

Malaria: How to fight it

Prevention (CDC):
<https://wwwnc.cdc.gov/travel/diseases/malaria>

Avoid mosquitoes. They like to bite between dusk and dawn. Many people stay in air-conditioned hotels where mosquitoes are kept out. If you won't be spending your evenings and nights in a mosquito-proof hotel, be careful: Stay in well-screened areas. Use mosquito nets. Wear clothes that cover most of the body. Use insect repellent on any exposed areas. Look for a repellent with N,N-diethyl-metatoluamide. (That's "DEET" for short.) Alternatively, look for a repellent with picaridin, IR3535, oil of lemon eucalyptus (OLE), para-menthane-diol (PMD), or 2-undecanone. Spray clothing and bed nets with permethrin (brand name Permanone®).

Take antimalarial drugs. We have information about your drugs. Study it. Sometimes there are side effects, even serious side effects. Sometimes the drugs don't work. Know what to do. **Special warning: Even if you follow all of our advice, you still might get malaria.**

IF YOU GET SICK, GET HELP. Headache, feeling generally out of sorts, feeling like you've got influenza, weakness, fever, chills, muscle ache, vomiting, diarrhea, and sweats (which may come and go) can mean malaria. It means you need medical attention *as soon as possible*. Don't presume that you have the "flu." You may need a blood examination for malaria. They may want to poke your finger with a needle to get blood. Make sure that they use a sterile needle. (Consider going to a pharmacy to buy some sterile lancets so you can take your own.)

You can get sick as early as 6 days after your first night in a malaria area—or as long as months (even years) afterward. Often you can treat malaria effectively **IF you treat it early.**

What can delays in treatment do? They can cause trouble. They can kill. Or leave you with brain damage. Malaria can cause other serious harm.

Which insect repellent do we prefer? This is a matter of personal preference. As individuals, we have our own opinions. We like Ultrathon™ because:

- It protects up to 12 hours.
- It is available in 2-ounce tubes of lotion. So it doesn't take up much space.
- It uses DEET. There's a lot of experience with DEET as an effective insect repellent.

Each year millions of people travel from the USA to countries with malaria. Each year several hundred come back with malaria. We want *you* to stay healthy. Read this material. Want more information? Check the website of the Centers for Disease Control and

In these pages:

Different advice	Page 1
If you're not sure	2
Be careful with DEET	2
About antimalarial drugs	2
Children	2
Pregnancy	3
Choosing antimalarial drugs	3
"There were demons in his blood"	4
Chloroquine	4
Doxycycline	5
Malarone®	5
Mefloquine	6

Different advice

Where did our advice come from? Mostly, from the Centers for Disease Control and Prevention (CDC).

Are there other ways to prevent malaria? Yes. No approach to malaria is perfect. For now, we think our approach is the best—all things considered. But other doctors may give other advice. Ask if you have questions.

But watch out. Maybe you have friends who live in a malaria area. Maybe your friends never take antimalarial drugs. Is it okay for you to visit them without taking antimalarial drugs? Maybe not. Your friends may have had malaria already. Maybe they were lucky enough to have a mild case and survive. Now your friends may have some immunity. So they may be able to get away without taking antimalaria drugs. But, coming from the Midwest, *you* may have no immunity. Some people think if they've had malaria before on a previous trip, they don't have to worry about getting it again because they're now immune from the earlier infection. Unfortunately, having malaria before doesn't make you permanently immune. A later infection may not be as severe as the first one, but it easily can be enough to put you in the intensive care unit. You need to take antimalarial drugs when you go to a malaria area.

Sometimes recommendations change. Maybe someone gave you old advice. Do you want to check with the CDC? Get their latest advice.

Different people may need different medicines. Why? It depends on whether you are allergic to some drugs. It depends on where you go. You have more risk in rural

areas. It depends on whether the malaria where you are going is resistant to some drugs. It depends on what you do. You have more risk if you're outdoors evenings and nights.

If you're not sure

If you're not sure you'll be in a malaria zone, should you take malaria pills anyway?

Pros:

- **Malaria reporting is poor in some countries.** Malaria may have already spread beyond the borders of recognized malaria zones. Taking precautions might protect you.
- **You might change your travel plans.** If you're already taking the pills, it will be easier for you to visit the malaria zone.
- **Malaria is serious.** It can make you very sick. It can kill you. The risks of taking extra pills are small compared to the risks of malaria.

