GUIDELINES FOR TREATMENT OF CLOSTRIDIUM DIFFICILE COLITIS IN ADULTS

Prior studies show that 3-26% of hospitalized patients are asymptomatically colonized with *C. difficile*. Available assays are not able to distinguish between *C. difficile* infection and colonization, and treatment of asymptomatic colonization is not recommended.

Patients with **new-onset** diarrhea without an alternative explanation should be considered for CDI testing. Diarrhea is defined as ≥3 unformed stools in 24 hours. A large percentage of hospitalized patients have other reasons for diarrhea, such as laxatives, chemotherapy, and enteral tube feeds. When possible, one should consider first stopping therapies to which diarrhea may otherwise be attributed (e.g., laxatives), and then reassess prior to testing for CDI.

The "*Clostridium difficile* by EIA" assay is the preferred test for CDI. The “Gastrointestinal Pathogen Panel” is a multiplex PCR assay that, in addition to CDI, tests for 21 other primarily community-acquired gastrointestinal pathogens. This test is intended for use in patients with diarrhea that began prior to or within three days of hospitalization and there is concern for other etiologies aside from *C. difficile*. A positive result should be interpreted based on clinical context and confirmatory testing is not required. There is no role for performing both tests simultaneously. This practice should be avoided.

### "Clostridium difficile by EIA" Assay Results

<table>
<thead>
<tr>
<th>Antigen Result</th>
<th>EIA Toxin Result</th>
<th>Reflex PCR Result</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>Negative</td>
<td>Not performed</td>
<td>No <em>C. difficile</em> present.</td>
</tr>
<tr>
<td>Positive</td>
<td>Positive</td>
<td>Not performed</td>
<td>Toxigenic <em>C. difficile</em> present.</td>
</tr>
<tr>
<td>Positive</td>
<td>Negative</td>
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<td>Toxigenic <em>C. difficile</em> present.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative</td>
<td>Non-toxigenic <em>C. difficile</em> present.</td>
</tr>
<tr>
<td></td>
<td>Positive</td>
<td>Positive</td>
<td>Toxigenic <em>C. difficile</em> present.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative</td>
<td>No <em>C. difficile</em> present.</td>
</tr>
</tbody>
</table>

1. The negative predictive value of this test for ruling-out *C. difficile*-associated diarrhea approaches 99%
2. *C. difficile* toxin assay is not a test of cure, and may be positive for up to 30 days after treatment. Re-testing is not recommended
3. PCR testing is automatically performed if the antigen and EIA toxin results are discordant
## Treatment of *Clostridium difficile* colitis

**For all patients:**
- Discontinue/change antibiotics if possible.
- Avoid PPI/H2 blockers without an appropriate indication.
- Implement infection control measures.

