

# *Clostridioides (Clostridium) difficile* infection

## Frequently Asked Questions

### 1. What is *Clostridioides (Clostridium) difficile* infection (CDI)?

*Clostridioides difficile* (previously *Clostridium difficile*) infection (CDI) is a gastrointestinal illness caused by a Gram-positive, spore-forming anaerobic bacterium, *C. difficile*. CDI is a mild to severe diarrhoeal disease and can result in inflammation of the colon (pseudomembranous colitis) and fatal toxic megacolon. Although *C. difficile* is part of the normal flora of the human gut, production of A (enterotoxin) and B (cytotoxin) toxins by the organism causes disease. CDI is a common cause of antibiotic-associated diarrhoea because certain antibiotic treatment eliminates normal flora but not spores of *C. difficile*, which then grow in the gastro-intestinal tract and cause disease. CDI is among the top five healthcare-associated infections and often affects patients who are immunocompromised and receiving prolonged antibiotic treatment. When hospital outbreaks of CDI occur, they are difficult to control because *C. difficile* spores are highly resistant to standard decontamination procedures.

### 2. Who can get CDI?

The risk of disease is high among hospitalised patients receiving broad-spectrum antibiotics, who have had gastrointestinal surgery, those with long stays in healthcare settings, those with underlying conditions, immunocompromised individuals and the elderly.

### 3. How is CDI transmitted?

The *C. difficile* bacteria and their spores are shed through faeces of infected people into the environment. Transmission occurs when people come into physical contact with contaminated surfaces or an infected person and touch their mouth (faecal-oral route). In healthcare settings, surfaces around an infected person become contaminated with faeces and may serve as a reservoir for *C. difficile* spores. Spores are often transferred to other patients via contaminated hands of caregivers and/or healthcare workers.

### 4. What are the signs and symptoms of CDI?

Symptoms of CDI vary widely and infection may result in asymptomatic carriage. Patients may experience a mild self-limiting diarrhoea or colitis or pseudomembranous colitis or progression to toxic megacolon often with fatal complications. Other signs may include watery and sometimes bloody diarrhoea, fever, loss of appetite, nausea, bloating and abdominal pain. Symptoms may occur after 5-10 days of receiving antibiotic therapy, or 2-10 weeks after antibiotic therapy has been completed. All classes of antibiotics have been associated with CDI.

### 5. How is CDI diagnosed?

*C. difficile* infection is diagnosed based on a patient's medical history, signs and symptoms, combined with test results. The optimal method for laboratory diagnosis of *C. difficile* is the subject of debate and depends on how carefully patients are selected for testing. When a patient has  $\geq 3$  loose or unformed diarrhoea in 24 hours that cannot be explained by an underlying condition or other possible causes of diarrhoea, a stool sample should be submitted for microscopy, culture and sensitivity (MC&S), as well as for parasites.

**Tests:** Stool culture for *C. difficile* is the most sensitive test. However, stool culture requires anaerobic culture which is not routinely available. Enzyme immunoassay (EIA) detects toxin A, toxin B, or both A and B. Due to concerns over toxin A-negative, B-positive strains causing disease, most laboratories employ a toxin B-only or A and B assay. Molecular tests such as PCR assays for the gene encoding toxin B are highly sensitive and specific for the presence of a toxin-producing *C. difficile* organism. For optimum CDI diagnoses, a multi-step algorithm involves a combination of these tests.

**Specimen collection and transport:** 1-2 mL of fresh, non-formed stools should be collected in a sterile specimen container and must be transported preferably at 2-8°C or at room temperature (15-25°C) to the laboratory. Specimens should not be frozen.

**Diagnoses in children:** A high proportion of infants who are less than twelve months of age carry toxigenic and non-toxigenic *C. difficile* in their gut without symptoms. Carriage of *C. difficile* is still high in children aged 1-2 years. Detection of *C. difficile* in these children does not indicate a CDI diagnoses unless other plausible causes (infectious and non-infectious) are not identified (e.g. rotavirus and adenovirus detection).