Cons:

- **Some malaria zones do have definite boundaries.** Some areas have very cool, very high mountains. Mosquitoes can't survive there. If you are going to spend all your time in the mountains, why worry about malaria?
- **Every medication can have side effects.** Why risk a serious drug reaction when you really don't have to take the drug?

Are you in doubt? We suggest that you err on the side of caution. Take the pills. But it's your choice.

Be careful with DEET

The most effective insect repellents with the most years of experience have DEET. Some persons have had problems with it. Some people worry about brain damage. Reduce your risk of problems. Follow these rules:

- Use repellent sparingly.
- Put repellent only on exposed skin or clothing. Keep it away from plastic watchbands; DEET will melt them.
- Don't put high-concentration repellent on the skin. This is especially important for children.
- Don't inhale repellents. Don't swallow them. Don't get them into the eyes.
- Don't put repellents on the parts of children's hands that might touch their eyes or mouth.
- Don't put repellents on wounds or irritated skin.
- Re-apply repellent every four hours, unless you use long-acting repellent.
- After coming indoors wash repellent-treated skin.

If you think you might have a reaction to repellent, wash the treated skin. Also, get medical attention.

About antimalaria drugs

Different doctors have different opinions about how to fight malaria. Read the material about your choices in fighting malaria. **There are many ways you can try to prevent malaria. Taking pills is just one. Read this material. Know about other ways to deal with malaria.**

Precautions while using the drugs

If you think you might have malaria or have a fever, see a doctor right away. Tell the doctor you have been exposed to malaria.

If you think you need to stop taking the medicine early, talk with a doctor right away. You may need to substitute another drug.

Children

Some children need to take *less than a single tablet* for each dose. **How can you give children small doses?** Ask the pharmacist to grind up tablets into powder. Ask the pharmacist to put the powder for each dose into a gelatin capsule.

Sometimes these drugs are bitter. Some children don't like bitter drugs. **How can you make it easier for children to take their malaria drugs?** Mix the powder in food and drink. Maybe that will cover up some of the taste.

Some malaria drugs are sold as liquids. Sometimes it's easier for children to take these liquids.

- When using insect repellent on children:
 - Do not use products containing oil of lemon eucalyptus (OLE) or para-menthane-diol (PMD) on children under 3 years old.
 - Do not apply insect repellent to a child's hands, eyes, mouth, cuts, or irritated skin.
 - Adults: Spray insect repellent onto your hands and then apply to a child's face.

Pregnancy

Are you pregnant? Do you think you might be pregnant now, during your trip, or in the two-month period after your trip? If your answer is "yes," we (and the CDC) have some advice for you: Cancel your trip.

Maybe you will be very careful about preventing malaria. Even if you try very hard, you still might get malaria. There is no perfect way to prevent malaria.

What if you get malaria while you're pregnant? You might get very sick, have permanent damage, or die. The same could happen to your baby.

What antimalarial drugs are safe in pregnancy? If you do decide to go to a malaria area during pregnancy, take chloroquine or mefloquine. Don't take doxycycline or Malarone™.

Choosing antimalarial drugs

Where are you going? Chloroquine is usually the best choice in Central America, Haiti, the Dominican Republic, and a few other areas.

In many other areas chloroquine won't work. You need to take a different drug. There are three main possibilities: doxycycline, mefloquine, and atovaquone-proguanil (brand name Malarone™). Each of these drugs has its pros and cons. We have a table that summarizes important facts about these drugs. Especially important facts are **in bold type like this**.

Here are the issues that help many people decide which drug to take:

Prices vary. Prices change. Here are some approximate prices, based on goodrx.com in mid 2022:

Length of trip	Doxy-cycline	Meflo-quine	Mala-rone™
7 days	\$10	\$30	\$34
3 weeks	\$12	\$36	\$58

For most people, Malarone™ has the fewest side effects. Some people do very well with mefloquine, but some people have terribly disturbing dreams. Many teenagers take doxycycline for acne, but it is extremely important to take precautions when you take doxycycline. If you take doxycycline, **you must take doxycycline with a full glass of liquid and stay upright for 30 minutes. Otherwise you might get a hole in your esophagus and need emergency surgery.** Also, with doxycycline you must use sunblock because some people have a reaction to the sun. Also, some people get yeast infections with doxycycline.

