



# Healthcare Happenings: IPC Highlight

## *Clostridioides difficile* (*C. diff*)

### WHAT IS IT?

*C. diff* is a spore-forming, Gram-positive anaerobic bacillus that produces two exotoxins: toxin A and toxin B. It is a common cause of antibiotic-associated diarrhea (AAD), accounting for 15-25% of all episodes of AAD. *C. diff* infection (CDI) can cause pseudomembranous colitis (PMC), toxic megacolon, perforations of the colon, [sepsis](#), and in rare cases death.

Most cases of CDI occur while a patient is being treated or soon after finishing antibiotics. It's estimated to cause **almost 500,000 infections** in the U.S. each year. Over 50% of *C. diff* cases among long-term care facility residents happen in those who were recently hospitalized.

About **17% of patients** who get *C. diff* will become infected again in the subsequent 2-8 weeks. **One in 11 people over age 65** diagnosed with a healthcare-associated *C. diff* infection die within one month.

Inappropriate antibiotic prescribing puts patients at risk for CDI. More than half of all hospitalized patients may receive an antibiotic at some point during their hospital stay, but studies have shown that 30-50% of antibiotic prescriptions in hospitals are unnecessary or inappropriate.

Colonization with *C. diff* is more common than infection. Colonized patients do not have disease caused by *C. diff* and are asymptomatic.

### What you need to know

- Strategies to reduce *C. diff* infections include improving antibiotic use and healthcare facility infection prevention and control, including cleaning and disinfection.
- *C. diff* infections are more common and often more severe in older patients.

### TRANSMISSION

*C. diff* is shed in feces. Any surface, device, or material (such as commodes, bathtubs, and electronic rectal thermometers) that becomes contaminated with feces could serve as a reservoir for the *C. diff* spores. *C. diff* spores can also be transferred to patients via the hands of healthcare personnel who have touched a patient with *C. diff*, contaminated surface or item without performing appropriate hand hygiene.

*C. diff* risk factors:

- Older age (65 and older)
- Antibiotic exposure (e.g., fluoroquinolones, third/fourth generation cephalosporins, clindamycin, carbapenems)
- Weakened immune system, such as people with HIV/AIDS, cancer, or organ transplant patients taking immunosuppressive drugs
- Recent stay at a hospital or nursing home
- Previous history of *C. diff*

## LABORATORY TESTS FOR DIAGNOSIS

Only test unformed stools in patients with increased stool frequency ( $\geq 3$  stools in 24 hours) with risk factors, and who are not on stool softeners/laxative medications. Some laboratories screen for GDH first, and if positive, proceed to EIA and/or PCR to test for toxin production.

**Antigen detection for *C. diff*:** rapid tests (<1 hour) that detect the presence of *C. diff* antigen glutamate dehydrogenase (GDH). Because results of antigen testing alone are nonspecific, antigen assays have been employed in combination with tests for toxin detection, PCR, or toxigenic culture in two-step testing algorithms.

**Nucleic acid amplification test (NAAT):** FDA-approved PCR assays, which test for the genes encoding toxin, are same-day tests that are highly sensitive and specific for the presence of a toxin-producing *C. diff* organism. PCR can be positive for *C. diff* in individuals who are asymptomatic and do not have infection. Patients with other causes of diarrhea might be positive, which could lead to over-diagnosis and treatment. When using multi-pathogen (multiplex) molecular methods, the results should be read with caution as the pre-test probability of CDI might be lower.

### Toxin testing for *C. diff*:

- Enzyme immunoassay (EIA) detects toxin A, toxin B, or both A and B. Due to concerns over toxin A-negative, toxin B-positive strains causing disease, most laboratories employ a toxin B-only or A and B assay. There are increasing concerns about their relative insensitivity (less than tissue culture cytotoxicity and much less than PCR or toxigenic culture).
- Tissue culture cytotoxicity assay detects toxin B only. Provides specific and sensitive results for CDI. Less sensitive than PCR or toxigenic culture for detecting the organism in patients with diarrhea.
- *C. diff* toxin is very unstable. The toxin degrades at room temperature and might be undetectable within two hours after collection of a stool specimen. False-negative results occur when specimens are not promptly tested or kept refrigerated until testing can be done.

**Stool culture for *C. diff*:** Most sensitive test available, but most often associated with false-positive results due to the presence of nontoxigenic *C. diff* strains. However, this can be overcome by testing isolates for toxin production

## TREATMENT

Although in about 20% of patients, CDI will resolve within two to three days after discontinuing the antibiotic to which the patient was previously exposed, CDI should usually be treated with an appropriate course (about 10 days) of treatment, including oral vancomycin, fidaxomicin or metronidazole. After treatment, repeat *C. diff* testing is not recommended if the patient's symptoms have resolved, as patients often remain colonized.

## IPC RECOMMENDATIONS

The primary infection control measures for prevention of *C. Diff* transmission in healthcare settings are:

- Adherence to [hand hygiene](#) with **soap and water instead of alcohol-based hand sanitizer**
- Use of contact precautions for patients with known or suspected CDI:
  - Place these patients in private rooms. If private rooms are not available, they can be placed in shared rooms (cohorted) with other CDI patients
  - Wear gloves and a gown when entering CDI patients' rooms and during care
  - Continue CDI precautions at least until diarrhea ceases
- Cleaning and disinfecting the patient care environment (daily and terminal cleaning) and reusable equipment, especially items likely to be contaminated with feces and surfaces that are touched frequently with [recommended sporicidal products](#)
  - Spores can live for months or sometimes years on surfaces

### References:

Information for Healthcare Professionals about *C. diff*. Centers for Disease Control and Prevention.  
<https://www.cdc.gov/cdiff/clinicians/index.html>