

# Travel to Developing Countries

June 2002

## WHAT GENERAL HEALTH PRECAUTIONS SHOULD THE TRAVELER MAKE?

Travelers who plan to visit developing or tropical countries and those embarking on prolonged vacations or arduous treks should take a number of precautions.

### Medical Preparation

A visit to the doctor is very important in preparing for travel to a developing nation.

- Travelers to developing countries should have a thorough check-up and prepare for any health contingency at least eight, and ideally 10, weeks before the trip.
- They should obtain a brief summary of their medical histories to take with them, including the results of abnormal tests or EKGs and a list of drug allergies.
- They should also prepare a list of medications they normally use, noting all trade and generic names as well as dosages. In addition, the doctor should provide a letter authorizing any necessary medications; this precaution will facilitate customs and security checks.
- Contact lens wearers should consider taking ocular antibiotics if traveling to remote countries.
- Since doctors may have trouble keeping abreast of medical trends in foreign countries, travelers should investigate medical problems specific to the countries on their itinerary.

### Immunizations: General Guidelines

The following are some general guidelines for vaccinations and immunizations when traveling:

- Everyone should be up-to-date in any recommended vaccinations for childhood diseases, regardless of age. Booster shots may be required for travelers to developing countries even if they have completed the initial series. Vaccinations may include polio, H. influenzae, the series for diphtheria, pertussis, hepatitis B, rotavirus, measles, varicella-zoster or chicken pox, and tetanus (DPT). For children who have not completed the DPT series, parents should consider having it completed while overseas. Parents of children vaccinated in 1998 should check with their physicians; one lot of DPT distributed during that time had problems in potency and such children may need an additional dose. [ See Well-Connected Report #90, Immunizations.]
- Pregnant women should have vaccinations appropriate to the trimester. Not all vaccinations are appropriate during pregnancy.
- Older adults may either not respond to a vaccination as quickly as younger people or

they may have a higher risk for toxic effects. They should check with their physicians.

- Upper respiratory infections are very common after foreign travel. The influenza vaccine may be recommended when traveling to any country during flu season, particularly for the elderly and people at risk for serious illness. This group may also need the pneumococcal vaccine.
- Travelers to areas where there are tuberculosis (TB) outbreaks should have skin tests before traveling; those with negative tests should have a repeat test two to four months after return.
- Vaccination against hepatitis A is recommended for all travelers to developing countries. Some expert groups also believe that such travelers should have hepatitis B vaccinations as well, but the CDC does not generally recommend them except under certain circumstances at this time.
- Vaccines for many of the common bacteria that cause traveler's diarrhea may soon be available. [ See How Is Traveler's Diarrhea Prevented and Treated *below*. ]
- Some countries may require vaccinations against yellow fever, meningitis, typhoid, cholera, Japanese encephalitis, and rabies under certain circumstances. Some of these are covered in this report. [ See Tables, [Vector-Borne Diseases Encountered by Travelers](#) and [Nonvector-Borne Bacterial or Viral Infectious Diseases Encountered by Travelers](#). ]

In any case, travelers to developing countries should check with the Centers for Disease Control for up to date information on immunization requirements for their destinations. [ See Where Else Can Help for Travelers be Found? *Below*. ]

## First Aid Kits and Other Supplies

First aid supplies should include:

- Sunblock.
- Topical disinfectants.
- Bandage materials.
- Insect repellent.
- Thermometer.
- Any prescription drugs regularly taken.
- Antifungal foot powder.
- Hydrocortisone cream for rashes.
- Loperamide (Imodium).
- Pepto-Bismol for diarrhea.
- Nonprescription pain reliever. Note: Acetaminophen, the generic name for Tylenol, is

known as paracetamol outside America.

- Devices or supplies to purify or filter water [See How is Traveler's Diarrhea Prevented and Treated?]

## Insurance

Travelers should remember to check what coverage their health insurance company offers for policyholders abroad. Medicare does not provide coverage outside the United States but other insurers offer limited coverage overseas. Individual supplementary health insurance policies should cost no more than a few dollars a day for international travelers.

## HOW IS TRAVELER'S DIARRHEA PREVENTED AND TREATED?

Traveler's diarrhea (TD) is almost always caused from ingesting certain organisms in contaminated food. Diarrhea frequently occurs within the first week of travel but may develop at any point, including after returning home. TD causes four or five loose or watery stools per day. Vomiting may also occur. It usually lasts three or four days, but about 14% of cases last longer. In rare cases TD lasts more than three months. It is rarely life threatening.

## Risk by Country

Traveler's diarrhea typically affects between 20% and 50% of all international tourists, with the highest risk occurring in travelers to developing countries:

- High-risk destinations include most of the developing countries of Latin America, Africa, the Middle East, and Asia.
- Intermediate risk destinations include most of the Southern European countries and a few Caribbean islands.
- Low-risk destinations include Canada, Northern Europe, Australia, New Zealand, the United States, and a number of the Caribbean islands.

## Pathogens

A number of infectious agents, including bacteria, parasites, and viruses, can cause diarrhea in the traveler. Bacteria and viruses cause diarrhea within a few hours and up to three days, while diarrhea from parasites can occur seven to 14 days after exposures. In about 10% to 50% of cases, the cause of TD is unknown.

- The most common bacterial cause of traveler's diarrhea, between 20% and 50% of cases, is *Escherichia coli* (ETEC or *E. Coli*), known as an enterotoxigenic organism (one that is toxic to the intestines). It is found in soil, water, and milk. Diarrhea caused by *E. coli* is generally explosive, non-bloody, and accompanied by nausea, vomiting, cramps, and fever.
- *Shigella* is the bacterial cause of *dysentery*, affecting 15% of travelers. It is common in countries experiencing natural disasters, socioeconomic upheaval, or during other times

when sanitary food and water are difficult to procure. *Shigella* causes bloody and mucus-laden diarrhea along with fever, cramps, and exhaustion.

- *Giardia* is a parasite found in contaminated water in every country in the world. It can cause chronic diarrhea lasting for several weeks, causing vague pain, weight loss, excessive burping, bloating, and fatigue.
- *Entamoeba histolytica* is a parasite that is prevalent Mexico, India, Africa, and Central and South America. It produces small stools that contain blood and mucus. If the condition becomes chronic, it can resemble inflammatory bowel disease (IBD). It is important to distinguish the two, since corticosteroids used to treat IBD can have dangerous effects in people carrying the parasite.
- Additional culprits are other bacteria (*Salmonella*, *Campylobacter*), parasites (Cryptosporidiosis, *Cyclospora*, *Cryptosporidia*), and rotavirus, usually in Latin America.

