



# Deployment Health and Family Readiness Library



## Mefloquine (Lariam®) *For Clinicians*

### Important Facts

- Mefloquine (Lariam®) is an anti-malarial drug effectively used to prevent malaria. It is FDA-approved for use in regions where local strains of malaria have developed a resistance to other anti-malarial agents such as chloroquine.
- Mefloquine is prescribed to over 350,000 Americans each year and has a relatively safe and efficacious record of relative safety and efficacy.
- Provide service members a medication guide detailing possible side effects of this medication before taking mefloquine.
- Advise service members to avoid using alcohol while taking mefloquine because the more serious side effects occur among those who consume alcohol while taking the medication.
- While rare, suicides have been reported, but not proved scientifically, as a result of taking mefloquine. Remain alert to talk or signs of suicide and evaluate as necessary.
- Advise female service members not to use mefloquine if they are pregnant and not to become pregnant for three months after taking the last dose.

### When should mefloquine be prescribed?

Mefloquine should be prescribed for patients traveling to regions in which malaria is present and the parasite is resistant to chloroquine. Alternatives to prophylactic mefloquine include doxycycline and Malarone® (atovaquone with proguanil), but these require daily dosing instead of mefloquine's weekly dosing.

For adults, the usual oral dosing regimen is 250 mg each week beginning at least one week before travel, continuing weekly during travel, and for 4 weeks after leaving an endemic area, generally with an additional antimalarial prophylaxis medication. Doses should be taken on the same day of each week.

Mefloquine should be taken with food and at least 8 oz. (240 ml) of water to enhance bioavailability and to minimize side effects, particularly an upset stomach or vomiting. Steady state drug levels are reached after seven to eight weeks of consistent weekly dosing. Thus, side effects are more likely to occur within three to seven weeks of initiation.

The elimination half-life is relatively long, lasting from 13 to 24 days.

### What are the contraindications?

Contraindications for mefloquine include those with a known hypersensitivity or allergy to mefloquine or related compounds (other quinoline methanol derivatives such as quinine, quinidine); current or past depressive disorder, general anxiety disorder, psychosis, schizophrenia, or other significant psychiatric illness; a cardiac conduction abnormality or dysrhythmia, liver disease, or history of convulsions.

Providers should not prescribe mefloquine for patients taking medications that alter cardiac conduction (especially beta-blockers such as propranolol, atenolol, and metoprolol), anticonvulsant medications, drugs related to mefloquine (e.g. chloroquine, quinine, quinidine, and halofantrine), aurothioglucose, ampicillin, ampicillin/sulbactam, or the antipsychotic ziprasidone (Geodon®).

Some occupational groups (e.g., aviators) may be restricted from taking prophylactic mefloquine because of certain side effects described later. No anti-malarial medication provides 100% effective prevention. Therefore, critical prevention efforts include properly wearing the uniform and use of insect repellants on clothing and skin.

### What are the common side effects?

For most patients, mefloquine is well tolerated and offers the best protection in regions with chloroquine-resistant malaria. Side effects occur in 3 to 25 per cent of patients, rates similar to chloroquine. Most side effects do not necessitate altering the type of prophylactic drug. Potential side effects that can impair reaction time and thinking include sensory and motor neuropathies, encephalopathy, convulsions, psychosis, nightmares, dizziness, and confusion.

Side effects can include insomnia, unusual dreams, lightheadedness, headache, vertigo, visual disturbances, ringing in the ear, rash, irritability, and gastrointestinal symptoms, such as nausea, vomiting, and diarrhea. Vomiting is the most common side effect, affecting 3 percent of users. Other complaints affect less than 1 percent of users. If any of these effects occur, individuals should seek medical advice about the safety of operating heavy

Your Suggestions: [http://deploymenthealthlibrary.fhp.osd.mil/product\\_feedback.jsp](http://deploymenthealthlibrary.fhp.osd.mil/product_feedback.jsp)

Visit the Deployment Health and Family Readiness Library: <http://deploymenthealthlibrary.fhp.osd.mil>

A collaborative effort between the Air Force Institute for Operational Health, the Deployment Health Clinical Center, Force Health Protection and Readiness, the Navy Environmental Health Center, the U.S. Army Center for Health Promotion and Preventive Medicine, and the OUSD(P&R)/Military Family and Community Policy



equipment or carrying a weapon while remaining on the medication. If these effects persist or significantly impair functioning, consideration should be given to stopping the drug and changing to another anti-malarial.

### What about neuropsychiatric side effects?

Rare instances of suicide in patients taking mefloquine have been reported but no studies have demonstrated a statistical association between mefloquine use and suicide, suicidal ideas, suicide attempts, or any other violent behavior. Patients with a history of psychiatric illness may be vulnerable to mefloquine-related psychiatric symptoms, and the package insert recommends against prescribing to patients with a history of psychiatric or alcohol problems.