<table>
<thead>
<tr>
<th>Clinical Setting</th>
<th>Initial Episode(^1,^2)</th>
<th>First Recurrence(^1,^2,^3)</th>
<th>Second Recurrence(^1,^3)</th>
</tr>
</thead>
</table>
| **Non-Fulminant Disease** | Consider Infectious Diseases and Surgery consultation in patients with severe disease (defined as WBC ≥ 15,000, absolute neutrophil count ≤ 500, or SCR ≥ 1.5 times pre-morbid level):  
**Vancomycin** 125 mg PO QID x10 days | Infectious Diseases consultation is recommended  
If metronidazole was used for the initial episode:  
Vancomycin 125 mg PO qid x 10 days  
If vancomycin was used for the initial episode:  
Vancomycin 125 mg PO qid x 14 days then taper\(^7\) over 5-11 weeks.  
Alternative if vancomycin taper cannot be performed:  
Fidaxomicin 200 mg PO BID X 10 days | Infectious Diseases consultation is strongly recommended  
If vancomycin taper was NOT used for the first recurrence:  
Vancomycin 125 mg PO qid x 14 days then taper\(^7\) over 5-11 weeks.  
If vancomycin taper was used for the first recurrence, the following options may be considered in consultation with Infectious Diseases\(^2\):  
- Repeat Vancomycin taper  
- **Fidaxomicin** 200 mg PO bid X 10 days  
- Fecal microbiota transplant  
- Repeat Vancomycin taper followed by Rifaximin ‘chaser’  
- Kefir staggered protocol |
| **Fulminant Disease**  
(Hypotension or septic shock, ileus, bowel obstruction, toxic megacolon, bowel perforation or peritonitis) | Surgery and Infectious Diseases Consultation are strongly recommended  
**Vancomycin** 500 mg PO QID + **Metronidazole** 500 mg IV q8h\(^a\)  
If ileus, bowel obstruction, or fecal diversion, add **Vancomycin** by enema q6h\(^b\)  
See footnote 11 for diverting loop ileostomy protocol.  
Duration: Minimum of 14 days of therapy, depending on clinical response. | Surgery and Infectious Diseases Consultation are strongly recommended  
Repeat primary therapy then taper vancomycin over 5-11 weeks\(^7\)  
Alternative if vancomycin taper cannot be performed:  
Fidaxomicin 200mg PO BID X 10 days  
See footnote 11 for diverting loop ileostomy protocol. | Surgery and Infectious Diseases Consultation are strongly recommended  
If vancomycin taper was NOT used for the first recurrence:  
Repeat primary therapy then taper\(^7\) vancomycin over 5-11 weeks.  
If vancomycin taper was used for the first recurrence, the following options may be considered in consultation with Infectious Diseases\(^2\):  
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See footnote 11 for diverting loop ileostomy protocol.
1. Failure is defined as no improvement or worsening symptoms after 48-96 hours of primary therapy. In failing patients, look for alternative explanations and consider infectious diseases and surgery consultation.

2. Randomized trials have all utilized 10-day durations of therapy. Extension of course to 14 days may be considered in patients who have not had symptom resolution by day 10.

3. C. difficile colitis recurrence is defined as recurrent symptoms and positive testing (after initial resolution) ≤8 weeks from the start of the original episode.

4. Parenteral administration of metronidazole has poor intraluminal penetration and should not be used alone for treatment. Parenteral vancomycin has no significant luminal accumulation and should not be used for C. difficile treatment.

5. Intracolonic vancomycin 500 mg in 500 mL of normal saline every 6 hours given as retention enema using the following procedure: 18-inch Foley catheter with a 30-mL balloon inflated into rectum, balloon inflated, vancomycin instilled, catheter clamped for 60 minutes, deflate and remove. In patients who do not have the entire colon in place (i.e., a colorectal stump due to Hartman’s procedure), a smaller volume of enema (100 mL) is acceptable.

6. Avoid multiple or prolonged courses of metronidazole in recurrent disease due to the risk for cumulative neurotoxicity.

7. Alternative and/or adjunctive agents:
   a. Vancomycin tapers should begin after the treatment course is completed. Example of PO vancomycin taper: 125 mg PO BID x 7 days, then 125 mg PO daily x 7 days, then 125 mg PO every other day x 7 days, then 125 mg PO every 3 days x 2-8 weeks. Patients on tapered doses of PO vancomycin should continue to be monitored for signs and symptoms of C. difficile disease.
   b. Rifaximin ‘chaser’. Vancomycin 125 mg PO QID x 10 days followed by Rifaximin 400mg TID x 20 days
   c. Kefir staggered protocol: Vancomycin 125 mg QID x 2 weeks, 375 mg q72h x 2 weeks, 250 mg q72h x 2 weeks, and 125 mg q72h x 2 weeks PLUS kefir (5-oz glass with each meal (at least 3 glasses per day)) for 15 weeks.
   d. Fecal microbiota transplantation (FMT) is a highly effective option for patients with recurrent CDI. Michigan Medicine uses stool preparations obtained from OpenBiome to perform FMTs in both the inpatient and outpatient settings. Patients with recurrent CDI (defined as having two or more episodes) or CDI not responsive to standard pharmacologic therapies by day 5 may be considered for FMT. Patients with hypotension or shock, ileus, megacolon, severe sepsis, peritonitis, or bowel perforation attributed to CDI are generally not candidates for FMT. For inpatient use, infectious diseases and gastroenterology consultation are required. For outpatient use, patients should be referred to the infectious diseases clinic. For more information CLICK HERE. For additional OpenBiome resources
   e. The role of probiotics in prevention and treatment of C. difficile colitis is unclear, and their use is not currently recommended for inpatients. Avoid the use of probiotics in immunocompromised patients (transplant recipients, unintact gut mucosa, neutropenic patients, HIV/AIDS patients, etc) and patients with severe C. difficile colitis.
   f. Cholestyramine binds PO vancomycin and may decrease its efficacy. Avoid concomitant use.

