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1 HOUR CE CBDM Approved

Nutrition and Infection Control

Play Key Roles in C. Diff Management

NUTRITION CONNECTION

Infection control and nutrition management offer a one-two punch to prevent and treat C. diff

Clostridioides difficile (also known as C. diff) is a bacterium that causes diarrhea and colitis (an inflammation of the colon) and is one of the most prevalent healthcare-associated infections in the United States. According to a 2015 study based on surveillance carried out by the Centers for Disease Control and Prevention (CDC), nearly 500,000 Americans suffer from C. diff annually, with one in five having recurrent disease. C. diff is responsible for more than 23,000 deaths annually and over $4.6 billion in treatment costs.

Between 2001 and 2010, the incidence of Clostridioides difficile infection (CDI) nearly doubled among adults hospitalized in the United States. Since 2010, the mortality rate has begun to decline, although infection rates continue to rise.

CDI can affect people of all ages. However, the risk of developing CDI is greatest in individuals over 65, those with chronic health conditions and comorbidities such as diabetes, those undergoing gastrointestinal surgery, those who are immunocompromised, and those who have a history of prior antibiotic use. Additionally, those who are subject to long stays in healthcare settings such as hospitals and long-term care facilities are also at increased risk.

The stage of infection with CDI is classified as mild to moderate infection (watery diarrhea three or more times

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a day for two or more days, mild abdominal cramping and tenderness); or severe infection (watery diarrhea 10 to 15 times a day, strong foul odor of diarrhea, abdominal pain and cramps, fever, nausea and/or vomiting, dehydration, loss of appetite, weight loss).

This article will provide an overview of C. diff, present key recommendations for infection control, and offer considerations for food and nutrition interventions.

WHAT IS C. DIFF?

Clostridioides difficile, formerly known as Clostridium difficile, is an anaerobic, gram-positive bacterium. It can exist in two forms: a dormant spore that has a tough protein coat, and a vegetative form that results from spore germination. Because of the anaerobic nature of the bacteria, the dormant spore is the infectious and transmissible form. C. difficile was first detected in the lower intestinal tract of newborns in 1935, but it was not until 1978 that it was understood to cause the disease now known as Clostridioides difficile infection.

C. difficile is a common bacteria and has been isolated from soil, houses, shops, and healthcare facilities; however, most cases of C. diff occur while taking antibiotics or not long after finishing antibiotics. People on antibiotics are seven to 10 times more likely to get C. diff while on the drugs and during the month after.

The Centers for Disease Control and Prevention emphasizes several actions that healthcare providers can take to prevent CDI to include:

- Prescribe and use antibiotics carefully.
- Use proper diagnostic tests for accurate results.
- Rapidly identify and isolate patients with CDI.
- Practice contact precautions such as wearing gloves and gowns when treating patients with C. dff.
- Practice hand hygiene using soap and water. Alcohol-based hand sanitizers do not inactivate C. difficile.
- Clean and disinfect the rooms of CDI patients daily and on discharge with an EPA-registered disinfectant with claims against C. difficile spores.
- When a patient with C. diff transfers, notify the new facility of the infection.

The cleaning and disinfection of surfaces, along with hand hygiene, are critical activities that can help prevent the transmission of C. difficile spores from patient to patient.

INFECTION CONTROL GUIDELINES AND C. DIFF

C. diff transmission can be either direct or indirect, hospital acquired (nosocomial) or community acquired. Ingesting C. diff spores transmitted from others and patients by hands or altered normal intestinal flora by antibiotic therapy allows rapid reproduction of C. diff in the colon.

Coming in contact with contaminated surfaces, devices, or material with Clostridioides difficile spores can easily be transferred to individuals by hands that have touched a contaminated surface or item.

Some examples of surfaces, devices, and materials contaminated with C. diff spores in healthcare settings and community/outpatient settings include: commodes, bathtubs, showers, hand rails, bed rails, countertops, door handles, drawer handles, wall light switches, clothing, medical equipment, blood pressure cuffs, walkers, and canes.

