

Preparing patients to travel abroad safely

Part 4: Reducing risk of accidents, diarrhea, and sexually transmitted diseases

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abstract

OBJECTIVE To present evidence-based recommendations on traveling abroad safely so family physicians can advise travelers on how to reduce risk of accidents, diarrhea, and sexually transmitted diseases (STDs) and how to treat diarrhea themselves if medical care is unavailable.

QUALITY OF EVIDENCE A MEDLINE search from 1990 to November 1998 found 163 articles on travel and accidents, 504 on travel and diarrhea, and 42 on travel and STDs. Titles and abstracts were reviewed, and randomized controlled trials (RCTs) and systematic reviews were sought. The Cochrane Collaboration database of systematic reviews and meta-analyses was searched for studies relevant to family physicians.

MAIN MESSAGE For preventing diarrhea, RCTs demonstrate that bismuth subsalicylate, doxycycline, ciprofloxacin, and trimethoprim-sulfamethoxazole are useful prophylactics. Once travelers have diarrhea, RCTs show that loperamide and zaldaride reduce symptoms and duration; quinolones, ciprofloxacin, norfloxacin, and oral aztreonam reduce abdominal symptoms and time to last liquid stool by several days; azithromycin is effective in treatment of ciprofloxacin-resistant *Campylobacter*; and trimethoprim-sulfamethoxazole is effective in treating cyclospora. There are no RCTs of preventing accidents and STDs abroad. Health Canada has issued a statement summarizing the risks of acquiring STDs abroad.

CONCLUSION Family physicians can advise their patients on how to reduce risk of travelers' diarrhea and how to treat it themselves on holiday. There is expert advice on how to reduce risk of STDs.

résumé

OBJECTIF Présenter des recommandations fondées sur des données probantes concernant la sécurité en voyage de manière à ce que les médecins de famille puissent conseiller les voyageurs sur les façons de réduire les risques d'accidents, de diarrhée et de maladies transmises sexuellement (MTS), et sur les moyens de traiter eux-mêmes la diarrhée si des soins médicaux ne sont pas disponibles.

QUALITÉ DES DONNÉES Une recension effectuée dans MEDLINE de 1990 à novembre 1998 a retracé 163 articles sur les voyages et les accidents; 504 sur les voyages et la diarrhée; et 42 sur les voyages et les MTS. Les titres et les résumés ont été examinés et on a recherché les essais aléatoires contrôlés ainsi que les synthèses critiques. Une recherche des études pertinentes aux médecins de famille a été réalisée dans la base de données des synthèses critiques et des méta-analyses du Centre de collaboration Cochrane.

PRINCIPAL MESSAGE Pour la prévention de la diarrhée, les essais aléatoires contrôlés font valoir que la doxycycline, la ciprofloxacine et la triméthoprime-sulfaméthoxazole constituent d'utiles prophylactiques. Si les voyageurs ont contracté la diarrhée, les essais aléatoires contrôlés indiquent que le lopéramide, et le zaldaride réduisent les symptômes et la durée; le quinolone, la ciprofloxacine, la norfloxacine et l'aztréonam par voie orale atténuent les symptômes abdominaux et réduisent de plusieurs jours la durée des selles liquides; l'azithromycine est un traitement efficace du *Campylobacter* résistant à la ciprofloxacine; et la triméthoprime-sulfaméthoxazole est efficace dans le traitement de la cyclospora. Il n'y avait aucun essai aléatoire contrôlé sur la prévention des accidents ou des MTS à l'étranger. Santé Canada a émis une déclaration résumant les risques de contracter des MTS à l'étranger.

CONCLUSION Les médecins de famille peuvent conseiller leurs patients sur les façons de réduire les risques de diarrhée en voyage et sur les moyens de se traiter eux-mêmes en vacances. Il existe des conseils d'experts sur la réduction des risques de contracter des MTS.

