



Travelers' Health

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Information for the Public: Prescription Drugs for Malaria

Know Your Risk of Malaria

Malaria is a serious illness transmitted by the bite of an infected mosquito. Travelers to Central and South America, Hispaniola, Africa, Asia (including the Indian Subcontinent, Southeast Asia, and the Middle East), Eastern Europe, and the South Pacific may be at risk for this **potentially deadly disease**.

All travelers to areas with malaria transmission, **including infants, children, and former residents of these areas**, should protect themselves from malaria by taking an antimalarial drug and by preventing mosquito bites. Despite the risk, most travelers can avoid becoming ill with malaria by taking these precautions.

To find out if your foreign travel will take you into an area with malaria:

- Visit CDC's Traveler's Health website at <http://www.cdc.gov/travel>
- Call CDC's Voice Information Line at 1-877-FYI-TRIP (1-877-394-8747) and listen to pre-recorded messages

See Your Health Care Provider

Allow plenty of time before your trip, 4-6 weeks, to see your health care provider. Any vaccinations you may need will have time to become fully protective. In addition, all the antimalarial drugs are prescription drugs and you will need to start taking them before travel. Infants and children's dosages may have to be specially prepared; allow your pharmacist sufficient time to prepare your prescriptions.

Find out Which Antimalarial Drug is Right for You and Your Family

Your health care provider will decide which antimalarial drug(s) are the right ones for you and your family. Some drugs may not be effective in some countries of the world. A medical condition may prevent you from taking a particular antimalarial drug. In addition, children's dosages are based on their age and weight and need to be carefully calculated.

Antimalarial Warnings and Instructions

- **Take your antimalarial drug exactly on schedule.** Missing or delaying doses may increase your risk of getting malaria.
- For the best protection against malaria, it is important to continue taking your drug as recommended after leaving the malaria-risk area (4 weeks for mefloquine, doxycycline, or chloroquine; 7 days for atovaquone/proguanil or primaquine). Otherwise, you can develop

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malaria.

- **Overdosage (taking too much of an antimalarial drug) can be fatal. Keep drugs in childproof containers out of the reach of children to prevent accidental poisoning.**
- Purchase your drugs before traveling overseas. Drugs purchased overseas may not be made according to United States standards and may not be effective. They may also be dangerous, contain the wrong drug or an incorrect amount of active drug, or be contaminated.
 - Halofantrine (also called Halfan) is widely used overseas to treat malaria. CDC recommends that you do **not** take Halfan because of serious heart-related side effects, including **deaths**.
 - You should avoid using antimalarial drugs that are not recommended **unless** you have been diagnosed with life-threatening malaria and no other treatment options are available.
- Most antimalarial drugs are well-tolerated; most travelers do not need to stop taking their drug because of side effects. However, if you are particularly concerned about side effects, discuss the possibility of starting your drug early (3-4 weeks in advance of your trip) with your health care provider. If you cannot tolerate the drug, ask your doctor to change your medication.

Antimalarial Drug Information

Travelers to areas with malaria risk in Africa, South America, the Indian Subcontinent, Tajikistan, Asia, and the South Pacific should take one of the following antimalarial drugs (listed alphabetically):

- atovaquone/proguanil
- doxycycline
- mefloquine
- primaquine (in special circumstances).

Atovaquone/proguanil (brand name: Malarone™)

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

Directions for Use

- The adult dosage is 1 adult tablet (250 atovaquone/100 mg proguanil) once a day.
- Take the first dose of atovaquone/proguanil 1 to 2 days before travel to the malaria-risk area.
- Take your dose once a day during travel in the malaria-risk area.
- Take your dose once a day for 7 days after leaving the malaria-risk area.
- Take your dose at the same time each day and take the pill with food or milk.

Side Effects and Warnings

The most common side effects reported by travelers taking atovaquone/proguanil are stomach pain, nausea, vomiting, and headache. Most people taking this drug do not have side effects serious enough to stop taking it; if you cannot tolerate atovaquone/proguanil, see your health care provider for a different antimalarial drug.

