



Focus on long-term and behavioral health outbreaks—

# Identify the pathogen: *Clostridium perfringens*

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**“While everyone is susceptible to *Clostridium perfringens* food poisoning, the very young and elderly are at the greatest risk for infection and complications, with illness lasting up to two weeks.”**

Hospital outbreaks are reported more often in the medical literature than occurrences in the long-term care (LTC) or behavioral health setting. By studying and learning from outbreaks in the LTC/behavioral health setting, infection preventionists (IPs) will glean additional knowledge and apply this information to hopefully prevent future infections, and infection clusters in their facilities. This quarterly column will assist the IP with heightening awareness of appropriate interventions for preventing an outbreak.

A recent *Morbidity and Mortality Weekly Report* (MMWR) describes 42 residents and 12 staff members at a state psychiatric hospital who experienced vomiting, abdominal cramps, and diarrhea.<sup>1</sup> Within 24 hours, three patients had died. The three patients who died were taking medications with anti-intestinal motility side effects. An investigation revealed that eating chicken served at dinner was associated with illness.

Based on your education and training, you suspect the following pathogen(s):

- ❶ Norovirus
- ❷ Astrovirus
- ❸ *Staphylococcus aureus*
- ❹ *Clostridium perfringens*

*Clostridium perfringens* enterotoxin was detected in 20 of 23 stool specimens from ill residents and staff members. This organism was also found in the chicken.

An investigation revealed the chicken was cooked approximately 24 hours before serving. It was not cooled properly, per the facility policy, and there was a delay with the required temperature checks. Additionally, the chicken was

removed from cooling at three different times for additional preparation steps, before being served as cold chicken sandwiches or chicken salad. The state sanitarians inspected the hospital kitchen and found no violations of the sanitary code.

## BACKGROUND ON CLOSTRIDIUM PERFRINGENS

*Clostridium perfringens* is a Gram-positive, spore forming bacterium that is found on raw meat and poultry, environmental sources, and in the intestines of humans and animals.<sup>2</sup> Some strains produce a toxin in the intestines that causes gastroenteritis. The Centers for Disease Control and Prevention (CDC) estimates this organism causes nearly one million cases of food-borne illness annually.<sup>2</sup> *Clostridium perfringens* infection usually has a sudden onset, lasts for less than 24 hours, and results in diarrhea and abdominal cramps.<sup>2</sup> Fever or vomiting does not usually occur. The infection is not transmitted person-to-person; use of Standard Precautions is sufficient when caring for the patient. The incubation period is six to 24 hours.<sup>3</sup> This organism is also the causative agent for gas gangrene and

