



The older population continues to increase; these individuals generally have substantial leisure time and are in good mental and physical health. As a result, they take the opportunity to travel. To avoid unnecessary risks, trips should be carefully planned with regard to updating immunizations according to the destination. Some older individuals suffer from chronic diseases which, though not a contraindication to travel, should be considered. Their medication should be reviewed with regard to the climate; there may be a need for specific travel medication such as chemoprophylaxis of malaria. It may be necessary to seek the advice of different specialists related to the patient's medical problem. With careful planning, older adults shall remember only the pleasant moments of the trip.

**Key words:** immunization, travel, older adults, infectious disease, advice.

## Safe Foreign Travel for the Older Adult

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### Introduction

Older adults account for a significant percentage of global travelers. While many aging individuals enjoy good health, advanced age is accompanied by a global immune deficit, which increases the incidence of infectious diseases.

Older adults represent 11% of the population, a proportion that will reach 30% in 2020. This segment of the population has captured the interest of travel agencies as these individuals can book without regard for the constraints imposed by formal employment and school holidays. The primary care physician should be aware that travelling is a safe endeavour for older adults, given that some medical advice is followed.

### General Preparation

Advanced age alone is neither a limitation nor contraindication to foreign and overseas travel—indeed, international travel has all the more to recommend for it as the conveniences of modern travel can be very good.

For people over 65, a general check-up must be performed that obtains a complete medical history and is accompanied by physical examination. Moreover, specific travel advice is useful according to the patient's travel destination and the nature of the trip (Table 1).

To allow for investigation and treatment if necessary of pre-existing illness or even undiagnosed troubles, this check-up should be performed well in advance of the planned departure, according to the destination and previous immunizations. If the individual travels annually, vaccination update one week before departure may suffice. If several new

immunizations are needed, vaccination two months prior is recommended.

The primary care physician should note that there are some contraindications to air travel. These include acute coronary syndrome, congestive heart failure, pneumothorax, cardiac surgery, abdominal surgery, or middle ear surgery within three weeks of departure, and illness or cerebrovascular injury within two weeks of departure. Other troubles, such as respiratory tract infection or cardiac/digestive disturbances, must be treated and controlled before departure.

If an increase in physical activity is anticipated during travel, a special conditioning program, started several weeks before, can identify undiagnosed pathology (mostly cardiopulmonary or muscular strength). General guidelines are necessary for older travelers (Table 2).

### Health Insurance

Older individuals who experience chronic medical problems need to be very attentive to health insurance; obtaining coverage for air evacuation is advised. Moreover, in addition to trip cancellation insurance, it is wise to arrange extra days of coverage in case return is delayed. Travelers should verify the procedure for filing a claim with the necessary forms.

If a patient has a complicated medical problem with respect to insurance, and is planning to visit another country, s/he may wish to contact the medical referral service of the local embassy or consulate.

### Medications

Older adults frequently use commonly prescribed and over-the-counter

medication and sometimes medical supplies. If syringes and needles are needed, the traveler must carry an official document on the physician's letterhead that states this information. Medications should be distributed across different pieces of luggage (including hand luggage) in case of lost or stolen baggage. It is further recommended that the traveler carry the prescription along with medications, particularly those individuals taking several medications.

The practitioner should forewarn the traveler against acquiring medication that seems to be cheaper in some developing countries. There is a substantial market in counterfeit medication that is inefficacious and sometimes dangerous.

**Table 1:** Health Information for Overseas Travelers

#### Behaviour modifications

To avoid:

Tap water, chipped ice, unpasteurized milk and cheese, unpeeled fruit, raw vegetables, street vendor food, swimming in ponds, lakes, or rivers, walking bare foot in muddy soil, raw fish, rare or raw meat

#### Avoidable diseases

Traveler's diarrhea ("turista"), amoebiasis, giardiasis, shigellosis, salmonellosis, schistosomiasis, strongyloidiasis, ankylostomiasis, flukes trichinellosis, taeniasis, dengue, leishmaniasis, malaria, yellow fever

#### Recommended prophylactic items:

bednets  
DEET-containing insect repellents  
tick repellent  
chemoprophylaxis  
immunization

Depending on the traveler's situation, certain medications may be useful and should be sought out in advance of departure. Traveler's diarrhea occurs in up to 50% of travelers in tropical areas, carrying a risk of fluid and electrolyte imbalance. Severe dehydration requires prompt therapy with oral rehydration and fluoroquinolone derivatives if necessary (ciprofloxacin, norfloxacin). Some other treatments for diarrhea, however, may cause drug reactions. For instance, trimethoprim-sulfamethoxazole (used to treat bronchitis, middle ear infection, and urinary tract infection, in addition to traveler's diarrhea) potentiates oral hypoglycemics; quinolones prolong the half-life of theophylline; and antimotility drugs (i.e., loperamide) may cause constipation.<sup>1</sup> In older adults, constipation during a trip can be more frequently experienced than diarrhea because of changes in lifestyle, schedule, diet, and water consumption. Packing some laxatives may be useful.

