

MaineHealth Infection Prevention and Control Consortium

Infection Prevention and Control Considerations for the Patient with *Clostridium difficile*-associated Disease (CDAD)

Clostridium difficile-associated disease is increasing in incidence and severity and may be coming more difficult to treat. Recently a more virulent strain has caused epidemics in the United States and elsewhere. Early recognition, strict infection control precautions and appropriate treatment are even more important to prevent severe disease and pathogen transfer to other patients.

C. difficile is a gram-positive, spore forming anaerobic bacillus that was first linked to disease in 1978, when it was identified as the causative agent of pseudomembranous colitis. *C. difficile* toxins can be found in the stool of 15% to 25% of patients with antibiotic associated diarrhea and more than 95% of the patients with pseudomembranous colitis. CDAD can range from asymptomatic carriage, uncomplicated diarrhea, to sepsis and even death.

More than 90% of health-care associated *C. difficile* infections occur after or during antimicrobial therapy. A meta-analysis by Bignardi suggests that broad-spectrum antimicrobial agents, which have a greater effect on the normal intestinal flora, are more likely to lead to CDAD. However, almost all antimicrobial agents except for aminoglycosides have been associated with CDAD.

Spread of *C. difficile* in health-care facilities has been well documented, occurring primarily person-to-person (from people with or without symptoms) and via contamination of the patient care environment. The most effective means of decreasing horizontal spread of *C. difficile* has been a combination of vigilant hand hygiene and use of isolation precautions. Controversy exists regarding the efficacy of alcohol hand gels in the prevention of transmission of *C. difficile* and many believe that the hypersporulating organism that is now present in most institutions is not inactivated by alcohol gels and that they should not be used to disinfect hands after caring for a CDAD patient.

Environmental contamination of *C. difficile* is due to persistence of spores that can be highly resistant to routine disinfectants and can dry on surfaces for many weeks or months. This guideline, consistent with CDC recommendations, specifies the use of chlorine-based cleaner to disinfect patient care areas where CDAD patients are housed or medically cared for.

1. Who to test:

- Early detection promotes effective treatment, prompt isolation, and decreased risk of transmission.
- One proven way to facilitate early detection is by use of standing orders. This is institution specific and must be approved by your administration/medical staff.
- To be effective, the use to these orders needs to be based on risk factors for *C. difficile* disease (CDAD) in the presence of a patient with diarrheal stools (defined as taking the shape of the container):
 - Age greater than 65 years
 - Severe underlying illness
 - Nasogastric intubation

- Recent antibiotic therapy
- Recent hospitalization or admission to long term care
- Recent/current proton pump/H2 blocker use (there is conflicting evidence about the role of anti-ulcer medications)

2. Testing and Stool Collection

- An accurate test result depends on proper specimen collection and handling. Staff need to be familiar with the specific test kit and the manufacturer's recommendation for processing and collection.
- Collect stool specimens:
 - Minimum one specimen
 - Additional specimens should be sent 24 hours apart.
 - Testing three stools can increase the likelihood of a positive test by 10%. However, this low increase in yield does not support multiple testing (SHEA guidelines 1995).
- Outpatients should receive clear written instructions regarding specimen collection and handling.

3. Testing for Cure

- C-diff stool testing for cure is not recommended.
- Resolution of symptoms for a minimum 24 hours should be used to guide discontinuation of Contact Precautions.

4. Infection Control Precautions Based on Current CDC Guidelines

- Contact Precautions is recommended for any rule out or laboratory confirmed CDAD patient.
- Gowns and gloves must be worn by all staff that enter the room and/or come in contact with the patient or the patient's environment.
- Family members should be educated about the importance of hand washing before and after visiting the patient. If, however, the family member is providing patient care, gowns and gloves need to be worn.
- Dedicated patient care equipment is preferred. However, if equipment must be used with multiple patients, it must be cleaned between patients (see cleaning).

5. Patient Placement

- A private room with a private bath is preferable. If that is not available, two patients with proven CDAD may share a room.
- When no other room is available, and a patient with CDAD must share a room with a non-CDAD patient the following must occur:
 - Contact Precautions must be maintained for the CDAD patient.
 - One patient must be given a bedside commode and should not share the bathroom facilities.
 - The mobility of each roommate and privacy issues is considered when determining which patient uses the bathroom versus the bedside commode.