## Water Precautions

The following methods or products help reduce exposure to contaminated water:

- Boiling water is the best method for eliminating infectious agents. There is some debate about how long to boil, but bringing the water to a good boil for at least a minute generally renders it safe to drink. Travelers might consider buying an electric heating coil to boil and purify tap water. Plug adapters and voltage converters may be required.
- Carbonated bottled water may be used for brushing teeth and drinking. Carbonation increases the acid in the water and kills bacteria. (Plain bottled water may not be safe, since it can be taken from contaminated sources. Even ice cubes can carry infection.)
- Iodine tablets (e.g., Polar Pure, Globaline, Potable-Aqua) purify water. Water may be purified by adding one iodine tablet to a quart of water 30 minutes before drinking it. Adding 50 mg of vitamin C will eliminate the iodine taste and color. Purifying is not effective against parasites such as *Cyclospora* and *Cryptosporidium*.
- Small portable water filters remove parasites and clear murky water without leaving the chemical taste. They are particularly beneficial for pregnant women and people who cannot take iodine. Filtering does not prevent viruses from passing through. When purchasing a filter, the phrase "EPA Registration" should be printed on the label, indicating that the Environmental Protection Agency has guaranteed its effectiveness.
- In all cases, do not swim in water that may be contaminated or contain dangerous infectious agents, such as parasites.

## Food Precautions

The old adage "If you can't cook it, boil it, or peel it, then forget it!" still applies, and could help prevent many common illnesses associated with international travel. Some important tips:

- Heated food should be hot to the touch and eaten promptly.
- Beware of sliced fruit that may have been washed in contaminated water.

- Don't buy food from street vendors.
- Travelers themselves should peel all fresh fruits and vegetables.
- Avoid dairy products.
- Avoid raw or undercooked meat and fish.

## Preventive Drugs

*Pepto-Bismol.* Taking two tablets of Pepto-Bismol four times a day before and during international travel can help prevent many cases of diarrhea. Pepto-Bismol should not be taken for more than three weeks. Bear in mind that both aspirin and Pepto-Bismol share the active ingredient salicylate, many medications interfere with salicylate, and people allergic to aspirin, pregnant women, and those who have ulcers, other bleeding disorders, or gout, should not take Pepto-Bismol without consulting a physician. Children under three and children and adolescents with flu or chicken pox should not take it. Side effects of Pepto-Bismol include ringing in the ears and black stools and tongue.

*Prophylactic Antibiotics.* Prophylactic antibiotic regimens are those that are used to prevent diarrhea while traveling. They are effective but there are many reasons that warrant against their routine use. Taking prophylactic antibiotics can trigger adverse drug reactions, development of superinfections, and can contribute to the widespread bacterial resistance to many antibiotics. Antibiotics are also not effective against parasites or viruses and may give travelers a sense of false security. Prophylactic antibiotics are therefore not recommended unless the traveler has an underlying medical condition or is taking a trip that would be utterly ruined by a change in schedule due to the brief illness. If antibiotics are warranted, ciprofloxacin is the standard preventive agent.

## Treatment for Diarrhea

*Fluid Replacement.* If diarrhea develops, prevention of dehydration is the most important first step. In severe cases, dehydration can be life threatening, particularly in children. Agitation may be an early symptom. Severe indications include listlessness and a weak pulse. Parents should seek medical help immediately if the child appears to be dehydrated.

- Fluid replacement must use solutions that contain the important minerals potassium, sodium, and calcium. The following are some suggestions:
- A recipe that is useful for fluid replacement calls for two glasses of fluid: the first containing 8 oz. of fruit juice, 1/2 tsp. of honey or corn syrup, and a pinch of salt; the second filled with 8 oz. of purified or carbonated water and 1/4 tsp. of baking soda. The traveler should drink alternately from each glass until the thirst is quenched.
- Parents with small children should bring commercial oral rehydration solutions (e.g., Pedialyte, Lytren, Gastrolyte, Ricelyte). Products containing rice flour work slightly faster than others. If the child finds the taste unpleasant, adding a half-teaspoon of Jell-O or Kool Aid to sweeten the solution does not appear to reduce its benefits.
- Adding a soluble fiber supplement and eating as soon as possible helps the intestine to absorb water and is beneficial for children and adults.

- Children with diarrhea should not drink apple juice, colas, or sports beverages, which do not contain the proper balance of salts and sugar.

*Helpful Foods.* Foods that help slow diarrhea include rice, wheat, potatoes, corn, and chicken. Contrary to popular advice, adding some milk (but not soymilk) to these foods may help many children. In fact, eating yogurt that contains active lactobacilli cultures may have positive benefits. Taking acidophilus powder, which contains these bacteria, may also be helpful. (It should be noted, however, that yogurt drinks in less developed countries carry a high risk for contamination.)

*Antimotility Agents.* Antimotility agents provide prompt but temporary symptomatic relief by reducing muscle spasms in the gastrointestinal tract. They include:

- loperamide (Imodium),
- diphenoxylate (Lomotil), and
- opiates (e.g., paregoric, tincture of opium, and codeine).

Antimotility agents should be discontinued if symptoms persist beyond 48 hours and should not be used at all under the following circumstances:

- In patients with high fever.
- If there is blood in the stool.
- In children under the age of two.

Note. Lomotil and Imodium are effective for treating diarrhea, but are not effective for prevention. Lomotil may even increase the risk for it.

*Antibiotics.* Antibiotics are generally effective for treating diarrhea that develops in an eight-hour period, with three or more loose stools, and especially if associated with nausea, vomiting, abdominal cramps, fever, or blood in the stools. Because antibiotics are prescription drugs, travelers at risk should obtain them before they depart and should receive directions for self-treatment while abroad. Antibiotics should not be used for nausea and vomiting when diarrhea is not present. Although self-treatment is generally safe, a doctor should be sought for any child with diarrhea and for adult patients who develop fever or bloody diarrhea.

In general, patients take one tablet every 12 hours for five days. Taking a single dose of an antibiotic such as ofloxacin (Floxin), plus an antimotility agent (usually Imodium), often provides relief within 24 hours for many patients. Other antibiotics used for diarrhea include ciprofloxacin (Cipro), norfloxacin (Noroxin), and azithromycin (Zithromax).

Parasites do not usually respond to standard antibiotics. Trimethoprim-sulfamethoxazole (Bactrim), for example, has fallen out of favor for routine use because of resistant bacteria, but it may be very effective against the severe diarrhea caused by the parasite *Cyclospora*. Metronidazole (Flagyl) is the standard agent for *Giardia*. Erythromycin and similar antibiotics may be useful for *Cryptosporidium* or *Campylobacter*. Nitazoxanide is another antibiotic showing promise for treating diarrhea caused by parasites.

Options for children include Bactrim (with erythromycin if *Campylobacter* is suspected) and azithromycin.

*Experimental Agents.* Racecadotril (Tiorfan), also called acetorphan, reduces water and electrolyte loss in the intestine. Studies report that the agent is safe and effective although it must be used in combination with rehydration solutions. In a comparison study with loperamide (Imodium), racecadotril was slightly less effective but caused less constipation and bloating. Racecadotril also seems to be safe in small children, while Imodium should not be used in this population. Racecadotril may not be effective against certain parasites, such as *Cryptosporidium*.

## WHAT INFECTIOUS DISEASES MIGHT CONCERN THE TRAVELER TO DEVELOPING COUNTRIES?

An estimated 15% to 45% of short-term travelers experience a health problem associated with their trip. And even more travelers to developing countries, including young adults, can expect to experience some health problem.