Travelers Who Should Not Take Atovaquone/Proguanil for Prophylaxis

The following travelers should **not** take atovaquone/proguanil to prevent malaria and should take a different antimalarial drug (see your health care provider):

- children weighing less than 11 pounds (5 kilograms) (Updated December 22, 2006)
- pregnant women
- women breast-feeding infants weighing less than 11 pounds (5 kilograms) (Updated December 22, 2006)
- patients with severe renal impairment

- patients allergic to atovaquone or proguanil.

Doxycycline (many brand names and generic drugs are available)

Doxycycline is related to the antibiotic tetracycline.

Directions for Use

- The adult dosage is 100mg once a day.
- Take the first dose 1 or 2 days before arrival in the malaria-risk area.
- Take your dose once a day, at the same time each day, while in the risk area.
- Take your dose once a day for 4 weeks after leaving the risk area.

Side Effects and Warnings

One of the most common side effects reported by travelers taking doxycycline include sun sensitivity (sunburning faster than normal). To prevent sunburn, avoid midday sun, wear a high SPF sunblock, long-sleeved shirts, long pants, and a hat.

Doxycycline may cause nausea and stomach pain. Take the drug on a full stomach with a full glass of liquid. Do not lie down for 1 hour after taking the drug to prevent reflux of the drug (backing up into the esophagus).

Women may develop a vaginal yeast infection on doxycycline. Treat vaginal discharge or itching with either an over-the-counter yeast medication or ask your health care provider for a prescription pill or cream.

Most people taking this drug do not have side effects serious enough to stop taking it; if you cannot tolerate doxycycline, see your health care provider. Other antimalarial drugs are available.

Travelers Who Should Not Take Doxycycline

The following travelers should **not** take doxycycline and should take a different antimalarial drug (see your health care provider):

- pregnant women
- children under the age of 8 years
- persons allergic to doxycycline or other tetracyclines

Mefloquine (brand name Lariam TM and generic)

Directions for Use

- The adult dosage is 250 mg (one tablet) once a week.
- Take the first dose 1 week before arrival in the malaria-risk area.
- Take your dose once a week, on the same day of the week, while in the risk area.
- Take your dose once a week for 4 weeks after leaving the risk area.
- Take the drug on a full stomach with a full glass of liquid.

Side Effects and Warnings

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. These serious side effects are more frequent with the higher doses used to treat malaria; fewer occurred at the weekly doses used to prevent malaria.

Mefloquine is eliminated slowly by the body and thus may stay in the body for a while even after the

drug is discontinued. Therefore, side effects caused by mefloquine may persist weeks to months after the drug has been stopped.

Most travelers taking mefloquine do not have side effects serious enough to stop taking the drug. (Other antimalarial drugs are available if you cannot tolerate mefloquine; see your health care provider.)

Travelers Who Should Not Take Mefloquine

The following travelers should **not** take mefloquine and should ask their health care provider for a different antimalarial drug:

- persons with active depression or a recent history of depression
- persons with a history of psychosis, generalized anxiety disorder, schizophrenia, or other major psychiatric disorder
- persons with a history of seizures (does not include the type of seizure caused by high fever in childhood)
- persons allergic to mefloquine
- Mefloquine is not recommended for persons with cardiac conduction abnormalities (for example, an irregular heartbeat).

Primaquine

In special situations when other antimalarial drugs cannot be taken and in consultation with malaria experts, primaquine may be used to prevent malaria while the traveler is in the malaria-risk area (primary prophylaxis).

Directions for Use

Note: Travelers **must** be tested for G6PD deficiency (glucose-6-phosphate dehydrogenase) and have a documented G6PD level in the normal range before primaquine use. **Primaquine can cause an hemolysis (bursting of the red blood cells) in G6PD deficient persons, which can be fatal.**

- The adult dosage is 2 tablets (30 mg base primaquine) once a day.
- Take the first dose 1-2 days before travel to the malaria-risk area.
- Take the dose once a day, at the same time each day, while in the risk area.
- Take the primaquine once a day for 7 days after leaving the risk area.

