



Hand Hygiene and *Clostridium Difficile* Infections

MARY MCGOLDRICK, MS, RN, CRNI

Clostridium difficile (*C. difficile*), a gram-positive spore-forming anaerobic bacillus, is an important cause of infectious disease death in the United States. In 2011, there were an estimated 453,000 *C. difficile* infections (CDI) occurring in the United States with two-thirds of these cases related to a stay in a hospital or nursing home. The other third were community-associated cases, involving people with no recent hospital or nursing home exposure, but had visited an outpatient clinic or a dentist within 3 months before their CDI diagnosis (Lessa et al., 2015). Eighty percent of the 29,300 deaths from CDI occurred in people 65 years of age and older, with one of nine patients over the age of 65 with CDI dying within 30 days of diagnosis (Centers for Disease Control and Prevention [CDC], 2015).

Many patients discharged from a hospital or nursing home with CDI didn't get sick until after they were at home (Lessa et al., 2015). This has important implications for home care as

the patient may become "symptomatic" and shed the spores. Patients need to be instructed to let their home care clinician know as soon as possible if they develop a watery diarrhea. *C. difficile* infections need to be diagnosed quickly to prevent home environmental contamination. The home care clinician can request an order for a *C. difficile* test (preferably a nucleic acid amplification test) if the patient has had three or more unformed stools (watery diarrhea) within a 24-hour period. Other clinical symptoms of *C. difficile* can include fever, loss of appetite, nausea, and abdominal pain and tenderness (McGoldrick, 2014). Symptomatic patients are known to excrete a large number of organisms in feces, as vegetative organisms or as spores, and bacterial spores are found in abundance in the environment of patients with CDI (Landelle et al., 2014). The sooner a *C. difficile* infection can be identified, the sooner the spores can be contained in the patient's home.

If the patient needs to be transferred to another healthcare provider, it would be important to communicate with the facility to let them know that the patient is infected with *C. difficile*.

Infections caused by *C. difficile* are an example of a secondary infection that are directly related to antibiotic use. Taking antibiotics alters the lower intestinal flora and suppresses the normal bacteria in the colon. This allows the proliferation of *C. difficile* in the colon. A patient gets a CDI via the fecal-oral route most often by touching a surface contaminated with *C. difficile* spores and then touching their mouth with the contaminated hand. The *C. difficile* spores are ingested and travel unharmed through the acidic environment of the stomach and germinate into the vegetative form. *C. difficile* produces toxins that cause damage to the colon tissue, and can cause the bacteria to leak into the bloodstream.

Therefore, glove use and hand hygiene are important components of an effective infection control program to prevent the spread of the *C. difficile* spores. Wearing gloves when caring for a patient with CDI or touching surfaces in their environment have been shown to be effective at preventing the transmission of *C. difficile*. Glove use is the only CDI prevention recommendation with the highest strength of recommendation and quality of evidence rating (Landelle et al., 2014). If the gloves are not carefully removed, the staff can further

Table 1. Strategies to Prevent the Transmission of *C. difficile* in the Home

1. Perform hand hygiene when indicated throughout the course of care, and perform meticulous hand hygiene with soap and water before leaving the home.
2. Wear gloves and carefully remove the gloves after use.
3. Implement Contact Precautions, as needed.
4. Clean and disinfect the equipment after use in patient care.
5. Use a surface barrier under a nursing bag, if it is brought into the home.
6. Alert others involved in the patient's care of the patient's infection with *C. difficile*.
7. Educate the patient and caregiver on methods to prevent the spread of spores in the home.

Adapted from McGoldrick, M. (2015). Patient and Staff Education. Home Care Infection Prevention and Control Program. Saint Simons Island, GA: Home Health Systems.



Figure 1. Gram-positive *C. difficile* bacteria. Source: www.cdc.gov

contaminate the environment with spores. Therefore, staff need to carefully remove the gloves and then immediately perform hand hygiene. Another reason to perform hand hygiene immediately after glove removal is that gloves may not provide absolute protection against hand contamination.

