Clostridium difficile
Essential Information
**Clostridium difficile**

**Origins**

*Clostridium difficile* (C. diff) is a Gram positive, spore forming, anaerobic bacterium with a rod structure. It was first identified in 1935 and by the late 1970’s, it was linked to causing certain types of colitis. Cases of C. diff have continued to increase globally, in part due to increased awareness of the illness, the emergence of new stronger strains, such as the NAP1 strain in the early 2000s, and better testing methods which allowed it to be identified from other illnesses that cause diarrhea.

A recent study funded by the CDC estimated annual C. diff cases for the US at 453,000 cases per year, resulting in 29,300 deaths, with the NAP1 strain being the most common strain of C. diff. The CDC also states that half of C. diff cases occur in patients over 65 and 90% of the deaths from C. diff occur in this group. Mortality for C. diff is 5-10% and is increasing because of the more virulent strains now occurring. C. diff is believed to be the most common cause of Healthcare associated diarrhea.

C. diff is believed to be responsible for 20-30% of cases of antibiotic associated diarrhea, 50-75% of cases of antibiotic associated colitis, and >90% of cases of antibiotic associated pseudomembranous colitis. C. diff is also associated with an increased length of hospital stay of 2.8 – 5.5 days.

In healthy people, having C. diff as part of the normal flora of the intestines does not cause health issues. It has been estimated that as many as 50% of hospital patients, 5-7% of nursing home residents, and <2% of the general adult population are colonized with C. diff.

C. diff is easy to acquire because it is prevalent in a Healthcare environment in the spore form. It can readily contaminate the hands of Healthcare workers and be transferred to a patient. If ingested, the spore coating protects the bacteria from the acids in the stomach, allowing the spore to settle in the intestinal tract. Once conditions favor sporulation, the bacteria can shed the spore coating and begin to produce enterotoxins (Toxin A) or cytotoxins (Toxin B).

While or after receiving antibiotics, if the normal flora of the intestines is suppressed, a toxigenic strain of C. diff can be acquired and either cause infection or colonize the person. The time from acquisition to developing disease is believed to be relatively short, potentially less than 7 days. People who become infected with C. diff have ~20% chance of having the infection reoccur after they recover.
Diagnosis

C. diff infection can cause a range of conditions including:
- Asymptomatic carriage
- Simple antibiotic associated diarrhea
- Pseudomembranous colitis
- Fulminant colitis with toxic megacolon

Risk factors for C. diff include:
- Exposure to antibiotics, especially fluoroquinones
- Gastrointestinal procedures and surgery
- Proton pump inhibitors
- Advanced age
- Length of stay in a Healthcare facility
- Immunocompromising conditions

Symptoms of C. diff infection include:
- Watery non-bloody diarrhea
- (3+ episodes per day for 2 days)
- Lower abdominal pain, cramping, or tenderness
- Fever
- Nausea, loss of appetite
- Malaise
- Leukocytosis (high white blood cell count)

Many of the initial symptoms likely to present early in the illness are often seen in patients with other common gastrointestinal diseases. Diagnosis and treatment should only be performed by a trained physician who can rule out other potential diseases. Diseases, such as the common cold, and certain coronaviruses, as they generate similar symptoms. Diagnosis and treatment should only be performed by a trained physician who can rule out other potential diseases.

Method of Transmission/Contagiousness

C. diff is shed in feces. Most patients remain asymptomatic after infection. Environmental surfaces and patient care equipment that can be contaminated by feces can be a potential source of infection for another patient.

Once environmental surfaces or patient care equipment is contaminated with C. diff, Healthcare workers may contaminate their hands by touching contaminated surfaces, and then touch an uninfected patient or that patient’s environment. If the uninfected patient contaminates their hands and then touches their mouth, they can acquire C. diff and subsequently become infected.
Prevention

Antibiotic Stewardship Program:
Hospitals should evaluate their practices for prescribing antibiotics to ensure they are used judiciously. As exposure to antibiotics is the top risk factor in developing a C. diff infection, reducing the use of antibiotics within a hospital can reduce the rate of C. diff.

