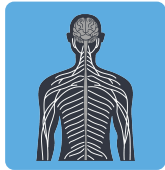


TOPIC: BOTULISM

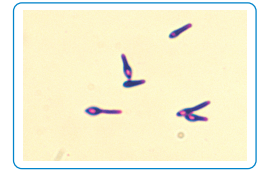


Botulism

Bacterial

GRAM ____

SHAPE: Endospore forming ____



(CDC, 1965).

CAUSE

Clostridium botulinum (*C. botulinum*).

- ◆ Anaerobic.
 - Highly specific growth conditions (low acidity, low salt, low ____).
- ◆ Produces ____ → ____ toxin.
 - ____ release of acetylcholine in synapses.
 - Muscles unable to ____ → ____ paralysis.
 - ____ uses toxin to paralyze muscles.
- ◆ 3 different types of botulinum toxin (A, B, & E).
 - Botulinum toxin A is most ____ toxin known.
 - ____ paralysis is fatal.

SPREAD

Three forms of botulism: ____, infant, & wound.

- ◆ **Foodborne botulism:** consumption of ____ in contaminated food.
 - Improperly canned foods (usually ____) (types A & B).
 - Improperly preserved ____ (E).
- ◆ **Infant botulism:** ____ able to survive in underdeveloped GI tract.
 - Endospores in ____, dust, & wind; most common form in US.
- ◆ **Wound botulism:** bacteria lives in improperly cleaned wounds (rare).
 - Dirty ____.

SYMPTOMS

Paralysis, ____, difficulty swallowing, blurred vision, nausea, & vomiting.

DIAGNOSIS

Toxin from sample plus antitoxin tested on ____.

Mice injected
w/ suspected
botulism sample.



A antitoxin



Development of
symptoms confirms
botulism.

B antitoxin



E antitoxin



Lack of symptoms
confirms toxin type.

TOPIC: BOTULISM

TREATMENT

Antitoxin → foodborne & infant botulism.

- ◆ Infant botulism: BabyBIG® → botulism immune globulin.
- ◆ Recovery requires regeneration of _____ endings; _____ to months.

IMMUNITY

No vaccine for the general public.

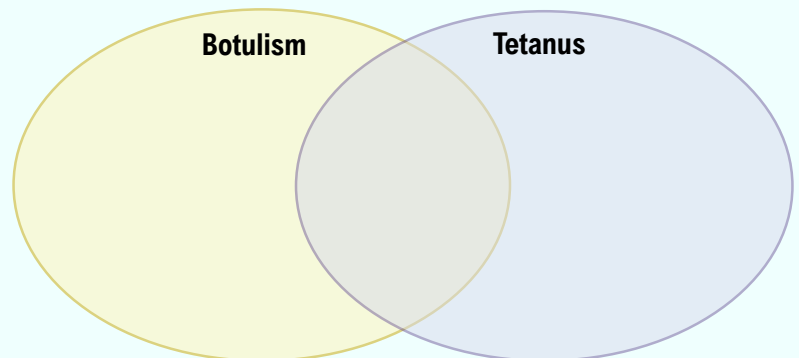
References:

Lombard, G. (1978) [Photomicrograph of *Clostridium botulinum*] Centers for Disease Control and Prevention. <https://www.cdc.gov/phil/Details.aspx?pid=2131>

EXAMPLE

Fill in the Venn diagram below to compare and contrast botulism and tetanus.

- Caused by *Clostridium* bacteria.
- Caused by the deadliest known toxin.
- Blocks the release of neurotransmitters.
- Causes sustained muscle contraction.
- Causes inability to contract muscles.
- Caused by bacteria that grow anaerobically.
- Typically caused by unclean wounds.
- Commonly caused by poor canning/food preservation.
- Affects the release of acetylcholine.
- May take months for full recovery.



PRACTICE

Which type of botulism is the most common in the United States today?

- Foodborne botulism.
- Infant botulism.
- Wound botulism.

TOPIC: BOTULISM

PRACTICE

Gina brings her 5-month-old son to the ER. His symptoms started with constipation a day prior and have progressed to poor feeding and lethargy. His clinical intake indicates that his parents have introduced solid foods, including home-made baby food sweetened with honey, starting about a week ago. Which of the following treatments might be appropriate?

- a) Tdap vaccine.
- b) Cephalosporin.
- c) BabyBIG®.
- d) Botulinum type E antitoxin.

PRACTICE

How does botulism cause paralysis?

- a) Blocking excitatory neurotransmitters (acetylcholine) prevents contraction.
- b) Blocking inhibitory neurotransmitters (GABA & glycine) prevents contraction.
- c) Blocking excitatory neurotransmitters (acetylcholine) prevents relaxation
- d) Blocking inhibitory neurotransmitters (GABA & glycine) prevents relaxation.