

# Infectious Diarrhea



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## KEYWORDS

- Diarrhea • Dehydration • Norovirus • Campylobacter • Salmonella • Shigella
- Shiga toxin-producing E coli • Parasites

## KEY POINTS

- Patients complaining of diarrheal illness without bloody and/or mucoid stools may use antimotility agents, but patients with bloody and/or mucoid stools should refrain from using these medications.
- Significant dehydration is the most common complication of diarrhea. Rehydration is the cornerstone of management for patients with diarrhea, regardless of any other ongoing therapies (eg, antimicrobials).
- Diagnostic tests are not needed for most cases of diarrhea, as it tends to be a benign, self-limited problem. Diagnostics are appropriate in some situations, such as an immunocompromised host, prolonged course of illness, or inflammatory diarrhea.

## INTRODUCTION

Diarrhea, an increase in stool frequency and/or liquidity, causes 1.5 million deaths per year across the globe,<sup>1</sup> including 750,000 children younger than 5 years.<sup>2</sup> Much of this burden of disease affects poor nations and is caused by improper hygiene, poor sanitation, or unsafe water supplies. These risk factors are generally minimized in countries with greater resources, and diarrheal illnesses are rarely fatal in such locations. In the United States, there are more than 200 million cases of diarrheal illness annually.<sup>3</sup> Although mortality is much lower in more affluent countries, it remains an important cause of lost productivity and the complaint in more than 8 million clinic visits annually.<sup>4</sup>

There are many pathogens that can cause diarrhea, and many (but not all) of these organisms are reviewed in this article. Broadly, these may be considered as viral (*Norovirus* is discussed later), bacterial (*Campylobacter*, *Salmonella*, *Shigella*, and Shiga toxin-producing *Escherichia coli*), or parasitic (*Cryptosporidium* and *Giardia*)

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infections. Careful history taking and physical examination are key to identifying the likely cause and severity of a case of infectious diarrhea and the selection of appropriate diagnostic and therapeutic interventions. Several important causes of diarrheal illness, including *Clostridium difficile* and *Rotavirus*, are not included in this review as they merit a more expansive discussion than can be included here.

### ***Inflammation***

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Inflammatory diarrhea, also known as dysentery, results from pathogens that classically affect the distal ileum and colon, where they invade the epithelium or release toxins. This invasion results in febrile diarrheal illness with small stool volume, tenesmus, and stools with blood, leukocytes, and/or mucus. Noninflammatory diarrhea is caused by organisms that generally affect the small intestine and cause larger-volume stools without fever, tenesmus, fecal blood, leukocytes, or mucus.<sup>5</sup>

### ***Severity of Dehydration***

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Traditionally, the degree of dehydration has been determined by the presence and degree of symptoms and the magnitude (in percent) of volume deficit. Mild dehydration (<3%–5%) is generally asymptomatic; moderate (5%–10%) dehydration will have some symptoms, such as dry mucous membranes and increased thirst; severe (>10%) dehydration will have numerous signs and symptoms, including electrolyte abnormalities and hemodynamic instability. Recent guidelines have combined mild and moderate dehydration to allow for some variability in the presence of symptoms in patients with less than 10% volume deficit.<sup>6</sup>

### ***General Approach to Evaluation***

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A detailed history and physical examination are indispensable to the evaluation of patients with diarrhea. Stool testing is not needed for most cases of infectious diarrhea, as most are self-limited. However, in cases of inflammatory or protracted diarrhea, diagnostics are appropriate. General testing modalities are mainly geared toward identifying inflammation (fecal leukocytes, fecal lactoferrin, or fecal occult blood) or fecal ova and parasites.<sup>3</sup> Testing for inflammation is appropriate for individuals with one or more the following<sup>3</sup>:

- Bloody stools
- Fever
- Tenesmus
- Recent antibiotics
- Day care center attendance
- Hospitalization
- Moderate to severe dehydration

More specialized testing for specific organisms and/or toxins may be appropriate in some cases; these are discussed in the relevant sections of this article. Stool cultures are invaluable for identification of bacterial pathogens and are the cornerstone of diagnostics for these organisms. Many laboratories are also using polymerase chain reaction (PCR) testing, as this can yield faster confirmation and higher sensitivity/specificity than culture. For patients hospitalized longer than 3 days who are not elderly or immunocompromised, stool cultures are very unlikely to yield an enteric pathogen other than *Clostridium difficile*.<sup>3</sup> Testing for parasitic infections, such as *Giardia* and *Cryptosporidium*, are appropriate for episodes of diarrhea lasting longer than 7 days or with risk factors for these infections.<sup>3</sup> To reduce the spread of disease, food handlers and health care workers should demonstrate 2 consecutive negative

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