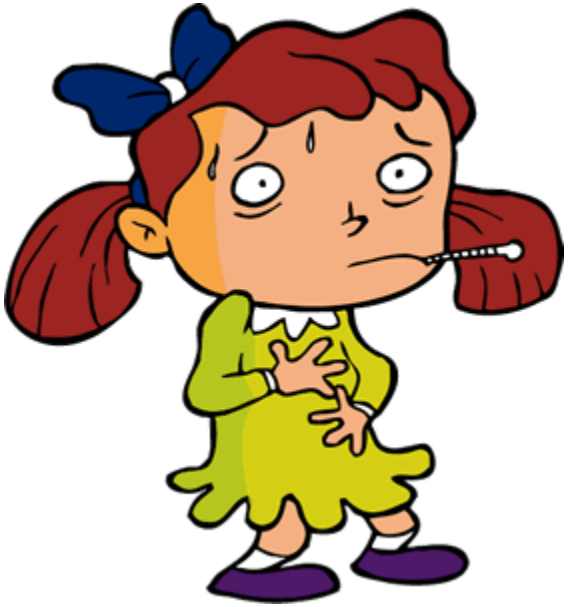
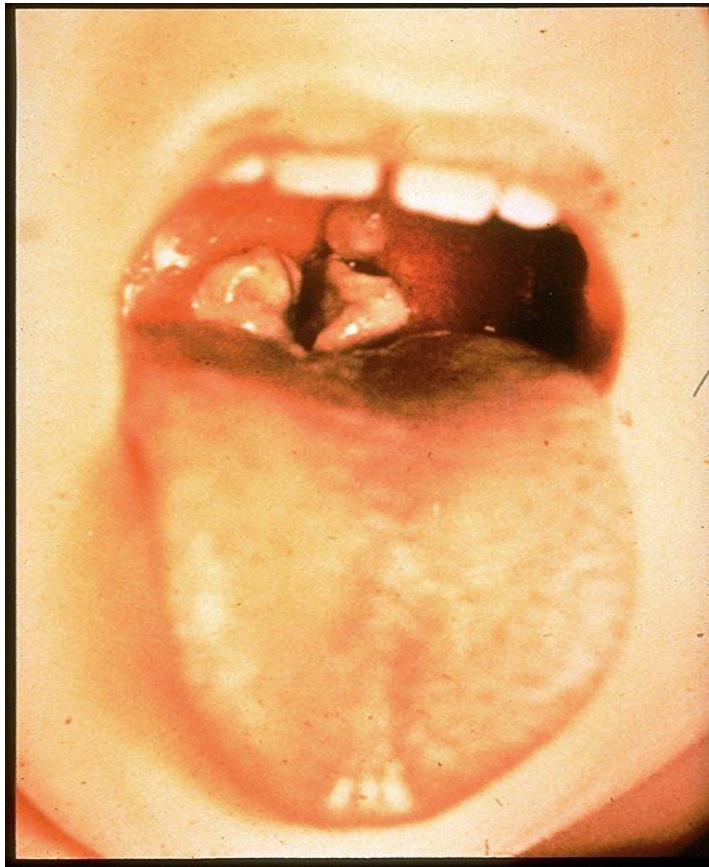
- A thick, gray membrane covering your throat and tonsils
- Difficulty breathing or rapid breathing
- Nasal discharge
- Fever and chills





Skin (cutaneous diphtheria)

- It is found in people with poor hygiene. Any break in the skin can become infected with diphtheria. The infected tissue develops an ulcerated area and a diphtheria membrane may form over the wound but is not always present. It is slow to heal and may be insensitive when touched.

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Complications

- **Breathing problems.** Diphtheria-causing bacteria may produce a toxin. This toxin damages tissue in the immediate area of infection — usually, the nose and throat. At that site, the infection produces a tough, gray-colored membrane composed of dead cells, bacteria and other substances.
- This membrane can obstruct breathing.

