

## Travelers' Diarrhea

### Key Points

- | Travelers' diarrhea (TD), the most common health problem encountered by travelers, is an intestinal infection caused primarily by bacteria acquired through consumption of contaminated food or beverages.
- | Risk is higher for young adults, persons with underlying illnesses, and those taking medicines that decrease gastric acidity.
- | Symptoms can vary from mild to severe and include uncomfortable diarrhea with fever, nausea, or vomiting. Significant dehydration is uncommon in adults.
- | Consequences of infection may include persistent diarrhea, recurrent diarrhea, and other chronic gastrointestinal discomfort.
- | Prevention includes observing food and beverage precautions and treating water.
- | No vaccine is available in the U.S., and preventive antibiotics are not recommended. A vaccine with limited effectiveness is available in some countries but is not recommended for healthy travelers.
- | Self-treatment includes fluid rehydration and antimotility or antisecretory agents. Travelers are encouraged to reserve the use of antibiotics for severe diarrhea.

### Introduction

TD is the most common health problem encountered by travelers, affecting up to 70% of travelers going to some developing countries. TD is characterized by the sudden onset of abnormally loose or liquid stools, such that the illness is either tolerable, interferes with many planned activities, or is incapacitating and prevents all planned activities. Some travelers may experience more than 1 episode per trip. TD usually resolves in 3 to 4 days. About 10% of cases last longer than 1 week, and 2% of cases last a month.

TD is caused by bacteria (*Escherichia coli*), protozoa, or viruses. For short-stay travelers, bacteria cause most cases of TD. Protozoa are uncommon in short-stay travelers but are more common in long-stay travelers and expatriates. Gastrointestinal viruses account for the remaining TD cases.

Prevention of diarrhea is important. However, despite prevention strategies (including the traditional advice to "boil it, cook it, peel it, or forget it") TD still occurs. Therefore, it is necessary to learn how to self-diagnose and manage TD when it occurs.

### Risk Areas

Destination is the most important determinant of risk for travelers. Developing countries in Africa, Asia, Latin America, and the Middle East are considered high risk. Most countries in southern Europe and a few Caribbean islands are deemed intermediate risk. Low-risk areas include Australia, Canada, Japan, New Zealand, northern Europe, several of the Caribbean islands, and the U.S.

### Transmission

Travelers get TD by consuming contaminated food or beverages. Poor sanitation, the presence of stool in the environment, and the absence of safe restaurant practices lead to risk of diarrhea from

eating a wide variety of foods. Because travelers are usually careful to avoid drinking untreated water, many acquire TD from eating contaminated food.

### Risk Factors

Individuals at particularly high risk for TD include young adults (prone to risk-taking behavior and often on limited budgets); persons with compromised immunity, inflammatory bowel disease, or diabetes; and those taking medicines (e.g., omeprazole) that decrease gastric acidity.

### Symptoms

TD caused by bacteria typically presents with abrupt onset of uncomfortable diarrhea and may be accompanied by fever, nausea, or vomiting. TD caused by protozoa is usually mild and begins gradually with loose stools occurring in distinct episodes during the day, slowly becoming more bothersome and associated with fatigue. Significant dehydration is uncommon in adults. Persons with protozoal infections often do not seek medical care for several weeks due to the generally mild nature of the symptoms.

### Consequences of Infection

Persistent diarrhea, recurrent diarrhea, and other chronic gastrointestinal discomfort (e.g., bloating, gas, constipation) may occur as a result of TD. When work-up yields no other diagnoses, these chronic gastrointestinal symptoms may be attributed to "postinfectious irritable bowel syndrome."

### Need for Medical Assistance

Seek medical attention as soon as possible for bloody stools and if intense cramps, fever and chills, or severe thirst with inability to keep liquids down occur and do not rapidly improve with self-treatment. Illnesses unresponsive to self-treatment will require specific investigation for possible protozoal causes.