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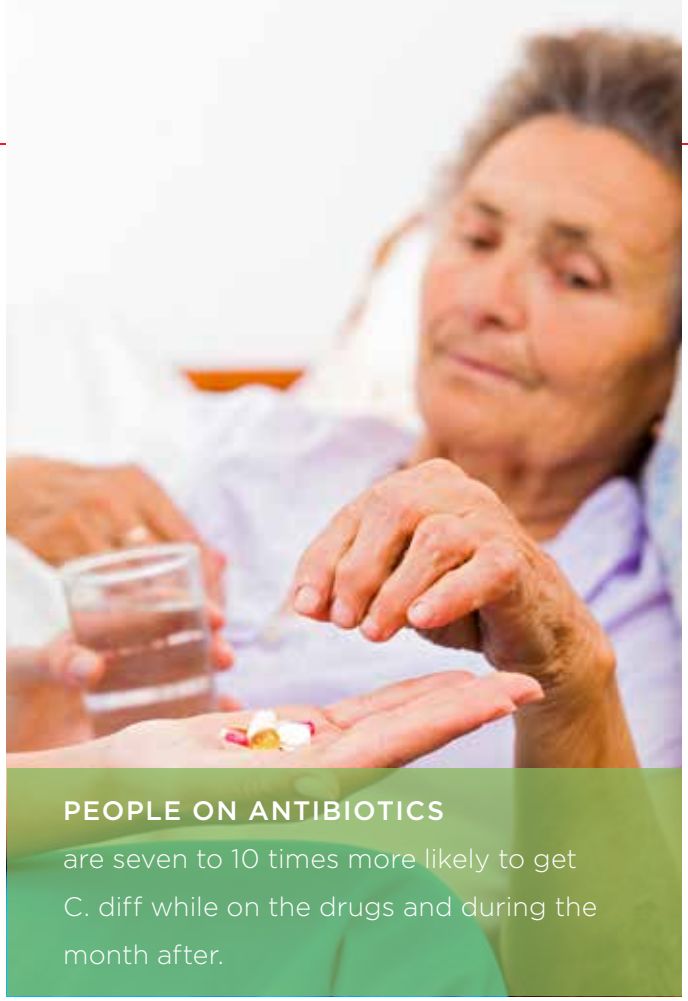
Infection control programs following "evidence-based best practice" guidelines are critical in prevention and management of C. diff. Regulatory requirements for healthcare settings continue to focus on ensuring the facility develops and implements an ongoing infection prevention and control program (IPCP) following accepted national standards to prevent, recognize, and control the onset and spread of infection to the extent possible, and reviews and updates the IPCP annually and as necessary.

In long-term care, F-Tag 880 requires that the facility must establish and maintain an infection prevention and control program designed to provide a safe, sanitary, and comfortable environment and to help prevent the development and transmission of communicable diseases and infections.

The Joint Commission also requires specific components of an infection control program for accreditation. Included in the requirements are the circumstances under which the facility must prohibit employees with a communicable disease or infected skin lesions from direct contact with residents or their food, appropriate hand hygiene, surface disinfection, and proper decontamination of dishware and eating utensils.

- **Hand Hygiene.** Appropriate hand hygiene techniques should be practiced by patients, healthcare staff, and visitors. Hands should be washed with soap and water for at least 30 seconds, followed by thorough drying with paper towels. Alcohol-based hand sanitizers do not inactivate C. difficile and should not be used when soap and water are available. In addition to hand hygiene, use gloves to prevent hand contamination from C. diff, but gloves are not a substitute for performing hand hygiene.
- **Surface Disinfection.** C. difficile spores are resistant to many common disinfectants, so an EPA-registered disinfectant with a claim to inactivate C. diff spores should be used. It is recommended to use disposable patient equipment when possible and ensure that reusable equipment is thoroughly cleaned and disinfected, preferably with a sporicidal disinfectant that is equipment-compatible. Studies on the survival of C. difficile on hard surfaces such as those found in the healthcare environment have shown that while the vegetative form dies within 24 hours, C. diff spores can persist for months. This long survival period of the spores increases the risk of transmission from a contaminated surface that has not been properly cleaned and disinfected.
- **Decontamination of Dishware and Eating Utensils.** Use disposable patient equipment when possible and ensure that reusable equipment is thoroughly cleaned and disinfected, preferentially with a sporicidal disinfectant that is equipment-compatible. The combination of hot water and detergents used in dishwashers may be sufficient to decontaminate dishware and eating utensils (be sure to check with the manufacturer). If adequate resources for cleaning utensils and dishes are not available, disposable products should be used.