Virtually any place in the world can be reached within 36 hours, less than the incubation period for most infectious diseases. The ease with which people see the world has dramatically increased the number of foreign travelers. Respiratory infections, such as influenza and colds, develop in between 10% and 25% of travelers. Even worse, physicians in Western countries are now seeing infectious diseases never before encountered. Travelers are at risk both from infections transmitted from person to person and by insects (vector-borne diseases). Malaria, which is transmitted by mosquitoes, is the most widespread and infects between 300 to 500 million people world wide annually. Between 10,000 and 30,000 of these cases occur in travelers. Anyone traveling to high-risk countries should take precautions. [For specific information see [Tables Vector-Borne Diseases Encountered by Travelers](#) and [Nonvector-Borne Bacterial or Viral Infectious Diseases Encountered by Travelers.](#)]

### General Precautions against Vector-Borne Infections

Vector-borne diseases are infections transmitted by insects that harbor parasitic, viral, or bacterial agents. Common diseases include yellow fever and malaria, but there are many others in every country in the world [ see [Table Vector-Borne Diseases Encountered by Travelers](#), below].

The risk for malaria and other mosquito-borne infections is highest when mosquitoes feed, between dusk and dawn.

*Use of DEET.* Travelers should apply a good insect repellent. It should be noted, however, that this precaution alone does not significantly reduce the risk for vector-borne disease.

Most insect repellents contain the chemical DEET (N,N-diethyl-meta-toluamide) in concentrations ranging from 5% to almost 100%.

- Adults should use repellents containing a DEET concentration of up to 35%. A 10% solution lasts 12 hours. A 20% sustained-release DEET solution that lasts 24 hours is also available.
- DEET is safe for older children when used as directed, but it should be avoided or used with caution in children under age eight.

- Infants under 12 months should never use DEET. Other agents such as oil of citronella or Avon's Skin-so-Soft are available. They are not as effective as DEET, however, and parents should realize that their effects only last 20 minutes.

Overexposure to DEET at any age can produce toxic effects, including itching and rash and, in severe cases, irritability, insomnia, and confusion. When applying the following precautions should be taken:

- Do not overapply.
- Do not apply over any cuts, wounds, or irritated skin.
- Use only enough to cover and exposed skin (except on the hands of children and around the eyes and mouth in everyone) and cloth. Do not use under clothing.
- Wash any treated skin after come back inside.
- If using a spray, apply DEET outdoors.

*Use of Permethrin.* Permethrin is an insect repellents used as a spray for clothing and bed nets, which can repel insects for weeks when applied correctly. Electric vaporizing mats containing permethrin may be very helpful. A permethrin solution is also available for soaking items, but should never be applied to the skin. Side effects from direct exposure may include mild burning, stinging, itching, and rash, but in general, this agent is very safe and its use may even reduce child mortality rates from malaria. Travelers allergic to chrysanthemum flowers or who are allergic to head-lice scabicides should avoid using permethrin.

*Other Preventive Measures.* Other preventive measures include:

- Wearing trousers and long-sleeved shirts, particularly at dusk. One survey suggested that this measure may significantly reduce the incidence of mosquito-born disease.
- Sleeping only in screened areas.
- Air-conditioning may reduce mosquito infiltration. Where air-conditioning is not available, fans may be helpful. Mosquitoes appear to be reluctant to fly in windy air.
- Not wearing perfumes.
- Minimizing skin exposure after dusk.
- Washing hair at least twice a week.
- Smoke from burning certain plants, including ginger, beetlenut, and coconut husks, have reduced mosquito infiltration, but the irritating and toxic effects on the eyes and lungs may be considerable.

Of note, insect light traps (commonly called bug zappers), which attract and electrocute insects, may actually spread viruses and bacteria that are on the insects. They are also not very effective for killing female mosquitoes (the ones that transmit many viruses). And, unfortunately, they are effective at killing insects that help keep harmful insect pests in check.

*Reducing Mosquito Populations.* Certain methods have been used to reduce mosquito

populations with varying degrees of success:

- Currently, the only proven method for reducing mosquito populations is to eliminate sources of standing water, such as in discarded tires, cans, and bottles.
- Some attempts have been made to control mosquito populations with natural defenses, including building bat and bird houses to attract natural predators or growing certain insect-repelling plants, such as the citrosa plant. To date, there is no evidence of substantial benefit, but these methods are not harmful.

<b>Common Vector-Borne Diseases</b>			
<b>Disease</b>	<b>Countries of Infection</b>	<b>Severity and Symptoms</b>	<b>Treatment and Medical Prevention*</b>
<p><b>Malaria</b></p> <p>Parasite transmitted by anopheles mosquitoes</p>	<p>The world's number one infection. Found in every tropical or subtropical country in the world and in some parts of Eastern Europe. In one 2001 Australian study the risk for travelers was highest in the Pacific region and sub-Saharan Africa (1 in 50 to 1 in 1000), followed by the Indian subcontinent (1 in 1000 to 1 in 12,000); it was lowest in Southeast Asia and South America. (There is no risk in North America, Western Europe, New Zealand, or Australia.) Note: Pregnant women are at higher than average risk for malaria,</p>	<p>Initial symptoms are flu-like, also possibly nausea and vomiting. Yellowish skin. Without prompt treatment, can be fatal. Typically develops 10 days to a month following exposure. Symptoms can occur up to a year or more, however, even after careful preventive measures. People who have been in countries with malaria should report fever or other symptoms plus travel information to their physician</p>	<p><b>Treatment:</b> Immediate treatment is important:</p> <p>Chloroquine in areas where resistance to this drug is low, usually followed by primaquine.</p> <p>Quinine (usually in combination with clindamycin or tetracycline) in chloroquine-resistant regions.</p> <p>Atovaquone/ proguanil (Malarone) in chloroquine-resistant areas if it has not been used for prevention.</p> <p>Derivatives of artemisinin (qinghaosu), including artemether, a traditional Chinese plant remedy.</p> <p>A combination of artesunate and amodiaquine is a promising new regimen.</p>

particularly in the second trimester through the early postpartum period.

even months after they return.

All have significant side effects.

Emergency Self-Treatment: If no help is available for 24 hours, self treatment may be necessary:

Typically, single dose of three Fansidar (a combination of pyrimethamine and sulfadoxine) if symptoms develop while traveling, but only if medical care is not available.

Continuous use can cause severe and even life-threatening reactions. Not for people allergic to sulfa drugs.

Malarone may prove to be useful in these cases.

**Medical Prevention:** \* Chloroquine (Aralen). Standard preventive drug, Resistant parasites limiting use in many countries.

The following are agents used in countries with parasites resistant to chloroquine; Mefloquine (Lariam). Recommended in US although not in many European countries. Significant side effects, including some risk for serious mental effects.