### Self-Diagnosis and Self-Treatment

The decision to self-treat depends on the severity of the functional disability caused by TD. Increased fluid intake is necessary to correct dehydration. Most cases will resolve with hydration and symptomatic treatment with antimotility or antisecretory agents (see Non-Antibiotic Agents, under Drug Treatment). Adding antibiotics for moderate TD may shorten the duration or severity of illness. All severe TD cases should receive antibiotics.

Discuss self-treatment options with your health care provider so that you can obtain available agents for your medical kit during travel. A strategy for self-treatment of TD under different circumstances is shown in Table 1.

**Table 1: Treatment Options by TD Severity**

Severity of Diarrhea	Recommended Treatment
<b>Mild:</b> loose or liquid stools (without body symptoms) that are tolerable, not distressing, and do not interfere with planned activities.	<ul style="list-style-type: none"> <li>  Antibiotics are not recommended.</li> <li>  May use bismuth subsalicylate (BSS) or antimotility agents (for maximum of 48 hours) if necessary for comfort during sightseeing or travel and if not contraindicated.</li> </ul>
<b>Moderate:</b> loose or liquid stools with cramps or nausea that interfere with planned activities.	<ul style="list-style-type: none"> <li>  Antibiotic use not encouraged due to potential for inducing resistant bacteria. May consider empiric azithromycin. Quinolone antibiotics may be used if azithromycin is not carried or available en route. Avoid quinolones for TD acquired in India and Southeast Asia.</li> <li>  May use antimotility agents (for a maximum of 48 hours) as monotherapy or as adjunctive therapy if necessary for comfort during sightseeing or travel and if not contraindicated.</li> </ul>
<b>Severe:</b> loose or liquid stools with cramps or nausea that are incapacitating or prevent planned activities. All dysentery (blood or pus in the stools) is considered severe.	<ul style="list-style-type: none"> <li>  Use empiric azithromycin</li> <li>  Stay in room and use toilet as necessary.</li> <li>  May use antimotility agents (for a maximum of 48 hours) if necessary for comfort, unless dysentery is present (blood or pus in the stools).</li> <li>  Pay attention to rehydration.</li> <li>  Seek medical attention if symptoms do not rapidly improve or if dysentery is present.</li> </ul>

## Fluid and Dietary Management

TD in adults is not typically associated with clinically significant dehydration, but replacement of fluids that are lost remains a cornerstone of self-treatment. Mild dehydration can be corrected with any fluid, and a patient should drink any available appropriate fluid while oral rehydration fluid is sought. Oral rehydration solutions (ORS) are designed to be rapidly absorbed from the intestine, thus they can be useful even in the presence of vomiting. If ORS is thought to be indicated, many stores and pharmacies in developing countries carry ORS packets. Travelers going to remote areas should carry their own ORS packets.

If not hungry, the ill traveler should drink fluids and not force oneself to eat. If hungry, eating is encouraged, but alcohol, coffee, strong tea, spicy food, greasy food and dairy products should be avoided.

## Drug Treatment

### Non-Antibiotic Agents

Antimotility agents, such as loperamide (Imodium), are often used to manage the symptoms of TD. Loperamide, which is available over-the-counter, appears to be safer than diphenoxylate (Lomotil), a prescription medicine. Take 4 mg (2 tablets) to start and then 2 mg after every loose stool (if diarrhea is uncontrolled) or every 6 hours, with a maximum of 16 mg per day.

Antimotility agents sometimes induce prolonged constipation, even at low doses, and can lead to a bloated, uncomfortable feeling if taken for moderately severe infections without taking an antibiotic as well. Use of these agents should be discontinued if symptoms last more than 48 hours. Bowel immobilizers should not be taken by travelers with fever or with bloody stool. Antisecretory agents, such as BSS, can also improve some symptoms of TD.