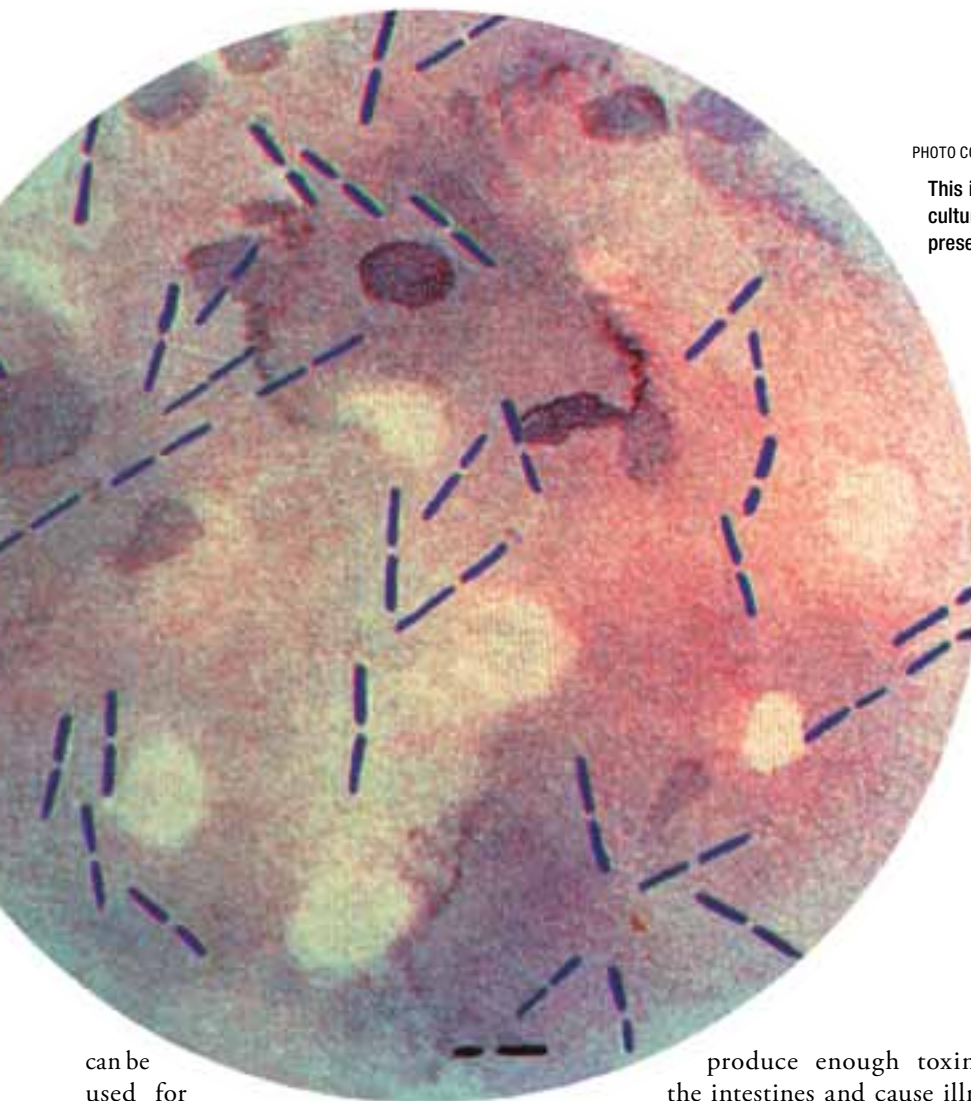



PHOTO COURTESY: CDC.

This illustration depicts a photomicrographic view of a Gram-stained culture specimen from a patient with gas gangrene, and revealed the presence of numerous *Clostridium perfringens* Gram-positive bacteria.

side effects, may have impaired gastrointestinal motility; this will delay elimination of the toxin and may result in severe intestinal damage and possible death.

- ⑤ Any food that has been left out too long may result in illness, despite a normal appearance. 



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#### References

- Centers for Disease Control and Prevention. Fatal foodborne *Clostridium perfringens* illness at a state psychiatric hospital—Louisiana, 2010. *MMWR*. 2012;61(32). Available at: [www.cdc.gov/mmwr/pdf/wk/mm6132.pdf](http://www.cdc.gov/mmwr/pdf/wk/mm6132.pdf). Accessed March 27, 2015.
- CDC. *Clostridium perfringens*. Food safety. 2014. Available at: [www.cdc.gov/foodsafety/clostridium-perfringens.html](http://www.cdc.gov/foodsafety/clostridium-perfringens.html). Accessed March 27, 2015.
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can be used for biological warfare.

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#### DIAGNOSIS AND TREATMENT

*Clostridium perfringens* food poisoning is diagnosed by either detecting the bacterial toxin in the feces or determining the number of spores per gram in the stool. Antibiotics are not recommended for treating the infection. Rehydration therapy is used to replace fluids and electrolytes lost due to diarrhea. There is no vaccine available to prevent illness.

#### HOW DOES FOOD POISONING OCCUR?

Common food sources containing this organism include beef, poultry, gravies, and dried or pre-cooked foods. Although this organism may be part of the normal intestinal flora, illness is due to ingesting food contaminated with a large number of *Clostridium perfringens* organisms that

produce enough toxins in the intestines and cause illness.<sup>2</sup>

Spores germinate between 54–140 degrees Fahrenheit; the bacteria grow very rapidly between 109–117 degrees Fahrenheit.

To prevent illness, foods should be cooked thoroughly at the recommended temperatures, then kept either warmer than 140 degrees Fahrenheit or cooler than 41 degrees Fahrenheit, which prevents spore growth.<sup>2</sup>

Food that is reheated must also be prepared at the recommended temperature; otherwise, live bacteria may become ingested.

#### TAKE HOME MESSAGES FOR THE LTC/ BEHAVIORAL HEALTH IP:

- ① It is critical to strictly adhere to recommended food cooking and storage temperatures to prevent illness.
- ② During environmental rounds in your facility's kitchen, review temperature logs to ensure policy compliance.
- ③ Include *Clostridium perfringens* as a possible pathogen when suspecting food poisoning on the milieu or in a LTC unit.
- ④ Patients taking psychiatric medications, or other medications with anticholinergic



## Learn more at the APIC 2015 Annual Conference

Attend Steven Schweon's session at APIC 2015, June 27–29 in Nashville, Tennessee.

### Outbreaks on Behavioral Health Units: What Happens When Intensive Inpatient Psychiatric Therapy Meets Communicable Diseases

Monday, June 29, 9:30–10:30 a.m.  
Learning objectives:

- Identify one reason an outbreak may go undetected in a behavioral health setting.
- State two evidence-based best practices to prevent outbreaks.
- Describe one intervention to halt an outbreak.