Combination of atovaquone-proguanil (Malarone). Effective

			<p>and better tolerated than mefloquine.</p> <p>Doxycycline. Can cause photosensitivity. Should not be used by small children or pregnant women.</p> <p>Regimen of weekly chloroquine and daily proguanil (Paludrine). Available outside the US. Safe for pregnant women. Has significant side effects.</p> <p>Other agents, including tafenoquine and vaccines are under investigation.</p>
<p><b>Yellow Fever</b></p> <p>An arbovirus transmitted by mosquito.</p>	<p>Nearly all cases in African countries occur near the equator and in tropical parts of South America. Most cases in moist savanna areas of West and Central Africa in rainy season. Occasional outbreaks in cities and villages in Africa. Lesser extent in any jungle regions. Recent outbreaks in Brazil and Guinea.</p> <p>Yellow Fever rarely infects travelers, but travelers are advised to be vaccinated before traveling to problem areas.</p>	<p>Symptoms are usually mild and include headache, fatigue, fever, nausea, vomiting, and constipation. Body temperature usually returns to normal after seven to eight days. If disease goes unrecognized, sufferers may begin to bleed under the skin or from mucous membranes, or vomit material resembling coffee grounds. A further symptom of advanced yellow fever is jaundice (thus,</p>	<p><b>Treatment:</b> No exact treatment regimen for symptoms.</p> <p><b>Medical Prevention:</b> * Vaccinations required in African countries near the equator, in tropical parts of South America, and sometimes when outbreaks occur in other areas, or when travelers come from infected areas. Vaccine not usually safe or appropriate for pregnant women, infants, immunocompromised patients, or possibly for elderly people. Nevertheless, if the risk for yellow fever is significant, the vaccination may be warranted in these people.</p>

		the name, "yellow fever"). Fatal in 20% of patients who develop jaundice. People who recover are immune for life.	
*For lifestyle preventive measures, see section on General Precautions against Vector-Borne Infections			

<b>Less Common Vector-Borne Diseases</b>			
<b>Disease and Method of Transmission</b>	<b>Countries of Infection</b>	<b>Severity and Symptoms</b>	<b>Treatment and Medical Prevention*</b>
<b>African sleeping sickness (African Trypanosomiasis)</b>  Parasite transmitted by tsetse fly bite.	Rural Africa, between latitudes 15 degrees N and 20 degrees S.	Symptoms may include fever, chills, headache, fluid accumulation in hands and feet, sleepiness, lethargy, and convulsions.	<b>Treatment:</b> Pentamidine and suramin for early stages. Rimantadine under investigation. Melarsoprol and eflornithine for late stage. <b>Nifurtimox being tested.</b>  <b>Prevention:</b> Flies attracted to moving vehicles and dark, contrasting colors. Flies not affected by insect repellents.
<b>Chagas' disease (Ameri-can Trypanosomiasis)</b>  Parasite transmitted by infected Reduviid bugs	South and Central America	Symptoms range from acute to chronic and may include: swelling of the eye, fatigue, fever, rash, diarrhea, vomiting, and	<b>Treatment:</b> Nitrofurans (e.g., Nifurtimox) and similar agents for short-term activity. Benzimidazole for recurrence. A number of agents under investigation.

		swelling of internal organs to heart problems in chronic stage.	<b>Medical Prevention:</b> * Avoid buildings made of mud, adobe, and thatch, which can harbor the reduviid bug.
<b>Dengue Fever</b> Virus transmitted by mosquitoes	Can occur in any tropical or subtropical country. Greater risk in cities than in the country. A large dengue epidemic currently reported spreading across Asia and the Pacific, including Hawaii and Philippines. Large outbreak also has been reported in Brazil.	High fever, severe headache, muscle and joint pain, and sometimes vomiting and rash on trunk and upper arms. Disease ends abruptly after three to six days. Patients usually recover, but fatal hemorrhage, can occur and be fatal. Fortunately, this is rare and more likely in someone with a second infection.	<b>Treatment:</b> Treatments include blood transfusions, plenty of fluids, pain killers (aspirin, ibuprofen, or other so-called NSAIDs should not be used).  <b>Medical Prevention:</b> * Vaccine is under investigation.
<b>Encephalitis</b> A number of different viruses carried by mosqui-toes.	Worldwide risk although higher in some regions than others. Overseas, high-risk areas include China and Korea, India, Southeast Asia. Low frequency in Japan, Taiwan, Singapore, Hong Kong,	Severity depends on the virus. Can be mild to life threatening, and can include headache, neck stiffness, confusion, irritability fever, weakness, dizziness, tremors, seizures, and	<b>Treatment:</b> Symptomatic Treatment only.  <b>Medical Prevention:</b> * The vaccine (Je-Vax) for Japanese encephalitis is recommended only if travelers are visiting rural areas in high-risk Asian countries for more than 30 days.

	and eastern Russia.	paralysis. Serious symptoms include lethargy, delirium, coma, and even death.	
<p><b>Leishmaniasis</b></p> <p>Parasitic disease transmit-ted sand fly.</p>	Central America, South America, Asia, and the Middle East.	Skin sores and mouth and nose ulcers, sometimes disfiguring. Organ infection can involve spleen, liver, and bone marrow.	<p><b>Treatment:</b> Antimony-containing drugs (meglumine antimonate) for organ infection; also pentamide, amphotericin B. Fluconazole effective for skin sores.</p> <p><b>Medical Prevention:</b>* No vaccines.</p>
<p><b>Plague</b></p> <p>Bacteria carried by rodents and transmit-ted by fleas.</p>	Most plagues are transmitted by handling infected animals. An exception is the Indian pneumonic plague, which can be passed in the air, although the risk of picking it up is very low. Human plague reported in recent years in Africa, South East Asia, parts of South American and the US. Recently been reported in India, Vietnam and Zambia.	Swollen and tender lymph nodes, fever, chills, headache, malaise, prostration, and gastrointestinal symptoms. Can be fatal without treatment.	<p><b>Treatment:</b> Antibiotics.</p> <p><b>Medical Prevention:</b> * Travelers should wear insect repellents and avoid handling any animals. Adults traveling to countries with plague outbreak may consider taking preventive antibiotics like tetracycline or doxycycline. Children may take sulfonamides. Vaccine under investigation.</p>

	Risk generally in rural mountainous areas. Risk to travelers is very small.		
<b>Schistosomiasis</b> <i>Schistosoma</i> parasite lives off a specific snail, in fresh water contaminated with feces.	Lake swimming in sub-Sahara Africa is a particular hazard for schistosomiasis in travelers. Other countries: Brazil, Puerto Rico, St. Lucia (an island in the West Indies), Egypt, the sub-Saharan part of Africa, Southern China, the Philippines, and Southeast Asia.	Causes fever, flu-like symptom, rash. Respiratory symptoms.  Can be mild, but also can damage liver, kidneys bladder, intestines, or central nervous system.	<b>Treatment:</b> The current treatment is praziquantel (Biltricide). Reports of resistance to this agent have raised concern.  <b>Medical Prevention:</b> * Do not swim or wade in fresh water and avoid contact with animals. Vaccine under investigation.
*For lifestyle preventive measures, see section on General Precautions against Vector-Borne Infections			

<b>Nonvector-Borne Bacterial or Viral Infectious Diseases Encountered by Travelers</b>			
<b>Disease</b>	<b>Countries of Infection</b>	<b>Severity and Symptoms</b>	<b>Treatment and Prevention</b>
<b>Cholera</b> Bacterial infection transmitted in contaminated water or food	Outbreaks occur in developing countries with poor sanitation. More common in warm	Usually mild diarrhea and vomiting lasting one to three days. In severe cases, profound dehydration	<b>Treatment:</b> Tetracycline usually effective within 48 hours. Consume as much purified water as possible.  <b>Prevention:</b> Vaccine available, but effective only about 50% of the time. If