There has been controversy over the method of performing hand hygiene and whether it should be done using an alcohol-based hand rub or using soap and water. To date, there has not been a clinical study demonstrating an increase in CDI with the use of alcohol-based hand hygiene products or a decrease in CDI with soap and water (Dubberke et al., 2014). This is why the preferential use of soap and water for hand hygiene after caring for a patient with CDI is not recommended in nonoutbreak settings. The recommendation to use soap and water preferentially in outbreak settings after caring for a patient with CDI is based on expert opinion as there are no data that demonstrate preferential use of soap and water for hand hygiene after caring for a patient with CDI in an outbreak setting is effective at preventing CDI (Dubberke & Gerding, 2011).

It's important to note that neither soap nor alcohol-based hand hygiene products are sporicidal. When washing the hands with soap and water, the soap reduces the surface tension on the skin and the friction during rubbing lifts the spores from the skin. The spores are then eliminated from the hands during the rinsing phase of hand washing. Spores may be difficult to remove from the hands, even with hand washing with soap and water. During routine care of a patient in the home with CDI, if the gloved hands are not soiled, it is acceptable to use the alcohol-based hand hygiene product when hand hygiene is indicated; however, it is suggested that at the end of the visit the staff wash their hands with soap and water before leaving the home.

As home care clinicians, we can make a difference by implementing infection prevention and control strategies *in combination* that can reduce the incidence of infection, which prevents the need for antibiotics in the first place. Data support that as much as 50% of the time, antibiotics are prescribed when they are not needed or they are misused (CDC, 2013). Antimicrobial stewardship is often not considered something that directly involves home care clinicians, but we can make a difference by helping reduce the amount of antibiotics used by patients. If a patient needs to be started on an antibiotic, educate the patient and caregiver on actions they can take to optimize the use of antimicrobials (McGoldrick, 2014).

An estimated one in five patients (83,000 of 453,000) who developed a CDI had at least one recurrence of their illness (Lessa et al., 2015). Some

patients do not even have a recurrence because they die or lose their colon to the initial disease (CDC, 2015). Therefore, we must be very aware of the significance of these *C. difficile* infections and implement other infection prevention and control strategies in the home. ■

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Mary McGoldrick, MS, RN, CRNI, is a Home Care and Hospice Consultant, Home Health Systems, Inc., Saint Simons Island, Georgia.

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Address for correspondence: Mary McGoldrick, MS, RN, CRNI, P.O. Box 21704, Saint Simons Island, GA 31522 (mary@homecareandhospice.com).

REFERENCES

- Centers for Disease Control and Prevention. (2013). *Antibiotic threats in the United States, 2013*. Retrieved from <http://www.cdc.gov/drugresistance/threat-report-2013/>
- Centers for Disease Control and Prevention. (2015). *Transcript for CDC telebriefing: Study on Clostridium difficile infection*. Retrieved from <http://www.cdc.gov/media/releases/2015/t0225-clostridium-difficile.html>
- Dubberke, E. R., Carling, P., Carrico, R., Donskey, C. J., Loo, V. G., McDonald, L. C., ..., Gerding, D. N. (2014). Strategies to prevent *Clostridium difficile* infections in acute care hospitals: 2014 Update. *Infection Control and Hospital Epidemiology*, 35(6), 628-645. <http://www.jstor.org/stable/10.1086/676023>
- Dubberke E. R., & Gerding D. (2011). *Rationale for hand hygiene recommendations after caring for a patient with Clostridium difficile infection: A compendium of strategies to prevent health-care-associated infections in acute care hospitals*. Retrieved from <http://www.shea-online.org/Portals/0/CDI%20hand%20hygiene%20Update.pdf>
- Landelle, C., Verachten, M., Legrand, P., Girou, E., Barbut, F., & Brun-Buisson, C. (2014). Contamination of healthcare workers' hands with *Clostridium difficile* spores after caring for patients with *C. difficile* infection. *Infection Control and Hospital Epidemiology*, 35(1), 10-15. <http://www.jstor.org/stable/10.1086/674396>
- Lessa, F. C., Mu, Y., Bamberg, W. M., Beldavs, Z. G., Dumyati, G. K., Dunn, J. R., ..., McDonald, L. C. (2015). Burden of *Clostridium difficile* infection in the United States. *New England Journal of Medicine*, 372(9), 825-834. doi:10.1056/NEJMoa1408913
- McGoldrick, M. (2014). Antimicrobial stewardship. *Home Healthcare Nurse*, 32(9), 559-560.