

Prevention of Tropical Illness In Older Travellers: The Older Cruiser

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Cruise ships are a popular way for seniors to travel to all parts of the world. Although cruises are generally safe, day and overnight excursions to tropical countries can expose travellers to diseases such as malaria, yellow fever and dengue fever and to pathogens that cause diarrhea. Family physicians should ensure that those patients considering a cruise are medically stable and receive up-to-date travel medicine advice. With proper preparation and precautions against infectious and vector-borne illness, risks can be minimized and older people can benefit from the stimulation of travel.

Key words: cruise ships, older traveller, travel medicine, vaccinations, yellow fever, dengue, malaria.

With the freedom of retirement, many seniors embark on travel to all parts of the world. For many, a cruise ship offers a safe mode of travel with a consistent and reliable source of accommodation and meals. However, itineraries are varied and many cruises offer side trips and day excursions that may expose travellers to tropical illness. It is important that older patients are made aware of this and are prepared for potential health problems while on holiday.

Trip Preparation

Older patients should begin their travel plans at least three months prior to departure. Those with chronic diseases such as diabetes, chronic obstructive pulmonary disease or cardiovascular disease should ensure that their conditions are stable. Travel medical insurance plans often require patients to be stable on their medications for the preceding three months. Patients should be advised to carry medication lists and medications in their hand luggage, with extra supplies in case of loss. Copies of consultation reports, physician contact numbers and ECGs may facilitate management of medical problems that occur during travel. Evacuation insurance should be con-

sidered and discussed with insurance agencies. This option is not automatically covered by regular insurance, and the costs incurred in the event of a serious illness or death overseas can be considerable.^{1,2} The U.S. Centers for Disease Control and Prevention (CDC) website is a good source of general information for cruise ship passengers.³

Risk Assessment

The risk of illness is determined by multiple factors, including itinerary, mode of transport and individual behaviour. For example, passengers on Alaskan cruise ships are not usually exposed to tropical illness but may be exposed to common viruses such as influenza and Norwalk-like (noro-) viruses. However, passengers on longer Pacific and Atlantic cruises might circumnavigate the coasts of South America, West Africa or East Africa, taking in multiple ports of call where they may be exposed to tropical vector-borne illnesses such as malaria and dengue and yellow fever, as well as to a higher risk of bacterial dysentery. Cruise package tours often include side trips up rivers such as the Orinoco in Venezuela, Amazon in Brazil and Yangtze in China, as well as trips to local villages and sites such as

Iguassu Falls in Brazil. Side trips to places like Cuzco, Machu Picchu, La Paz and Lake Titicaca expose travellers to altitudes over 8,000 feet where altitude sickness becomes a problem for some. These travellers need to be assessed by travel medicine specialists with up-to-date resources who can advise them about prophylaxes, precautions and appropriate vaccinations and medications (Figure).

Prevention

All patients should be aware of prevention techniques for food- and water-borne diseases. For cruise ship passengers, meals on shore from street vendors come with a higher risk of diseases such as hepatitis A, typhoid and other enteric infections compared with a meal on board ship. Vaccination against hepatitis A is recommended for most travellers; mortality rates for hepatitis A are up to 4% for those older than 60 years.⁴ Patients who opt for the combination hepatitis A/B vaccine schedule should complete the series prior to travel, as a single dose of hepatitis A/B vaccine may not confer total immunity to hepatitis A. Typhoid vaccine is an option for travellers on prolonged trips, those who are "adventuresome eaters" and particularly for those who are traveling to the Indian subcontinent. A new oral vaccine, Dukoral™, provides protection from enterotoxigenic *Escherichia coli* (ETEC), which accounts for a substantial proportion of traveller's diarrhea and cholera. Drawbacks to this vaccine, however, are its expense, its only partial coverage for traveller's diarrhea and the negligible risk of cholera to most travellers.

Older patients on proton pump inhibitors or with achlorhydria are at higher risk of enteric infections due to their reduced gastric acidity. These patients may carry a standby treatment of a fluoroquinolone antibiotic (e.g., ciprofloxacin 500mg b.i.d. x 3 days) or

seek help from the cruise ship physician at the onset of severe diarrhea. General information about cruise ship infection control can be obtained from the CDC website.