#### During Travel

During travel by car, cruise ship, or sometimes by plane, motion sickness can occur but is experienced less frequently

by older adults than in those under 50. The patient can use physical methods to alleviate the effects (i.e., closing eyes, fixing the gaze on the horizon, lying down). The alternate option is to use certain drugs such as antihistamines and anticholinergic agents (scopolamine orally or transdermally) but older adults are at high risk of serious side effects from these medications. These include drowsiness, confusion, falls, urinary retention (mostly in older men with prostatic hypertrophy), glaucoma, and/or ileus.<sup>2</sup>

The incidence of medical emergencies among air travelers of all ages is low (1/10,000 passengers) and is often due to the stress of travel, the turbulence, or the barometric pressure changes. The most frequent emergencies are cardiac events, syncope, bronchospasm, and seizures. A basic medical kit is available on board each plane, and is enough to provide first aid in case of basic emergencies.

An increasing risk, particularly with long-haul flights (>6–8 hrs), is venous thrombo-embolic disease (also called "economy class syndrome"). The biggest risk factor in this case is obviously immobility, but other potentiating risk factors include a history of malignancy, recent

**Table 2:** General Advice to Offer the Older Traveler

Travel should be planned well ahead of time (2–3 months, depending on the needed immunizations).

A medical check-up is necessary before departure.

Investigating options for medical assistance and/or supplemental health insurance is important.

Travelers should bring medication sufficient to last the entire trip plus extra to provide for the event of travel delays or extensions (bring prescriptions).

The patient must carry a copy of a short medical history, with some pertinent medical records and documentation of current therapies (bearing generic names of medications and dosages).

The patient must carry his/her personal physician's contact information.

When using contact lenses, travelers should carry extra eyeglasses; pack additional batteries for hearing aids if necessary.

Older adults should acclimatize gradually to heat and saunas as they are more vulnerable to heat stroke than youth and middle-aged adults.

Older adults should avoid rapid ascents to high altitudes.

Figure 1:  
**Incidence and Immunization of Infectious Disease**  
*cause for awareness in the older adult*