	<p>months. Specific outbreaks in 2002 have been reported in Somalia, Malawi, and Republic of Congo. Other recent outbreaks reported in South America.</p>	<p>can be fatal.</p>	<p>given with yellow fever vaccine should be administered at least three weeks apart. Investigative vaccine (Peru-15) is promising.</p> <p>[For lifestyle preventive measures see Traveler's Diarrhea above].</p>
<p><b>Typhoid Fever and Parathyroid Fever (Enteric Fever)</b></p> <p>Bacterial infection (salmonella typhi) in contaminated water or food. Can be spread by flies.</p>	<p>Can occur in any region where food or water is contaminated. Outbreaks common after natural disasters in poor countries. Tends to occur in urban areas. Common in India, Pakistan, and neighboring regions, North and West Africa (except Tunisia), and Peru.</p>	<p>The first symptoms include flu-like symptoms and classic "stepladder" low-grade fever that increases every day for a week or more. Temperature highest in the evenings. Possible pink rash across the abdomen which fades.</p> <p>In the second stage, fever stabilizes. "Pea soup" diarrhea or constipation can develop. Untreated, disease can last up to four weeks and is fatal in 10% of such cases. Death is rare in travelers.</p>	<p><b>Treatment:</b> Antibiotics essential and can cure the disease. Ciprofloxacin is antibiotic of choice. Fluid replacement and nutrition maintenance is critical. [See Traveler's Diarrhea above.]</p> <p><b>Prevention:</b> Vaccinations recommended for travelers to high-risk countries staying for more than four weeks.</p> <p>Oral vaccines include: (Ty21a, Vivotif). The oral vaccines are not effective against parathyroid fever.</p> <p>One-shot vaccine (Typhim Vi). Can be taken as early as two weeks before travel. Vi-rEPA is a newer injected vaccine that is safe in children and may be more effective than other vaccines to date.</p> <p>No vaccine is 100% effective, and the response tends to be lower in older people.</p> <p>Anyone exposed should keep hands very clean and avoid preparing food for others.</p>

			<p>Patients who have contracted typhoid fever may still carry it when they return, even if their symptoms have been relieved. They should continue to take strict precautions against passing it on until a physician has determined that the bacteria have been eliminated. They should abstain from sexual contact until they finish a full course of antibiotics, about two to three weeks.</p>
<p><b>Hepatitis A</b> Viral infection transmitted in contaminated water or food</p>	<p>Worldwide. Highest risk in developing nations, particularly where cholera and typhoid are prevalent.</p>	<p>Nausea and vomiting, decreased appetite, itching, extreme fatigue, jaundice, fever, and abdominal pain. Serious complications are rare, but recovery may take months.</p>	<p><b>Treatment:</b> No specific treatment for acute hepatitis. Stop all medications except as approved by physician. Abstain from alcohol and sexual contact. Avoid dehydration and becoming over tired. Keep own eating and cooking utensils separate from others.</p> <p><b>Prevention:</b> Two vaccines are available as well as combination vaccine for hepatitis A and B. Vaccination recommended for travel to any nation where risk is intermediate or high. Immunity from vaccine may develop more slowly in elderly people. CDC recommends vaccination four weeks before travel.</p> <p>Immune globulin used for children under two years.</p> <p>[For lifestyle preventive Measures see Traveler's Diarrhea above.]</p>
<p><b>Hepatitis B</b> Viral infection</p>	<p>Common in Southeast Asia, Africa,</p>	<p>Flu-like mild symptoms. Sometimes</p>	<p><b>Treatment:</b> Treatment of symptoms for acute hepatitis B. [For treatment</p>

<p>transmitted through contaminated blood. Can be passed from cuts, scrapes, and other breaks in the skin.</p>	<p>the Middle East, islands of the South and Western Pacific, the Amazon region of South America, and the Mediterranean.</p>	<p>rash, aching in joints. Symptoms usually appear four to 24 weeks but can also occur long after the initial infection. Often no symptoms, but even patients with symptoms can remain chronically infected with the virus.</p>	<p>of chronic hepatitis B see Well-Connected Report #59, Hepatitis.]</p> <p><b>Prevention:</b> Several vaccines are now available, including a combination vaccine (Twinrix) both hepatitis A and B. Vaccination recommended for all children and travelers to developing countries.</p>
<p><b>Poliomyelitis (Polio)</b></p> <p>Viral infection transmitted in contaminated water or food</p>	<p>Most developing countries in Africa, Asia, Latin American, the Middle East, India and neighboring regions, and most of the new independent countries of the former Soviet Union, including Albania. In 2001, cases reported Haiti, and the Dominican Republic.</p>	<p>Symptoms in small children can be mild and flu-like. More likely to be serious in older children and adults. In such cases symptoms include severe fever, headache, stiff neck and back, deep muscle pain, or odd sensations. Can lead to paralysis, sometimes only in certain muscles. Can be fatal.</p>	<p><b>Treatment:</b> Treatments are available only for symptoms.</p> <p><b>Prevention:</b> Universal immunization with vaccine required. Booster needed for adults traveling to developing country. Inactivated polio vaccine (eIPV) preferred. Travelers not previously immunized should receive three doses of injectable vaccine at intervals of one to three months. If departure is imminent, travelers should have a single dose at home and booster shots at appropriate intervals abroad.</p>
<p><b>Meningococcal Disease</b></p> <p>Bacterial infection in the fluid and membranes covering the</p>	<p>The so-called meningitis belt (countries extending across sub-Saharan Africa from Nigeria to Somalia).</p>	<p>Fever, chills, headache, stiff neck, rash caused by bleeding into the skin, and vomiting. Can also cause</p>	<p><b>Treatment:</b> Antibiotics. Early administration is life saving.</p> <p><b>Prevention:</b> Vaccines for travelers in the meningitis belt.</p>

<p>brain and spinal cord. It is spread through coughs, sneezes.</p>	<p>Outbreaks in the belt have been reported in 2002.</p>	<p>pneumonia. It is particularly dangerous for children.</p>	
<p><b>Leptospirosis</b>  Bacteria excreted in the urine of animals</p>	<p>Contracted from swimming or bathing in fresh contaminated water. Travelers who engage in water sports, such as rafting, are at higher risk. Tropical and subtropical countries pose highest risk.</p>	<p>Flu-like symptoms, diarrhea, and eye inflammation. In severe cases, it can cause internal bleeding and liver and kidney damage.</p>	<p><b>Treatment:</b> Antibiotics (as early as possible).  <b>Prevention:</b> Avoid water activities where leptospirosis occurs.</p>
<p><b>Tuberculosis</b>  Bacterial infection spread through air, typically from long-term exposure to infected person. Also has been passed in unpasteurized milk.</p>	<p>A few reports of TB in airline passengers exposed to TB during long flight. High rates of TB are found in Mexico, China, Hong Kong, Taiwan, Central America, Philippines, Vietnam, India, Haiti, and South Korea.</p>	<p>Coughing, weight loss, fever, night sweats.</p>	<p><b>Treatment:</b> Isoniazid or two months of rifampin plus pyrazinamide.  <b>Prevention:</b> BCG vaccine available for children in developing countries. Not routinely used for travelers. Consider screening children who return from developing countries.</p>
<p><b>Rabies</b>  Viral infection. Virus passes from exposure to saliva from an infected animal (even</p>	<p>Worldwide except Antarctica (some specific countries are rabies free).</p>	<p>Disease is nearly always fatal once symptoms develop.</p>	<p><b>Treatment:</b> Supportive treatments only.  <b>Prevention:</b> Vaccine for travelers who intend to work with animals or spend time in rural areas for more than a month in</p>

from licking).  
Dogs are main carriers but all mammals susceptible.

countries where the rabies virus is endemic. Immunization does not eliminate the need for treatment after exposure to the virus, but it does shorten the course of the disease.