Cont'd….Complications

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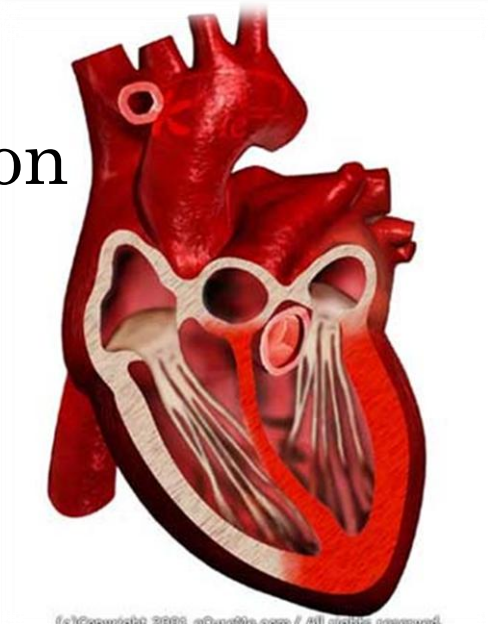
- **Heart damage:** The diphtheria toxin may spread through bloodstream and damage other tissues in your body, such as heart muscle, causing inflammation of (myocarditis).
- It may be slight, showing up as minor abnormalities on an ECG, or severe, leading sudden death.



Cont'd….Complications

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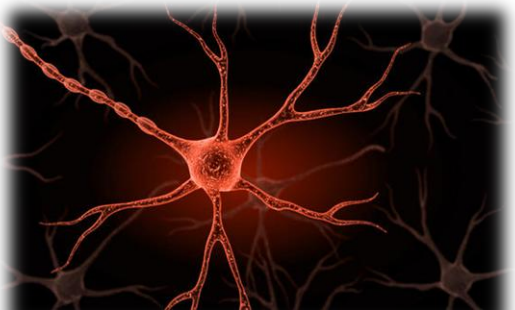