Patients over 65 years old should be offered annual influenza vaccine and a one-time immunization against *Streptococcus pneumoniae* (e.g., Pneumo 23). Influenza season is from November to March in the northern hemisphere, all year round at the equator, and from May to October in the southern hemisphere. As an alternative to flu vaccine, patients may carry a standby antiviral, such as amantidine or zanamivir. Although cheaper, amantidine must be used with caution if renal function is diminished, and is only effective against influenza A. Zanamivir and oseltamivir work against influenza A and B. The use of these drugs aboard a ship is empiric because of the inability to confirm the diagnosis of influenza. In addition, depending on the diagnostic facilities on board, ruling out bacterial pneumonias may be problematic.⁵

Older patients who are surgically or functionally asplenic are at particular risk for overwhelming sepsis from encapsulated bacteria and require vaccination against *Neisseria meningitidis* and *S. pneumoniae*, as well as immediate medical follow-up of fever.

With regard to other vaccines, tetanus and diphtheria immunizations should be kept current and an inactivated polio booster may be indicated depending on age and travel destination.⁶ Rabies vaccine is not commonly offered because of its high cost and the relatively low risk of rabies in cruise ship travellers who are instructed to stay away from dogs. Finally, hepatitis B should always be considered in travellers who are at risk due to sexual activity.

Vector-borne Tropical Illnesses

Cruise passengers are often surprised to learn that they are at risk for exotic mosquito-borne illnesses.

Dengue Fever

Dengue fever is caused by a flavivirus that

is transmitted worldwide in urban tropical environments by *Aedes* mosquitoes. Many infections are asymptomatic, but the milder classic dengue fever presents with a high fever, muscle and joint pain, headache and hematological changes such as thrombocytopenia. Older patients can become quite ill with dengue. The more severe form of dengue—a hemorrhagic fever—occurs in those who are reinfected by a different viral serotype and manifests with internal bleeding and mortality rates of up to 10%. Travellers who disembark from ships for day excursions in tropical zones should be advised to take adequate precautions against dengue-carrying mosquitoes. Peak biting times for these mosquitoes are at dawn and dusk.

Yellow Fever

Also caused by a mosquito-borne flavivirus, yellow fever is transmitted in tropical South America and sub-Saharan Africa. The main reservoir of infection lies

in monkeys in the forests and jungles, but humans may be infected and initiate urban transmission. Urban transmission is more common in Africa than in South America; however, over the last few years reports of urban transmission are increasing in Manaus, Brasilia and Sao Paulo (Brazil) and Iquitos (Peru). Travellers who disembark in West African ports, such as in Senegal and The Gambia, may be at risk, as may passengers on South American cruises who take trips to Iguassu Falls or to Amazon river villages. Yellow fever is transmitted by the day-biting *Aedes* mosquito, putting passengers at possible risk when they make day trips ashore.

A vaccine for yellow fever has been available for over 60 years. It is distributed by approved yellow fever vaccine centres and travel clinics that have access to current outbreak and vaccine information and abide by strict vaccine “cold chain” rules to ensure that the vaccine is efficacious. These centres are listed on the



