



Algorithmic Approach

- A. In the setting of new onset diarrhea, history and physical examination are the first step with specific inquiry about risk factors for *C. difficile* colitis. Usually, the diarrhea is watery. The strongest risk factor is recent antibiotic use, and patients who are immunosuppressed or diagnosed with inflammatory bowel disease are at higher risk [1]. Physical examination should evaluate for abdominal distention and peritoneal signs.
- B. A diarrheal specimen should be evaluated for *C. difficile* toxin [2].
- C. With a positive assay, the severity of colitis is determined next. Vital signs and laboratory studies including complete blood count (CBC), electrolytes, renal function, and albumin should be obtained.
- D. Patients should be evaluated for fulminant *C. difficile* colitis, which includes systemic toxicity, hypotension, oliguria, tachycardia, or perforation [3]. A plain abdominal X-ray may be obtained to evaluate for toxic megacolon. With a concerning physical exam, a CT scan can assist in determining the extent of colonic inflammation and can further characterize signs of perforation or impending perforation with pneumatosis.
- E. If fulminant disease or perforation is identified, total abdominal colectomy with end ileostomy and a stapled rectal stump is the safest surgical option [4].
- F. Without peritoneal signs or perforation, antibiotic therapy in addition to supportive care is indicated. The antibiotic regimen chosen is based upon disease severity as listed below [5]:
 - (a) Mild disease (WBC <15,000 and creatinine (Cr) less than 1.5 times baseline) is treated with oral or IV antibiotic therapy with metronidazole 500 mg tid for 10–14 days.
 - (b) Severe disease (WBC >15,000 and/or Cr >1.5 times baseline Cr) is treated with 125 mg vancomycin PO qid for 10–14 days.
 - (c) Severe-complicated disease is characterized by additional complicating factors, including ileus, shock requiring vasopressors, and megacolon, or worsening symptoms or lack of improvement after 5 days of antibiotic treatment. CT scans of the abdomen/pelvis should be obtained. Treatment: IV metronidazole 500 mg tid, PO vancomycin 125 mg qid,

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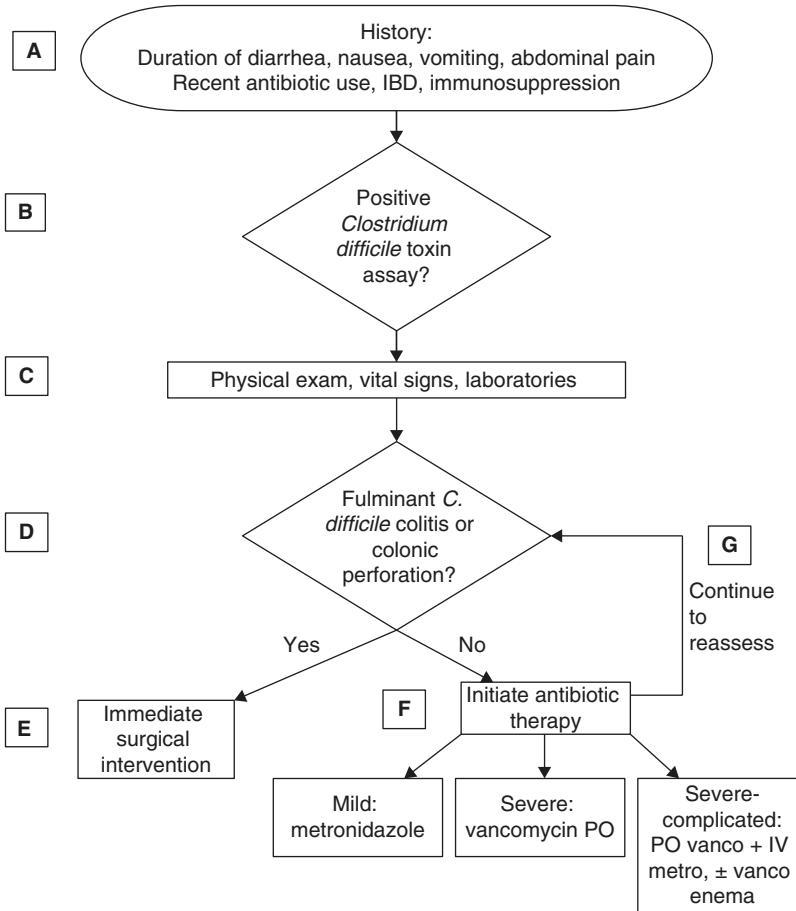
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and if ileus: add vancomycin enema 500 mg qid.

G. Continue to monitor patient for signs of *C. difficile* colitis. Patients who clinically worsen or do not respond to medical ther-

apy should be evaluated for surgical intervention. Patients with refractory or recurrent disease should be considered for fecal microbiota transplant prior to surgical intervention [6].



Algorithm 63.1

References

1. Ananthakrishnan AN. Detecting and treating *Clostridium difficile* infections in patients with inflammatory bowel disease. *Gastroenterol Clin N Am.* 2012;41(2):339–53.
2. Surawicz CM, Brandt LJ, Binion DG, Ananthakrishnan AN, Curry SR, Gilligan PH, et al. Guidelines for diagnosis, treatment, and prevention of *Clostridium difficile* infections. *Am J Gastroenterol.* 2013;108(4):478–98. quiz 99
3. Butala P, Divino CM. Surgical aspects of fulminant *Clostridium difficile* colitis. *Am J Surg.* 2010;200(1):131–5.
4. Kaiser AM, Hogen R, Bordeianou L, Alavi K, Wise PE, Sudan R, et al. *Clostridium difficile* infection from a surgical perspective. *J Gastrointest Surg.* 2015;19(7):1363–77.
5. Katzman M. Antibiotic therapy for *Clostridium difficile* infection. *Semin Colon Rectal Surg.* 2014;25(3):143–9.
6. Lee CH, Steiner T, Petrof EO, Smieja M, Roscoe D, Nematallah A, et al. Frozen vs fresh fecal microbiota transplantation and clinical resolution of diarrhea in patients with recurrent *Clostridium difficile* infection: a randomized clinical trial. *JAMA.* 2016;315(2):142–9.