



TRAVELLER'S MALARIA POCKET GUIDE

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1 THE DISEASE

Malaria is the most important tropical parasitic disease causing illness in over **200 000 000** and the death of approximately **500 000** people living and travelling in affected areas around the world.

The epidemiology of the disease is complex, depending on factors such as altitude, climate (temperature and rain fall), mosquito-breeding sites and human behaviour for successful transmission of the disease. Approximately 40% of the world population in around 109 countries, in the tropics and sub-tropics, as well as travellers to these regions, are exposed to malaria. **The risk is greatest in sub-Saharan Africa, Papua New Guinea and the Solomon Islands.** The Indian sub-continent, Amazon basin and remote rural areas of Southeast Asia also pose a significant risk.

The most important of five *Plasmodium* species causing malaria in humans is *Plasmodium falciparum* (*P. falciparum*), the **most prevalent parasite in Africa and responsible for almost all deaths caused by malaria globally.** [*P. falciparum* is the cause of kidney, respiratory and multi-organ failure.]

Malaria as a result of any of the other species (non-falciparum malaria) rarely lead to death during acute illness, only doing so in pregnant woman and those with chronic, untreated disease. In order of prevalence they include: *P. vivax*; *P. malariae*; *P. ovale*; *P. knowlesi*. The latter species has only recently been acknowledged as causing malaria in humans.

Plasmodium vivax and *Plasmodium ovale* may lead to repeated illness without re-infection due to the ongoing presence of parasites in the liver, even following apparently effective treatment of the initial acute illness. These parasites can be eradicated with Primaquine, a drug **not used for the treatment of acute malaria.** In most parts of the world *P. falciparum* has developed varying degrees of resistance to drugs used for malaria prevention and treatment. **There is no vaccine against malaria.**

2 THE DISEASE

Malaria is transmitted via the **bite of parasite infected female Anopheles mosquitoes.** (The parasites infect the liver and then the red blood cells). The incubation period - time from being bitten to becoming ill - varies from 7 to 17 days in all malaria species with the exception of *P. malariae* which presents between 18 and 40 days after a bite. The incubation period may be highly variable due to a variety of factors and in exceptional cases the onset of illness may be more than a year after the infected bite.

There are no 'typical' malaria symptoms: All persons experiencing a 'flu-like' illness with symptoms that may include all or any of the following, **have MALARIA UNTIL PROVEN OTHERWISE:** fever; cold shivers; headache; muscle and/or joint pain; vomiting and even diarrhoea. **Suspected malaria represents a MEDICAL EMERGENCY** and requires immediate medical consultation.

Correct diagnosis and effective treatment depend on a comprehensive, detailed travel and exposure history, thorough clinical examination and reliable laboratory confirmation in order to confirm the clinical diagnosis of malaria or any other life threatening disease that presents with fever.

3 PREVENTION

- Do not get bitten:** Anopheles mosquitoes usually hunt between dusk and dawn. Avoid bites at all times in all malaria risk areas, but especially during or immediately after the rain season. The more mosquito-avoidance measures used, the better. Cover up with long sleeves, trousers, socks and shoes. **(90% of mosquito bites occur below the knees!) Apply DEET** (diethyltoluamide) insect repellent to exposed skin every 4 hours. Only sleep in air-conditioned or screened accommodation or carry an insecticide-impregnated bed net - and sleep under it!
 - Seek early treatment:** Any flu-like illness, (fever, shivers, headache, muscle aches, vomiting, even diarrhoea) commencing 7 days, and for up to 6 months or even longer, after leaving a malaria risk region, should be presumed to be malaria. This is regardless of whether you think you have been bitten and/or malaria-prevention drugs have been taken correctly or not. Seek expert medical care immediately and ensure that the clinical diagnosis is confirmed with a **reliable laboratory diagnosis** to include a malaria blood smear and/or rapid antigen test, preferably with a full blood count.
 - Take "The Pill":** Malaria chemoprophylaxis kills the malaria parasite before the traveller (who has no natural immunity to malaria and never acquires it in spite of repeated infections) becomes clinically ill. They act mostly on the parasites in the blood phase when the parasites exit the liver at the end of the 'incubation period'. Atovaquone / Proguanil however, works on the liver stage shortly after being bitten. Chemoprophylaxis **must therefore be commenced before entering the malaria area**, to ensure that protective drug levels are reached and that the drugs are tolerated. Likewise prophylaxis has to be continued for 4 weeks after leaving the area to ensure eradication of parasites still emerging from the liver. Because Atovaquone / Proguanil also acts on the liver stage of the parasites, it can be stopped seven days after leaving the malaria area.
- No drug or bite prevention method is 100% effective**, but chosen and applied well, the combination can provide 90% protection against malaria illness and death. It has been shown that even if illness does occur, the likelihood of cerebral malaria is diminished and the chance of death reduced significantly.