### **Mad Cow and Foot and Mouth Diseases**

Much confusion has arisen over Mad Cow Disease and Foot and Mouth Disease, which are animal diseases that have occurred mostly in the United Kingdom over the past few years. They are entirely different problems and in both cases, serious health risk to the traveler is nearly zero.

*Foot and Mouth Disease.* This is a viral disease that affects cloven-footed animals (such as cows and sheep, not horses). It is a mild condition in animals but is a very serious economic concern for farmers. If humans catch it, symptoms are mild and flu-like. No treatments are necessary. Restrictions imposed in countries where there are outbreaks are to prevent transmission to animals from people carrying the infection on clothing and shoes.

*Mad Cow Disease.* Mad Cow Disease, medically known as bovine spongiform encephalopathy (BSE) is a rare degenerative brain disease in cows (not people). Nearly all of these cases have been reported in the UK although some animals have been infected in other parts of Europe. The infectious agent that causes BSE also causes a degenerative brain disease in people called new variant Creutzfeldt-Jakob disease (nvCJD). This disease develops over years and causes deterioration in the central nervous systems and death. The agent that causes it is not known and the disease is rare even in animals (100 cases per 1 million cows). Although, because of the long period of incubation, experts do not fully know how many people might be infected, the disease is not easily transmitted. Only about 100 cases of known or suspected nvCJD have been reported in the UK since 1996 and experts estimated that the final total will reach less than 600. The risk even in the UK is about one case of nvCJD per 10 *billion* servings of beef products and it is almost zero in other countries that have reported BSE. Solid muscle meat and milk and milk products are not believed to pose any risk.

**WHAT PRECAUTIONS ARE HELPFUL FOR SPECIFIC TRAVEL SITUATIONS?**

## **Motion Sickness**

Motion sickness results from a mismatch between what the eyes are seeing (e.g., a stationary book) and the message being relayed to the brain by the inner ear on the position of the body (e.g., it is bouncing up and down as the car moves forward). More women than men experience motion sickness. Women appear to be at higher risk just before and during menstruation. Motion sickness may also trigger migraines, even in people who do not ordinarily have them. Alcohol intake increases the risk of vomiting. The following are some remedies tried for motion sickness:

*Medications.* Prescribed medications include a scopolamine patch (Transderm Scop), which is worn behind the ear and releases the drug slowly. Scopolamine can cause heart disturbances. Over-the-counter medications include Dramamine, Bonine, and Marezine. All of these medications cause drowsiness, mouth dryness, and blurred vision. Oral medications should be taken an hour before traveling to be effective.

*Nonmedicinal Treatments.* Nonmedicinal or alternative remedies are widely used, but are of unproven benefit. Some are even silly, but travelers who experience motion sickness may wish to try anything that isn't harmful. They include the following:

- Ginger root capsules.
- Acupressure wrist bands. Such wristbands exert pressure on the so-called nausea-relief point. One wristband (ReliefBand) uses batteries that create a small electric charge at the acupuncture point that purportedly relieves nausea from motion sickness. Small studies have been positive, although the device may cause a rash. People with pacemakers should not use it.
- Cold packs. In one study apply cold packs to the forehead reduced stomach activity motion sickness.
- Eating small meals. (Protein meals may be more effective in controlling stomach activity than carbohydrates.)
- Self-Pressure. Travelers can also try pressing on the nausea-relief point, located two finger widths below the crease of the wrist on the palm-up side and between the two major tendons leading to the hand.
- Head-in-a-Box. One expert suggested an exercise for nausea where the traveler imagines his or her head in a box. Then, he or she moves the head backward and forward 20 times against the imaginary sides of the box, slowly at first, then increasing in speed. Next, the head is moved side to side 20 times. The traveler should start out with eyes open and then close them as symptoms improve. This exercise is repeated five to 10 times a day.
- Other common recommendations include focusing on the horizon (not on nearby areas) and avoiding strong odors.

## **Issues Involving Air Travel**

*Effects on Circulation.* Traveling by car, airplane, or train for more than four hours increases the risk for blood clots in the legs in anyone. In order to keep circulation moving during international flights or on trains, travelers should drink plenty of fluids, avoid salt, wear

slippers, take frequent walks in the aisles, and lift their legs up and down several times an hour. [For more detailed information for patients with specific heart and lung problems, see *How Should Travelers with Special Health Problems Protect Themselves?*]

*Respiratory Infections.* Flight cabins have very low humidity, which not only increases the risk for dehydration and dry eyes, but it also increases the risk for triggering disease in the airways. Fliers with colds or allergies are especially susceptible. The first rule is to drink plenty of liquids. Taking a decongestant tablet or nasal spray (not one containing an antihistamine) 30 minutes before flight can help prevent sinus and ear infections.

Of greater concern are studies suggesting that the prolonged time (eight hours or more) spent in the confined space of an airplane plus the close proximity to co-passengers from the entire world may facilitate the spread of serious contagious diseases. The CDC and World Health Organizations now have guidelines on when and how to determine the need for preventive treatments after possible exposure to infectious agents.

*Preventing Jet Lag.* Crossing time zones can throw off the body's natural rhythms, especially when travelers fly from west to east. But jet lag can be minimized. A few days before long flights, adjust sleeping and eating patterns:

- When traveling west, travelers might avoid outdoor light after 6 PM.
- If traveling east, travelers might begin going to bed earlier a few days before the trip and avoid outdoor light until 10 AM.
- If possible, flights should be completed well ahead of an important event requiring concentration.
- If crossing multiple time zones, the traveler should schedule overnight stopovers.
- The traveler should drink plenty of fluids, but avoid alcohol and coffee, which increase fluid loss.
- Melatonin, a natural hormone associated with light changes, may help people recover from jet lag. Some people report good results by taking it on the day of departure a half hour before the expected sleeping time in the arrival city.

## **Cruise Ships**

Reports of illnesses aboard cruise ships have alarmed many travelers. In one case in 1994, a third of passengers became ill on a ship that received high scores on both annual inspections. Cruise ships are inspected twice a year and are then rated. At this time these ratings are the only guide for a healthy cruise. The Center for Disease Controls provides ratings to the public for all ships sailing from US ports [ see *Where Else Can Help for the Traveler Be Found?*, below].

A sanitation program conducted by the US Public Health Service should significantly cut the risk for gastrointestinal problems from contaminated food on board ships. Meanwhile, cruise-ship travelers should avoid eating eggs and shellfish to help protect against diarrhea.

Aside from sanitation, health problems are common on cruise ships. A study of one major cruise ship reported that nearly 30% of the passengers were treated for skin disorders and 26% for respiratory problems while on board. Flu outbreaks sometimes occur even in summer. Older people who have not been immunized the previous flu season should ask their

physician about flu vaccinations. They add no value for people who had been previously immunized.

## Preventing Skin Disorders

An estimated 3% to 10% of travelers experience some skin problem related to their trip, particularly when traveling to tropical and subtropical areas.