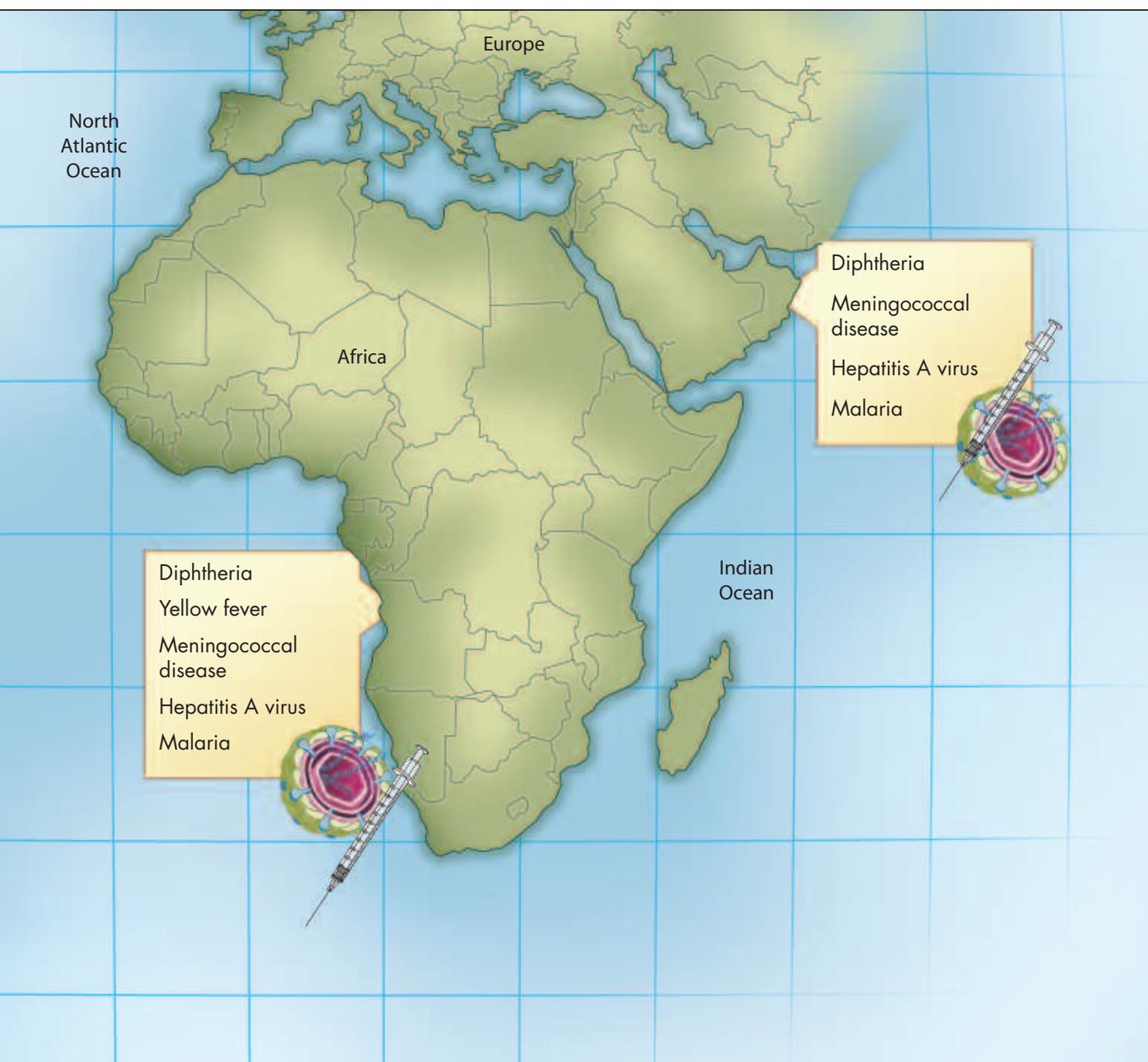


lower extremity trauma, recent major surgery, prolonged immobilization (prior to the flight), and personal or familial history of thrombophilia. Hydration and short “walks” are recommended countermeasures, along with compression stockings (as long as there is no peripheral vascular disease) in addition to acetylsalicylic acid and low molecular weight heparin if necessary and recommended by a physician.<sup>3</sup>

Jet lag, commonly experienced by

older adults during travel, provokes sleep disturbance and impaired overall function. A rest before the trip and good hydration may improve well-being independent of any remediable effect on jet lag. Benzodiazepines are not recommended in older adults because of the potentially severe side effects (including confusion and falls). The use of melatonin has produced conflicting results, and the long-term safety of this drug is unknown.

Driving a car may pose a greater risk of accident for some older adults due to slowed reaction times; specific difficulty may arise when driving on the left side on the road (if the traveler comes from a country in which one drives on the right side). Night vision and visual acuity may be compromised should the individual have cataract/glaucoma, and hearing in many older adults declines. Moreover, some drug therapies (i.e., antihista-



mines, antidepressants, antihypertensives) can influence driving capacity.

Acclimatization to hot climates is sometimes difficult for older individuals because of decreased perspiration and the dilatation of peripheral blood vessels. Appetite loss, nausea, vomiting, and fever contribute to dehydration. If travelers have diabetes mellitus, cardiovascular disease, or are overweight, susceptibility to heat is increased. Optimal acclimatization requires air condi-

tioning, shade, dark glasses, and cool showers, as well as minimal exposure to the sun (particularly in midafternoon). In cold climates, appropriate clothing is necessary, including protection for the head, hands, and feet.

### Immunization

Aging is accompanied by a global impairment of immunity, mostly cell-mediated immunity. The thymus is completely replaced by adipose tissue

at 50 years, and thymic hormones disappear at about 60 years. There is a decrease in the number of Th and Tc lymphocytes, of interleukin 2 (IL2) and correspondingly an increase of NK lymphocytes, of IL6 and of auto-antibodies. If the global number of lymphocytes is not disturbed, the number of T-lymphocytes is reduced as are their functions, mostly in cases of malnutrition. Inadequate nutrition is frequent among older adults. The B-lymphocytes are not dis-

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turbed, but IgG and IgA are increased (Table 3).<sup>4</sup>

After immunization, which should be given up to three months before travel, the primary response decreases while the secondary response is quite normal. Among older adults, immune stimulation after immunization tends to be slower and weaker than for healthy adults.<sup>5</sup>

Malnutrition, which depresses the immune system, is found in 1.5% of community-dwelling older adults, in 20% of hospitalized patients, and in 55% of patients in geriatric units/long-term care.<sup>4</sup> Malnutrition increases the deficit of cell-mediated immunity by decreasing the number of lymphocytes and their function. Such disturbances disappear once adequate nutrition levels are restored.