PEOPLE ON ANTIBIOTICS
are seven to 10 times more likely to get C. diff while on the drugs and during the month after.

As part of an education program, family and visitors should be educated about how they can help prevent C. diff transmission. This includes being provided with information on the disease and transmission, the correct way to wash hands, and the steps they can take once patients are discharged—such as cleaning and disinfecting homes, not sharing towels or hygiene products, and best practices for laundering.

NUTRITIONAL MANAGEMENT OF C. DIFF

Nutritional intake during the treatment and post-C. diff infection can be challenging and is person-centered as it varies between individuals.

Some common suggestions include:

- Using a clear liquid diet for up to three days; use exceeding more than three days is not recommended as this does not provide adequate nutrients.
- Whole milk and milk products may cause additional G.I. upset as lactose intolerance can occur during a C. difficile infection.
- Avoiding greasy foods and foods high in fat content as these may cause additional diarrhea episodes.
- Additional foods that may cause added abdominal/intestinal bloating and discomfort include cabbage, broccoli, cauliflower, whole-grain breads, onions, beans, nuts, and seeds.
- Avoiding spicy foods as they may elevate the symptoms during a C. diff infection.
- Avoiding large amounts of caffeine is suggested as caffeine will irritate the gastrointestinal system and prolong healing and the recovery process. Caffeine also has diuretic effects, creating a fluid shift promoting diarrhea episodes by pulling fluid from the tissue into the intestinal tract.
- What about probiotics with C. diff? Probiotics contain microorganisms, most of which are bacteria similar to the beneficial bacteria that occur naturally in the human gut. Probiotics have been widely studied in a variety of gastrointestinal diseases; however, a lack of clear guidelines on when to use probiotics and the most effective probiotic for different gastrointestinal conditions can be confusing.
  - > Probiotics have an important role in the maintenance of immunologic equilibrium in the gastrointestinal tract through the direct interaction with immune cells. Probiotic effectiveness can be distinct to the microorganism species, dose, and the specific disease, and the duration of therapy depends on the clinical indication.
  - > There is high-quality evidence that probiotics are effective for acute infectious diarrhea, antibiotic-associated diarrhea, Clostridioides difficile–associated diarrhea, hepatic encephalopathy, ulcerative colitis, irritable bowel syndrome, functional gastrointestinal disorders, and necrotizing enterocolitis. On the contrary, there is evidence that probiotics are not effective for acute pancreatitis and Crohn's disease.
  - > Probiotics are safe for infants, children, adults, and older patients, but caution is advised in immunologically-vulnerable populations.
  - > Be sure to have the registered dietitian nutritionist review appropriate use of a probiotic.

CONCLUSION

CDI can affect people of all ages. However, the risk of developing C. diff is greatest in individuals over 65, those with chronic health conditions and comorbidities such as diabetes, those undergoing gastrointestinal surgery, those who are immunocompromised, and those with a history of prior antibiotic use. Additionally, individuals who are subject to long stays in healthcare settings such as hospitals and long-term care facilities are also at increased risk.

CDI is one of the most prevalent healthcare-associated infections in the United States, and proper infection control for safe food with appropriate nutrition interventions play a critical role in overall prevention and management. E

C. DIFF FACTSHEET

Clostridioides difficile (formerly known as *Clostridium difficile*) is a bacterium that causes diarrhea and colitis (an inflammation of the colon). *C. diff* infections can be deadly.

IMPACT

C. diff causes close to half a million illnesses each year and can affect people of all ages.[1]

1 in 5 patients will get *C. diff* at least once more.[1]

One in 11 people over 65 diagnosed with a healthcare-associated *C. diff* infection die within a month.[1]

RISK

People on antibiotics are 7 to 10 times more likely to get *C. diff* while on the drugs and during the month after.[2]

Extended stays in healthcare settings, especially hospitals and nursing homes, also increase risk.

More than 80% of *C. diff* deaths occur in people 65 and older.