Alaska

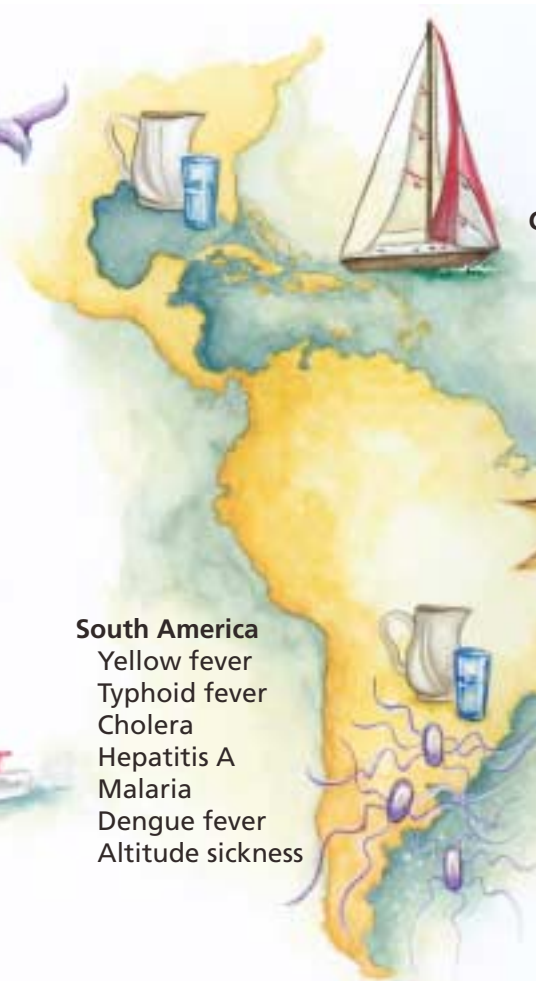
Norwalk-like viruses
Influenza

The risk of tropical illnesses in older cruise ship passengers is determined in part by the cruise itinerary, but can largely be minimized with adequate preparation and precautions against such infectious and vector-borne illnesses.



South America

Yellow fever
Typhoid fever
Cholera
Hepatitis A
Malaria
Dengue fever
Altitude sickness



Health Canada website.⁷ Many cruise ships require mandatory vaccination of passengers, but the ultimate decision requires an assessment of the risk/benefit ratio based on the type of exposure, age and medical condition. Adverse effects to the vaccine are rare but can occur. Itinerary is also important as many countries require a valid certificate of vaccination from travellers who have transited through yellow fever "endemic zones". Countries have been known to detain and vaccinate travellers who do not have a valid certificate. In some cases a waiver may be given in lieu of vaccination.^{8,9}

Malaria

Malaria is caused by the *Plasmodium* parasite and transmitted by *Anopheles* mosquitoes throughout the tropical world. Of the four types of malaria, *P. falciparum* presents the most serious risk and is responsible for more than a million deaths worldwide annually. *Anopheles*

mosquitoes bite after sunset; therefore, cruise passengers may not require prophylaxis if they retire early to an air-conditioned room. However, it is important for a travel health professional who is familiar with current malaria distribution to review the itinerary carefully. These mosquitoes may fly kilometres from breeding sites, and it is possible for passengers to be bitten if they make evening excursions ashore or spend time at night outside on deck.

Choice of appropriate malaria prophylaxis requires knowledge about resistance patterns to chloroquine and mefloquine, and screening for medical conditions that may influence efficacy or potentiate side effects (Table). First-line drugs for chloroquine-sensitive zones are chloroquine or doxycycline. For chloroquine-resistant zones there are now three first-line drugs: mefloquine, doxycycline and atovaquone-proguanil (MalaroneTM). In mefloquine-resistant

zones (border areas of Thailand), doxycycline or atovaquone-proguanil are recommended.

Mefloquine is taken once weekly and is generally well tolerated by older people; however, it is contraindicated for patients with cardiac arrhythmias, seizures or any kind of mood disorder. Doxycycline, a daily medication, is known to cause reflux esophagitis. Atovaquone-proguanil, a newer and more expensive drug, is used daily and acts on the liver stage of plasmodia. Therefore, this medication can be discontinued seven days after leaving malaria zones, in contrast to the usual four weeks for other malaria prophylaxes. Primaquine is occasionally used for prophylaxis but can produce hemolysis in patients with glucose-6-phosphate dehydrogenase (G6PD) deficiency. All patients should be screened for G6PD deficiency before using this medication. Current CDC guidelines for malaria prophylaxis should be followed by health professionals who prescribe antimalarials. Canadian guidelines, available online, are prepared by the Committee to Advise on Tropical Medicine and Travel (CAT-MAT).¹⁰ The CDC also makes similar information available. Both these websites are excellent sources of general health information for travellers.

All passengers exposed to mosquito-borne illnesses should take precautions to prevent being bitten. These include use of 30% DEET on the skin, 0.3% permethrin spray on clothing and appropriate skin coverage. Passengers who develop fever during travel or on return from malarial areas should be instructed to seek immediate medical attention.

