C. diff
Care Guide

seec.diff TREATABLE

Peggy Lillis Foundation
For C. diff Education & Advocacy

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Message from the Executive Director

When I was in college, I got the flu on New Year's Day. I lived at home with my mother, Peggy. I was a healthy 19-year-old who went to college full-time, worked part-time and had a very active social life. But this flu hit me like a ton of bricks. I was at brunch when I started getting the chills and felt cold and clammy. When the food arrived, my stomach churned. I sipped water, ignored my plate and was grateful when my friend agreed to drive me home.

Once home, my mother put her hand to my forehead and said, "Jesus, you're burning up. Get into bed and I'll bring you some medicine." I lay in that bed for over 72 hours, feverish, sweating. I don't recall ever being that sick before or after. But I do remember my mother stirring me to drink water and take medicine. I vividly remember her placing cool cloths on my forehead, which felt like Heaven. Basically, I felt safe and cared for by someone who loved me.

It's how we treated my mother when she was violently ill with what we later learned was a *C. diff* infection. Though Mom didn't survive her ordeal, her spirit lives on. Mom cared for her children, her siblings, her parents, and her nieces and nephews. She even cared for friends and chosen family. Mom was tough; a hard worker who pushed me and my brother to succeed. But if you were ill, or if you were facing a crisis, she provided the tenderest possible care. That's something everyone should have.

It's in her spirit that Peggy Lillis Foundation for *C. diff* Education and Advocacy offers this Care Guide.

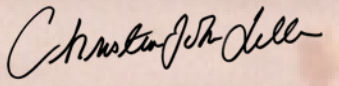
Minimal public awareness of *C. diff* infections—only about 1/3 of Americans have heard of them—means that most people first learn of it when they or a loved one is diagnosed. Often they have already been sick with diarrhea for several days, so they feel awful and have little energy. Unlike chronic illnesses, infectious diseases bring with them fear of spreading it to loved ones, little social support, and worries on the part of caregivers that they may become infected. It's a lot to process.

We hope this Care Guide will provide *C. diff* sufferers and their caregivers with all the information they need to manage the illness and recover fully. For the majority of *C. diff* patients, a course of antibiotics will resolve the infection. But for 20–40 percent of those initially diagnosed, their infection will prove difficult to treat or they will experience one or more recurrences following initial treatment. While we offer this guide to help all *C. diff* patients and caregivers, it is those who struggle with refractory or recurrent infections that will get the most out of it. It is our wish that the information within ensures that everyone battling this disease gets the best possible care. Because everyone deserves that.

Creating this guide was a labor of love, to which many people contributed. We are grateful to our lead author Marijke Vroomen Durning, our Scientific Advisory Council, for ensuring the guide is medically accurate, and members of our Advocates Council, who shared their stories and reviewed the guide for accessibility.

Lastly, we are grateful to Bio-K Plus, whose financial support was critical to this project.

Be well,



Christian John Lillis
Executive Director

Peggy and her sons, circa 1979.

What is *C. difficile*?

If you or someone you know has been diagnosed with a *C. difficile*, or *C. diff*, infection, you may have questions about the bacterium and the infection it causes.

While *Clostridioides difficile* [klos–TRID–e–OY-dees dif–uh–SEEL] was first discovered in 1935[i], more people[ii] are contracting the infection than ever before. It is now the most common cause of infectious diarrhea among hospitalized patients in the United States. You may have heard about it by its former name, *Clostridium difficile*.

The Centers for Disease Control and Prevention (CDC) reported that each year, about half a million people[iii] in the U.S. contract a *C. diff* infection; about 29,000 die. While *C. difficile* is the most common cause of healthcare-acquired infections[iv] in the U.S., about 41% of *C. diff* cases actually start at home, in the community. Once you have a *C. diff* infection, you are at higher risk for getting another.

> “Because of my professional knowledge of antibiotic stewardship, I am very concerned with the lacking knowledge of the prescribing community about *C. diff*. I think there is still a belief that *C. diff* happens to those in the high-risk groups and not in the community setting to healthy individuals.”

KATHY WREN, PHARMACIST
INDIANA

i https://www.health.harvard.edu/staying-healthy/clostridium-difficile-an-intestinal-infection-on-the-rise
ii https://www.cdc.gov/cdiff/clinicians/faq.html#anchor_1529601972882
iii https://www.ncbi.nlm.nih.gov/books/NBK431054/#:~:text=difficile%20infects%20approximately%20half%20a,difficile%20infection
iv https://www.infectiousdiseaseadvisor.com/home/decision-support-in-medicine/hospital-infection-control/clostridium-difficile-in-the-hospital-infection-prevention-considerations/#:~:text=Clostridium%20difficile%20infection%20(CDI)%20is,infections%20in%20the%20United%20States

Why is *C. diff* Dangerous?

