



# *Clostridioides difficile*

## General Information

*Clostridioides difficile* is a Gram-positive, anaerobic, spore-forming, and motile bacterium that produces enterotoxin A and cytotoxin B. *C. difficile* is found throughout nature and is especially prevalent in soil. *C. difficile* is typically associated with being a nosocomial and antibiotic associated pathogen.

## Host Range

Humans, pigs, calves; wide range of animal species

## Incubation Period

5-10 days; can range from 1 day to several weeks.

## Survival Outside Host

*C. difficile* can exist in a vegetative state, which is the active form that reproduces in the gastrointestinal tract, and as inactive spores which allows it to survive for long periods outside the host. *C. difficile* spores can survive for months or years on surfaces and in soil.

## Laboratory Hazards

Transmitted in feces mainly through the fecal-oral route. Contaminated surfaces can serve as a reservoir for *C. difficile* spores. The primary lab hazard is ingestion.

## Symptoms of Exposure

Symptoms include severe and watery diarrhea, fever, loss of appetite, nausea, and abdominal pain or tenderness.

## Lab Acquired Infections (LAIs)

At least 2 reported LAIs since 2008.

## Personal Protective Equipment



## Disinfection & Inactivation

*C. difficile* spores are generally resistant to disinfection. Refer to [EPA's Registered Antimicrobial Products Effective Against Clostridium difficile Spores](#). Most spores can be inactivated by moist heat at 121°C for 15-30 minutes.

## Waste Management

Refer to [USC's Biological and Infectious Waste Management Plan](#).

## Lab Containment

[Biosafety Level 2 \(BSL-2\)](#) for activities with materials and cultures known or reasonably expected to contain *C. difficile*.

## Animal Containment

[Animal Biosafety Level 2 \(ABSL-2\)](#) for activities with experimentally infected animals for the duration of the animals life. A biosafety cabinet or other physical containment device must be used for all experiments and animal care activities.

## Medical Surveillance/Treatment

**Surveillance:** Monitor for symptoms. Detection of toxins is done using cell culture assays, or Enzyme Immunoassay (EIA).

**Prophylaxis:** Antibiotic prophylaxis is not recommended.

**Vaccines:** None

**Treatment:** Antibiotics, fluid replacement and rebalancing of electrolytes.

## Spill Procedures

See [USC Biological Spill Procedures](#)

## Exposure Procedures

See [USC Protocol for Post Exposure Evaluation and Follow-up](#). Use of sharps should be strictly limited. A biosafety cabinet should be used when there is a potential to create aerosols or droplets.

## References

Emilio Bouza et. al, Laboratory-Acquired *Clostridium difficile* Polymerase Chain Reaction Ribotype 027: A New Risk for Laboratory Workers?, *Clinical Infectious Diseases*, Vol 47, Issue 11, 1 Dec 2008, Pages 1493–1494, <https://doi.org/10.1086/593109>

CDC. [Clostridioides difficile Infection](#)

Public Health Agency of Canada. [Pathogen Safety Data Sheets: Infectious Substances – Clostridium difficile](#)

Weese, J. Scott. "Clostridium (Clostridioides) Difficile in Animals." *Journal of Veterinary Diagnostic Investigation*, vol. 32, no. 2, Mar. 2020, pp. 213–221, doi:10.1177/1040638719899081.

Mayo Clinic. [C. difficile infection](#).