Transmission Based Precautions:
When a person infected with C. diff is being treated in a hospital, they will generally be put into a single patient room to help protect the Healthcare staff, other patients, and visitors. Healthcare workers entering the patient’s room will observe contact precautions in addition to standard precautions. This includes wearing a gown and gloves, performing hand hygiene on room entry and exit and before/after glove use. Contact precautions should be used for the duration of the diarrhea and for 48 hours after it resolves. If a patient presents with diarrhea, they should proactively be placed in contact isolation until testing confirms the source of the infection.

Hand Hygiene:
Proper hand hygiene by staff, patients, and visitors, is one of the main ways to prevent transmission of C. diff. While the use of alcohol hand rubs is always acceptable on patient room entry, on patient room exit, hand washing with soap and water is preferred in some guidelines, especially in times of outbreaks or hyperendemic environments. To simplify procedures for staff, it may be easier to always recommend hand washing on room exit, rather than changing the recommendation based on the number of cases of C. diff in the hospital at any given time. Also, it is better to have staff perform exit hand hygiene with alcohol hand rub, even if it may be less effective on C. diff spores, than to perform none if the handwashing sink is not conveniently located, which may cause Healthcare workers to not perform hand hygiene on room exit at all.

Reduce Risk for Healthy People:
If a patient in a hospital has diarrhea, they should be put in a single patient room with their own toilet or cohorted with other patients with C. diff. Only the patient should use the patient’s bathroom. Visitors should use public toilets. If around a patient with diarrhea, staff and visitors should avoiding touching their eyes, nose, and mouth as this can help prevent acquisition of the C. diff bacteria.

Surface Cleaning/Disinfection:
C. diff is widely found in Healthcare environments, although generally at low levels. Thorough environmental cleaning and disinfection of commonly touched environmental surfaces (door handles, toilet flush handles, light switches, elevator buttons, keyboards, phone, etc.) is important to reduce the risk posed by environmental surfaces. In the spore form, C. diff can live for months on environmental surfaces, so eradication from the environment is important. In areas with high C. diff rates or in outbreaks, the use of a disinfectant that is sporicidal against C. diff is recommended.

Patient care equipment should be dedicated to a patient during their stay or cleaned and disinfected between patients. Some multi-use patient care equipment, such as digital (electronic) thermometers, is no longer recommended for patients with C. diff due to contamination risk. Facilities should assess all patient care equipment for cleanability to ensure it can be adequately decontaminated after use with a patient with C. diff.

Cleaning compliance should also be assessed as some expert recommendations now specify assessing and improving cleaning compliance before making changes to the disinfectants being used to reduce C. diff infection rates.
Much of the information used in the development of this brochure was taken from the sites listed below.

http://www.cdc.gov/HAI/organisms/cdiff/Cdiff_infect.html

Fraser, Clostridium difficile. Downloaded 10 June 2015 from: http://www.clevelandclinicmeded.com/medicalpubs/diseasemanagement/infectious-disease/clostridium-difficileinfection/


Fabric Handling:
Ensuring soiled fabric is handled in a way to prevent transmission. Standard Healthcare laundering procedures for contaminated fabric are capable of making the fabric hygienic.

Good Health Practices:
Practicing good health is also helpful in preventing the development of many illnesses. The strength of a person’s immune system is often related to their overall health. Get plenty of sleep, eat healthy, be physically active, manage stress, and drink plenty of fluids to keep your immune system strong.
Diversey has been, and always will be, pioneers and facilitators for life. We constantly deliver revolutionary cleaning and hygiene technologies that provide total confidence to our customers across all of our global sectors. Led by Dr. Ilham Kadri, President & CEO, and headquartered in Charlotte, North Carolina, USA, Diversey employs approximately 9,000 people globally, generating net sales of approximately $2.6 billion in 2016.

For more information, visit www.diversey.com or follow us on social media.