Humans have trillions of microorganisms in the gut, including at least 1,000 different species of known bacteria. This is called the gut microbiome.

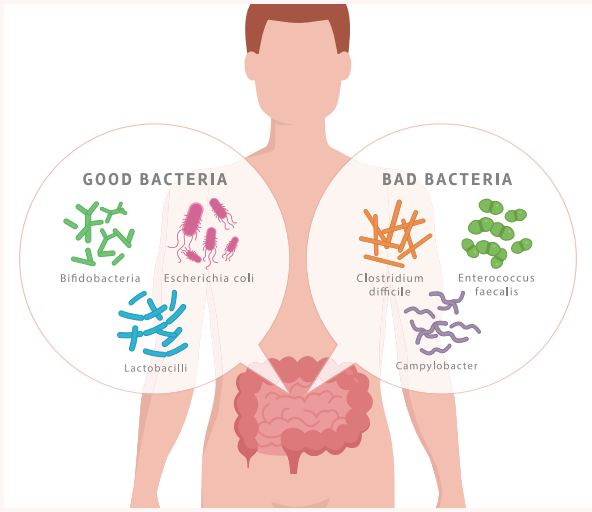
Most of these germs are helpful with digesting food, absorbing nutrients and more. Some even fight off "bad" bacteria that make their way into the gut through the food you consume. For example, unwashed produce may carry bacteria, as can food that has come into contact with a contaminated food prep surface or hands.

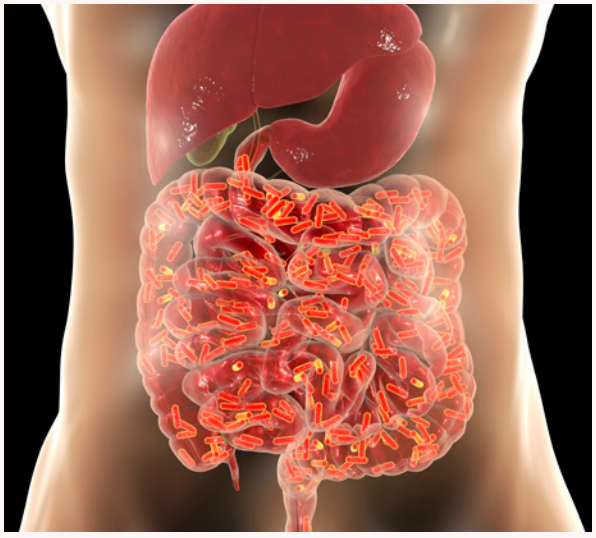
It may be surprising to learn that *C. diff* bacteria are part of this microbiome. Usually, other bacteria keep *C. diff* in check, not allowing it to spread or cause disease. If the bacteria can't do this job, *C. diff* spores begin to multiply and produce toxins. These toxins, which can start emerging as early as 24 hours after the *C. diff* multiplies, then damage the colon (gut) lining and can cause:

- Frequent loose or watery and foul-smelling diarrhea
- Abdominal cramping

If left untreated or if the infection doesn't respond to treatment, the symptoms can get much more serious, such as:

- Dehydration
- Fever
- Kidney failure
- Loss of appetite
- Nausea
- Rapid heart rate
- Serious abdominal cramping and pain
- Swollen abdomen
- Watery diarrhea 10 to 15 times a day
- Pus or blood in the stool
- Weight loss





Why is *C. diff* Dangerous? *Cont'd*

> **I had just started a new job, I began to get very ill. I had extremely bad diarrhea, and it was difficult for me to keep anything down. After about four or five days, the illness became so bad that I could not go to work, so I went to the doctor. My doctor had me give them a stool culture so that he could determine what was making me so sick. The next day, my doctor called and said that I had *C. diff*."**

RACHEL
KANSAS

Without treatment, the infection can lead to life threatening toxic megacolon. In toxic megacolon, the colon increases in size like a balloon and can rupture or perforate, spilling fecal contents into parts of the abdomen that are normally sterile.