Mefloquine is very controversial. It had been used by the U.S. military in Afghanistan. However, some people believe that it causes mental illness. Other people dispute this. **If you get a prescription for mefloquine, be prepared to defend your decision. Your pharmacist or your friends may tell you that it should be taken off the market because it might make you go crazy.**

	Doxycycline	Mefloquine	Atovaquone-proguanil (Malarone™)
Special situations in which you must not take the drug	<ul style="list-style-type: none"> • Pregnancy • Breast-feeding • Age less than 8 years old 	<ul style="list-style-type: none"> • Psychiatric problems • Heart problems involving irregular heart beat or abnormal spread of electrical impulses • Seizure disorder • Working as an airplane pilot. Other activities that need fine coordination and spatial discrimination. 	<ul style="list-style-type: none"> • Pregnancy • Breast-feeding a child under 11 pounds • Children under 11 pounds • Severe kidney disease
How to take	<ul style="list-style-type: none"> • With a full glass of liquid. Stay upright for 30 minutes. • Don't take with calcium. Ordinary food is okay. • Don't take with Pepto Bismol. 	On an empty stomach	With food or a milky drink
Important side effects	<ul style="list-style-type: none"> • Hole in the esophagus. Prevent by following advice for "how to take." • Rash on skin exposed to sun. Prevent by avoiding sun and using sunblock. • Vaginal yeast infection. 	<ul style="list-style-type: none"> • Vivid dreams sometimes • Dizziness sometimes • Serious psychiatric problems. Controversial. Some research supports this, some doesn't 	Side effects are rare
When to start	1-2 days before entering malaria area	1-2 weeks before entering malaria area	1-2 days before entering malaria area
When to take	Daily	Weekly	Daily
When to stop	4 weeks after leaving malaria area	4 weeks after leaving malaria area	7 days after leaving malaria area
Cost	\$ if no insurance	\$\$ if no insurance	\$\$ if no insurance
Cost if your insurance covers it	For a 2-week trip, 2 copayments (if your insurance gives you one month's supply at a time)	For a 2-week trip, 2 copayments (if your insurance gives you one month's supply at a time)	For a 2-week trip, 1 copayment (if your insurance gives you one month's supply at a time)

There were demons in his blood

In 1992, *Condé Nast Traveler* published an article, "There were demons in his blood. A traveler survives malaria, barely."

The author, Rian Malan, described a trip to a malaria zone. I "was so cavalier about malaria that I hadn't even bothered to take" malaria drugs.

He described his experience with malaria. "My eyes started burning and aching. The headache got worse and worse. Amorphous aches beset my body, and then came the cold shivers accompanied by vomiting."

The article goes on to describe even more symptoms that were even more disturbing. He went on to have delusions. Ultimately he lost 15 pounds. He was so weak

that he couldn't turn a water faucet. He took months to recover.

And yet he was lucky. He survived.

Do you think malaria is something to disregard? Look up the article. Go to the CDC website to read more stories about malaria.

<http://www.cdc.gov/malaria/stories/index.html> See if you still are "cavalier about malaria."

Chloroquine

This drug is used for preventing malaria. Please read our information on the first page of "Malaria: How to fight it." Also, read "About malaria drugs." In our

“Welcome” material, please read “Using your drugs.” The National Library of Medicine has more information about this drug:
<http://www.nlm.nih.gov/medlineplus/druginfo/meds/a682318.html>

Chloroquine is pronounced “KLOR oh kwin.” Aralen® is a popular brand of chloroquine. Each Aralen® tablet has 500 mg of chloroquine phosphate. (Your pharmacist may find it helpful to know that 500 mg of chloroquine is chemically equivalent to 300 mg of chloroquine base.)

Usually your prescription would have these instructions: Chloroquine phosphate (brand name Aralen® 300 mg base (same as 500 mg salt) tablets. Start 1 or 2 weeks before travel to malaria areas. Take one each week. Continue 4 weeks after you leave the malaria areas. Take on a full stomach.

Important: Taking chloroquine with meals or milk may prevent upset stomach.

Some pharmacists run computer checks that show a drug interaction between levofloxacin and chloroquine. Levofloxacin is a drug used to treat diarrhea, among other things. However, this is only a theoretical issue. In fact, the CDC’s guide to travel medicine does not list this as an interaction. See:
<https://wwwnc.cdc.gov/travel/yellowbook/2020/preparing-international-travelers/interactions-between-travel-vaccines-and-drugs>

Doxycycline

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<http://www.nlm.nih.gov/medlineplus/druginfo/meds/a682063.html>

Doxycycline is pronounced “DOCKS ee SIGH clean.”