- Strict hand washing must be maintained between the patients.

6. Hand-hygiene

- Hand hygiene using either an alcohol based hand rub or soap and water is important to prevent the spread of CDAD.
 - Visible soiling always requires soap & water handwashing.
- Some facilities may limit the use of alcohol based hand rub and encourage soap and water hand wash as the preferred method of hand cleaning.
- If an outbreak occurs or an increase in baseline rate of *C. difficile* is noted, soap and water hand hygiene should be recommended.

7. Environmental Considerations

- Recent studies show that the environment plays a significant role in the transmission of CDAD. Environmental contamination by CDAD spores is well known, especially in places where fecal contamination may occur. Direct exposure to contaminated patient-care items and high-touch surfaces in patients rooms have been implicated as sources of infection.

8. Cleaning

- Meticulous daily cleaning of the patient room is essential to reduce the bioburden to a minimum.
- Attention must be directed to high touch surfaces such as toilet handles, faucet handles, toilet seats, bedside commode, light switches, bed rails, doorknobs, phone, call bell, etc.
- Bedside computer keyboards should be cleaned according to manufacturer's recommendation.
- Currently there is no hospital disinfectant that will kill the spore form of the disease. Healthcare facilities are encouraged to use a bleach-based solution for routine environmental and equipment cleaning.
 - When increased transmission rates are suspected, a 1:10 bleach solution (5,000 – 6,000 ppm) should be used and must be mixed daily to ensure that effective disinfection has occurred.
- After a patient has been successfully treated and symptoms have abated, the patient should be moved to a new room and the previous room should be thoroughly cleaned with a bleach-based solution before being used for any new patient.
 - When two patients with CDAD are cohorted, the patient no longer requiring precautions should be moved into the clean room.

9. Out of room activities:

- Prior to ambulation, transfer or transport insure that:
 - All excretions, secretions, and drainage are contained
 - Patients are dressed in clean garments
 - Patients have washed their hands
 - Transport vehicle is clean and draped
 - The patient is covered with a clean sheet or housecoat

- After ambulation, transfer or transport:
 - Patients should wash their hands
 - Transport vehicle must be cleaned

10. Surveillance

Definitions:

- A CDAD case is defined as a case of diarrhea or toxic megacolon without other known etiology that meets one or more of the following criteria:
 - (1) The stool sample yields a positive result of a laboratory assay for *C. difficile* toxin A and/or B or a toxin-producing *C. difficile* organism is detected in the stool sample by culture or other means.
 - (2) Pseudomembranous colitis is seen during endoscopic examination or surgery.
 - (3) Pseudomembranous colitis is seen on histopathological examination.
- A recurrent CDAD case meets the above criteria and occurs 8 weeks or less after the onset of a previous episode, provided that CDAD symptoms from the earlier episode resolved with or without therapy.

For surveillance purposes attempting to identify the potential source of acquisition is important. Recent literature defines CDAD cases by their exposure:

- HCF-associated CDAD
 - Healthcare facility (HCF) onset – the patient with CDAD symptom onset more than 48 hours after admission to an HCF.
 - Community-onset – the patient with CDAD symptoms onset in the community or 48 hours or less after admission to an HCF, provided that symptom onset was less than 4 weeks after the date of discharge from a HCF.
- Community-associated CDAD
 - Patient with CDAD symptom onset in the community or 48 hours or less after admission to an HCF, provided that symptom onset was more than 12 weeks after the last discharge from any HCF.
- Indeterminate or unknown disease
 - Patient who does not fit any of the above criteria for an exposure setting – for example, a patient who has CDAD symptom onset in the community but who was discharged from the same or another HCF 4-12 weeks before symptom onset.

11. Presentation of data:

It is recommended that rates of CDAD infection be expressed in incidence by month per 1,000 patient days. This rate reflects the per-day patient risk of CDAD transmission and disease risk

factors. The use of 10,000 patient days is often used for international bench marking and comparisons.

12. Education

- Staff education:
 - Reinforce adherence to established guidelines of strict hand hygiene and contact precautions
 - Meticulous daily cleaning patient's environment
- Family and patient education:
 - Provide instruction of the importance of hand hygiene and bathroom hygiene. See associated brochure for addition teaching points.

References

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