C. diff, like any infection, can lead to sepsis. Sepsis is the body's serious and life-threatening response to an infection. If you have a *C. diff* infection and any of these common sepsis symptoms, seek medical help immediately. Time is of the essence. According to the Sepsis Alliance TIME™ campaign, watch for:

- **T** – Temperature that is higher or lower than normal
- **I** – Infection (the *C. diff*, in this case)
- **M** – Alteration in mental status, such as confusion, sleepiness
- **E** – Extreme feeling of illness, including being short of breath

Sepsis is initially treated with intravenous (IV) fluids and antibiotics. Drugs to raise blood pressure and manage other issues caused by sepsis may be needed. People in septic shock are often treated in an intensive care unit (ICU), where they may need advanced life support, such as a ventilator to help them breathe.

How is *C. diff* Spread?

The *C. diff* bacterium is quite common. You can find it in the environment—in the air, soil, water—and in feces of both animals and humans. The bacterium can also contaminate foods.

C. diff is a spore-forming bacterium, which means when it is outside the body, it transforms into a spore, similar to an acorn. It can stay behind on common surfaces, like door handles and bed rails, or in food, for up to several months. Although the spores can also be in the air, it's not the same as a virus, such as the flu, which is suspended in the air after a cough or sneeze. Instead, *C. diff* spores can spread if, for example, a toilet that contains *C. diff*-positive diarrhea is flushed with the lid open. This sends aerosolized bacteria through the air, which then settle on surrounding surfaces.

Healthy people can have *C. diff* bacteria in or on their body and not get sick. This is called being colonized or being a carrier. They have no symptoms of the infection, so they may spread it unknowingly. The best way to stop the spread is by thorough hand washing after using the bathroom or before and after performing personal care for someone else.

Who is at Risk for *C. diff*?

The biggest risk factor for developing a *C. diff* infection is taking antibiotics. In fact, your risk for the infection increases 7 to 10 times by taking antibiotics, particularly those in these classes:

- Clindamycin (Brand name Cipromycin®)
- Fluoroquinolones (Levaquim®)
- Cephalosporins, such as cefalexin (Keflex® and Daxbia®)
- Penicillins

When you take an antibiotic to fight an infection anywhere in your body, it kills the "good" bacteria in your gut as well as those causing the infection. This is when *C. diff* can start to multiply. Infection can happen within a few days of starting the antibiotics, or up to three months later[v]. When prescribed appropriately, antibiotics can be lifesaving. However, antibiotics are often not needed for symptoms like fever or cough. If you do take antibiotics, you should monitor your health to watch for signs of *C. diff*.[vi]

Other risk factors include:

- Proton pump inhibitors, which reduce stomach acid
- Exposure to a hospital or other type of healthcare facility, especially if admitted through an emergency room
- Hospitalization in an intensive care unit
- Older age (typically 65 years or older)
- Prior gastrointestinal surgery
- Previous *C. diff* infection

If you must take antibiotics, ask your physician if you should take probiotics to reduce[vii] the risk of *C. diff* infection. Some studies have shown that certain probiotics can help prevent the infection. However, probiotics are considered supplements by the Food and Drug Administration, and they are not regulated like drugs. Therefore, the quality and efficacy of probiotics are not guaranteed. It's important for people to choose any probiotic carefully. Check out **"Choosing the Best Probiotic for *C. diff*"** on our website.

v https://www.mayoclinic.org/diseases-conditions/c-difficile/symptoms-causes/syc-20351691#:~:text=Some%20people%20carry%20the%20bacterium,up%20to%20two%20months%20later
vi https://www.sciencedaily.com/releases/2018/10/181023110545.htm
vii https://www.cochrane.org/CD006095/IBD_use-probiotics-prevent-clostridium-difficile-diarrhea-associated-antibiotic-use

Diagnosing *C. diff*

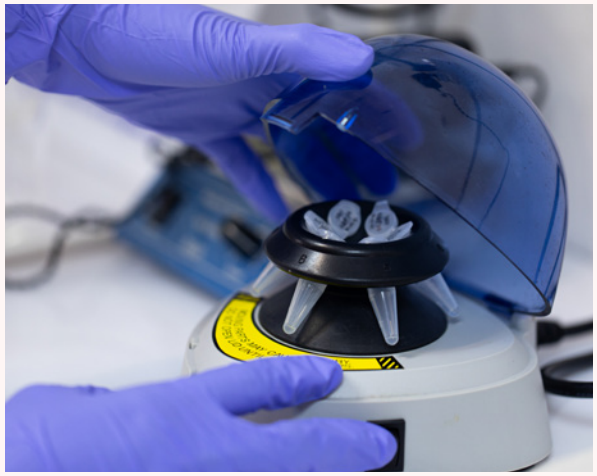
If you suspect you have a *Clostridioides difficile* infection (CDI), receiving a quick diagnosis and treatment can make all the difference in your outcome.

