

## Malaria

### Additional Information for the long-term traveller

Malaria is a potentially fatal mosquito borne disease that occurs in many parts of the world. It is transmitted between dusk and dawn by the female Anopheles mosquito.

There are 4 species of malaria which infect humans: Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale, and Plasmodium malariae. Falciparum is the most common species in Africa, and causes potentially fatal cerebral malaria.

The risk of malaria depends on your exact destination, and can be quite different even within a country. For example, travellers to rural areas are often at higher risk. However, not all urban areas are free of malaria. Risk is significant in some major cities in Africa, India and Pakistan. Areas at high altitude are usually malaria-free, as are cooler regions. Malaria risk varies depending on the season in some areas. Therefore your travel plan should be discussed in detail with a specialist in travel medicine.

Local populations in malaria endemic areas usually have partial immunity against malaria, and are therefore less susceptible to it than the traveller. This immunity disappears after 1-2 years away from the endemic area.

No anti-malarial medication is 100% effective. Avoiding mosquito bites is essential, even if on anti-malarial medication. Currently there is no vaccine available.

Malaria is totally curable in the early stages. 1-2% of returned travellers infected with malaria die, usually because of delayed treatment. Cerebral malaria can be fatal within 24-48 hours.

In Australia 600-800 cases per year are reported in returned travellers.

There is a 1 in 4000 chance of dying from malaria in travellers on an extended overland Africa trip.



Specific anti-malarial medications will need to be discussed with a doctor. The choice of medication depends on destination, length of stay, potential side effects of medications, pre-existing medical conditions, other regular medications, allergies, etc. The pros and cons of taking medications should be discussed with a doctor, especially for long term travellers, pregnant women, and children.

Anti-malarial medications are not 100% effective, and any fevers or flu-like illness will need to be investigated, preferably with a blood test. Symptoms are very variable and may be non-specific in the early stages; they may include fever, nausea, vomiting, headaches, muscle and joint pains, tiredness, runny nose, sore throat, cough, abdominal pain, and diarrhoea.

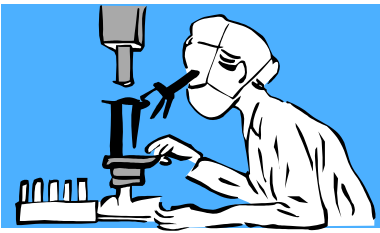
Travellers who stay long term or frequent travellers sometimes choose not to be on regular anti-malarial medications for various reasons, including side-effects of medications, concern about potential side-effects, or personal preference not to take medications on a long term basis. The risk of malaria may be low at a mine site or work site if good environmental mosquito control measures are in place, e.g. fogging, eliminating stagnant water, air-conditioned accommodation, fly screens, mosquito nets. (Remember that if travelling to areas outside of the mine site or work site malaria risk may be much higher.) A lower risk during dry season, easy access to reliable medical facilities for diagnosis and treatment of malaria, and cost are other factors in not using preventative medication. Travellers who choose not to take anti-malarial medications will need to take extra care with mosquito avoidance.

No anti-malarial medication is without potential side effects, but remember that you are taking them to reduce your risk of contracting malaria, which can be fatal. If you have concerns about masking symptoms of malaria while on preventative tablets, remember that it is healthier for you to be mildly unwell and stay alive if you catch malaria while on the prevention, than to be terribly unwell and know you have malaria and die from it, not being on the medication. Keep this in mind especially if you are in remote areas away from immediate medical care.

There is a ten-fold reduction in malaria risk with adequate behavioural and physical measures to avoid mosquito bites.



Consider taking a malaria test kit (ICT test kit for Falciparum malaria) and emergency treatment medications for malaria, especially if travelling to high risk areas and not taking anti-malarial medications for any reason, or if travelling to remote areas where medical care may not be readily available or reliable.



It is preferable that diagnosis is made by trained medical staff examining your blood using microscopy - this is more accurate and can ensure that you receive the most appropriate treatment for the strain of malaria you have caught.