Often, potential neuropsychiatric side effects are the greatest concern for patients. Side effects may include anxiety, paranoia, depression, agitation, restlessness, mood changes, panic attacks, forgetfulness, hallucinations, aggression, and psychotic behavior.

Studies indicate that these may occur in 1 in 2,000 to 1 in 13,000 people who receive prophylactic mefloquine. Neuropsychiatric side effects may occur more commonly among those who consume alcohol while taking mefloquine, so patients should be carefully instructed to avoid alcoholic beverages.

Symptoms may continue long after mefloquine use has been stopped. If neuropsychiatric symptoms occur, mefloquine use should be discontinued in favor of other prophylactic medications or measures.

### What neuropsychiatric red flags should precipitate a referral?

In the event a patient who is taking mefloquine experiences suicidal ideation, depression, acute psychosis, or any of the other above-mentioned neuropsychiatric symptoms, the clinician should initiate an urgent medical referral including psychiatric assessment by a specialist. Under some deployed conditions, a psychiatric consultation may not be possible. In this situation, medical consultation with careful patient observation may be substituted. Mefloquine should be discontinued and replaced with another appropriate anti-malarial medication.

### How can I report adverse drug events potentially related to mefloquine?

Health care providers are encouraged to document and report known or suspected patient adverse drug events.

The FDA has the primary responsibility for assuring the safety and efficacy of all regulated drug products. MedWatch, the FDA Safety Information and Adverse Event Reporting Program, serves both health care professionals and the public. MedWatch facilitates voluntary and confidential reporting of adverse events potentially related to various medications. Reporting can be done via the FDA website at <http://www.fda.gov/medwatch/report/hcp.htm>, telephone (1-800-FDA-1088), fax (1-800-FDA-0178) or mail. FDA MedWatch Form 3500 may also be completed online. It is also appropriate to notify the local Medical Treatment Facility Pharmacy and Therapeutics Committee of adverse events potentially due to prescribed or dispensed medications. This committee can review the event and forward the report to the FDA (see AR 40-3, Chapter 11, paragraph 11-6 d(9)).

### What medical tests are indicated?

Baseline liver function tests are ideal though potentially impractical before deployment and should be repeated if clinical signs or symptoms suggest possible liver problems. An EKG should be performed for signs or symptoms suggestive of a potential cardiac problem. Animal studies have suggested changes in vision may occur with long-term mefloquine administration. Therefore, baseline vision testing is recommended and patients should be told to report vision problems to their provider. Repeat vision testing and eye examinations should be performed if the patient reports vision changes or if administration is prolonged (twelve months or more).



## Can mefloquine be used during pregnancy or breastfeeding?

CDC has advised that mefloquine can be used during pregnancy and breastfeeding, but its use in the first trimester should be based on assessment of benefits versus risks. Pregnant women or those desiring to become pregnant while in malarial regions should be advised against travel to such locations. Women of childbearing age should use a reliable contraceptive during prophylaxis and for three months after the last dose to avoid conceiving. Consultation with a travel medicine or infectious disease expert is recommended for these patients.

### Where Do I Get More Information?

**Air Force Institute for Operational Health (AFIOH)**

Phone: (888) 232-3764

<http://www.brooks.af.mil/afioh/>

**DoD Deployment Health Support Directorate (DHSD)**

Phone: (800) 497-6261

<http://www.deploymentlink.osd.mil>

**U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM)**

Phone: (800) 222-9698

<http://chppm-www.apgea.army.mil>

**DoD Deployment Health Clinical Center (DHCC)**

Phone: (866) 559-1627

<http://www.pdhealth.mil/>

**Navy Environmental Health Center (NEHC)**

Phone: (757) 953-0700

<http://www-nehc.med.navy.mil>

**Food and Drug Administration Medication Guide**

<http://www.fda.gov/medwatch/SAFETY/2003/LariamMedGuide.pdf>

**Medication Label**

[http://www.fda.gov/medwatch/SAFETY/2003/Lariam\\_PI.pdf](http://www.fda.gov/medwatch/SAFETY/2003/Lariam_PI.pdf)



**Your Suggestions:** [http://deploymenthealthlibrary.fhp.osd.mil/product\\_feedback.jsp](http://deploymenthealthlibrary.fhp.osd.mil/product_feedback.jsp)

**Visit the Deployment Health and Family Readiness Library:** <http://deploymenthealthlibrary.fhp.osd.mil>

*A collaborative effort between the Air Force Institute for Operational Health, the Deployment Health Clinical Center, Force Health Protection and Readiness, the Navy Environmental Health Center, the U.S. Army Center for Health Promotion and Preventive Medicine, and the OUSD(P&R)/Military Family and Community Policy*