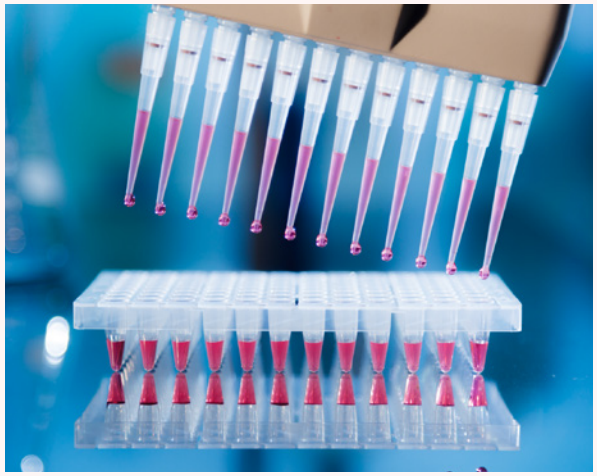
Since CDIs range from virtually symptomless to fulminant pseudomembranous colitis, receiving a quality exam is crucial to diagnosis. What follows is the typical manner in which CDIs are diagnosed, along with warning signs of more severe cases. Ultimately, CDI is considered a clinical diagnosis, meaning it is based not just on a diagnostic test but also other symptoms and a patient's history. Because you can still have *C. diff* bacteria in your gut without having an active infection, the results of a diagnostic test are insufficient. Similarly, doctors do not test for "cure."

PATIENT HISTORY

A CDI diagnosis requires your doctor taking a careful history with a particular emphasis on antibiotic use during the previous three months. As some antibiotics are more often implicated in *C. diff* disease, knowing the type and duration of your antibiotic use can be helpful.

The doctor may ask you for a detailed description of your diarrhea, including its color, consistency, and frequency. This is an important detail in differentiating *C. diff*-related diarrhea from other causes. Other important factors include a history of fever, immunosuppression (from chemotherapy, HIV or other causes), a recent surgical procedure, recent stay in a healthcare facility, previous infection with *C. diff*, recent change in bowel habits, recent proton-pump inhibitor use, and the presence of abdominal symptoms.





LABORATORY TESTING

Toxins produced by *C. difficile* bacteria can usually be detected in a sample of your stool. Several main types of lab tests exist, and they include:

- **Polymerase chain reaction.** This sensitive molecular test can rapidly detect the *C. difficile* toxin B gene in a stool sample and is highly accurate.
- **GDH/EIA.** Some hospitals use a glutamate dehydrogenase (GDH) test in conjunction with an enzyme immunoassay (EIA) test. GDH is a very sensitive assay and can accurately rule out the presence of *C. difficile* in stool samples.
- **Enzyme immunoassay.** The enzyme immunoassay (EIA) test is faster than other tests but isn't sensitive enough to detect many infections and has a higher rate of falsely normal results. This is typically not the only test used.
- **Cell cytotoxicity assay.** A cytotoxicity test looks for the effects of the *C. difficile* toxin on human cells grown in a culture. This type of test is sensitive, but it is less widely available, is more cumbersome to do and requires 24 to 48 hours for test results. It's typically used in research settings.

Blood tests are also important in the diagnosis of *C. diff* colitis, particularly as an indication of impending fulminant colitis. A sudden rise in the peripheral white blood cell count is an invaluable signal that progression to shock or toxic megacolon is imminent.

FLEXIBLE SIGMOIDOSCOPY AND COLONOSCOPY

A flexible sigmoidoscopy is an examination where a fiberoptic tube with a light and camera on its end is inserted into the rectum and the sigmoid colon. In most people with *C. diff* colitis, pseudomembranes will be visible in the rectum and sigmoid colon.

RADIOLOGY

X-ray examinations and computed-tomography (CT) examinations of the abdomen will occasionally demonstrate thickening of the wall of the colon due to inflammation, but these x-ray findings are non-specific, revealing only that colitis is present but not its cause (e.g. *C. diff*). They may be used to rule out other conditions, such as intestinal blockage.

Once diagnosed, it's important to treat *C. diff* as quickly as possible to prevent complications. Except in special situations, the antibiotic that precipitated the infection should be discontinued immediately. If you still need antibiotics to treat the original infection, other options may be available.