## Antibiotics

Travelers are often in areas where prompt, effective medical care is unavailable. Therefore, it may be more practical to self-treat bacterial diarrhea with antibiotics that have been prescribed and purchased prior to leaving for the trip. The use of antibiotics can turn a 3- or 4-day illness into a 1-day illness. Increased intestinal carriage of antibiotic-resistant bacteria in returning travelers is particularly serious in South Asia, where 80% of travelers had TD treated with antibiotics. Antibiotic choice for the treatment of moderate (antibiotics discouraged) and severe TD in adults is shown in Table 2.

**Table 2: Antibiotic Treatment for Severe and Moderate Bacterial TD in Adults<sup>1</sup>**

CAUSATIVE INTESTINAL ORGANISM	ANTIBIOTIC PRESCRIPTION <sup>2</sup>	DOSE/SCHEDULE	PRIMARY CONTRAINDICATIONS
Typical noninvasive bacterial causes of severe TD	Azithromycin 500 mg; 4 tablets	500 mg orally, single dose <sup>3</sup>	Azithromycin allergy
		If symptomatic after 24 hr: continue with 500 mg orally, once per day for 2 more doses	
	Ciprofloxacin 500 mg; 6 tablets	750 mg single dose (1½ tablets)	Quinolone allergy; pregnancy; concomitant administration with tizanidine
		If symptomatic after 24 hr: continue with 500 mg orally, twice per day for 4 more doses	
Levofloxacin 500 mg; 3 tablets	500 mg orally, single dose	Quinolone allergy; pregnancy	
	If symptomatic after 24 hr: continue with 500 mg orally, once per day for 2 more doses		
Ofloxacin 400 mg; 6 tablets	400 mg orally, single dose	Quinolone allergy; pregnancy	
	If symptomatic after 24 hr: continue with 400 mg orally, twice per day for 4 more doses		
Noninvasive <i>E. coli</i> that cause TD (includes ETEC, EPEC, EAEC)	Rifaximin 200 mg; 9 tablets	200 mg orally, 3 times per day for 3 days	Rifamycin (or component) allergy; pregnancy; adults aged 65 years and older (studies on safety in this age group have not been done)

- For use when fluid rehydration and antimotility or antisecretory agents are insufficient and diarrhea is severe or moderate (per Table 1). Antibiotic use increases intestinal carriage of antibiotic-resistant bacteria in returning travelers; travelers should be encouraged to restrict the use of antibiotics to self-treatment of diarrhea that is severe.
- Side effects  
Azithromycin: Those with heart problems or heart rhythm problems should only use azithromycin under the supervision of a physician.  
Quinolones: At the first sign of tendon pain, swelling, or inflammation, the traveler should stop taking the quinolone, avoid exercise and use of the affected area, and seek medical assistance. Quinolones may cause photosensitivity reactions in the tropical sun.
- Seek medical attention as soon as possible for bloody stools. If effective medical care or medical consultation is unavailable, self-treatment is recommended. Preferred regimen for dysentery (bloody diarrhea) is a full 3-day course with a 1000 mg initial dose.

## Antiparasitic Drugs

In general, patients should not carry these medicines for self-treatment. See a health care provider because a proper diagnosis for protozoal infection is necessary and these medicines are administered under supervision. Travelers going to extremely remote locations or on long trips may be given tinidazole to carry on a case-by-case basis.

## Prevention

Although it is difficult to guarantee the safety of food and beverages when traveling, especially in developing countries, travelers should carefully follow food and water precautions and eat the types of food that tend to be safest. Where one eats may be even more important than what one eats. Poor hygiene in the kitchen may contaminate even "safe" foods before, during, or after cooking. Nevertheless, food and water precautions can help reduce the number of organisms ingested and thus the severity of TD (see *Food and Beverage Precautions*).

Although the typical traveler going to the developing world can access safe, purchased or prepared water, sometimes water purity cannot be guaranteed. In these situations, travelers should treat water by boiling, using chemical disinfectants, or using other methods (see *Treating Water*).