During the medical check-up, GPs should take the opportunity to update

**Table 3:** Immunoglobulins in Healthy Adults and in Nonagenarians (in 4).

Ig (in g/l)	Healthy adults	Older adults >90 years
IgA	2	30.7
IgG	12	15.7
IgM	1.3	1.2

Source: Adapted from Lesourd, 1990.<sup>4</sup>

common immunizations (diphtheria, tetanus, polio, pneumococcal infection, influenza)<sup>6</sup> and to administer new immunizations according to the travel destination (Table 4).<sup>7</sup>

Pneumococcal vaccine (23-valent—containing extracts from 23 of the most common types of *Streptococcus pneumoniae* bacteria) is recommended for adults 65 years of age and older regardless of whether or not they plan to travel, but vaccine efficacy is only around 60%.<sup>12</sup> A

booster is useful if the patient received the vaccine more than five years previously. Pneumonia is responsible for 20% of deaths among adults over 60.

Influenza is often associated with morbidity and mortality among aging adults.<sup>8</sup> The flu vaccine is recommended annually for all people over the age of 65 and induces antibody titers as low as 30%. Nevertheless, this immunization reduces mortality due to influenza by 80% under 60 years, by 50% in individuals between the ages of 60 and

**Table 4:** Different Immunizations Appropriate to Older Adults

Disease	Vaccine type	Efficacy	Booster needed at
Cholera	killed whole-cell B subunit	60–100%	2 years
Hepatitis A	formalin-inactivated viral antigen	95%	10 years
Hepatitis B	inactivated viral antigen	95%	only if antibodies anti-HBs titer < 10 mIU/ml
Influenza	inactivated viral vaccine	30–70%	annually
Japanese B encephalitis	inactivated viral vaccine	99%	3 years
Meningococcal	polysaccharide vaccine 2-valent A + C or 4-valent A + C + Y + W135	90%	3 years
Pneumococcus	polysaccharide	90%	3 years
Poliomyelitis	inactivated viral vaccine	99%	10 years
Rabies	inactivated viral vaccine	99%	3 years
Tetanus-diphtheria	combined toxoid	99%	10 years
Tick-borne encephalitis	inactivated viral vaccine	99%	3 years
Typhoid	polysaccharide vaccine	96%	2 years
Yellow fever	live attenuated viral vaccine	100%	10 years

70 years, by 31% for adults age 70 to 80 years, and by 11% after 80 years.<sup>9</sup>

### Specific Disease Entities and Corresponding Vaccines

Diphtheria cases are reported in Central Europe, and in Algeria, poliomyelitis and tetanus still occur in tropical areas. Seropositivity declines with age,<sup>10</sup> and a decennial booster dose (usually combined with diphtheria toxoid) is recommended.

Yellow fever occurs in South America (particularly the Amazon) and in sub-Saharan Africa (Figure 1). It is transmitted by mosquito bites (*Aedes*). There is a risk of serious and possibly fatal illness due to hepatitis, hemorrhages, and renal failure. A single dose of vaccine confers prolonged immunity of at least 10 years (the vaccine is an International Health Requirement). Mild local reactions are very seldom. According to some authors, the risk of systemic adverse events is 3.7% for people aged 65–74 years and 11.6% for those over 75 years of age.<sup>11</sup>

Meningococcal vaccine is recommended for travelers to areas with a high incidence of meningococcal disease (including Brazil and sub-Saharan Africa, which is known as the “meningitis belt” of the world). In these countries, immunization against meningococcal strains A+C is adequate. For pilgrimages to Mecca (Saudi Arabia), immunization by the quadrivalent vaccine A+C+Y+W135 is required, even for older adults. The duration of immunity is at least three years.

Typhoid fever is not uncommon in tropical areas, and a vaccine should be offered to everybody traveling to these areas—particularly to older adults, because the severity of illness increases with age. The polysaccharide vaccine is well-tolerated. The duration of immunity is at least three years.