Treating *C. diff*

PRIMARY, OR FIRST, INFECTION

Mild to Moderate Disease

Currently, the number of antibiotics that can treat *C. diff* is limited. For mild to moderate infections, the most common treatments are vancomycin or fidaxomicin, taken by mouth for 10 days. If one doesn't work, you may need to try the other. However, if the infection is severe, you may be hospitalized to receive intravenous (IV) antibiotics.

If you are at home, it may be tempting to take a medication that stops or slows diarrhea. In the case of *C. diff* infection, this is not recommended[viii] as it can lead to more severe disease, and even sepsis.

Moderate to Severe Disease

If the infection is moderate to severe or does not resolve with antibiotics, your physician may offer other treatments. One includes utilizing an enema so the antibiotic—usually vancomycin—can be introduced directly into the colon.

People with *C. diff* are also encouraged to drink a lot of fluids to help flush out the infection and avoid foods that can cause cramping or diarrhea. A healthy diet may also help rebuild a healthy gut microbiome.

In severe, life-threatening cases, patients may undergo surgery to remove damaged parts of the colon—or the entire colon.

"I've been fighting *C. diff* for the last nine years of my life—each and every year. I have been sick with or have been treated for a *C. diff* infection for at least six to eleven months of every one of those years."

LISA N.
MISSOURI

For more detailed information on treatment guidelines visit:

peggyfoundation.org/for-patients-families/treatment-options

viii https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4442717/

"My battle did not end after I was diagnosed, however. I was put on Flagyl, then Vancomycin, then Dificid… Nothing seemed to work for me. I took Florastor, Culturelle, and ate yogurt, but nothing alleviated my symptoms [except a fecal transplant]."

RICKY S.
CALIFORNIA

RECURRENT INFECTION

About 20% to 30%[ix] of people who develop a *C. diff* infection experience a recurrence—and every time someone has a recurrent infection, their risk of having another one increases. Those most likely to have repeat cases are people who:

- Are over age 65
- Continue to take other antibiotics while being treated for *C. diff* infection
- Have chronic medical conditions

Unlike some other types of infections, recurrent *C. diff* infections don't occur because the bacterium has become resistant to treatment. Rather, it is because some *C. diff* spores can survive initial treatment. While your physician may prescribe a new drug, patients are often treated again using the same antibiotic. Your physician may prescribe a longer course or a "taper" by which the antibiotic is taken at longer intervals.

If the infection keeps returning, a newer treatment, a fecal microbiota transplant (FMT) may help. To perform FMT, physicians use stool from a donor known to the patient, often a family member, or from a stool bank that tests for other dangerous bacteria and viruses. This stool is then inserted into the patient's colon via colonoscopy, where it helps restore microflora in the colon. Some centers are also trying an oral form, using capsules.

It may sound extraordinary, but research is showing that FMT can be effective. The treatment is not yet approved by the FDA[x], but many centers are using it as an experimental treatment.

ix https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4442717/
x https://www.health.harvard.edu/blog/stool-transplants-are-now-standard-of-care-for-recurrent-c-difficile-infections-2019050916576

PREVENTING RECURRENCE

Probiotics can help prevent recurrent *C. difficile* infections (CDI). Two clinical trials have shown when S. boulardii CMCM I-745 is given along with standard antibiotics to treat CDI, the recurrence rate is significantly reduced, especially if a high dose (2 grams/day) of vancomycin is given. The probiotic should be started at the same time of the vancomycin and continued for at least four weeks to allow the normal microbiome to become restored.