Side Effects and Warnings

The most common side effects reported by travelers taking primaquine include stomach cramps, nausea, and vomiting. The following travelers should **not** take primaquine and should ask their health care provider for a different drug:

- persons with G6PD deficiency
- persons who have not had a blood test for G6PD deficiency
- pregnant women (the fetus may be G6PD deficient, even if the mother's blood test is in the normal range) women breast-feeding infants unless the infant has a documented normal G6PD level
- persons allergic to primaquine
- Do not share primaquine with others; they may be G6PD deficient and suffer bursting of their red blood cells, which can be fatal.

Chloroquine phosphate (brand name Aralen™ and generics)

Travelers 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 (Hydroxychloroquine sulfate is available as an alternative; see below).

Directions for Use

- The adult dose is 500 mg chloroquine phosphate once a week.
- Take the first dose of chloroquine 1 week before arrival in the malaria-risk area.
- Take your dose once a week, on the same day of the week, while in the risk area.
- Take your dose once a week for 4 weeks after leaving the risk area.
- Chloroquine should be taken on a full stomach to lessen the risk of nausea and stomach upset.

Side Effects and Warnings

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. Most travelers taking chloroquine do not have side effects serious enough to stop taking the drug. Other antimalarial drugs are available; see your health care provider.

Note: In malaria-risk areas where chloroquine is the recommended drug but chloroquine cannot be taken, atovaquone/proguanil, doxycycline, mefloquine, or primaquine can be used as your antimalarial drug.

The following travelers should **not** take chloroquine and should ask their health care provider for a different drug:

- patients allergic to chloroquine

Hydroxychloroquine sulfate (brand name: Plaquenil™)

Hydroxychloroquine sulfate is an alternative to chloroquine phosphate, although less evidence exists on its effectiveness as an antimalarial drug.

Directions for use

- The adult dosage is 400 mg once a week.
- Take the first dose 1 week before arrival in the malaria-risk area.
- Take your dose once a week, on the same day of the week, while in the risk area.
- Take the dose once a week for 4 weeks after leaving the risk area.
- Take hydroxychloroquine sulfate on a full stomach to lessen nausea and stomach upset.

Side Effects and Warnings

Nausea and vomiting, headache, dizziness, blurred vision, difficulty sleeping, and itching have been reported with hydroxychloroquine sulfate use. Minor side effects usually do not require stopping the drug. Hydroxychloroquine sulfate may worsen the symptoms of psoriasis. Other antimalarial drugs are available; see your health care provider.

Note: In malaria-risk areas where hydroxychloroquine sulfate is the recommended drug but hydroxychloroquine sulfate cannot be taken, atovaquone/proguanil, doxycycline, mefloquine, or primaquine can be used as your antimalarial drug.

Protect Yourself from Mosquito Bites

Malaria is transmitted by the bite of an infected mosquito; these mosquitoes usually bite between dusk and dawn. To avoid being bitten, remain indoors in a screened or air-conditioned area during the peak biting period. If out-of-doors, wear long-sleeved shirts, long pants, and hats. Apply insect repellent (bug spray) to exposed skin.

Choosing an Insect Repellent

For the prevention of malaria, CDC recommends an insect repellent with DEET (N, N-diethyl-m-toluamide) as the repellent of choice. Many DEET products give long-lasting protection against the mosquitoes that transmit malaria (the anopheline mosquitoes).

A new repellent is now available in the United States that contains 7% picaridin (KBR 3023). Picaridin may be used if a DEET-containing repellent is not acceptable to the user. However, there is much less information available on how effective picaridin is at protecting against all of the types of mosquitoes that transmit malaria. Also, since the percent of picaridin is low, this repellent may only protect against bites for 1-4 hours.