SPREAD

C. diff spreads when people touch surfaces that are contaminated with poop from an infected person.

Or when people don't wash their hands with soap and water.

It can also happen when one healthcare facility fails to notify another when it transfers a patient with *C. diff.*

Healthcare professionals can help PREVENT *C. diff by:*

BE ANTIBIOTICS AWARE
SMART USE. BEST CARE.

Improving the way they prescribe antibiotics.

Using the tests that give the most accurate results.

Rapidly identifing and isolating patients with *C. diff*.

Wearing gloves and gowns when treating patients with *C. diff*—and remembering that hand sanitizer doesn't kill *C. diff*.

Cleaning surfaces in rooms where *C. diff* patients are treated with EPA-approved, spore-killing disinfectant (see List K).

cdc.gov/cdiff

[1] Table 3 from Lessa FC, Mu Yi, Bamberg WM et al. N Engl J Med 2015;372:825-34. DOI: 10.1056/NEJMoa1408913
[2] Hensgens MPM, Goorhuis A, Dekkers OM, Kuijper EJ. J Antimicrob Chemother 2011. DOI: 10.1093/jac/dkr508

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Centers for Disease Control and Prevention

REFERENCES AND RESOURCES

- *State Operations Manual Appendix PP—Guidance to Surveyors for Long Term Care Facilities Table of Contents (Rev. 11-22-17) https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/GuidanceforLawsAndRegulations/Nursing-Homes.html*
- *Centers for Disease Control and Prevention (CDC)*
  - > *C. diff Fact Sheet: https://www.cdc.gov/cdiff/what-is.html*
  - > *Clostridioides difficile (C. diff): https://www.cdc.gov/cdiff/index.html*
  - > *Hand Hygiene in Healthcare Settings: https://www.cdc.gov/handhygiene/index.html*
  - > *The Progression of a C. Diff Infection: https://www.cdc.gov/cdiff/pdf/Cdiff-progression-H.pdf*
- *Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee, 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, Updated 2018. https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html*

CE Questions | NUTRITION CONNECTION

This Level II article assumes that the reader has a foundation of basic concepts of the topic. The desired outcome is to enhance knowledge and facilitate application of knowledge to practice.

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Reading *Nutrition and Infection Control Play Key Roles in C. Diff Management* and successfully completing these questions online has been approved for 1 hour of continuing education for CDM, CFPPs. CE credit is available ONLINE ONLY. To earn 1 CE hour, access the online CE quiz in the ANFP Marketplace. Visit **www.ANFPonline.org/market**, select "**Publication**," then select "**CE article**" at left, then search the title *"Nutrition and Infection Control Play Key Roles in C. Diff Management,"* purchase the article, and complete the CE quiz.

1. Clostridioides difficile (also known as C. diff) is responsible for more than _____ deaths annually and over $4.6 billion in treatment costs.
   A. 18,000
   B. 23,000
   C. 35,000
2. CDI can affect people of all ages; however, the risk of developing CDI is greatest in individuals over ___ years old.
   A. 62
   B. 65
   C. 67
3. A number of actions that healthcare providers can take to prevent CDI include proper hand hygiene using soap and water. Alcohol-based hand sanitizers _____ inactivate C. difficile.
   A. Do not
   B. Always
   C. Might
4. Infection control programs following "evidence-based best practice" guidelines are critical in prevention and management of C-diff, and regulatory requirements for healthcare settings focus on ensuring a facility develops and implements an ongoing _____ (IPCP).
   A. Individualized person-centered protocol
   B. Infection prevention and control program
   C. Intermittent person-centered program
5. Use of _____ in addition to hand hygiene is very important to prevent hand contamination from C. diff but are not a substitute for performing hand hygiene.
   A. Tongs
   B. Hairnets
   C. Gloves
6. Nutritional intake during the treatment of C diff may include use of a clear liquid diet for up to _____ days; however, exceeding more than _____ days is not recommended as this does not provide adequate nutrients.
   A. Three
   B. Five
   C. Seven
7. Avoiding large amounts of _____ is suggested as it irritates the gastrointestinal system and has diuretic effects, creating a fluid shift promoting diarrhea episodes by pulling fluid from the tissue into the intestinal tract.
   A. Juice
   B. Soup
   C. Caffeine