If diagnosed with malaria and/or treated while overseas, record details of the type of malaria species if known, and the treatment medication given to you as this will assist greatly in further care.

Depending on the type of malaria, the incubation period may be from 1 week to 1 year. Any fevers or flu-like illness on return to Australia need to be investigated.

Present to a travel clinic or your doctor for a check-up on return to Australia to ensure malaria has been treated adequately. They will determine if further treatment to eradicate liver parasites is necessary, otherwise relapses may occur. The doctor should also screen for other tropical diseases, which may mimic malaria.

Self-treatment should be considered for travellers to remote areas where medical attention is not readily available, especially if using less effective prophylaxis or if in a malaria area long-term and not on preventative medication at all.

Self-treatment regimes available in Australia may include:

- Malarone (Atovaquone/Proguanil) - This is the emergency self-treatment of choice. The dosage is 4 tablets daily for 3 days. Take with meals to maximise absorption. Malarone is very effective and has fewer side effects than Lariam, but is expensive.
- Riamet (Artemether and Lumefantrine) - Take 4 tablets when diagnosed, then 4 tablets at 8, 24, 36, 48 and 60 hours thereafter. Take with meals to maximize absorption.
- Lariam (Mefloquine) - 2 x 250-mg tablets to start, then a further 2 x 250-mg tablets 6 hours later. Potential side effects may include nausea, vomiting, headaches, confusion, dizziness, anxiety, and agitation (i.e. all the possible side effects of Lariam, but more common because of the higher dose used for treatment). We recommend taking an anti-nausea medication (eg stemetil) half an hour before taking each treatment dose of Lariam. There is Lariam resistance in South-east Asia. Lariam is not effective for treatment if you are already taking it for prevention. Lariam should not be used with Halfan, Quinine, Chloroquine, or beta-blockers. It is not recommended in people with a past history of epilepsy, neurological or psychiatric problems.
- Fansidar (Sulphadoxine/pyrimethamine) - 3 tablets together as a single dose. Fansidar resistance occurs in Southeast Asia, South America, and Africa. Do not take Fansidar if allergic to sulphur drugs.
- Quinine - This is very effective but has many side effects. It should only be used in hospitalised patients.

Other malaria treatment used overseas:

- Halfan (Halofantrine) - no longer used in Australia because of side effects. Halfan may cause a cardiac arrhythmia especially if used with Lariam (Mefloquine). People should have a normal ECG before using Halfan.
- Qinghaosu derivatives (from a Chinese herb) eg Artesunate (cotecxin), Artemether, Artemisinin. These are widely used in Asia and Africa and are very effective, cheap and easily available "over the counter". There is a high incidence of recurrence if artesunate is used alone, so another anti-malarial like Lariam or Doxycycline should be added to the treatment, depending on which preventative drug was used. They are not recommended during pregnancy, and should not be used as preventative medication.
- Chloroquine - still an effective and cheap treatment for malaria in some areas, but Chloroquine resistance is now widespread in many parts of the world. If you have been treated with Chloroquine and symptoms do not improve, seek further medical care. It is often used as first line treatment in Africa because it is cheap and readily available.



Be aware of Primaquine, which is used to eradicate liver parasites if infected with some types of malaria (vivax and ovale). People who are deficient in an enzyme called G6PDH can develop acute haemolysis (breakdown of blood cells) if they take Primaquine. G6PDH levels can be checked with a blood test before the use of Primaquine. This can be done in Australia prior to travel if you are going long-term to countries with high incidence of vivax or ovale malaria (e.g. Papua New Guinea). Primaquine is not recommended in pregnancy.

Remember to recommence your malaria prophylaxis medication one-week after self-treatment of malaria.



Also consider that if you contract malaria in developing countries, it may lead to exposure to unhygienic needles, syringes, and IV drip equipment that may not be sterile and blood products which may not be adequately screened for blood-borne diseases like HIV and Hepatitis B and Hepatitis C.