The hepatitis A virus has a worldwide distribution. Contamination occurs by the fecal-oral route, usually by food or water contaminated with feces. Older travelers who have lived in endemic regions (i.e., in Africa or Asia) often have hepatitis A antibodies. Severity of illness

**Table 5:** Rate of Immune Response and Level of Antibodies after Hepatitis B Vaccination

Rate of response	Young Adults	Older Adults
After 2 injections	74%	26%
After 3 injections	95%	46%
<b>In Older Adults</b>	<b>60–70 years old</b>	<b>&gt;90 years old</b>
rate of response	69%	33%
Level of antibody (mIU/ml)	300	4

increases with age. Travelers to all tropical areas should receive the hepatitis A vaccine, which is well-tolerated. Seroconversion rates in older adults are 60–80%.

Hepatitis B has a prevalence of about 10% in tropical areas, mostly in sub-Saharan Africa. The risk of sexual transmission is low but accidental contact with blood is always possible (e.g., at the scene of a traffic accident). Therefore, vaccination is recommended. The response to the vaccine reaches only 50% in people age 60 and over, with a very low titer of antibodies in nonagenarians (Table 5).<sup>13</sup>

The risk of contracting rabies is low for most older travelers, and immunization is advised only for those planning stays in high-risk areas, such as India, Cameroon, or Guatemala (a full listing of high-risk areas can be found at [www.rabies.net](http://www.rabies.net)). Older adults respond adequately to immunization.<sup>14</sup>

Malaria prevention is essential for everybody traveling in endemic areas (Figure 2). Older adults must be very vigilant in their efforts against contracting

malaria because malaria may manifest more severely in this age group, and the rate of mortality increases with age. Protection against mosquitoes requires the use of bednets and as well as the use of DEET-containing topical repellents. Chemoprophylactic agents containing chloroquine, chloroquine-proguanil, or atovaquone-proguanil are necessary according to zones A, B or C (Table 6). The general adult population benefits from weekly-dosed mefloquine but as adverse events are frequent (digestive and neuropsychiatric disturbances) this drug is not recommended for use in older adults.

### On Return Home

When older adults residing in Europe or North America return home, a post-travel check-up is recommended within a period of one month that should aim to detect any subclinical illness incurred, even if there was no problem during travel. Of course, the history and physical examination must be

**Table 6:** Chemoprophylaxis of Malaria

Zone A (Haiti, Dominican Republic, Latin America): chloroquine: 100 mg daily <ul style="list-style-type: none"> <li>• Start the first day of travel and continue for four weeks after travel</li> </ul>
Zone B (West Africa, India): chloroquine-proguanil: one tablet daily. <ul style="list-style-type: none"> <li>• Start the first day of travel, and continue for four weeks after travel</li> </ul>
Zone C (Southeast Asia, the Amazon, West and Central Africa): chloroquine-proguanil or atovaquone-proguanil: one tablet daily. <ul style="list-style-type: none"> <li>• Start the first day of travel and continue for one week after travel, or one tablet (250 mg) of mefloquine weekly. Start one week before travel and continue for four weeks after travel.</li> </ul>

### Key Points

Advanced age alone is neither a limitation nor contraindication to foreign and overseas travel.

Older adults should plan their travel well in advance of departure to arrange for any needed vaccinations, as well as to acquire supplemental health insurance.

Additional medication, supplies, and current prescriptions should be carried; items should be distributed across stowed and carry-on luggage.

Prophylaxis for common travelers' ailments (i.e., diarrhea, constipation, motion sickness) should be obtained.

Immunizations according to destination should be given 1–3 months prior to travel; immune stimulation after immunization tends to be slower and weaker than for healthy adults.

Severity of many tropical illnesses generally increases with age.

A post-trip check-up is recommended within a period of one month for the traveler returning from abroad.

completed according to particular condition such as fever,<sup>15</sup> diarrhea, cutaneous lesions, or hypereosinophilic syndrome.

### Conclusion

Given the aging of the population as well as new lifestyle trends, the number of older travelers will likely increase. With adequate preparation and appropriately adapted advice, travel is beneficial to older adults' general physical and psychological health.

Careful advance planning and a medical check-up prior to departure are necessary to avoid encountering medical problems during the trip. Vaccinations are recommended according to the travel destination, and older adults should be informed of appropriate precautionary protocols for safety in tropical areas.



The author has no competing interests to declare.

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