

Clostridium. perfringens

What is *C. perfringens*?

Clostridium perfringens toxins are widely distributed in the environment and frequently occur in the intestines of humans and many domestic and feral animals. The toxins are produced by certain bacteria, plants, or other living organisms. Spores of the organism persist in soil, sediment, and areas subject to human or animal fecal pollution.

How does *C. perfringens* make people sick?

C. perfringens toxins can make a person ill if they ingest enough. Perfringens food poisoning is the term used to describe the common foodborne illness caused by *C. perfringens*. A more serious but rare illness is also caused by ingesting food contaminated with Type C strains. The latter illness is known as enteritis necroticans or pig-bel disease.

How can someone come into contact with *C. perfringens* toxins?

Clostridium perfringens toxins cannot be spread from person to person and they do not grow or increase in number in the body. They can be produced from bacteria found everywhere in the environment. They are most commonly associated with food poisoning, which can happen when a person swallows a large amount of the bacteria, which then multiply and produce toxin in the intestine or when a person eats contaminated food with the toxin already in it.

Why is there concern about *C. perfringens* as a weapon?

The toxins can be purified into a concentrated form which could then be aerosolized and used to infect a large number of people. It could also be placed in food or water to make people ill and it would take a while to figure out the cause.

What happens when someone gets sick from *C. perfringens* toxins?

Food poisoning: The symptoms of *C. perfringens* causing illness from food include crampy stomach pain followed by diarrhea which may begin 6 to 24 hours after eating the contaminated food. Nausea is common, but fever and vomiting usually are not symptoms. The illness is usually over within 24 hours, but less severe symptoms may persist in some individuals for 1 to 2 weeks.

Purified toxins (weapon): Release of purified toxin may have multiple effects. The specific effects will depend on the strain of bacteria used, the type of toxin purified, the method of release, and the amount taken into the body. The toxins can produce:

- *Stomach effects:* Loss of appetite, nausea, vomiting, and watery or bloody diarrhea with crampy stomach pain.
- *Respiratory effects:* Difficulty breathing, wheezing and coughing. Mouth and throat pain with some blood in the saliva and sputum may be possible.

- *Skin effects:* Burning pain, redness, itching, rash, or blisters.
- *Brain and nerve effects:* One of the toxins produced (called epsilon toxin) damages the brains and nerves of animals in laboratory tests. It can lead to dizziness, difficulty with balance and coma. It is possible that these effects may occur in humans.

How is the illness in people diagnosed?

Perfringens poisoning is diagnosed by its symptoms and the typical delayed onset of illness. Diagnosis is confirmed by detecting the toxin in the feces of patients.

Does anyone ever die from *C. perfringens* toxins?

Most people who suffer from *C. perfringens* intoxication are uncomfortable, but not many of them die. People usually recover in 24 hours or less. It is unknown how deadly a release of purified toxin would be.

What foods are most often associated with perfringens poisoning?

In most instances, the actual cause of poisoning by *C. perfringens* is not maintaining appropriate food temperatures. Small numbers of the organisms are often present after cooking and multiply to food poisoning levels during cool down and storage of prepared foods. Meats, meat products, and gravy are the foods most frequently implicated.

How common is *perfringens* poisoning?

Perfringens poisoning is one of the most commonly reported foodborne illnesses in the U.S. There were 1,162 cases in 1981, in 28 separate outbreaks. At least 10-20 outbreaks have been reported annually in the U.S. for the past two decades. Typically, dozens or

even hundreds of people are affected. It is probable that many outbreaks go unreported.

What should someone do if they think they have come into contact with *Clostridium perfringens* toxin?

First, leave the area where the toxin was released and get to fresh air. Next remove clothing that may have the toxin on it. Wash any skin that may have been affected with lots of soap and water. If the eyes are burning or vision is blurred, rinse eyes with plain water for 10 to 15 minutes. If contacts are worn, remove them with a clean hand and put them with the clothing. Discard contaminated items. Call the NH Department of Health and Human Services Disease Control Section at 603-271-4496 or the NH Poison Control Center at 1-800-222-1222.

For specific concerns about *Clostridium perfringens*, call the New Hampshire Department of Health and Human Services, Bureau of Infectious Disease Control at 603-271-4496 or 800-852-3345 x4496. For further information, refer to the Centers for Disease Control and Prevention website at www.cdc.gov or the New Hampshire Department of Health and Human Services website at www.dhhs.nh.gov .