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Considerable evidence indicates that travelers are insufficiently aware of the risks of traveling abroad and of how to reduce them. Accidents are a serious risk and account for about 25% of all deaths of travelers abroad.¹

Travelers' diarrhea can severely impair enjoyment of travel. A study in a general practice in Scotland showed that the odds of getting diarrhea abroad were 6.5 times greater than at home.² Risk of diarrhea increases with poor hygiene.³ Some travelers take risks through sexual contact with high-risk individuals abroad and acquire sexually transmitted diseases (STDs).

Accidents

Accidents injure and kill many travelers. In one study,³ 21% of deaths among Scottish travelers abroad were due to injuries from accidents. Another study showed that 25% of deaths of United States travelers abroad were due to accidents: 28% were motor vehicle crashes, 16% drownings, and 9% homicides.⁴

Many developing countries have 20 times as many traffic accidents per million miles as Canada because of washed-out roads, speeding, overloaded vehicles, and poor vehicle maintenance. Specific high-risk activities are traveling by motor scooter,⁵ on overcrowded buses, and on pay day (increased risk of drunk drivers). Those involved in traffic accidents on the Island of Crete were more likely to be drunk.⁶ Swiss orthopedic surgeons have documented that, when the snow is poor, skiers try tobogganing over hillsides with exposed rocks and have severe accidents.⁷ Some people go abroad to try risky sports and adventure excursions not available at home.

There are no RCTs of strategies for preventing accidents abroad. Family physicians should discuss patients' intended activities with them and help them identify risks and suggest how to minimize them.

Diarrhea

A study in a general practice in Scotland showed that those who traveled abroad were 6.5 times more likely to have diarrhea than if they stayed home.² Travelers to the United States, Canada, northern Europe, and Australasia have an 8% risk of travelers' diarrhea; those going to the Mediterranean or the Caribbean have an 8% to 20% risk; and those traveling to Africa, Asia, and Latin America a 20% to 50% risk.⁷ Bacteria are an

important source of diarrhea: enterotoxigenic *Escherichia coli* (ETEC) is the most common pathogen (40%) with *Shigella sonnei*, *Salmonella*, *Campylobacter*, and viruses, such as rotavirus and Norwalk agent, each contributing about 10%^{8,9} (Table 1).

Some societies have especially high rates of diarrheal illness. In Kathmandu, Nepal, 83% of tourists and 64% of resident expatriates with diarrhea had bacterial pathogens (ETEC, *Campylobacter*, and *Shigella*) in their stools. Risk of diarrhea is higher for travelers who are young, stay only a short time, and eat in restaurants. The burden of pathogens is so high in Nepal that 49% of expatriates had diarrhea each month during the first 2 years, implying that diarrhea is difficult to prevent in Nepal even with precautions and that a mild degree of immunity comes very slowly.³

Risk of diarrhea increases with poor hygiene.

Enteropathogens survive in food not thoroughly cooked, in ice, in swimming pools, and in sewage that sometimes drains near beaches.⁸ United States naval personnel who experienced ETEC diarrhea after visits ashore in Asian and Persian Gulf ports had not followed

Table 1. Causes and prevention of travelers' diarrhea

| CAUSES |
|---|
| Bacterial causes (60%): in order of decreasing frequency, enterogenic E coli (ENTEC), viral gastroenteritis, <i>Salmonella</i> and <i>Shigella</i> , <i>Campylobacter</i> , <i>Giardia</i> , Norwalk agent, rotavirus, and <i>Cryptosporidium</i> . Predominant causative agents vary by country, eg, ENTEC (Mexico) and <i>Campylobacter</i> (Thailand). |
| Breakdowns in food hygiene: food grown with human excrement as fertilizer, food handled by people who do not wash their hands, improperly washed salads, ice cubes made with local water, uncooked vegetables, fruit not peeled at the table, food purchased from street vendors. |
| Antacids or H ₂ -blockers reduce resistance to absorption of bacterial pathogens. |
| PREVENTION |
| Do not buy food from street vendors. |
| Eat only food seen to have been prepared in hygienic conditions. |
| Cooked food should be very hot when served. |
| Avoid uncooked meat and seafood. |
| Peel fruit and vegetables. |
| Clean off ice water used to chill beverage cans. |
| Take a kettle and adaptor plugs; bring water just to a boil for washing fruit, drinking, and cleaning teeth. Or use a 2-m-pore filter or water-purifying tablets. |