8. Oral vancomycin capsules are available in generic form but may still be cost-prohibitive for patients. Discharge planners should be made aware of this issue prior to discharge so coverage may be assessed. In patients for whom oral capsules are not feasible, some options are:
   a. Metronidazole is an option for patients with non-severe primary (i.e., not recurrent) disease
   b. Taubmann outpatient pharmacy compounds oral vancomycin (from the intravenous formulation) that may be less expensive for some patients.
   c. A patient assistance program is available for Fidaxomicin (https://www.merckconnect.com/dificid/patient-assistance.html?hcpUser=yes), which is often an option (see above) in patients who cannot afford or tolerate vancomycin.

9. In patients being treated for CDI who require concomitant antibiotic therapy beyond the 10-14 day of CDI treatment, continuation of vancomycin can be considered for the duration of the concomitant antibiotic course. The dose of vancomycin in this scenario should be 125 mg daily to BID.

10. Consider the use of vancomycin prophylaxis in patients that had a first or greater recurrence of CDI or fulminant disease in the past 90 days and require antimicrobials for a different infection. Other patients may be considered candidates for prophylaxis on a case-by-case basis in consultation with Infectious Diseases. The dose of prophylactic vancomycin is 125 mg daily to BID and the duration should be at least 50% of the expected duration of antibiotic therapy for the other infection.

11. Postoperative diverting loop ileostomy regimen consists of antegrade vancomycin flushes (500 mg in 500 mL of Lactated Ringers; 8 hours for a duration of 10 days) via a 24 French Malecot catheter in the effenter limb of the ileostomy and intravenous (IV) metronidazole (500 mg q8 hours) for 10 days. See Reference Neal MD, et al. Ann Surg 2011;254:423-7.

Reference:
Clinical Practice Guidelines for Clostridium difficile Infection in Adults and Children: 2017 Update by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA). Available at: https://academic.oup.com/cid/advance-article/doi/10.1093/cid/cix1085/485916


<table>
<thead>
<tr>
<th>Antimicrobial Subcommittee Approval:</th>
<th>03/2018</th>
<th>Originated:</th>
<th>07/2014</th>
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<tr>
<td>P&amp;T Approval:</td>
<td>07/2018</td>
<td>Last Revised:</td>
<td>01/2020</td>
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</tbody>
</table>

Revision History: Added diverting loop ileostomy footnote 01/2020

The recommendations in this guide are meant to serve as treatment guidelines for use at Michigan Medicine facilities. If you are an individual experiencing a medical emergency, call 911 immediately. These guidelines should not replace a provider’s professional medical advice based on clinical judgment, or be used in lieu of an Infectious Diseases consultation when necessary. As a result of ongoing research, practice guidelines may from time to time change. The authors of these guidelines have made all attempts to ensure the accuracy based on current information, however, due to ongoing research, users of these guidelines are strongly encouraged to confirm the information contained within them through an independent source.

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