- **Nerve damage.** The toxin can also cause nerve damage. Typical targets are nerves to the throat, where poor nerve conduction may cause difficulty swallowing. Nerves to the arms and legs also may become inflamed, causing muscle weakness. Toxin may damages the nerves that used in breathing muscles and become paralyzed. Respiration become impossible without device .



Cont'd….Complications

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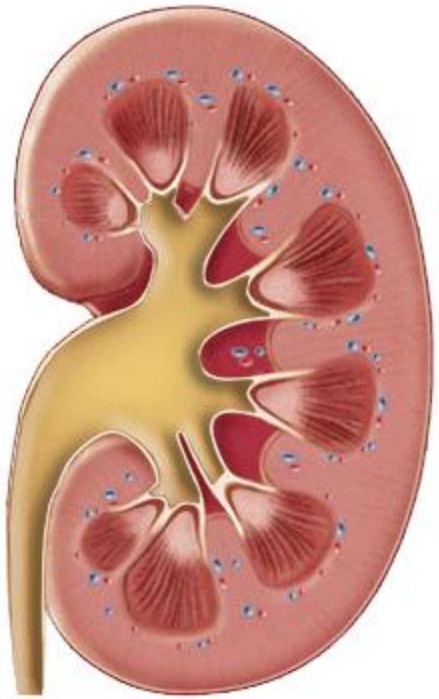
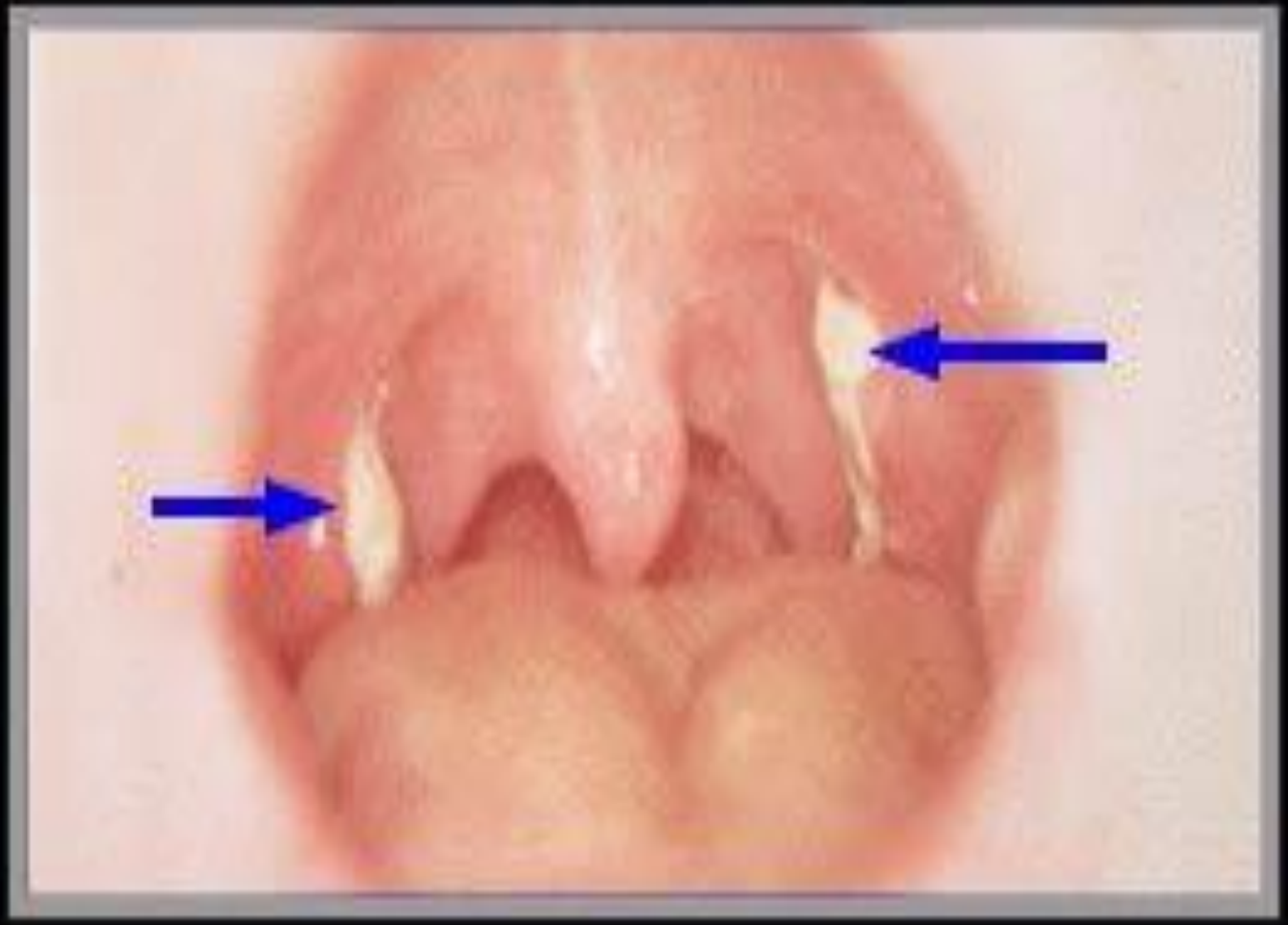
- **Renal:** The diphtheria toxin may damage the kidneys, affecting their ability to filter wastes from the blood.

