

Difficile Infection

◆ *C. Difficile* is a gram positive anaerobic bacterium that causes inflammation of the colon, known as colitis. Infection due to *Clostridium Difficile* (*C. difficile*) is the most common cause of health care-associated infection. *C. difficile* was estimated to cause almost half a million infections in the United States in 2011. Approximately 83,000 of the patients who developed *C. difficile* experienced at least one recurrence and 29,000 died within 30 days of the initial diagnosis.

◆ Signs/Symptoms

- Fever, watery diarrhea (at least 3 bowel movements per day), nausea/loss of appetite/abdominal pain

◆ Risk Factors:

- Advanced age, female gender, Caucasian, immunocompromised, hospitalization
- Drug-Induced:
 - Antibiotics (multiple, long-term, broad spectrum all increase the risk)

Lower Risk of <i>C.difficile</i>	Higher Risk of <i>C.difficile</i>
Nitrofurantoin Sulfamethoxazole-trimethoprim Fosfomycin Aminoglycosides Tetracyclines Penicillin Macrolides	Fluoroquinolones* Clindamycin Cephalosporins Carbapenems

-PPI's (Omeprazole, Pantoprazole, Lansoprazole, etc.) → avoid using for long durations unless medically necessary.

-H₂ receptor blockers (Ranitidine, Famotidine)

-Chemotherapies

-Discontinue therapy with the inciting antibiotic (s) as soon as possible as this may influence the risk of *C. Difficile* infection recurrence.

◆ Diagnostics:

- Symptoms including diarrhea (3 or more unformed stools in ≤ 24 hours) AND stool test positive for *C. Difficile* toxins OR evidence of pseudomembranous colitis.

◆ 2017 Update by the Infectious Diseases Society of America (IDSA) recommends the following for treatment:

Clinical Definition	Supportive Clinical Data	Recommended Treatment
Initial episode, non-severe	Leukocytosis with a WBC count of $\leq 15,000$ cells/mL and a serum creatinine < 1.5 mg/dL	Vancomycin 125 mg PO QID for 10 days OR Fidaxomicin (Dificid) 200 mg PO BID for 10 days If above agents are not available: metronidazole 500 mg TID for 10 days
Initial episode, severe	Leukocytosis with a WBC count $\geq 15,000$ cells/mL or a serum creatinine > 1.5 mg/dL	Vancomycin 125 mg by mouth QID for 10 days OR Fidaxomicin 200 mg BID for 10 days
Initial episode, fulminant	Hypotension or shock, ileus, megacolon	Vancomycin 500 mg PO or NG tube QID. If ileus, considering adding rectal instillation of vancomycin. IV administered metronidazole 500 mg q8h should be administered with oral or rectal vancomycin, particularly if ileus is present.
First recurrence		Vancomycin 125 mg po QID for 10 days if metronidazole was used for the initial episode OR Use a prolonged tapered and pulse vancomycin regimen if standard regimen was used for the initial episode (eg, 125 mg qid for 10-14 days, 2 times per day for a week, once per day for a week, and then every 2 or 3 days for 2-8 weeks) OR Fidaxomicin 200 mg BID for 10 days if Vancomycin was used for the initial episode
Second or subsequent recurrence		Vancomycin in a tapered and pulsed regimen OR Vancomycin 125 mg qid for 10 days followed by rifaximin 400 mg tid for 20 days OR Fidaxomicin 200 mg bid for 10 days OR Fecal microbiota transplantation

**Please refer to the IDSA guidelines referenced for specifics regarding definitions and strategies for diagnosis.

- ◆ Remember, always use gloves and proper hand hygiene by washing with soap and water when caring for a patient with known *C. Difficile* infection. Hand sanitizer DOES NOT kill *C. Difficile*.
- ◆ *C. Difficile* infection can be prevented by using infection control recommendations and being more careful with antibiotic use.

References:

1. <https://www.cdc.gov/hai/organisms/cdiff/cdiff-patient.html>
2. Clinical Infectious Diseases, Volume 66, Issue 7, 19 March 2018, Pages e1–e48
3. Owens RC Clin Infect Dis 46:S19-S31.
4. Stevens V. Clin Infect Dis 53:42-28.

Show What You Know

C. Difficile Quiz

1) True or False

C. Difficile can be killed with alcohol-based sanitizer. Hand washing with soap and water is not necessary.

2) M. Smith, an 87 year old female has been diagnosed with her first episode of *C. Difficile*. It's determined to be a non-severe infection. She has no known medication allergies. The best treatment option for her would be:

- a. Vancomycin 125 mg po qid for 10 days
- b. Metronidazole 500 mg tid for 10 days
- c. Fecal transplant
- d. None of the above.

3) True or False

PPI's such as Protonix are safe to be continued indefinitely, as they don't carry any risk of adverse effects, including *C. Difficile* infections.

4) The following medication carries the highest risk of *C. Difficile* infection:

- a. Nitrofurantoin
- b. Tetracycline
- c. Ciprofloxacin (fluoroquinolone)
- d. Sulfamethoxazole/Trimethoprim

Quiz Answers- How Did You Do?

1. False
2. A - Vancomycin 125 mg po qid for 10 days
3. False
4. C - Ciprofloxacin (fluoroquinolone)