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## INFECTIOUS DISEASES BOARD REVIEW MANUAL

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## Nosocomial Diarrhea

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## Nosocomial Diarrhea

Circle S. Alcantara, MD

### INTRODUCTION

Nosocomial diarrhea is generally defined as loose or liquid stool in a hospitalized patient occurring 3 or more days after admission. Approximately 50 episodes of nosocomial diarrhea occur per 1000 hospital admissions.<sup>1</sup> Risk factors for nosocomial diarrhea include antibiotic use, enteral feedings, gastrointestinal manipulation, and chronic medical and surgical conditions.

Nosocomial diarrhea can be caused either by infectious organisms (eg, *Clostridium difficile*) or by noninfectious agents. The infectious organisms most commonly reported to cause nosocomial diarrhea are listed in **Table 1**. These organisms typically are transmitted by infected or already colonized patients, by the hands of health care providers, or by the hospital environment itself.

This manual discusses in greater detail the infectious causes of nosocomial diarrhea, using a case-based format to illustrate major clinical points. The noninfectious causes of nosocomial diarrhea also are treated. The manual concludes with a suggested approach to the hospitalized patient with nosocomial diarrhea, with an emphasis on prevention and control.

### INFECTIOUS CAUSES OF NOSOCOMIAL DIARRHEA

#### CASE 1 PRESENTATION

A 60-year-old woman is admitted to the hospital because of community-acquired pneumonia. On the fifth hospital day, she begins having watery stool and abdominal cramps. Nosocomial diarrhea is suspected. Results of a complete blood count are unremarkable, except for a leukocyte count of  $12 \times 10^3/\text{mm}^3$  (80% segmented neutrophils). Fecal analysis shows a moderate number of polymorphonuclear cells. No evidence of ova and parasites is found. Another stool specimen is obtained for *C. difficile* toxin A and toxin B assay.

- What factors favor infection with *Clostridium difficile* in patient 1?

#### CLOSTRIDIUM DIFFICILE-ASSOCIATED DIARRHEA

##### Epidemiology and Etiology

*C. difficile* is the most common microbial cause of hospital-acquired diarrhea or colitis. It can be isolated in as many as 20% of stool specimens submitted for evaluation for nosocomial diarrhea.<sup>1</sup> In epidemic settings, as many as 30% of hospitalized patients with diarrhea will have *C. difficile*-associated diarrhea.<sup>2</sup> Although *C. difficile* infection accounts for only 10% to 20% of antibiotic-associated diarrhea, it accounts for most cases of colitis associated with antibiotic use and nearly all cases of pseudomembranous colitis.<sup>3</sup>

It is estimated at least 20% of adults hospitalized for longer than 1 week are colonized with *C. difficile*.<sup>4</sup> The colonization rate is proportional to the length of hospitalization.<sup>5</sup> Asymptomatic carriers of *C. difficile* are less likely to develop *C. difficile*-associated diarrhea.<sup>6</sup> Intestinal colonization with *C. difficile* is also very common in healthy neonates, although carriage rates diminish markedly during the first year of life.<sup>7</sup>

Hospitalized patients at high risk for acquiring symptomatic infection with *C. difficile* include those of advanced age, those exposed to antimicrobial agents, and those who have had gastrointestinal surgery or manipulation. Exposure to antimicrobial agents is the most significant risk factor for the development of *C. difficile* infection. Occasionally, chemotherapeutic drugs with antimicrobial activity have been reported to precipitate *C. difficile* infection. However, antibiotic-associated diarrhea does not always indicate infection with *C. difficile*. Rare examples of intestinal infections associated with a history of antibiotic therapy include *C. perfringens*-associated self-limited nosocomial intestinal infections (mostly in elderly patients), methicillin-resistant *Staphylococcus aureus* enterocolitis, and intestinal infections associated with either multiply-resistant *Salmonella* species or *Candida* species. The antimicrobial agents usually implicated as causing *C. difficile* infection include clindamycin, cephalosporins, and broad-spectrum penicillins.<sup>8–10</sup>

Patient 1 is at risk for nosocomial infection, given her age and length of hospitalization (ie, 5 days). Because she was admitted to the hospital for treatment of pneumonia, she most likely has been receiving