

Just the Facts...

Falciparum Malaria



Falciparum is the most severe kind of malaria and may result in death if left untreated. Since no vaccine is available for falciparum malaria, optimum protection for Soldiers involves the combined use of these measures: taking anti-malarial drugs, limiting exposure to biting mosquitoes, sleeping under a permethrin-treated bednet, and using the DOD Insect Repellent System. Prompt and correct diagnosis of symptoms is key to mitigating life-threatening complications in patients infected with falciparum malaria.

Q. What is falciparum malaria?

A. *Falciparum* malaria is a mosquito-borne illness that is caused by a microscopic parasite which infects red blood cells. Four kinds of malaria parasites can infect humans: *Plasmodium falciparum*, *P. malariae*, *P. ovale*, and *P. vivax*. The severity of the disease depends on the kind of *Plasmodium* causing the infection.

Q. How can I be infected with falciparum malaria?

A. Malaria is spread when a female *Anopheles* mosquito ingests blood from an infected person. The parasite develops into an infective stage within the mosquito and later is injected into another person when that infected mosquito feeds again. Malaria cannot be transmitted from person-to-person like a cold or the flu.

Q. Why is falciparum malaria considered the most dangerous type of malaria?

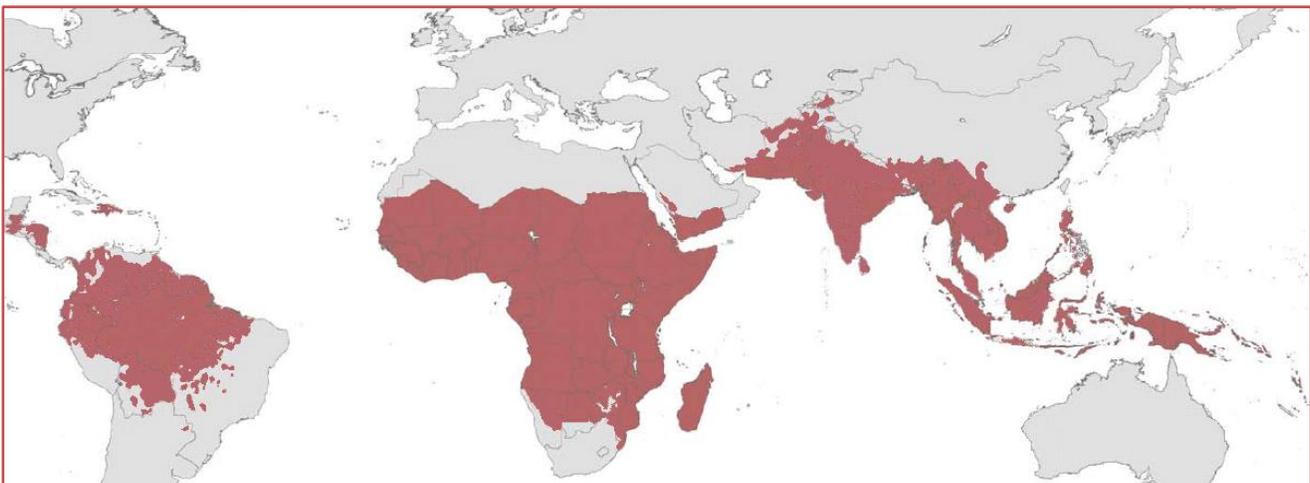
A. *Falciparum* malaria is a life-threatening disease that can produce liver and kidney failure, brain damage and coma. Worldwide, malaria causes up to a million deaths per year. *Falciparum* malaria is responsible for the majority of these deaths. If diagnosis and proper treatment are delayed, *falciparum* malaria can kill the patient very quickly. In addition, *P. falciparum* is becoming increasingly resistant to anti-malarial drugs in some areas.

Q. Where is falciparum malaria found?

A. In general, *falciparum* malaria is found in tropical regions close to the equator. Most cases originate in sub-Saharan Africa and Southeast Asia. *Falciparum* malaria is also endemic in some Central and South American countries as well as a few locations in the Caribbean, including Haiti. About 1,200 cases of malaria are diagnosed in the United States each year, and most of these cases are persons entering the country for the first time or returning from foreign travel. As a result of urban migration, poverty, and poor sanitation, many countries have been experiencing an increase in the number of *falciparum* malaria cases.



Falciparum malaria is an infectious disease caused by a parasite which infects red blood cells. Diagnosing this disease includes microscopic examination of a blood smear, using a stain to show the parasites inside red blood cells (red arrows).



