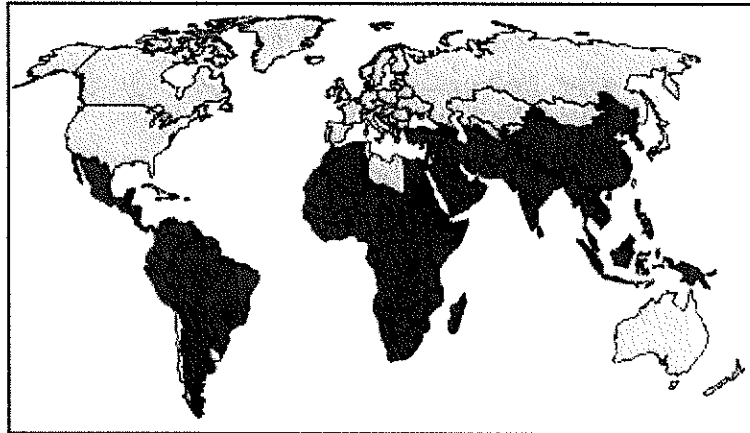


PREVENTING MALARIA IN TRAVELERS

A Guide for Travelers to Malaria-Risk Areas



Many travelers acquire malaria, a potentially life-threatening disease, during travel to tropical and subtropical countries. If you are traveling to Mexico and Central America, Haiti, the Dominican Republic, South America, sub-Saharan Africa, the Indian subcontinent, Eastern Europe, Asia, the Middle East, Papua New Guinea, Vanuatu, or the Solomon Islands, you could be at risk for malaria.



Areas in dark blue indicate malaria risk may exist in a part of the country. For specific malaria-risk areas, see the CDC Travelers' Health Web site at www.cdc.gov/travel

Malaria is always a serious disease and may be a deadly illness. Humans get malaria from the bite of a mosquito infected with the parasite. You can usually prevent malaria by taking an antimalarial drug and by avoiding mosquito bites.

Travelers to countries with malaria, including infants, children, and former residents of these countries, should visit their health care provider 4-6 weeks before travel, for vaccinations and a prescription for an antimalarial drug.

Malaria and its symptoms

Symptoms of malaria include fever and flu-like illness, including shaking chills, headache, muscle aches, and tiredness. Nausea, vomiting, and diarrhea may also occur. Malaria may also cause anemia and jaundice (yellow coloring of the skin and eyes) because of the loss of red blood cells. Malaria is potentially life-threatening, if not immediately treated. Complications of untreated malaria include mental confusion, seizures, coma, kidney failure, and death.

Malaria symptoms will occur at least 7 to 9 days after infection; fever in the first week of travel is unlikely to be malaria, although any illness should be promptly evaluated.

Malaria is diagnosed by looking for the parasites in a drop of blood. The blood is placed on a microscope slide and stained so that the parasites are visible under a microscope.

Immediate treatment of malaria is critical. Any traveler who becomes ill with a fever or flu-like illness while traveling and up to 1 year after returning home should immediately seek professional medical care. Inform your health care provider that you have been in a malaria-risk area.

Antimalarial drugs

Antimalarial drugs are available in the United States by prescription only. Your health care provider will prescribe your antimalarial based on your travel itinerary and medical history.

Side effects of antimalarial drugs

All medicines may have some side effects. Minor side effects such as nausea, occasional vomiting, or diarrhea usually do not require stopping the antimalarial drug. **If you cannot tolerate your antimalarial drug, see your health care provider; other antimalarial drugs are available.**

If you travel to malaria-risk areas in South America, Africa, the Indian subcontinent, Asia, Papua New Guinea, Vanuatu, the Solomon Islands, and certain countries in Central America and the Middle East, you should take **one of the following drugs (listed alphabetically): atovaquone/proguanil, doxycycline, or mefloquine.**

Atovaquone/proguanil (brand name Malarone™)

Atovaquone/proguanil is a fixed combination of two drugs, atovaquone and proguanil. It is available in the United States as the brand name Malarone.

The adult dosage is one adult tablet (250 mg atovaquone/100 mg proguanil) once a day, starting 1-2 days before travel to the malaria-risk area, daily while at risk, and daily for 7 days after leaving the risk area. Take the dose at the same time each day with food or milk.

Atovaquone/proguanil side effects

The most common side effects reported by travelers are abdominal pain, nausea, vomiting, and headache. If you cannot tolerate atovaquone/proguanil, see your health care provider for an alternative antimalarial drug.

Atovaquone/proguanil should NOT be taken by

- ◆ Patients with severe renal impairment
- ◆ Pregnant women
- ◆ Children weighing less than 11 kilograms (25 pounds)
- ◆ Women breast-feeding infants weighing less than 11 kilograms (25 pounds).

Doxycycline (many brand names and generics)

Doxycycline is related to the antibiotic tetracycline.

The adult dosage is 100 mg once a day. Take the first dose 1-2 days before travel, daily while in the risk area, and daily for 4 weeks after leaving the risk area. Take the dose of doxycycline at the same time each day.

Doxycycline side effects

Doxycycline may cause you to sunburn faster than normal. Avoid the midday sun, use a high SPF sunblock, and wear clothes and a hat to cover exposed skin.

Take doxycycline on a full stomach to minimize stomach upset; do not lie down for an hour after taking the drug to prevent reflux (stomach contents backing up into the esophagus). Women may develop a vaginal yeast infection; take along an over-the-counter medication or see your health care provider for a prescription pill. If you cannot tolerate doxycycline, see your health care provider; alternative drugs are available.

