

## Clostridium Difficile (C. Difficile) Infections

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### Overview

*Clostridium difficile* ("C. difficile" or "C. diff") is a type of spore-forming bacteria that produces two types of toxins. The main clinical symptoms of *C. difficile* infection (CDI) are watery diarrhea, fever, nausea, abdominal pain/tenderness, and loss of appetite. More serious conditions can also result such as pseudomembranous colitis (inflammation of the colon), perforations of the colon, and sepsis. It is possible to carry *C. diff* bacteria in your body but not show any symptoms; this is called [colonization](#). After treatment, repeat testing is not recommended if the patient's symptoms have resolved, since many patients remain colonized with the bacteria.

Some patients/residents may be at higher risk for developing CDI due to prolonged use of antibiotics, underlying gastrointestinal issues or prior gastrointestinal surgery, history of frequent hospitalizations, immunocompromised status, advanced age, or other underlying chronic health conditions. It is important that both the patient and the healthcare providers take the appropriate steps to help prevent an infection.

### Estimated burden of CDI in healthcare facilities in the United States:

#### • Morbidity

- In a recent national prevalence survey, *Clostridium difficile* was the most commonly reported pathogen, causing 12% of HAIs, and an estimated 80,400 hospital-onset infections. ([citation](#))
- According to the latest [CDC National and State HAI Progress Report](#), in 2013, acute care hospitals experienced a 10% reduction in hospital-onset *C. difficile* infections compared to 2011.
  - [Virginia hospitals](#) experienced a 2% reduction in hospital-onset *C. difficile* infections between 2011 and 2013.
- *C. difficile* accounts for 15-25% of all episodes of antibiotic-associated diarrhea.
- In Virginia, hospitalizations for *C. difficile* increased from 9 per 100,000 people in 2000 to 29 per 100,000 people in 2010. ([citation](#)) In 2010 in Virginia:
  - The rate of hospitalization with *C. difficile* was more than twice as high for people 85 years or older than for people 65 to 84 years of age.
  - Compared to men, *C. difficile* hospitalization rates were 30% higher for women.
- In 2009, patients diagnosed with *C. difficile* in Virginia hospitals stayed an average of 13.2 days, almost three times as long as the average stay of all other patients (4.6 days). ([citation](#))

#### • Mortality

- CDI has been associated with an attributable mortality rate of 6.9% at 30 days after diagnosis and 16.7% at 1 year. ([citation](#))

#### • Costs

- Nationally, the estimated cost per infection ranges from \$6,000 - \$9,000 and the estimated total cost per year ranges from \$1 billion - \$1.6 billion. ([citation](#))
- In 2009 in Virginia, the total hospital cost for patients with *C. difficile* was over \$157 million. The average hospital cost for patients with *C. difficile* was nearly three times higher than patients without *C. difficile* (\$23,190 vs. \$8,860). ([citation](#))

In January 2013, the Centers for Medicare and Medicaid Services (CMS) will begin requiring acute care hospitals participating in their Inpatient Prospective Payment System (IPPS) to report laboratory-identified *C. difficile* infections facility-wide using the National Healthcare Safety Network (NHSN). These data will be made publicly available on [Hospital Compare](#).

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## Prevention Strategies for Healthcare Providers

To prevent CDI, doctors, nurses, and other healthcare providers should follow CDC infection prevention guidelines including:

- Use antibiotics judiciously.
- Implement contact precautions for patients/residents with known or suspected CDI:
  - Place patients/residents with CDI in private rooms. If private rooms are not available, patients/residents can be placed in rooms (cohorted) with other persons with CDI.
  - Use gloves when entering the room of a patient/resident with CDI and during patient/resident care.
  - Perform hand hygiene after removing gloves.
    - Because alcohol does not kill *C. difficile* spores, use of **soap and water** is more efficacious than alcohol-based hand rubs. However, early experimental data suggest that, even using soap and water, the removal of *C. difficile* spores is more challenging than the removal or inactivation of other common pathogens.
    - Preventing contamination of the hands via glove use remains the cornerstone for preventing *C. difficile* transmission via the hands of healthcare workers.
    - If your institution experiences an outbreak, consider using only soap and water for hand hygiene when caring for patients/residents with CDI.
  - Use gowns when entering the room of a patient/resident with CDI and during patient/resident care.
  - Use dedicated medical equipment or perform cleaning and disinfection of any shared medical equipment.
  - Continue these precautions until diarrhea ceases.
    - Because patients/residents with CDI continue to shed the bacteria for a number of days after diarrhea stops, some facilities routinely continue isolation for either several days beyond symptom resolution or until discharge, depending upon the type of setting and average length of stay.
- Implement an environmental cleaning and disinfection strategy:
  - Ensure adequate cleaning and disinfection of environmental surfaces and reusable devices, especially items likely to be contaminated with feces and surfaces that are touched frequently.
  - Consider using an Environmental Protection Agency (EPA)-registered disinfectant with a sporicidal claim for environmental surface disinfection after cleaning in accordance with label instructions. Generic sources of hypochlorite (e.g., household chlorine bleach) also may be appropriately diluted and used.
    - Note: Standard EPA-registered hospital disinfectants are not effective against *Clostridium difficile* spores.
    - Hypochlorite-based disinfectants may be most effective in preventing *C. difficile* transmission in units with high endemic rates of *C. difficile* infection.

[Clinical Practice Guidelines for \*Clostridium difficile\* Infection in Adults: 2010 Update by the Society for Healthcare Epidemiology of America \(SHEA\) and the Infectious Diseases Society of America \(IDSA\)](#)

[Clostridium difficile Infection in Adults and Children \(2013\)](#) – a policy statement from the American Academy of Pediatrics

[SHEA/IDSA Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals - \*C. difficile\*](#)

[CDC CDI Prevention Collaborative Toolkit](#) – contains background on epidemiology of CDI as well as core and supplemental prevention strategies

## Tools and Resources

[Advancing Excellence in America's Nursing Homes](#) - checklists for nursing homes to help improve *C. diff* prevention policies, procedures, knowledge and practices. Includes assessment checklists for early identification/containment, hand hygiene, cleaning/disinfection, and antibiotic stewardship.

[Antibiotic stewardship webpage](#)

[APIC Guide to Preventing \*Clostridium difficile\* Infections, 2013](#)

[CDC Commentary: Testing for \*Clostridium difficile\* Infection](#) (Medscape login required; registration free)

[CDC Vital Signs Report: Making Health Care Safer – Reducing \*Clostridium difficile\* Infection \(March 2012\)](#) - latest findings of progress on *C. difficile* prevention in different healthcare settings

[Morbidity and Mortality Weekly Report \(MMWR\) – March 6, 2012](#) - more detailed information on methodology of Vital Signs report

[C. difficile fact sheet for assisted living facilities and nursing homes](#)

[Clostridium difficile in Long-Term-Care Facilities for the Elderly, 2002 \(SHEA Position Paper\)](#)

[Clostridium difficile Prevention: Dodging a "One-Two Punch"](#) - educational flyer for consumers that contains *C. difficile* facts and prevention strategies. Developed by VHI.

[Deadly Diarrhea](#) (CDC infographic)

[Drug Resistance and Antibiotic Stewardship fact sheet](#)

[General \*C. difficile\* fact sheet](#)

[NHSN Multidrug-resistant Organism and \*Clostridium difficile\* Infection \(MDRO/CDI\) Module](#) – click on the appropriate healthcare setting and select the MDRO/CDI link to access the training, protocols, forms, analysis resources, and other support materials

[SHEA Patient Education Guide \(\*C. diff\*\)](#) – fact sheet that educates patients and their families about 7 types of HAIs (including *C. diff*) and how to work with healthcare professionals to prevent them.

[VHQC/VDH \*Clostridium difficile\* infection prevention collaborative](#)

- Conducted in partnership with VHQC
- Statewide project with enrolled acute care and long-term care facilities to conduct surveillance for *C. difficile* labID events, implement prevention strategies, and share best practices
- Collaborative resources available by contacting the VDH HAI Program

For more patient resources, please see the [Consumer and Public Information](#) page or go to the [CDC \*C. difficile\* website](#).

**Citation:**

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