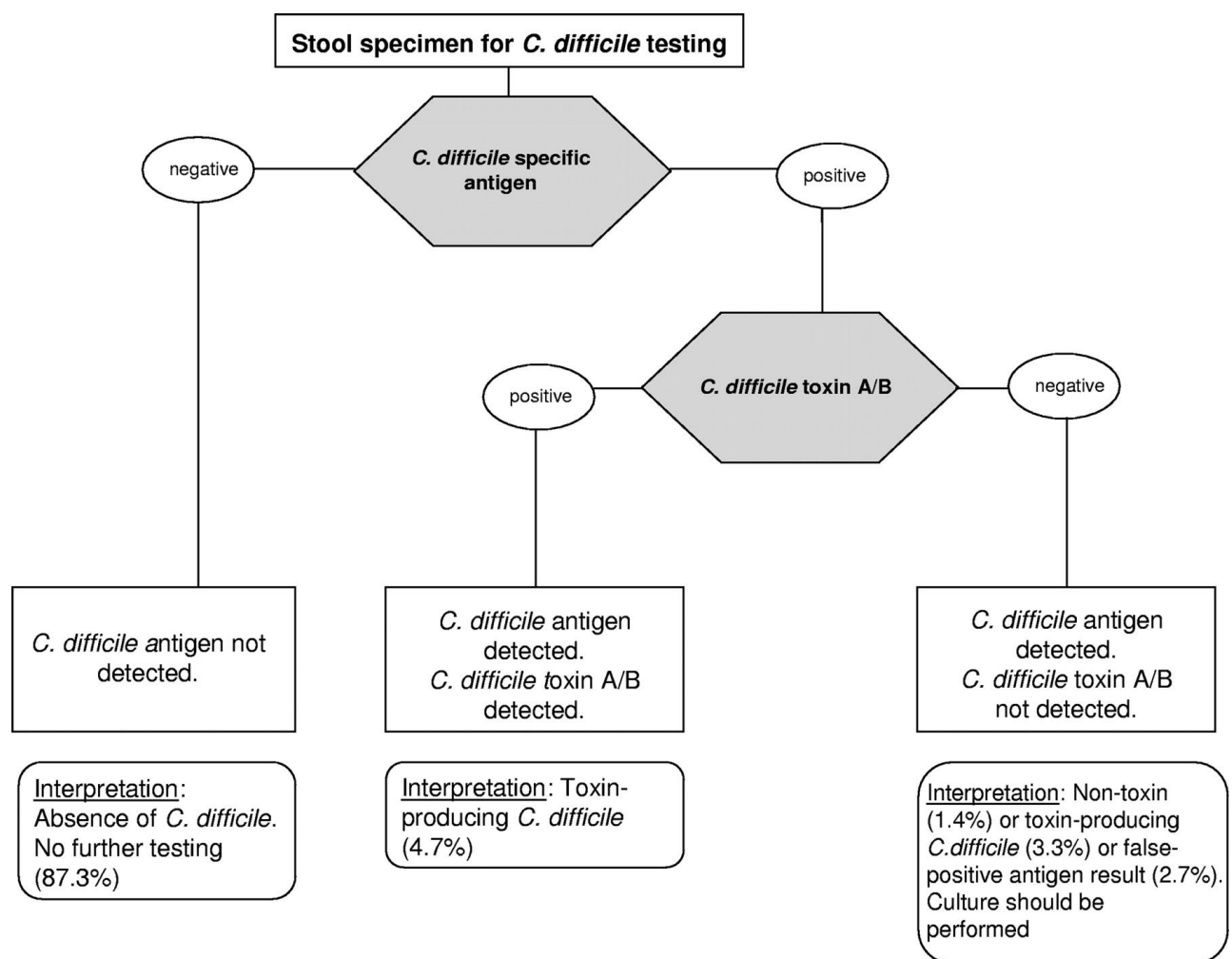


Figure 1: *C. difficile* testing algorithm.

Source; L. Fenner, *et al.*, Rapid and Reliable Diagnostic Algorithm for Detection of *Clostridium difficile* DOI: 10.1128/JCM.01503-07.

## 6. How is CDI treated?

In about 20% of patients, CDI resolves within 2-3 days of discontinuation of the antibiotic to which the patient was previously exposed. If treatment is necessary, vancomycin or fidaxomicin are recommended first-line antibiotics because they are better at preventing recurrent episodes of CDI compared to the more widely available drug metronidazole. When a patient has non-severe CDI and vancomycin and fidaxomicin are not available, metronidazole can be used as an alternative. Supportive treatment should be given to all patients.

## 7. How can CDI be prevented?

Routine screening for *C. difficile* in hospitalised patients without diarrhoea is not recommended and asymptomatic carriers should not be treated. A hospital-based infection control programme can help to reduce the incidence of CDI. In healthcare settings:

- Antibiotic stewardship is recommended to reduce the risk of CDI.
- Contact precautions should be used for patients with known or suspected CDI. These include:
  - Placing patients in private/isolation rooms. If private rooms are not available, these patients can be placed in rooms with other patients with CDI (cohorted).
  - Plastic gowns and gloves should be used when entering patients' rooms and during patient care. This is to prevent picking up *C. difficile* and spreading it to other patients or the environment.
  - All staff and visitors should wash their hands with soap and water when they enter and leave the patient room. Alcohol does not kill *C. difficile* spores. Soap and water is more effective than alcohol-based hand rubs.
  - Patients must wash their hands with soap and water before going to another part of the hospital for tests or treatments. Staff transferring the patient and helping with the tests also need to wear gowns and gloves, and wash their hands carefully.
  - Patients with *C. difficile* should have their rooms cleaned twice daily.
  - Dedicate or perform cleaning of any shared medical equipment.
- Environmental cleaning and disinfection:
  - Disinfection of environmental surfaces using disinfectant with *C. difficile*-sporicidal label claim or chlorine-containing cleaning agents (e.g. household chlorine bleach) appropriately diluted (5000 parts per million).

## 8. Where can I find out more information?

**For more information:** contact the Outbreak Response Unit, the Centre for HAI, AMR and Mycoses or the Centre for Enteric Diseases.

- Medical / clinical related queries: NICD Hotline +27 82 883 9920 (for use by healthcare professionals only)
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