4 PREVENTION

No drug is completely without side effects. The decision whether to use preventive drugs or not should be based on consultation with a knowledgeable health care provider regarding the relative malaria risk in the area to be visited, any pre-existing disease or chronic medication the traveller may have or use, the availability of effective malaria prophylaxis, the potential side effects and cost of the available appropriate anti-malaria drugs.

People born in malaria-endemic areas become partially immune because of frequent infection, but the mortality rate amongst babies and toddlers remain extremely high.

Travellers never become immune - in spite of frequently being infected - and they are in danger of dying every time they contract malaria.

5 PROPHYLACTIC MEDICINES

Mefloquine 250mg (Mefliam®, Lariam®) Take 1 tablet weekly, on the same day each week, after breakfast with plenty of liquid. Commence 1 week before entering the risk area, continue weekly while in the area and for 4 weeks after leaving. If never used before, it may be advisable to commence three weeks prior to departure to ensure that no serious side-effects occur. Avoid heavy alcohol consumption for 24hrs before and after the weekly dose. People with epilepsy, neuropsychiatric or psychological illness, an irregular heartbeat, pilots and scuba divers, should avoid this drug. (If minor side effects occur, try splitting the dose e.g. taking a half tablet on Sunday and taking a half tablet on Thursday). If major symptoms such as dizziness, agitation, depression or racing pulse occur, stop the drug immediately and seek professional advice.

- Children: Mefloquine may be prescribed to children who weigh more than 5 kg. Prescribe according to weight.
- Pregnancy: Drug of choice in all three trimesters.

Doxycycline 100mg (several brand names): Take 1 tablet daily, after a good breakfast with plenty of liquid. Commence 2 days before entering a risk area, daily whilst there and for 4 weeks after leaving the area. Best avoided by those suffering from heartburn or stomach ulcers. Sun sensitive persons may want to take additional measures to avoid excessive sunburn (covering up and sun screen). Safe in scuba divers.

- Children: Do not prescribe under the age of eight years and preferably not before adolescence.
- Pregnancy: Contra-indicated throughout pregnancy and breast feeding.

Atovaquone 250mg / **Proguanil** 100mg fixed combination (Malanil®/ Malarone® / Mozitec® / Malateq®): Take 1 tablet per day, after breakfast with plenty of liquid. Commence 1 day prior to arrival, continue daily for the duration of stay and continue for 7 days after leaving the area. May be prescribed to pilots subject to the usual precautions applicable to flying with medication and may be used with caution in scuba divers.

- Children: Paediatric Malanil® may be prescribed to children who weigh more than 11 kg. Prescribe according to weight.
- Pregnancy: Contra-indicated throughout pregnancy and breast feeding. (No safety data available)

6 MANAGEMENT OF SUSPECTED MALARIA

There are no 'typical' malaria symptoms. Any person experiencing a 'flu-like' illness with symptoms that may include all or any of the following, **has MALARIA, UNTIL PROVEN OTHERWISE:** Fever, cold shivers, headache, muscle and / or joint pain vomiting and even diarrhoea.

- Seek expert medical consultation. State clearly that you suspect malaria and insist on a complete medical examination and laboratory diagnosis.
- If there is no medical expertise and provided you have the necessary kit available:
 - Ask a trained travel companion to perform a rapid malaria antigen test
 - With the results in hand, obtain telephonic support from a Travel Health Consultant
 - If the test is positive, commence standby emergency treatment (SBET).
 - Make your way towards good medical care immediately.**
 - Remember:
 - One negative test does NOT exclude malaria**
 - Not all fever is due to malaria - it may be due to another serious disease that requires expert medical care

Malaria Rapid Antigen Test Kits (RAT)

The test strip detects the presence of a chemical component of the parasite wall - the antigen. It is used to diagnose new onset malaria, but can NOT be used to monitor treatment efficacy as it may remain positive for two weeks after effective treatment. There are a number of these kits on the market, but not all are of equal quality. As the only life-threatening malaria in travellers is caused by *P. falciparum* and the tests detecting multiple species is less sensitive and specific, the single species test is preferable.

