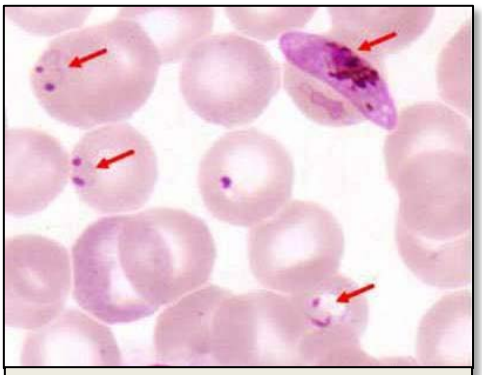
Falciparum Malaria

FACT SHEET 18-073-0216

Just the Facts...

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 bed net, 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.



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).

What is falciparum malaria?

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.

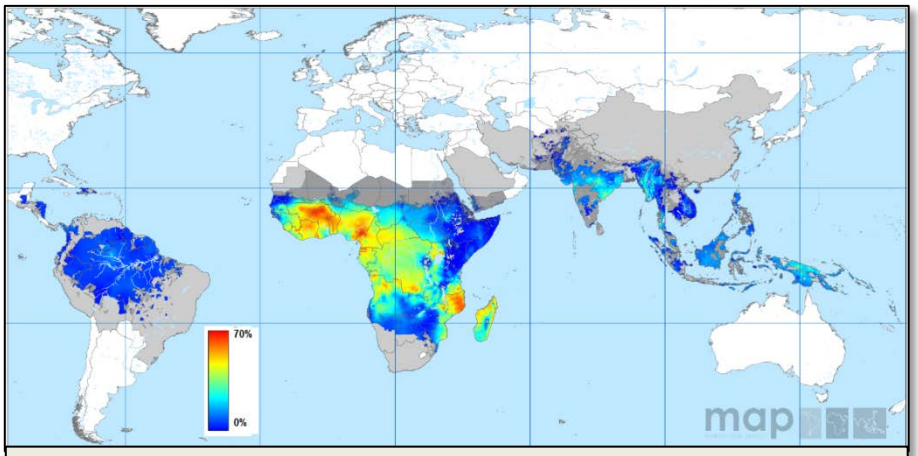
How can I be infected with falciparum malaria?

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.

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

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.

Where is falciparum malaria found?



Distribution of Plasmodium falciparum malaria endemicity in 2010. Severity of risk depends upon many factors, including weather, time of year, and local public health infrastructure. Map adapted from the Malaria Atlas Project

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 1,500 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.

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

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.

How is falciparum malaria diagnosed and treated?

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

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5158 Blackhawk Road, APG, MD 21010-5403
COM 410-436-3613 / DSN 312-584-3613 / Website: http://phc.amedd.army.mil

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.

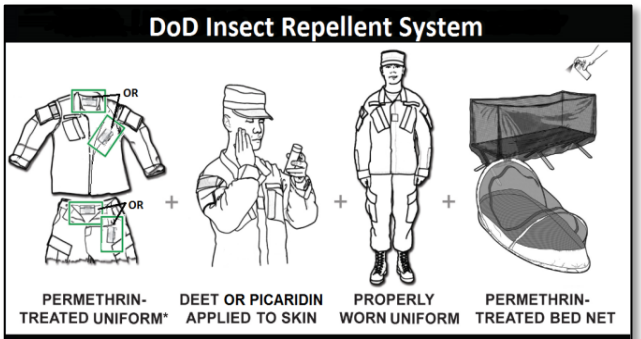
Why is it important to take chemoprophylaxis medication as prescribed?

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.

What can I do to reduce my risk of becoming infected with malaria?

AVOID MOSQUITO BITES! Using the DoD Insect Repellent System provides the best protection from mosquito bites. It incorporates permethrin repellent on the uniform, DEET or picaridin repellent on exposed skin, a properly worn uniform and sleeping inside a permethrin-treated bed net.