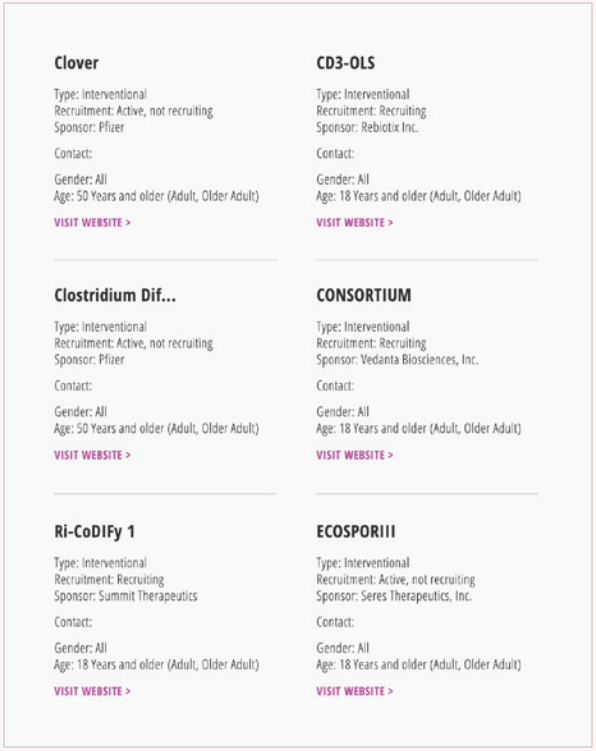
REFRACTORY C. DIFF

Unlike recurrent *C. diff* infection, refractory infection occurs when treatment fails altogether and the infection never goes away. Patients with refractory *C. diff* may benefit from a clinical trial to find a treatment that works for them.

CLINICAL TRIALS

A clinical trial is a research study using human volunteers that is intended to add to medical knowledge. Clinical trials can vary in size from a single location in one country to multiple locations in multiple countries. Some research studies may determine if an investigational product can be administered to children or special populations. Some studies assess a drug's long-term effectiveness and its impact on the quality of a person's life.

All studies of a drug, biological product, or medical device regulated by FDA must be reviewed, approved, and monitored by an institutional review board (IRB) or Ethics Committee (EC). Due to the nature of CDI, particularly the high rate of recurrence following standard treatments, participating in a clinical trial may be an option for sufferers who don't respond to antibiotics. You can find a list of ongoing clinical trials in your state at peggyfoundation.org/c-diff-101/in-your-state/.



Clover
Type: Interventional
Recruitment: Active, not recruiting
Sponsor: Pfizer
Contact:
Gender: All
Age: 50 Years and older (Adult, Older Adult)
VISIT WEBSITE >

CD3-OLS
Type: Interventional
Recruitment: Recruiting
Sponsor: Rebiotix Inc.
Contact:
Gender: All
Age: 18 Years and older (Adult, Older Adult)
VISIT WEBSITE >

Clostridium Dif...
Type: Interventional
Recruitment: Active, not recruiting
Sponsor: Pfizer
Contact:
Gender: All
Age: 50 Years and older (Adult, Older Adult)
VISIT WEBSITE >

CONSORTIUM
Type: Interventional
Recruitment: Recruiting
Sponsor: Vedanta Biosciences, Inc.
Contact:
Gender: All
Age: 18 Years and older (Adult, Older Adult)
VISIT WEBSITE >

Ri-CoDIFy 1
Type: Interventional
Recruitment: Recruiting
Sponsor: Summit Therapeutics
Contact:
Gender: All
Age: 18 Years and older (Adult, Older Adult)
VISIT WEBSITE >

ECOSPORIII
Type: Interventional
Recruitment: Active, not recruiting
Sponsor: Seres Therapeutics, Inc.
Contact:
Gender: All
Age: 18 Years and older (Adult, Older Adult)
VISIT WEBSITE >

C. diff in the Intensive Care Unit

Patients with severe *C. diff*, particularly if it causes sepsis, will often be admitted to an ICU. They are extremely sick and require close monitoring.

They may need care related to another medical problem that occurs along with the infection, such as renal failure. There is often a delicate balance of which medications to give and how they may interact with each other.

At times, severely ill patients are unable to breathe properly on their own and must be intubated. Intubation is having a tube placed into the trachea (windpipe) and attached to a ventilator, which breathes for the patient. While patients are on a ventilator, they are placed in a medically induced coma for two reasons. One, this allows patients to relax so they don't waste energy trying to breathe. Two, being intubated is extremely uncomfortable, and when people start to wake up, they may thrash about or try to pull the tube out. This is also why some people may have restraints on their wrists.

Just as patients can become infected with *C. diff* on a regular hospital floor, it can also occur in the ICU. A study[xi] published in 2018 found that the longer a patient stayed in an ICU, the higher the risk of *C. diff* infection. Patients who were in the ICU because of a trauma (like a car accident) or after surgery were at higher risk than others. Others at increased risk were those who:

- Had chronic obstructive pulmonary disease (COPD)
- Had diabetes
- Were receiving medications to lower blood pressure, called vasopressors
- Had been admitted from a nursing home

Staff should maintain strict isolation protocols for patients who have *C. diff* to keep it from spreading. That means you may not be able to have visitors or visit your loved one while they're in the ICU. If you are allowed to visit, you may be asked to wear a disposable gown, gloves and other protective gear.

xi https://www.liebertpub.com/doi/10.1089/sur.2017.253

Caring for Someone with *C. diff*

People who care for or live with someone with *C. diff* must take precautions not to contract the infection or pass it on to others. They must also take care of themselves in terms of their mental and emotional health.