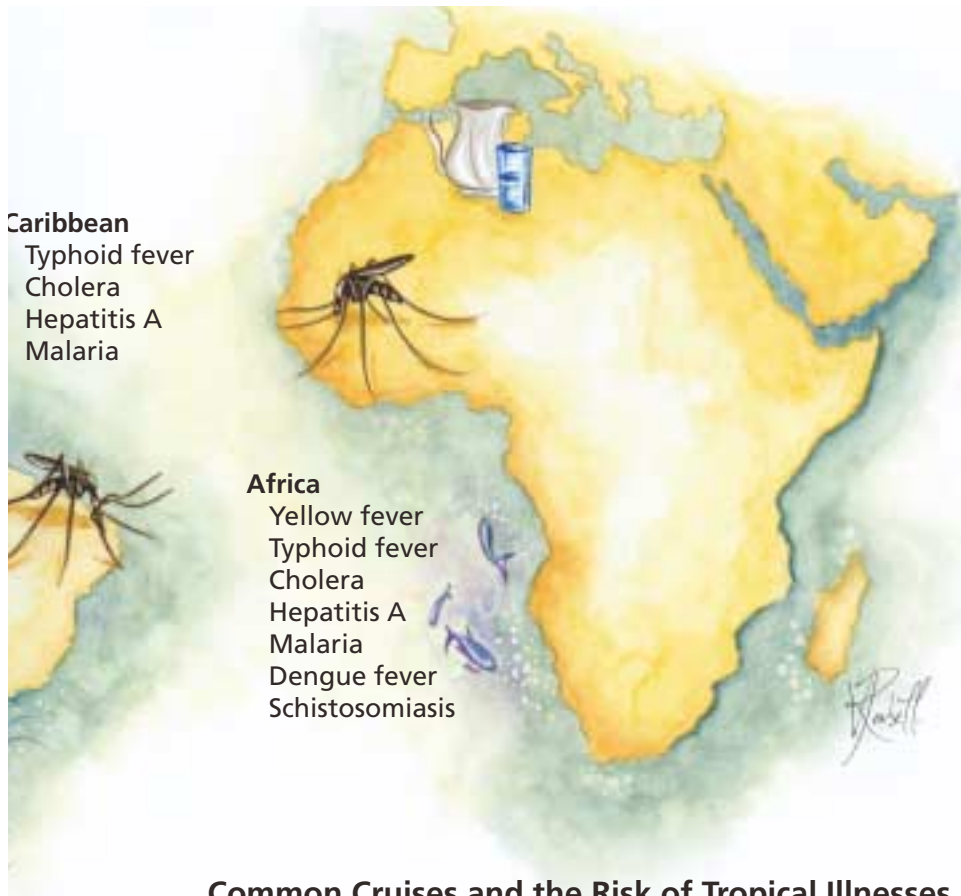
Conclusion

With the precautions described above, it should be possible for older people to benefit from the excitement of new environments and cultures while minimizing the risk of tropical illness. ♦

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Common Cruises and the Risk of Tropical Illnesses



Common Malaria Prophylaxis*

	Dosage	Instructions	Common Contraindications	Possible Adverse Effects
Chloroquine-sensitive areas[†]				
Chloroquine phosphate (Aralen)	-300mg base (500mg salt) weekly -Aralen comes in 250mg or 500mg (salt) tablets	Orally once/week beginning one week before entering malarious area and continuing for four weeks after leaving malarious area.		Pruritus, nausea, headache
Doxycycline	100mg, one capsule	Orally once daily beginning two days before entering malarious area and continuing for four weeks after leaving malarious area.	Myasthenia gravis	Reflux esophagitis, yeast vaginitis, photosensitivity
Chloroquine-resistant areas				
Mefloquine (Lariam)	250mg salt (228mg base), one tablet	Orally once/week beginning one week before entering malarious area and continuing for four weeks after leaving malarious area.	Mood disorders, seizures and cardiac conduction abnormalities	Insomnia, nausea, dizziness
Doxycycline	100mg, one capsule	Orally once daily beginning two days before entering malarious area and continuing for four weeks after leaving malarious area.	Children under eight years old	Reflux esophagitis, yeast vaginitis
Atovaquone-proguanil (Malarone)	atovaquone 250mg/proguanil 100mg, one tablet	Orally once daily beginning two days before entering malarious area and continuing for seven days after leaving malarious area.		Nausea, abdominal pain, headache, rash
Primaquine	30mg base orally/day -one tablet contains 15mg -take two tablets daily	Orally once daily beginning two days before entering malarious area and continuing for seven days after leaving malarious area.	G6PD deficiency—must test	Gastrointestinal upset
Mefloquine-resistant Areas May use doxycycline, atovaquone-proguanil or primaquine				
*Please note that this table is not comprehensive and physicians should familiarize themselves with these medications before prescribing. †Available from numerous sources, including the "Yellow Book", Health Information for International Travel, published by the U.S. Centers for Disease Control and Prevention every two years.				

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