Another important preventive measure is to eliminate mosquito breeding sites. Anopheles larvae are adapted to a variety of aquatic habitats, but occur predominantly in ground waters, ranging from small collections of water such as animal footprints and puddles that lack vegetation to large bodies of water such as rice fields, swamps and river margins that have shelter provided by vegetation. A number of species thrive in both fresh- and brackish-water habitats and some normally inhabit only brackish-water pools. Stay in air-conditioned areas or make sure your door and window screens do not have holes. Minimize time outdoors at night and during twilight periods, which are the peak biting times for the *Anopheles spp*. mosquitoes that transmit malaria.



Using all elements of the DoD Insect Repellent System provides maximum and safe protection from mosquito-borne diseases. Diagram: VID, APHC

How do I know if my uniform is treated with permethrin repellent?

Factory-treated permethrin Army Combat Uniforms (ACU Permethrin) are now available to all Soldiers. The ACU Permethrin trouser and coat will have a sewn-in label indicating the uniform is factory-treated with permethrin. If not factory-treated, Soldiers can field-treat using either the IDA Kit (NSN 6840-01-345-0237), which can last up to 50 washings, or the 0.5% aerosol spray can (NSN 6840-01-278-1336), which should be reapplied after six weeks and the sixth washing. When applying permethrin, always read and follow the label directions. Permanently mark the uniform label with the permethrin field-treatment date. **Never apply permethrin to the skin**. Aerosol products containing 0.5% permethrin and clothing factory-treated with permethrin are also commercially available for civilian use.

What standard military insect repellent products are available for exposed skin?

Approved military insect repellents for use on exposed skin come in a variety of formulations. Always refer to the label to determine frequency of repellent application based on activity. **Do not apply repellent to eyes, lips, or to sensitive or damaged skin**. Available military repellents are:

- **Ultrathon™** (NSN 6840-01-284-3982) contains 33% controlled-release DEET lotion; one application protects for 12 hours.
- **Ultra 30™ Insect Repellent Lotion** (NSN 6840-01-584-8393) contains 30% Lipo DEET; one application protects for up to 12 hours.
- **Cutter® pump spray** (NSN 6840-01-584-8598) contains 25% DEET; one application protects for up to 10 hours.
- **Sunsect** combination sunscreen & repellent (NSN 6840-01-288-2188) contains 20% DEET with SPF 15 sun protection.
- **Natrapel® pump spray** (NSN 6840-01-619-4795) contains 20% picaridin; one application protects for up to 8 hours.

All standard approved skin repellents contain the active ingredient DEET or picaridin, and are registered by the U.S. Environmental Protection Agency (USEPA). These products are safe to use and effectively repel mosquitoes, sand flies, fleas, ticks and other potential disease vectors and pests. Photo: VID, APHC

What is considered a "properly worn combat uniform"?

Worn properly, military combat uniforms act as a physical barrier against insects, ticks and other disease transmitters and biting nuisance pests. Wear uniforms with the sleeves rolled down; tuck pants into boots and undershirt into pants. Wear uniform loosely since mosquitoes can bite through fabric that is pulled tight against the skin. A permethrin-treated uniform does not provide protection to exposed skin; protect exposed skin with an approved insect repellent.

What standard bed nets are available to help protect Soldiers from mosquito bites while sleeping?

Treated bed nets provide a barrier between a sleeping Soldier and pests (e.g. mosquitoes/ticks). Lightweight, self-supporting, pop-up bed nets factory-treated with permethrin are available in coyote brown (NSN 3740-01-518-7310) or green camouflage (NSN 3740-01-516-4415). The newly-released Egret bed net (NSN 3740-01-644-4953) will also protect against mosquitoes, and has a higher ceiling. Untreated mosquito bed nets (NSN 7210-00-266-9736) should be treated with 0.5% permethrin aerosol spray and assembled properly on a cot. Check for holes in the netting and keep loose edges off the ground by tucking them under the sleeping bag.

For more information please consult the APHC website - http://phc.amedd.army.mil