*Preventing Sunburn.* Everyone should avoid episodes of excessive sun exposure, particularly during the hours of 10 AM to 4 PM, when sunlight pours down 80% of its daily dose of damaging ultraviolet radiation. Reflective surfaces like water, sand, concrete, and white-painted areas should be avoided. Clouds and haze are not protective. High altitudes increase the risk for burning in shorter time compared to sea level and lower altitudes. Sunscreens and sunblocks used generously are important, but they should not be relied on for complete protection. Wearing sun-protective clothing is equally important and protects even better than sunscreens. Everyone, including children, should wear hats with wide brims [ see Well-Connected Report #20, Skin: Aging Disorders].

*Preventing Other Skin Disorders.* Overexposure to the sun is the most common problem, but other skin disorders may also develop.

- Berloque dermatitis, a temporary condition, resembles sunburn, but is caused by exposure to ultraviolet light and chemicals in certain tropical fruits. Topical steroids relieve discomfort.
- Botfly eggs implanted into the skin by mosquitoes cause cutaneous myiasis. The affected area is a small hole that becomes prickly and swollen.
- Hikers are at increased risk for insect bites from ants, spiders, or fleas, which can cause itching, burning, and red bumps.
- A number of fungal infections can occur in warm and damp climates, such as sporotrichosis (causes ulcerated areas and nodules), tinea nigra (causes the palms and soles to darken), and piedra (causes stony bumps on the hair shaft).
- Creeping eruption is a particularly unpleasant skin disorder caused by larvae from dog and cat feces deposited on beaches. The larvae cause red, fluid-filled bumps that create a continuous track as they move under the skin. Creeping eruption is treated with oral medications.

## Precautions when Traveling to High Altitudes

Acute high altitude illness, or mountain sickness, can effect the brain (mountain sickness, cerebral edema) or the lungs (pulmonary edema) or both. Studies suggest that about one-quarter of climbers experienced symptoms at 7,000 to 9,000 feet and 42% of them have symptoms at 10,000 feet. In most cases the condition is mild. Severe lack of oxygen at high altitudes, however, can cause serious problems in some people.

- *Acute Mountain Sickness.* This syndrome is defined as headache and at least one other relevant symptom when a person climbs to about 8,000 feet. Other symptoms include upset stomach, dizziness, weakness, fatigue, and difficulty sleeping. It typically develops between six and 10 hours after ascent but some people experience them as early as an

hour after a climb.

- *High Altitude Cerebral Edema (HACE)* . HACE is a life-threatening brain swelling and the severe endpoint of acute mountain sickness. Symptoms include altered consciousness and loss of coordination. In extreme cases, it can lead to coma and death.
- *High Altitude Pulmonary Edema (HAPE)* . HAPE is fluid in the lungs that in rare cases can be severe. In one study, about 75% of mountain climbers who went to 15,000 feet had some mild form of HAPE. Worse performance and a dry cough suggests the onset of HAPE. In extreme causes it can cause severe lung deterioration. (If it is going to develop at all, HAPE usually occurs in the first two days and rarely after four days at a given altitude.)

Luckily, symptoms of the more severe complications come on slowly, are easily recognized, and resolve when returning to a lower altitude.

*Risk Factors for High Altitude Sickness.* The risk for high altitude sickness is determined by certain characteristics: the rate at which a person ascends; the altitude reached; altitude during sleep; and individual physiology. People who live yearlong at low altitudes are much more likely to be ill at greater heights.

Being physically stronger is *not* protective. And certain common conditions (heart disease, diabetes, hypertension, mild emphysema, and pregnancy) play no role in a person's risk for high altitude sickness. (Upper respiratory infections, however, do increase the risk for HAPE.)

*Precautions against Mountain Sickness.* A reassuring study found that older people, even those with heart disease, can usually exercise safely at higher altitudes. They are advised, however, to take it easy for a few days at higher levels until they can adjust to the altitude. Those taking medication to combat hypertension should consult a physician about increasing dosage if traveling to high altitudes. And anyone with a chronic medical condition should check with his or her doctor.

The following are some measures for preventing mountain sickness.

- As a rule, ascend no more than 1,000 feet per day at altitudes of 8,000 feet and above. Drink six to eight glasses of water or juice a day and avoid alcohol.
- Stop climbing when experiencing any symptoms of acute mountain sickness. Descend if symptoms worsen. Also descend immediately if there are any symptoms of HACE or HAPE.
- Supplementary oxygen may be required for people who show signs of these conditions.
- People who are hiking to very high altitudes may consider an inflatable chamber (Gamow bag and others). Such devices enclose a person, and when pumped up they simulate air pressure found at low altitudes.

*Medications Preventing and Managing Mountain Sickness.* Some medications are available for prevention or treatment of acute mountain sickness.

- Ibuprofen (Advil) may be sufficient to manage headache associated with acute mountain sickness.

- Acetazolamide (Ak-Zol, Diamox) taken one day before, and continued during initial exposure to high altitude, can reduce symptoms of acute mountain sickness, improve exercise performance and sleep, and reduce muscle and body fat loss. It may be used to treat minor symptoms of acute mountain sickness, but if symptoms persist, the trekker should descend.
- Dexamethasone (Decadron Phosphate, Dexasone, Hexadrol Phosphate) is used to treat acute mountain sickness and cerebral edema (HACE). Dexamethasone is not recommended for prevention, however, because of potentially dangerous side effects.
- Nifedipine (Adalat) is used to treat pulmonary edema (HAPE) and may be used for prevention in people who know they are at high risk for HAPE.
- One study suggested that solmeterol (Serevent), an inhaled asthma drug known as a beta-adrenergic agonist, reduced the risk for HAPE by over 50%.

## **Precautions for Divers**

Travelers planning to descend rather than ascend must also take precautions. Individuals with the following conditions should not scuba dive:

- Heart and lung problems.
- Bleeding disorders.
- Chronic ear infections.
- Insulin-dependent diabetes.
- Pregnancy.
- History of seizures.
- History of migraine headaches. Diving, in fact, is becoming known as a cause of many types of headaches, and anyone with a history of chronic or frequent headaches should discuss these issues with a health professional familiar with this sport.

*Avoiding Air Embolism.* Air embolisms are bubbles that obstruct blood vessels and can occur in divers who hold their breath while swimming up to the surface. They can be life threatening and cause long-term neurologic impairment, including memory lapses, impaired thinking, and emotional disorders. Even tiny bubbles may do some harm over time. One study found that in amateur divers who dive frequently, tiny bubbles appeared to increase the risk for small brain lesions and degenerating spinal disks.

To eliminate these bubbles, experts advise the following:

- Ascending no faster than 30 feet per minute.
- Remain 15 feet below the surface for three to five minutes before surfacing.

Those who do scuba dive should avoid air travel for 24 hours after diving.

*Drowning.* The other major cause of scuba diving deaths is drowning in underwater caves due to improper training and poor equipment.

## **HOW SHOULD TRAVELERS WITH SPECIAL HEALTH PROBLEMS PROTECT THEMSELVES?**

### **Diabetes**

Diabetics who do not require insulin injections do very well during international travel provided they monitor diet and exercise. Insulin-dependent patients should remember that if they are traveling eastward the first day is shortened, and they will need less insulin. Westward travel means a longer day, thus will require additional insulin. Of note, patients who travel by aircraft and need to carry syringes or needles now require medical documents.

