CLOSTRIDIUM DIFFICILE TOXIN GENE BY NAA

Now reporting toxigenic *C difficile* with presumptive identification of the epidemic strain BI/NAP1/027

C difficile is recognized as a **primary pathogen** responsible for health care-associated diarrhea.[1] The incidence of *C difficile* is also increasing in community settings.[2]

Clostridium difficile infection (CDI) has substantially increased in incidence, severity, and resistance, leading to historic highs in disease mortality.[3,4] From 2000 to 2009, the number of hospitalized patients with CDI discharge diagnoses more than doubled to more than 330,000, with many more cases developing in outpatient settings.[4,5] Similarly, the estimated number of deaths attributed to CDI sharply increased between 1999 and 2007, from 3000 deaths per year to 14,000.[4]

Not only are hospitalized or elderly patients at risk for CDI, but the CDC has advised of a potential risk of infection in young and previously healthy persons who have not been exposed to health care environments or antimicrobial therapy.[6]

The recurrence of CDI is challenging.[7] Even after successful therapy, approximately 20% of patients are at risk for recurrent CDI.[7] The individual's risk of recurrence sharply rises with each episode (about 40% after one episode, 60% after two or more episodes).[7]

The epidemic strain of *C difficile* (BI/NAP1/027) has been reported to produce a higher number of *C difficile* spores and toxins.[8,9] The epidemic strain has also been identified as a cause of healthcare-associated outbreaks worldwide.[10,11]

Patients with the epidemic strain are associated with more severe disease and frequent relapse.[9-13] The epidemic strain is associated with greater mortality; increasing the importance of monitoring these patients closely.[9-13]

As CDI continues to become more severe and resistant to metronidazole, rapid and accurate diagnosis is critical for improved patient outcomes.[3] The CDC has stated that nucleic acid amplification (NAA) tests can be as much as twice as sensitive as enzyme immunoassays and can detect CDI more accurately when used in populations with an appropriate pretest probability.[4]

The following associations have also published guidelines regarding appropriate testing for CDI.

The American College of Gastroenterologists (ACG) guidelines in 2013 include:[14]

- Nucleic acid amplification (NAA) tests for *C difficile* toxin genes are superior to toxins A+B EIA as a standard diagnostic test for CDI.
- Evidence suggests that NAA assays for toxigenic *C difficile* are good standalone tests.
- EIA lacks sensitivity and should not be used as a standalone test.

The American Society for Microbiology (ASM) guidelines in 2010 include:[15]

- NAA testing can be used to detect *C difficile* toxin genes as a standalone test.
- Of the current NAA methods to date, PCR is the most sensitive and specific method for *C difficile*.
- Toxin A/B EIA for *C difficile* diagnosis is insensitive and no longer recommended as a standalone test.

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LabCorp's *Clostridium difficile* toxin gene test by NAA — sensitivity and specificity to aid in the diagnosis of CDI.[16]

Sensitivity*	Specificity*
93.39%	94.02%

* Relative to reference culture with PCR-ribotyping

CDI may be suspected (and testing may be indicated) when a patient presents with clinically significant diarrhea of three or more loose stools per day during one to two days.[3,15]

Test Information

Test Description	Test Number	Method	Specimen Collection	Notes	Additional Information
***Clostridium difficile* Toxin Gene, NAA**	**183988**	Real-time polymerase chain reaction (PCR)	Sterile screw-cap container or stool transport without preservatives (Para-Pak® white clean vial)	Specimen should be refrigerated at 2ºC to 8ºC and transported to the laboratory within 24 hours of collection. **Do not freeze.** This test is for use with unformed (ie, soft, loose) stool samples only. Formed stool would be a cause for rejection. Specimens submitted in "Cool Whip"-type containers, denture cups, or other similar containers often leak or even explode during transport and may be rejected by the laboratory.	This test detects and presumptively differentiates the BI/NAP1/027 strain from other toxigenic strains of *C difficile*. Detection of BI/NAP1/027 strains of *C difficile* is presumptive and is solely for epidemiological purposes and is not intended to guide or monitor treatment for *C difficile* infections.

LabCorp now reports the presumptive identification of the epidemic strain of *C difficile* (BI/NAP1/027) to provide health care professionals with additional information for appropriate infection control decisions. Patients with the epidemic strain are associated with more severe disease and frequent relapse.[9-13] The epidemic strain is associated with greater mortality, increasing the importance of monitoring these patients closely.[9-13]

References

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Visit the online Test Menu at **www.LabCorp.com** for full test information, including CPT codes and specimen collection requirements.

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