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recommendations to avoid restaurants: 92% had drunk ashore, 82% had eaten ashore, and 59% had eaten lettuce.¹⁰

United States students in Mexico who prepared their own food had the lowest rates of diarrhea. Those who ate with Mexican families or purchased food from street vendors had the highest rates. Food samples showed large amounts of *E coli*, and rotavirus was found in tap water.¹¹

Reducing the risk of diarrhea. One study¹ found that travelers who consulted their doctors for pretravel advice were more likely to carry medication, to treat themselves, and to not need to consult their doctors after travel. Whether family physicians should prescribe antibiotics for prophylactic use on holiday depends on a balance between shortening the duration of an uncomfortable illness for an individual traveler and increasing the eventual risk of antibiotic resistance in society.

Prophylactic medications are effective, however, and family physicians could feel justified in prescribing them for travelers with serious health problems that would be adversely affected by diarrhea.⁸

Antibiotic prophylaxis to prevent diarrhea. A number of RCTs have shown that, for preventing ETEC and *Campylobacter* infection, quinolones are highly effective: trimethoprim-sulfamethoxazole, ciprofloxacin, doxycycline, erythromycin, and mecillinam reduce the attack rate by 80% to 95%; and bismuth subsalicylate reduces the attack rate by 60% or more (Table 2¹²).⁸

Antibiotic treatment for diarrhea. Some RCTs have shown that travelers with diarrhea on cruise ships improved faster with loperamide or zaldaride (not currently available in Canada; similar to loperamide) than placebo¹³; that Finnish travelers in Morocco taking norfloxacin had diarrhea for 1 day compared with 3 days for those taking placebo¹⁴; that British troops in Belize who took a single 500-mg ciprofloxacin tablet had to wait only 24 hours until their last liquid stool compared with 53 hours for those taking placebo¹⁵; that 70% of US troops in Thailand recovered within 48 hours on either azithromycin or ciprofloxacin, but those with *Campylobacter* given azithromycin recovered after 40 hours compared with 51 hours for those given ciprofloxacin¹⁶; that travelers to Mexico given oral aztreonam recovered 50 hours faster from ETEC and 90 hours faster from shigellosis¹⁷; and that only 6% of expatriates in Nepal with cyclospora still had the virus in their stools after 7 days of trimethoprim-sulfamethoxazole compared with 88% of those given placebo.¹⁸

Table 2. Evidence-based statements about antibiotic prophylaxis and treatment of travelers' diarrhea¹²

PROPHYLAXIS

For the widest coverage, ciprofloxacin (500 mg once daily) or oral aztreonam are effective against enterogenic *E coli* (ENTEC), *Campylobacter*, *Yersinia*, *Vibrio*, *Shigella*, *Salmonella*, *Aeromonas*, and *Plesiomonas*.

Second-choice drugs are once daily trimethoprim (160 mg) and sulfamethizole (800 mg); in South America, Africa, and Asia, ENTEC, *Shigella*, and *Campylobacter* are showing considerable resistance.

Third choice is doxycycline (100 mg once daily).

Bismuth subsalicylate (two 262-mg tablets or 60 mL of liquid four times daily) is less effective than antibiotics and should not be taken by people allergic to acetylsalicylic acid (240 mL is equivalent to taking eight 325-mg ASA tablets daily). On a long trip, the liquid form would prove heavy to carry. If travelers decide to take antibiotics, they should stop the bismuth because it will reduce absorption of antibiotics and doxycycline taken for malaria prophylaxis.

TREATMENT

Replace fluids with non-carbonated beverages, canned juices, or oral rehydration solutions and calories with complex carbohydrates.

Loperamide can be taken with antibiotics to reduce the number of loose stools.

Advice about diarrhea. The key step in avoiding travelers' diarrhea is to observe the rules of hygiene. Evidence from RCTs indicates that the risk of bacterial diarrhea can be reduced by taking antibiotics prophylactically. Travelers and physicians should consider that using antibiotics will increase antibiotic resistance¹⁹ and restrict use as much as possible.