Caring for someone who is ill can take its toll on the strongest of people. There is often a feeling of helplessness watching a loved one suffer. There is also fatigue and worry, as well as issues surrounding everyday life, such as taking on more household tasks, caring for children, going to work while worrying, missing work to provide care, and more. Financial issues can trigger stress and anxiety.

Caregivers may also fear contracting the infection themselves, or that they may not clean sufficiently and others in the family or visitors may become ill. The pressure can mount, causing anxiety and depression. It's important to reach out to your social support system or seek therapy if that doesn't provide relief. There are also online groups for *C. diff* patients and family members that may help.

If you give direct care to a loved one with *C. diff*, there are some precautions you can take to reduce the risk of spreading the infection:

- Wear gloves while providing care
- If possible, have your loved one use a dedicated bathroom
- If there is no second bathroom available, every time your loved one uses the bathroom, wash all common surfaces with a bleach product
- Avoid using antibiotics unless they are truly necessary

If you aren't giving direct care, you should still wash your hands for at least 20 seconds with soap and water whenever you have been in contact with your loved one or common surfaces or objects.

Unlike many other bacteria and viruses, *C. diff* cannot be eliminated with hand sanitizers, so only rely on soap and running water to clean your hands.

Preventing *C. diff* Spread in the Home

Recommendations for Eliminating *C. diff* Spores While Cleaning

HOUSECLEANING

1 part bleach +
10 parts water

Wear gloves when using product

DISHWASHING

Dish soap + hot water

Final rinse (optional):
1 tbsp bleach +
1 gallon water

LAUNDRY

Rinse off any stool beforehand

Set to hottest water + dry on high heat

Use bleach when possible

Housecleaning must be adapted to reduce the presence of *C. diff* spores and the risk of contamination.

The CDC recommends using a cleaner made of 1 part bleach to 10 parts water. Wear gloves while using the product. Any object or surface touched by someone with *C. diff* should be cleaned, including common surfaces such as doorknobs, light switches, toilets (and handles), etc. Heat from dishwashers will kill the spores on glasses, cups and cutlery. For hand washing, regular dish soap and hot water are sufficient, but some people feel more comfortable doing a final rinse with a bleach solution of 1 tablespoon[xv] of bleach in a gallon of water.

C. diff can stay on towels and cloths, so have a dedicated towel for your loved one that is not shared with anyone else. Laundry routines need to be adapted to ensure spores are eliminated from bedding, towels and clothing. Caregivers should wash their hands thoroughly after handling the laundry.

The CDC recommends that all items should be washed using the hottest water safe for the items and then dried by heat in a dryer. If the items can be bleached, this is also recommended. If the clothing or bedding has stool on it, these items must be rinsed first before laundering. Dry cleaning isn't as effective in killing the spores.

xv https://www.azdhs.gov/documents/preparedness/epidemiology-disease-control/healthcare-associated-infection/advisory-committee/step/education-training/cdiff-living-with-pamphlet-general.pdf

Preventing *C. diff* when Visiting Someone

If your loved one is in the hospital and on isolation or "enteric precautions," it is mandatory to follow the instructions to keep yourself and others safe.

You may be told to wear a clean gown every time you enter the room and to dispose of it in a special bin when you leave it. Do not keep the gown on to go to other parts of the facility. You may also be told to wear gloves. These, too, will be disposed of when you leave the room.

C. diff is a serious infection, but it can be treated in most cases. The important thing is to watch for it and to get diagnosed as quickly as possible. If you have any suspicion that you or a loved one may have *C. diff*, begin infection prevention activities immediately to reduce the risk of spread. Many cases of *C. diff* are related to unnecessary use of antibiotics and could have been prevented if the antibiotics were never taken.

"Families need to make sure treating doctors go over all medical records and are immediately notified of a patient's transfer to facilities that increase their risk for *C. diff*."

LORI
TEXAS

Lasting Effects of *C. diff*

Most people treated for *C. diff* recover with no further issues, unless they had colon surgery to treat the infection.