- This leads to renal failure.



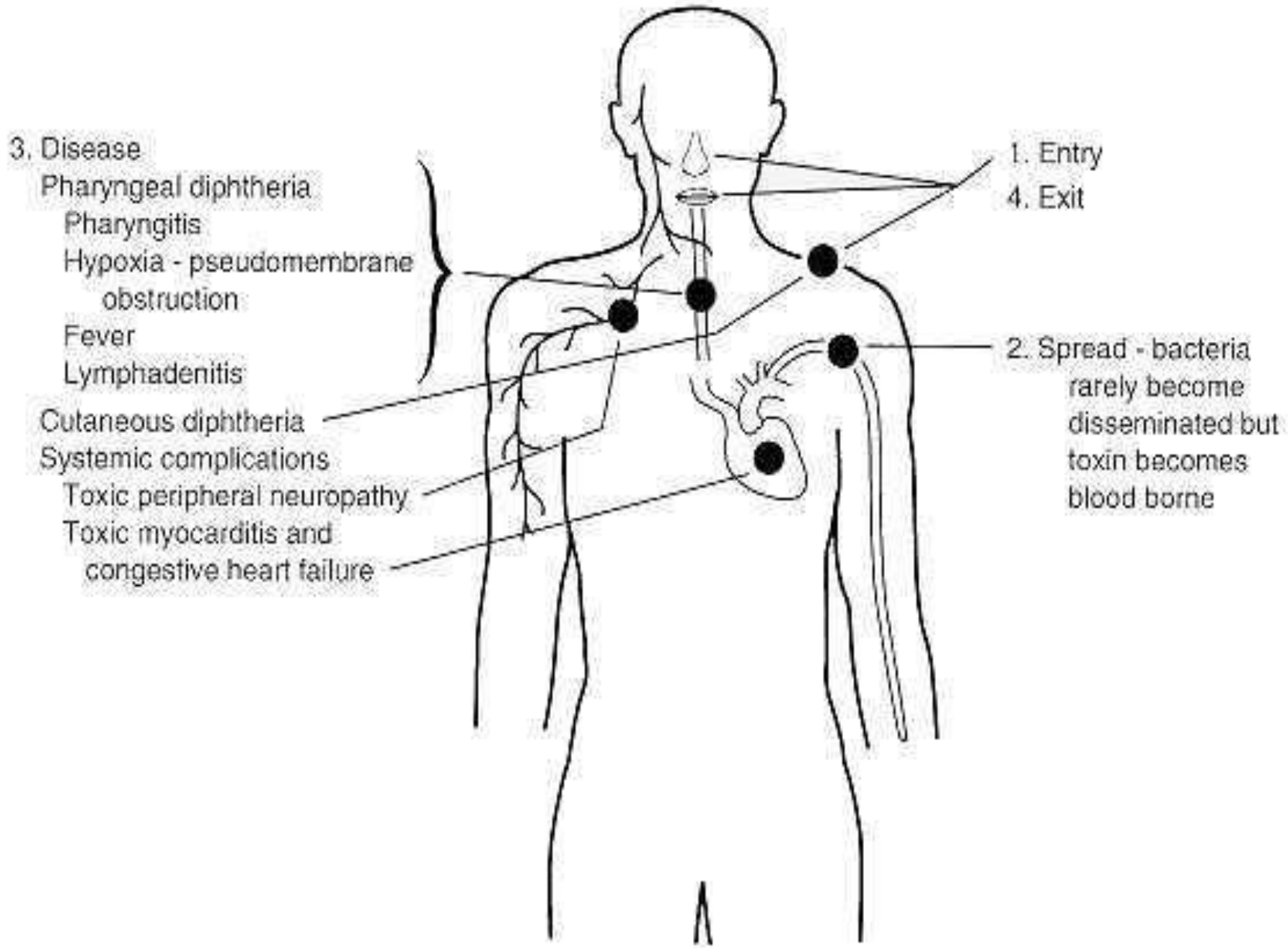


Diphtheria - notice the pseudomembrane in the posterior pharynx. It can become very large and may obstruct the airway.

10 y/o boy with severe diphtheria

- conjunctivitis
- pharyngeal membrane
- bull neck
- severe myocarditis
- all vaccines contraindicated

CDC


3. Disease
Pharyngeal diphtheria
Pharyngitis
Hypoxia - pseudomembrane obstruction
Fever
Lymphadenitis
Cutaneous diphtheria
Systemic complications
Toxic peripheral neuropathy
Toxic myocarditis and congestive heart failure
1. Entry
4. Exit
2. Spread - bacteria rarely become disseminated but toxin becomes blood borne

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Transmission

- Person-to-person transmission occurs through oral or respiratory droplets, close physical contact

Tests and diagnosis

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- Diphtheria can be diagnosed usually by proper clinical examination, throat culture from the infected area and blood tests
  - Tests used may include:
  - Gram stain or **throat culture** to identify *Corynebacterium diphtheria* .
  - (**ECG**).

Treatment

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An antitoxin. After doctors confirm diphtheria, the infecte child receives an antitoxin. Th antitoxin, injected into a vein muscle, neutralizes the diphtheria toxin already circulating in the body.

Antibiotics. Diphtheria is also treated with antibiotics, such as penicillin or erythromycin. Antibiotics help kill bacteria in the body, clearing up infections.

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Prevention

- Diphtheria is easily prevented with the use of a safe and effective vaccine.
- Most people receive their first vaccination for the disease as children. This is know as the DTP vaccine (diphtheria-tetanus-pertussis).

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DPT (Diphtheria, Pertussis, and Tetanus) "3-in-1" vaccine

DT (Diphtheria and Tetanus) "2-in-1" vaccine; no pertussis

Td (Tetanus and Diphtheria) "2-in-1" vaccine for adults

Summary

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- Diphtheria is a highly communicable, acute bacterial infection. It was once a leading cause of death among children. The germ produces a toxin that can spread from the site of infection to other tissues in the body. Diphtheria usually affects the throat and nose. But, in more serious cases, it may affect the nervous system and heart

Conclusion

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We recommended primary course of vaccination is at 2, 4 and 6 months of age. Vaccination against diphtheria is part of the National Immunizations Program (NIP) schedule, and use of this vaccine has made diphtheria extremely rare in areas of the developed western world where most people are immunized against the disease.

References

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