The red-shaded areas show where there is a significant risk of transmission of *falciparum* malaria to humans via the bite of an infected female *Anopheles* mosquito. Severity of risk depends upon many factors, including weather, time of year, and local public health infrastructure.

Q. How does *falciparum* malaria make me sick and what are the symptoms?

A. In humans, the malaria parasites grow and multiply first in liver cells and then invade red blood cells and destroy them. The symptoms of *falciparum* malaria can begin as soon as 8 days after being bitten by an infected mosquito. These symptoms include: overall discomfort and fatigue, high fever (104-106 °F) and sweating, shaking chills, headache, and nausea. Untreated, these symptoms can progress to life-threatening complications.

Q. How is *falciparum* malaria diagnosed and treated?

A. *Falciparum* malaria must be diagnosed promptly in order to treat the patient in time to avoid life-threatening complications. Malaria parasites are identified by examining a drop of the patient's blood, spread out as a "blood smear" on a microscope slide. When reliable microscopic diagnosis is not available, Rapid Diagnostic Tests (RDTs) may be a useful diagnostic alternative. Anyone who has a fever during or after a visit to an area where malaria occurs should seek immediate medical attention. To help ensure proper testing is performed, the patient should inform the healthcare provider about any recent travel to a region with malaria. *Falciparum* malaria may be effectively treated with a variety of prescription drugs, especially if diagnosed before it becomes severe and life-threatening.

Q. What can I do to reduce my risk of becoming infected with *falciparum* malaria?

- A.** No vaccine is available for any type of human malaria. Prevention of malaria involves the combined use of all of these measures:
- Take malaria chemoprophylaxis pills as directed by the medical authority.
 - Limit outdoor activities during peak biting times for *Anopheles* mosquitoes (from dusk until dawn).
 - Sleep under a permethrin-treated bednet.
 - Protect against mosquito bites by using the DoD Insect Repellent System.

Q. How can I use the DoD Insect Repellent System to protect against *falciparum* malaria?

A. The DoD Insect Repellent System is the best Soldier protection against biting mosquitoes. It involves the combined use of all of these measures:

- Proper wear of the uniform - pants tucked into boots, sleeves down, undershirt tucked into pants
- Application of 33% DEET lotion (NSN 6840-01-284-3982) on exposed skin
- Application of permethrin (aerosol spray, 0.5% permethrin, NSN 6840-01-278-1336 or IDA impregnation kit, 40% permethrin, NSN 6840-01-345-0237) to the Army Combat Uniform (ACU) and Battle Dress Uniform (BDU)



The **DOD Insect Repellent System** is a proven strategy used to prevent diseases transmitted by mosquitoes, flies, ticks, and other biting arthropods. It is implemented through the combined use of skin and clothing repellents and properly worn uniforms.

Note: Soldiers cannot treat their Flame Resistant Army Combat Uniforms (FR ACU's) or Nomex ACU's with permethrin in the field. Beginning in 2010, all deploying soldiers will be issued FR ACU-P's (uniforms that have been factory treated with permethrin).

Q. Why is it important to take chemoprophylaxis medication as prescribed?

A. It is the Army's policy to provide the best protection for our Soldiers' health and well-being. This policy includes the use of anti-malarial drugs, known as chemoprophylaxis, to prevent the development of malaria. Chemoprophylaxis is a proven component of malaria prevention complementing other personal protective measures aimed at avoiding mosquito bites. Normally, you will take anti-malarial drugs prior to, during, and for a period of time after your deployment. It is extremely important that Soldiers take their anti-malarial medication as prescribed by medical authorities; with some drugs, missing a single day may put you at risk of contracting *falciparum* malaria.

References:

- Department of The Army Personnel Policy Guidance (PPG) For Overseas Contingency Operations**, Chapter 7, Medical & Dental, Section 7-6, Immunizations and Force Health Protection Prescription Products, Paragraphs d.(1-4), 23 March 2010 Update.
- DoD Memorandum**, "Updated Policy for Prevention of Arthropod-Borne Diseases Among Department of Defense Personnel Deployed to Endemic Areas", 18 May 2007, available at <http://usachppm.apgea.army.mil/DODIRS>.
- Guerra, C.A., et al.**, "The Limits and Intensity of *Plasmodium falciparum* Transmission: Implications for Malaria Control and Elimination Worldwide", PLoS Med, February 2008, Volume 5, Issue 2 e38.
- Heymann, D.L. (Ed.)**, "Control of Communicable Diseases Manual", Malaria pp. 373-393, American Public Health Association, Washington, DC, 2008.