Once acquired, most episodes of travelers' diarrhea are self-limited. The important treatment is replacement of fluids and electrolytes using lightly salted soups, fruit juices, and complex carbohydrates (potatoes, rice, or bread) to promote glucose-sodium cotransport.⁸ For infants and elderly people, oral rehydration agents dissolved in clean water are suitable. Antidiarrheal agents can be used to diminish stool frequency in people with watery diarrhea.⁸

Sexually transmitted diseases

Gonorrhea and chlamydia are among the most common infections acquired abroad. Some travelers take substantial risks: 25% of patients at United Kingdom genitourinary clinics who had recently traveled had sexual relations with new partners abroad; only 40% to 50% consistently used con-

doms.²⁰⁻²² Of 1700 US naval personnel abroad, 50% visited prostitutes, as did 50% of Spanish seamen abroad (only 25% used condoms).¹² Only 34% of young Australians visiting Thailand said they did not intend to have sex.¹²

In some countries, many prostitutes are HIV-positive: 81% in Nairobi, Kenya; 69% in Port-au-Prince, Haiti; and 44% in Bangkok, Thailand.¹² Sexual transmission of viral hepatitis B and C is well documented. In Asia, 6% to 18% of prostitutes were found to carry hepatitis B surface antigen.¹² In some studies in Africa and southeast Asia, 50% of *Neisseria gonorrhoeae* was resistant to penicillin.¹²

There are no RCTs of the effects of advising travelers on how to reduce STDs. Health Canada's statement summarizes the literature on risk, but is not evidence-based.²³ Family physicians could advise travelers to buy condoms before departure; alert them to the high risk of STDs, including HIV, chlamydia, and penicillin-resistant gonorrhea; and reinforce that alcohol lowers inhibitions.

Conclusion

- Family physicians can advise travelers that antibiotics are effective for both preventing and treating diarrhea, but that they should be used cautiously to avoid increasing antibiotic resistance.
- Some RCTs have shown that quinolones, trimethoprim-sulfamethoxazole, ciprofloxacin, doxycycline, erythromycin, and mecillinam reduce the attack rate of ETEC and *Campylobacter* bacteria by 80% to 95%; and that bismuth subsalicylate reduces the attack rate by 60% or more.
- Once travelers acquire diarrhea, RCTs show that they improve faster with loperamide or zaldaride than with placebo. Trimethoprim, doxycycline, erythromycin, mecillinam, norfloxacin, ciprofloxacin, azithromycin, and oral aztreonam all reduce abdominal symptoms and the duration of diarrhea by several days compared with placebo. Ciprofloxacin-resistant *Campylobacter* responds to azithromycin; cyclospora responds to trimethoprim-sulfamethoxazole.
- There are no evidence-based statements on how to prevent accidents or STDs abroad. Physicians should advise patients on how to reduce risks. ♦

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Key points

- Accidents are the greatest cause of death among travelers—notably motor vehicle accidents.
- Travelers' diarrhea can be reduced by practising good hygiene and using prophylactic antibiotics.
- In most cases, travelers' diarrhea is self-limited and best treated with oral fluid-electrolyte solutions. Antidiarrheal medications and some antibiotics might be considered to reduce symptoms.
- Travelers should be aware that STDs, including HIV, are very common among prostitutes and quite common in the general population in many developing countries.

Points de repère

- Les accidents représentent la principale cause de décès chez les voyageurs—plus précisément les accidents de la route.
- La diarrhée en voyage peut être évitée en ayant de bonnes pratiques d'hygiène et en utilisant des antibiotiques prophylactiques.
- Dans la majorité des cas, la diarrhée en voyage peut être résolutive et traitée le plus efficacement au moyen de solutions hydro-électrolytiques par voie orale. Des médicaments anti-diarrhéiques et certains antibiotiques peuvent être envisagés pour réduire les symptômes.
- Les voyageurs devraient être au courant que les MTS, dont le VIH, sont très courantes chez les prostituées et assez fréquentes dans la population générale de plusieurs pays en développement.

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