Anyone planning to use the test in the field **MUST** be trained in the use of the specific test prior to departure.

Stand by Emergency Treatment

This may be appropriate for travellers away from reliable medical assistance:

- who have been exposed;
 - are asymptomatic;
 - have a positive RAT;
- to start treatment immediately.

DRUG	DOSAGE	COMMENT
Artemether 20mg/ Lumefantrine 120mg Coartem®/Riamet® and other generic substances	Adults: 4 tablets initially, repeat after 8 hours and then 4 tablets every 12 hours for a total of 24 tablets	Take with fatty food or a little milk
Quinine sulphate 1 tab = 300mg PLUS Doxycycline 1 tab = 100mg	Adults: 2 tablets, 3 times a day for 7 days Adults: 1 tablet, twice a day for 7 days	Do not use within 12 hours of mefloquine After a meal

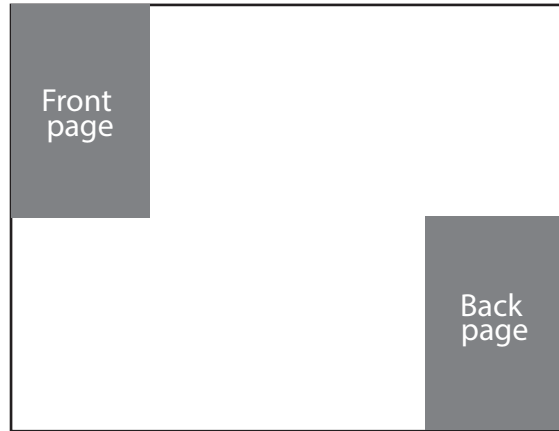
Children: Discuss treatment with a doctor.

Travellers in Africa may also encounter

Artesunate plus Mefloquine (Artequin®), Amodiaquine (Falcimon®), Sulfadoxine-Pyrimethamine (Arintate®) or Dihydroartemisinin (Euraksim®). These are reasonable alternatives if none of the above is available. In accordance with WHO stipulations, Artesunate and its derivatives on its own should NOT be used. Any patient with malaria that requires intravenous Quinine or Artesunate, should be treated in a well-equipped and staffed intensive care unit. If this is not available, medevac to a sophisticated facility is vital.

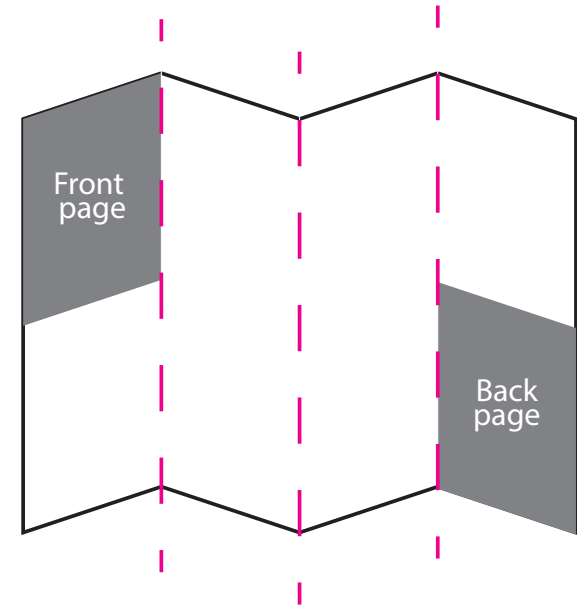
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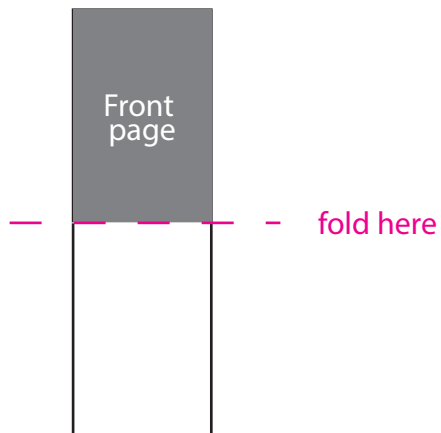
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step 4

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