### **Heart and Lung Diseases**

Those with any serious medical conditions should check with their physician before travel. Of note, cabin pressure in aircraft is also typically equal to about 5,000 to 8,000 feet above sea level. This can produce a 4% reduction of oxygen in the blood, which can affect patients with heart or lung problems.

*Recommendations for Patients with Heart Risks.* One study reported that over half the deaths that occurred in overseas travelers were due to heart disease. Generally, the following recommendations may be useful for travelers with a history of heart disease. Individual conditions vary, however, and any patient with heart disease, particularly a history of heart attack should check with a physician before traveling.

- If a traveler has had an uncomplicated heart attack, he or she should wait four to six weeks before traveling. A two-week wait is recommended after uncomplicated bypass surgery. There are no restrictions after angioplasty, assuming the patient does not experience chest pain.
- Implanted pacemakers and cardiac defibrillators can trigger metal detectors, so patients should have a card proving they have an implanted device and ask to be hand checked. Pacemaker patients should also carry an EKG taken with and without pacemaker activation. Defibrillators are also available on board many commercial airlines. Patients should check to see if the airline trains their flight attendants on their use (rather than rely on traveling physicians, who may or may not be on board).
- Patients with a history or risk of heart disease might be advised to wear elastic compression stockings and take low-dose aspirin before long trips to prevent blood clots. They should also take ordinary precautions, including drinking fluids, taking frequent walks, and performing leg-lifts several times an hours.

*Recommendations for Patients with Lung Disease.* The following are some recommendations for patients with lung disease:

- For reasons of fuel economy, jets now fly higher and cabins are pressurized with up to 25% less oxygen than in the past. Patients with lung problems should consult their physicians about whether air travel might exacerbate their condition.

- People who require supplemental in-flight oxygen cannot supply their own but must arrange with the airline. This requires a prescription and the patient must call the air carrier at least 48 hours before the flight. Not all carriers supply in-flight oxygen and none supply oxygen on the ground. That must be arranged separately.

## **Pregnancy**

Pregnancy alters a woman's immune system. Before traveling to any country with health risks, pregnant women should note the following:

- Avoid live vaccines, unless the pregnant traveler plans to visit an area endemic for yellow fever. Women in their first trimester should not receive any vaccines at all.
- Pregnant women should be certain they are immune to rubella (German measles) before taking a cruise. Outbreaks of have been reported on cruise ships; this normally harmless disease can cause fetal damage if a pregnant woman contracts it.
- Take strict precautions against mosquitoes it traveling to countries where malaria occurs. Pregnant women appear to be at higher risk for malaria than not pregnant women.
- Use portable water filters instead of iodine tables for purifying water.

In considering air travel, pregnant women should consider the following:

- Avoid frequent air travel. During flight, although the emissions are generally considered safe, very slight radiation from cosmic rays occurs.
- To avoid hassles during airline travel, carry a letter from the physician indicating the baby's due date. Most airlines prohibit women who are 35 or more weeks pregnant from flying internationally.
- Walk in the aisles during long flights to help prevent blood clots. Wear seat belts low around the hips in case of air turbulence.
- Try to avoid travel altogether if expecting multiple births or if there is a history of preeclampsia (pregnancy-induced hypertension) or a high risk for other conditions such as circulatory problems.

## **WHERE ELSE CAN HELP FOR TRAVELERS BE FOUND?**

The traveler should check with the US Embassy or Consulate in the destination country. The embassies often have lists of English-speaking physicians and information on available vaccines.

The Centers for Disease Control (CDC), 1600 Clifton Rd, Atlanta, GA 30333. Call (800/311-3435) or CDC Travelers' Health Hotline (877-FYI-TRIP) or fax-on-demand (888-232-3299). Monday through Friday or (<http://www.cdc.gov/travel>) or (<http://www.cdc.gov/travel/blusheet.htm>) for the "blue sheet," the CDC health report card for countries worldwide.

The CDC web site is invaluable for any traveler with access to the Internet. Their phone number provides access to voice and an excellent fax on-demand service, including information on vaccination requirements, epidemic out breaks, and other travel information.

International Association for Medical Assistance to Travelers, 417 Center Street, Lewistown, New York, 14092. Call (716-754-4883) or (<http://www.cybermall.co.nz/NZ/IAMAT>)

IAMAT is a non-profit organization with a worldwide directory of physicians, hospitals and health care centers. Gives information on various tropical diseases. Mosquito netting can also be purchased from IAMAT.

International SOS Assistance, US Offices, Eight Neshaminy Interplex, Suite 207, Trevose (Philadelphia), PA 19053. Call or (215-245-4707) or (<http://www.intsos.com/>)

This organization provides information on English-speaking physicians and emergency assistance for members traveling in other countries.

American Society of Tropical Medicine and Hygiene, 60 Revere Dr., Suite 500, Northbrook IL 60062.  
Call (847-480-9592) or (<http://www.astmh.org/>)

International Society of Travel Medicine, P.O. Box 871089, Stone Mountain, GA 30087. Call (770-736-7060) or (<http://www.istm.org/>).

This is an excellent web site that provides travel clinics, up to date information on epidemics, and other useful information.

World Health Organization. 525 23<sup>rd</sup> Street, NW, Washington, DC 20037. Call (202-974-3000) or (<http://www.who.ch>) or for outbreak news (<http://www.who.int/disease-outbreak-news/>)

Association for Safe International Road Travel (ASIRT), 11769 Gainsborough Road, Potomac, MD 20854. Call (301-983-5252) or (<http://www.asirt.org/>)  
Provides information on road and driving conditions in over sixty countries worldwide

Vessel Sanitation Program, National Center for Environmental Health, Centers for Disease Control and Prevention (CDC) (<http://www2.cdc.gov/nceh/vsp/vspmain.asp>)  
CDC provides a list of recent inspections of cruise ships sailing from US ports and score results based on sanitation levels.

Wilderness Medical Society, 3595 East Fountain Blvd, Ste. A-1, Colorado Springs, CO 80910. Call (719-572-9255) or (<http://www.wms.org/>)

Divers Alert Network, The Peter B. Bennett Center, 6 West Colony Place, Durham, NC 27705.

Call (800-446-2671) for general information or call (919/684-8111) or 1-919/684-4DAN (collect) for medical emergencies or (<http://www.diversalertnetwork.org/>)  
Has a 24-hour hot line for diving accidents and general information on scuba diving. DAN also publishes Alert Diver, a monthly publication.

## Useful Internet Sites

Medicineplanet. A complete and excellent site for all travel information ( <http://www.travelhealth.com/>).

US Department of State. (<http://travel.state.gov/>) This site offers detailed information on all aspects of travel, including travel warnings for specific countries, passport and visa information.

Travel Health Online (<http://www.tripprep.com>).

Travel Medicine, Inc. This site sells travel supplies, including medical kits, insect repellent supplies, water filters, and travel insurance. (<http://www.travmed.com>).

## Companies that sell travel-insurance plans online:

HTH Worldwide Insurance Services (<http://www.hthworldwide.com/>) or Call (888-243-2358).

Travel Guard International (<http://www.travel-guard.com>) or Call (877-216-4885).

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