Usually your prescription would have these instructions: Doxycycline 100 mg. Start 1 to 2 days before arrival in malaria zone. Take one by mouth each day. Stop 4 weeks after leaving malaria zone.

Important: Take each pill with a full glass of liquid, not just a gulp. After you take each pill, remain upright for 30 minutes. You may be standing, sitting, or walking. But do not lie down for 30 minutes after taking each pill. This is important. It can prevent serious problems, such as a hole in your esophagus requiring emergency surgery.

Some people say you can’t eat regular meals when you take doxycycline. Look at the material from the National Library of Medicine. You will see that the National Library of Medicine disagrees with those people. The National Library of Medicine says to continue your normal diet. We agree.

However, some medications don’t mix with doxycycline. These include antacids with aluminum, calcium, or magnesium. These include Pepto-Bismol®. Ask your doctor about other medications. Don’t take them within 2 hours of doxycycline.

It is always a good idea to wear sun block when you are out in the sun. This can protect your skin. It is especially important to use sun block when you are taking doxycycline. Some people who take doxycycline have a skin reaction when they are exposed to sunlight. Other ways to protect your skin from sunlight include:

- Try to avoid the sun
- Wear a sunhat
- Wear long clothing

When some people taking doxycycline, they tend to get yeast infections. This may cause vaginitis in women. This may cause itching and redness between the legs in men. Heat and moisture can make the tendency to get yeast infections even worse.

Malarone™

This drug is used for preventing malaria. Please read our information on the first page of “Malaria: How to fight it.” Also, read “About malaria drugs.” In our “Welcome” material, please read “Using your drugs.” The National Library of Medicine has more information about this drug:
<https://medlineplus.gov/druginfo/meds/a619023.html#precautions>

Usually your prescription would have these instructions: Malarone Tablets (250 mg atovaquone/100 mg

proguanil). Start 1-2 days before arrival in malaria zone. Take one by mouth daily. Continue for 7 days after leaving malaria zone.

This drug is sometimes more expensive than other malaria drugs. Will insurance cover it? Sometimes yes, sometimes no. You may need to ask your insurance company if they will pay for it. Don't wait til the last minute to check. If you can't afford this medicine, we may have to talk with you about the pros and cons of other medicines. All this may take some time.

Mefloquine

This drug is used for preventing malaria. Please read our information on the first page of "Malaria: How to fight it." Also, read "About malaria drugs." In our "Welcome" material, please read "Using your drugs." The National Library of Medicine has more information about this drug:

<http://www.nlm.nih.gov/medlineplus/druginfo/meds/a603030.html>

The Food and Drug Administration (FDA) has approved this guide to mefloquine:

http://www.accessdata.fda.gov/drugsatfda_docs/label/2008/019591s023lbl.pdf

Mefloquine is pronounced "MEF low kwin."

Usually your prescription would have these instructions: Mefloquine (Lariam) 250 mg. Start 2 weeks before arrival in malaria zone. Take once by mouth each week. Stop 4 weeks after leaving malaria zone.

Mefloquine is the most controversial medicine for preventing malaria. Many people like it. Many people dislike it.

People like it because it is convenient. You only need to take one pill each week. Also, the only common side effect is disturbing dreams, and many people don't even have this problem.

Some people dislike it because they have dreams that disturb them tremendously. Those people have dreams that seem very much like reality, and they are disturbed by the dreams.

The biggest controversy is with mental illness. Some people think that mefloquine causes serious mental illness. On September 4, 2002, the Wall Street Journal

published an article about the controversy.

<http://online.wsj.com/article/0,,SB103107575262822675,00.html>

Some people think that mefloquine caused people to commit murder or suicide. Other people think that murderers were just trying to find an excuse so they wouldn't be punished.

Many people have received mefloquine prescriptions from our staff and have done well. Some have had very disturbing dreams.

In general, we do not recommend it for anyone with any mental illness. Also, we do not recommend it for individuals who are doing activities that require fine coordination and spatial discrimination. Examples include being an airplane pilot and doing rock climbing.

If you do decide to take mefloquine you need to be ready to defend your decision. Your pharmacist may try to talk you out of it. Your friends may show you an article like one from Consumer Reports. ("Drug Risks the System Missed")