**Field Guide: *Clostridium difficile* Infection**

**Definition and Harm Impact**

*Clostridium difficile* infection (CDI) is a spore-forming bacteria that colonizes in the large intestine and is best known for causing diarrhea and colitis that can lead to larger complications such as toxic megacolon, perforation, sepsis, and even death. To develop CDI, two events must occur: (1) exposure to CDI spores (ingested; think hand to mouth), and (2) exposure to antibiotics (a risk that can persist weeks after stopping the drug). These two events can occur in either order. CDI is spread by bacterial spores found in feces. Surfaces contaminated with the spores can lead to further spread by healthcare workers who come in contact with them. Clinical risk factors include the widespread use of antimicrobials, increased use of proton pump inhibitors (PPIs), and an aging population that is more susceptible to infection. Additionally, laboratory testing protocols may influence the number of cases of CDI reported.

It is estimated around 453,000 people per year in the United States alone will develop CDI and roughly 29,000 of them will die. Almost half of infections occur in people younger than 65, but more than 90 percent of deaths occur in people 65 and older. While CDI still poses a risk to thousands of patients each year, California acute care hospitals have shown positive decreases in the rate of CDI since 2015.

**Engaging Patients and Families**

Patient/family education and partnership in CDI prevention is critical to successful reduction of CDI infection and spread.

Education points:
- Ensure high-risk patients, such as those immunocompromised due to transplant, cancer care, or multiple comorbidities, are educated about characteristics of opportunistic infections, CDI specific characteristics such as presence of spores that can foster transmission, signs/symptoms of infection, and key prevention strategies.
- Ensure non-symptomatic carriers of *Clostridium difficile* understand transmission modes, signs/symptoms of infection, role of hand hygiene, and precautions for preventing CDI.
- Hand hygiene—Use Teach-Back methods to educate patients and visitors on the frequency, options (alcohol rub, soap and water), and best-practice handwashing techniques as part of a standardized handwashing program.
- For patients infected with *Clostridium difficile*, educate patient/family and visitors about contact precautions. Educate staff members entering CDI patient rooms about wearing gowns and gloves and performing hand hygiene upon entry and exit. Society for Healthcare Epidemiology of America (SHEA) consider *C. difficile* as potentially harmful to visitors and recommend that visitors also follow contact precautions, if this can be realistically enforced and regularly evaluated for compliance by hospitals. If included in hospital policy, visitors should receive instructions from hospital staff members on how to properly put on and take off their gowns and gloves.
- Cleaning (environment and personal hygiene)—Educate staff members that surfaces should be carefully cleaned with products that kill spores, such as bleach, and that decreasing clutter makes cleaning easier.
Keep patients’ items off the floor and away from waste containers. Teach the importance of daily bathing; consider use of chlorhexidine bathing.

For high-risk hospitalized patients such as transplant or oncology, foster a culture of environmental hygiene by involving patients and families to keep high-touch surfaces clean and clutter free.

Address the relationship between CDI and appropriate use of antibiotics—Help patients and family members understand that antibiotics are not always necessary (e.g., with viruses, such as the common cold). If the patient is feeling better, encourage the patient and/or family members to ask about stopping antibiotics (see antibiotic stewardship field guide for additional patient and family engagement strategies).

Patient engagement strategies include:

- Instill with staff members and physicians a culture of patient and family engagement through partnerships involving communication strategies, feedback on hand-washing, and contact precautions training and environmental hygiene.
- Invite patient and family feedback on education materials and processes through PFAC or other committees.
- Invite patients and families to assist in handwashing “secret shopper” feedback quality improvement efforts.
- Include regular review CDI prevention strategies as part of shift-to-shift report or huddles with high-risk patients and families.

Hospital Improvement Strategies

Successful strategies in the work toward reducing CDI rates include:

- **Antibiotic stewardship**
  - Restriction and/or review of antibiotics has shown to decrease CDI numbers. Consider restricting the use of fluoroquinolones, as this drug has shown a four-fold increased risk of developing CDI any time it is used.
  - While not an antibiotic, consider also review/restriction of PPI use. In patients who require some form of coverage, consider switching to a lower-risk H2 antagonist (H-2 blocker).
  - Conduct medication reviews for patients with a positive CDI diagnosis to identify and discontinue unnecessary medications such as antibiotics, stool softeners, or laxatives.
  - The use of probiotics for patients receiving antibiotic therapy has been recommended.

- **Hand hygiene**
  - Establish, maintain, and monitor an effective hand hygiene program.

- **Rapid identification/isolation and diagnosis**
  - Best practice promotes that a patient with CDI symptoms should be isolated immediately upon onset. Review hospital protocol to ensure a standardized algorithm is used to identify and test for CDI. To minimize the risk of transmission prior to potential confirmation of CDI, early isolation with proper use of personal protective equipment (PPE) and dedicated use of noncritical medical devices for an isolated patient are recommended following identification of symptoms. Confirmed CDI patients should remain on isolation for the duration of hospitalization.
  - Use a standardized approach to ensure that communication of patient isolation status is occurring with patient/family and among staff members (e.g., when a patient goes for a procedure or is transferred to another unit), particularly with environmental services.
• Environmental cleaning and disinfection strategies
  – Establish cleaning protocols that include a sporicidal cleaning solution, a clear understanding of who cleans (what, when, and how), and a process for monitoring cleaning. Provide feedback (educating where necessary and rewarding/recognizing those involved).

• Use of an intra-facility transfer form
  – Ensure communication and documentation of a patient’s symptoms, antibiotic indications, and anticipated duration when transferring between facilities. The goal is to establish consistency in practice and messaging, share information, and implement shared infection control actions to stop transmission from facility to facility. Forms currently exist in local and state departments of public health, if needed.

Measurement

The Hospital Improvement Innovation Network (HIIN) goal for improvement in CDI rates is a 20 percent reduction in 2015 baseline rates for facility-wide CDI. CDI is measured as the total number of hospital-onset \textit{C. difficile} lab-identified events among all inpatients in the facility. This number excludes well-baby nurseries and neonatal intensive care units (NICUs). It is based on the national metric from the National Healthcare Safety Network (NHSN) and is measured as the total number of patients who develop lab-identified hospital-onset \textit{C. difficile} divided by the total number of facility-wide patient days multiplied by 1,000.

The standardized infection ratio (SIR) is an outcome measure that compares the number of observed hospital-onset CDI events to the number predicted. Variables included in the new Centers for Disease Control and Prevention (CDC) risk adjustment include facility surveys and community-onset prevalence rates to determine significant variables associated with the incidence of CDI. \textit{C. difficile} laboratory testing type was also considered by the CDC when analyzing the new risk adjustment.

Resources and Guides for Hospitals


• Association for Professionals in Infection Control and Epidemiology (APIC)—Implementation Guide: Guide to Preventing \textit{Clostridium difficile} Infections, 2013. Available at: \url{http://apic.org/Resource_/EliminationGuideForm/59397fc6-3f90-43d1-9325-68be75d86888/File/2013CDiffFinal.pdf}.


• TEDx Talk—Improving Healthcare: Straight from the Heart, 2016. Available at: \url{https://www.youtube.com/watch?v=U3MtvvNjUR4}.

• CDC—Strategies to Prevent \textit{Clostridioides difficile} Infection in Acute Care Facilities. Available at: \url{https://www.cdc.gov/hai/prevent/cdi-prevention-strategies.html}.