Doxycycline should NOT be taken by

- ◆ Pregnant women
- ◆ Children under the age of 8 years; teeth may be permanently stained
- ◆ Persons allergic to tetracyclines.

Mefloquine (brand name Lariam™ and one generic)

The adult dosage is 250 mg (one tablet) once a week. The first dose is taken one week before travel, once a week during travel, and once a week for 4 weeks after leaving the malaria-risk area. Take the dose of mefloquine on the same day each week. Mefloquine should be taken on a full stomach, for example, after dinner.

Mefloquine side effects

The most common side effects reported by travelers taking mefloquine include headache, nausea, dizziness, difficulty sleeping, anxiety, vivid dreams, and visual disturbances. Mefloquine has rarely been reported to cause serious side effects, such as seizures, depression, and psychosis. If you cannot tolerate mefloquine, see your health care provider; alternative drugs are available.

Do NOT take mefloquine if you

- ◆ are allergic to it
- ◆ have depression or a recent history of depression
- ◆ have a history of psychosis, generalized anxiety disorder, schizophrenia, or other major psychiatric disorder
- ◆ have a history of seizures (not including seizures caused by high fever in childhood).

If you travel to malaria-risk areas in Mexico, Haiti, the Dominican Republic, and certain countries in Central America, the Middle East, or Eastern Europe, you should take **chloroquine** as your antimalarial drug.

Chloroquine (brand name Aralen™ and generics)

The adult dosage is 500 mg chloroquine phosphate once a week. The first dose is taken one week before travel to the malaria-risk area, once a week while in the risk area, and once a week for 4 weeks after leaving the risk area. Take the dose of chloroquine on the same day each week. Chloroquine should be taken on a full stomach to prevent nausea.

Chloroquine side effects

The most common side effects reported by travelers taking chloroquine include nausea and vomiting, headache, dizziness, blurred vision, and itching. Chloroquine may worsen the symptoms of psoriasis. If you cannot tolerate chloroquine, see your health care provider; alternative drugs are available.

Pregnancy and travel

- ◆ Getting malaria while you are pregnant can harm you and your fetus. It is best if you do not travel to malaria-risk areas during your pregnancy. If you have to travel, take **either** mefloquine or chloroquine (see below) to help reduce your chance of getting malaria. Preventing mosquito bites also helps reduce the risk

that you will get sick. Taking medicine to prevent malaria while you are pregnant is safer for you and your fetus than getting sick with malaria.

- ◆ Pregnant women traveling to malaria-risk areas in South America, Africa, the Indian subcontinent, Asia, Papua New Guinea, Vanuatu, the Solomon Islands, and certain countries in Central America and the Middle East should take **mefloquine** as their antimalarial drug. Less is known about the safety of mefloquine during the first trimester of pregnancy. However, taking the drug and not getting malaria is safer than getting malaria.
- ◆ Pregnant women traveling to malaria-risk areas in Mexico, Haiti, the Dominican Republic, and certain countries in Central America, the Middle East, and Eastern Europe should take **chloroquine** as their antimalarial drug. Experience with chloroquine indicates that it is safe to take during pregnancy, including the first trimester.

Pregnant women should NOT take Malarone or doxycycline to prevent malaria.

Traveling with children to malaria-risk areas

All children, even very young infants, can get malaria and need to take an antimalarial drug. Take your child at least 4-6 weeks before travel for vaccinations and an antimalarial drug, if needed. Children's dosages of antimalarials may have to be specially prepared; allow plenty of time for the pharmacy to fill your child's prescription.

Self-treatment

Malaria can be a fatal disease if not treated quickly. If your travel itinerary will take you more than 24 hours away from professional medical care, see your health care provider about a self-treatment drug. If you develop a fever or other flu-like illness *and professional medical care is not available within 24 hours*, take your self-treatment drug and seek medical care immediately after self-treatment.

Preventing mosquito bites

Protect yourself from mosquito bites. Mosquitoes that transmit malaria bite between dusk and dawn. Prevent mosquito bites by staying indoors, if possible. If out-of-doors, wear long-sleeved shirts, long pants, and a hat. Apply insect repellent to exposed skin only; do not use under clothing. Use insect repellents containing DEET for the best protection.

When using repellent with DEET, follow these recommendations:

- ◆ Read and follow all directions and precautions on the product label.
- ◆ Use only when outdoors and wash skin with soap and water after coming indoors.
- ◆ Do not breathe in, swallow, or get into the eyes. (DEET is toxic if swallowed.)
- ◆ Do not put repellent on wounds or broken skin.
- ◆ Higher concentrations of DEET may have a longer repellent effect; however, concentrations over 50% provide no added protection.
- ◆ Timed-release DEET products may have a longer repellent effect than liquid products.
- ◆ DEET may be used on adults, children, and infants older than 2 months of age. Protect infants by using a carrier draped with mosquito netting with an elastic edge for a tight fit.
- ◆ Children under 10 years of age should not apply repellent themselves. Do not apply to young children's hands or around eyes and mouth.

Take a flying-insect spray or mosquito coils on your trip to help clear rooms of mosquitoes. The product should contain a pyrethroid insecticide to quickly kill mosquitoes.

If you will not be staying in well-screened or air-conditioned rooms, take additional precautions, including sleeping under mosquito netting (bed nets). Bed nets sprayed with the insecticide permethrin are more effective. In the United States, permethrin is available as a spray or liquid to treat clothes and bed nets. You can purchase bed nets that have already been treated with permethrin. Permethrin or another insecticide, deltamethrin, may be purchased overseas to treat nets and clothes.

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