

## Guidance on *C. difficile* testing for long-term care providers

Gastrointestinal infections from *Clostridium difficile* (*C. diff*) are a major problem in US healthcare facilities. Although at one time most of these infections occurred in hospitals, now over 75% of *C. diff* infections are first identified outside of the hospital setting. Nursing homes and other long-term care settings are among the most common places where *C. diff* infections can happen.

Through efforts to increase training and education on infection prevention activities in long-term care settings, the Georgia Department of Public Health and other partners have learned that the identification *C. diff* can be a major challenge for nursing home providers. Reliable testing for *C. diff* infection remains challenging. Understanding the diagnostic tests available for identifying *C. diff* and using those tests correctly are important steps in building an effective *C. diff* prevention program in any facility.

Below are information and tips about *C. diff* testing along with resources to help your facility implement the best practices for *C. diff* diagnosis:

### Which laboratory tests are commonly used to diagnose *C. diff* infection?

**Enzyme immunoassay:** Many commercial and reference laboratories use the enzyme immunoassay (or EIA) to detect toxins A and B in the stool. Although these tests are relatively inexpensive, easy to perform and provide rapid results, the sensitivity (ability of the test to detect people with infection) of the commercially available EIA tests is relatively low. Clinicians, aware of the poor sensitivity of this test, may order multiple stool studies for *C. diff* to try to get a reliable result. However, this repeat testing may lead to more false positives [1], so repeat stool testing may not be the best solution.

**Tissue cytotoxin assay:** This test also detects free toxin in the stool, is generally more sensitive than the EIAs and was historically viewed as the gold standard test for the diagnosis of CDI [2]. However, the tissue cytotoxin assay is more difficult to perform than the EIA and has a relatively slow turnaround time, which may limit how useful it is in the clinical setting.

**Molecular tests:** These are FDA-approved rapid tests which detect and amplify specific segments of the *C. diff* genes using polymerase chain reaction (or PCR). These tests are highly sensitive and specific (ability of test to exclude people without disease) for the presence of a toxin-producing *C. diff*.

**Antigen detection for *Clostridium difficile*:** These are rapid tests (<1 hr) that detect the presence of *C. diff* antigen by latex agglutination or immunochromatographic assays. Because results of antigen testing alone are non-specific, antigen assays are often used in combination with toxin detection tests or molecular tests (PCR) in two-step testing algorithms [3,4].

1. Peterson LR, Robicsek A. Does my patient have *Clostridium difficile* infection? *Ann Intern Med.* 2009;151:176-179.
2. Walker RC, Ruane PJ, Rosenblatt JE, et al. Comparison of culture, cytotoxicity assays, and enzyme-linked immunosorbent assay for toxin A and toxin B in the diagnosis of *Clostridium difficile*-related enteric disease. *Diagn Microbiol Infect Dis.* 1986;5:61-69.
3. Peterson LR, Manson RU, Paule SM, et al. Detection of toxigenic *Clostridium difficile* in stool samples by real-time polymerase chain reaction for the diagnosis of *C. difficile*-associated diarrhea. *Clin Infect Dis.* 2007;45:1152-1160.
4. Sivapalan M, Wren MWD, Shetty NP, Kinson R. Laboratory diagnosis of *Clostridium difficile* infection. An evaluation of tests for faecal toxin, glutamate dehydrogenase, lactoferrin and toxigenic culture in the diagnostic laboratory. *Br J Biomed Sci.* 2009;66:1-5.

*Tip: Ask your laboratory provider which test is used for detecting C.diff*

### How should stool samples for *C.diff* testing be handled before they get to the lab?

*C. diff* toxin is very unstable. The toxin degrades at room temperature and may be undetectable within 2 hours after collection of a stool specimen or kept refrigerated until testing can be done. If a facility does not have a refrigerator for laboratory samples, the stool specimen cup can be placed inside a zip-lock bag, which is then placed inside another zip-lock bag filled with ice. False-negative results occur when specimens are not promptly tested or kept cold prior to arriving in the lab.

*Tip: Evaluate your current process for obtaining and handling stool specimens sent for C.diff testing*

## **What is the difference between *C.diff* colonization and infection?**

A resident with *C. diff* colonization will have NO clinical symptoms, but may still have a positive stool test. With *C. diff* infection (CDI), clinical symptoms (such as diarrhea, fever, etc.) are present, and the resident will have a positive test. People who have recently recovered from CDI may remain colonized with *C. diff* for several weeks or months; therefore a resident without active signs/symptoms of infection may still have toxin detected in their stool, but would not require further treatment.

*Tip: Only send stool specimens for C.diff testing from residents with active diarrhea*

## **Should people be retested for *C. diff* after symptoms have resolved to demonstrate they have been cured?**

*NO* - retesting residents whose diarrhea has resolved is not useful to show clinical response to treatment and is not recommended. Facilities should not be submitting formed stools for *C. diff* testing to the laboratory and should not request that transferring facilities provide a negative *C. diff* test prior to accepting a resident with a history of *C.diff* infection.

*Tip: Make sure your current transfer/admission policies are not requiring inappropriate C. diff testing*

## **Resources:**

1. The GA Healthcare Associated Infections Advisory Committee policy statement on appropriate use of *C.diff* laboratory testing for healthcare facilities and providers: [https://dph.georgia.gov/sites/dph.georgia.gov/files/related\\_files/site\\_page/3\\_GA%20HAI%20Policy%20Statement%20Cdiff%2022%20April%202014.pdf](https://dph.georgia.gov/sites/dph.georgia.gov/files/related_files/site_page/3_GA%20HAI%20Policy%20Statement%20Cdiff%2022%20April%202014.pdf)
2. 2010 CDC Expert commentary on *C.diff* testing: <http://www.medscape.com/viewarticle/725822>
3. Advancing Excellence campaign resource for early identification and containment of *C.diff* infections in nursing homes: [https://www.nhqualitycampaign.org/files/EarlyID\\_Assessment.pdf](https://www.nhqualitycampaign.org/files/EarlyID_Assessment.pdf)
4. CDC website on *C.difficile*: [http://www.cdc.gov/HAI/organisms/cdiff/Cdiff\\_infect.html](http://www.cdc.gov/HAI/organisms/cdiff/Cdiff_infect.html)