At this time, use of other repellents is not recommended for the prevention of malaria because there is insufficient data on how well they protect against the mosquitoes that transmit malaria.

Precautions When Using Any Repellent

- Read and follow the directions and precautions on the product label.
- Use only when outdoors and thoroughly wash off the repellent from the skin with soap and water after coming indoors.
- Do not breathe in, swallow, or get repellent into the eyes or mouth. If using a spray product, apply to your face by spraying your hands and rubbing the product carefully over the face, avoiding eyes and mouth.
- Never use repellents on wounds or broken skin
- Pregnant women should use insect repellent as recommended for other adults. Wash off with soap and water after coming indoors.
- Repellents may be used on infants older than 2 months of age
- Children under 10 years old should not apply insect repellent themselves. Do not apply to young children's hands or around their eyes and mouth.

Using Repellents With DEET

- Do not get repellent containing DEET into the mouth. DEET is toxic if swallowed.
- Higher concentrations of DEET may have a longer repellent effect; however, concentrations over 50% provide no added protection.
- Timed-release DEET products, which are micro-encapsulated, may have a longer repellent effect than liquid DEET products. Re-apply as necessary, following the label directions.

Other Recommended Anti-mosquito Measures

- Travelers should take a flying insect spray on their trip to help clear rooms of mosquitoes. The product should contain a pyrethroid insecticide; these insecticides quickly kill flying insects, including mosquitoes.
- Travelers not staying in well-screened or air-conditioned rooms should sleep under bed nets (mosquito nets), preferably nets treated with the insecticide permethrin. Permethrin both repels and kills mosquitoes as well as other biting insects and ticks. In the United States, permethrin is available as a spray or a liquid (e.g. Permanone™). Pre-treated nets, permethrin or another insecticide deltamethrin, are available overseas.

For information on ordering insecticide-treated bed nets: <http://www.travmed.com>, phone 1-800-872-8633, fax: 413-584-6656; or <http://www.travelhealthhelp.com>, phone 1-866-621-6260.

- Protect infants (especially infants under 2 months of age not wearing insect repellent) by using a carrier draped with mosquito netting with an elastic edge for a tight fit.
- Clothing, shoes, and camping gear, can also be treated with permethrin. Treated clothing can be repeatedly washed and still repel insects. Some commercial products (clothing) are now available in the United States that have been pretreated with permethrin.

Know the Signs and Symptoms of Malaria

You can still get malaria despite taking an antimalarial drug and using protection against mosquito bites. Taking an antimalarial drug greatly reduces your chances of getting malaria. Symptoms are very flu-like and can include fever, shaking chills, headache, muscle aches, and tiredness. Nausea, vomiting, and diarrhea may also occur.

Malaria symptoms will occur at least six to nine days after being bitten by an infected mosquito. Therefore, fever in the first week of travel in a malaria-risk area is unlikely to be malaria; however, ill travelers should still seek immediate medical care and any fever should be promptly evaluated.

If you or your child becomes ill with a fever or flu-like illness while traveling in a malaria-risk area and up to 1 year after returning home, seek immediate medical care. Delaying treatment can lead to serious complications such as coma, kidney failure, and death. Tell your health care provider where you have been traveling and that you have been exposed to malaria.

Self-treatment

Travelers who will be more than 24 hours from professional medical care during their trip should ask their health care provider about a self-treatment drug. If you develop 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.

For more information on malaria, see the [Diseases](#) section and read the following:

- [Frequently Asked Questions](#)
- [Preventing Malaria in Pregnant Women \(Information for the Public\)](#)
- [Preventing Malaria in Infants and Children \(Information for the Public\)](#)

**Use of trade names is for identification purposes only and does not imply endorsement by the Public Health Service or by the U.S. Department of Health and Human Services.*

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Centers for Disease Control and Prevention, 1600 Clifton Rd, Atlanta, GA 30333, U.S.A
Tel: (404) 639-3311 / Public Inquiries: (404) 639-3534 / (800) 311-3435



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