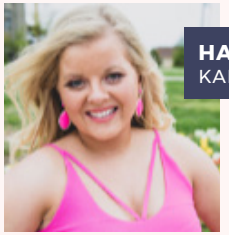
However, some people do continue to have bowel issues afterward, including post-infectious irritable bowel syndrome (IBS). Post-infectious IBS is poorly understood, but many physicians believe it is related to a change in colonic motility that arises after alteration of the gut microbiome from *C. diff* or other gut infections. Living with IBS often means changing habits and adjusting to a new reality. The more severe the IBS flares—when symptoms worsen—the harder it may be to function normally. Living with IBS may mean adjusting your diet to eliminate foods that may trigger diarrhea or constipation, ensuring plans include easy access to a bathroom at short notice, and much more.

Researchers aren't entirely in agreement over if people who have had *C. diff* infection are at risk for post-infectious IBS. One very small study published in 2007 said there is no increased risk[xii]. But a larger 2016 study[xiii] disagreed. In fact, researchers learned that not only is post-infectious IBS common among those who had *C. diff*, but the risk is higher for people who:

- Had C. diff infection for more than 7 days
- Experienced nausea, vomiting and/or abdominal pain with the infection
- Were anxious
- Had higher body mass index

Post-infectious IBS in this study was diarrhea only or mixed. Mixed IBS occurs when there are periods of diarrhea and constipation. It is important for people to know about the possibility of post-infectious IBS after a *C. diff* infection. If they seek medical advice for their IBS symptoms, they should tell their physician about their *C. diff* history.

"Although I do not have *C. diff* currently, I still deal with chronic diarrhea and symptoms that still affect me every single day. I take multiple anti-diarrheal medications every day."



HAILEY
KANSAS

xii https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2658587/
xiii https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4982831/

Social-Emotional Impacts of *C. diff*

Psychologically, recovering from a *C. diff* infection can also have a prolonged impact. Some newer behaviors[xiv] after an infection can include:

- Washing hands more frequently
- Changing household cleaning habits, such as by using antibacterial products
- Eating out less frequently
- Avoiding public areas
- Avoiding taking certain types of medications that could cause *C. diff*
- Starting or increasing probiotic use

Aside from obvious changes in behavior, life after *C. diff* can change how people see themselves, particularly if they had other chronic illnesses or conditions.

According to a 2020 study, many people experienced worsening of IBS, inflammatory bowel disease (IBD), arthritis and depression after *C. diff*. Others complained of disturbed sleep, fear of eating (in case it brings on another bout of illness) and a negative impact on their social life. Some had to stop working. If symptoms of anxiety or depression persist after the infection is cured, psychotherapy or another form of counseling may be helpful. There are many types of therapy that are highly effective in managing or overcoming anxiety and depression.

The cost of *C. diff* goes beyond physical and psychological health. For some, there is a significant impact on their financial health. Aside from the costs of medications and products, loss of work not only means loss of income, but may also mean loss of medical insurance.

xiv https://pubmed.ncbi.nlm.nih.gov/28946934/, https://www.hcplive.com/view/patients-alter-behavior-after-c-difficile-encounter

Glossary

AEROSOLIZE

Fine spray or suspension that has been sent into the air

ANTIBIOTICS

Medications that kill or prevent bacteria from reproducing

BACTERIA

A group of microorganisms

BACTERIUM

One bacteria

COLON

The gut, the intestines

COLONOSCOPY

Medical procedure using a long, flexible tube inserted through the rectum to visualize and treat some bowel conditions

DEHYDRATION

The state of not having enough fluid in the body

DIARRHEA

Frequent and liquid stool

FECAL MICROBIOTA TRANSPLANT (FMT)

Introducing stool that is not contaminated with *C. diff* into a patient who has *C. diff* in an effort to regain "good" control of bacteria in the gut

FEVER

An abnormally high body temperature, usually 100.4 degrees Fahrenheit or 38 Celsius or higher

HEALTHCARE FACILITY

A building or location that provides medical care, from acute to long-term

INFECTION

An illness caused by microorganism, such as bacteria, viruses, and fungi

IRRITABLE BOWEL SYNDROME (IBS)

Condition that causes abdominal pain and cramping, diarrhea, constipation, or alternating diarrhea and constipation

MICROBIOME

The environment consisting of microorganisms

MICROORGANISM

A germ, an organism that is too small to see with the naked eye

PROBIOTICS

Live microorganisms that are good for the digestive system

PROTON PUMP INHIBITOR (PPI)

Medications that reduce the amount of acid in the stomach

SEPSIS

The body's toxic response to an infection

SPORES

Single microscopic cells that reproduce

Thank You!

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