

## Malaria

Malaria is an infection characterised by fever, shivering, chills, malaise, headache and sweats, but it can present as a respiratory or gastrointestinal illness. It is caused by any of four different species of the Plasmodium parasite, passed on via the bite of an infected mosquito. Malaria caused by *Plasmodium falciparum* is life threatening. Infants, the elderly and those with compromised immunity may be at greater risk.

The incidence of malaria is on the rise, with around 311 million new infections, and 900,000 deaths worldwide every year. Australia is free of endemic malaria, but Australians can catch the disease when travelling to tropical regions in Asia, Africa, and Central or South America. Most Australian cases of malaria are contracted in Papua New Guinea, East Timor and Indonesia. Effective treatment relies on early diagnosis and specific anti-malarial medications.

### Symptoms of malaria

Symptoms include:

- A slow rising fever that escalates to a rapid temperature rise and fall
- Headache
- Nausea
- Chills
- Shivering
- Excessive sweating
- Diarrhoea
- General malaise
- Anaemia and associated symptoms.

### Four different species of parasite

Malaria is caused by infection by one of four different species of the Plasmodium parasite: *P. vivax*, *P. ovale*, *P. malariae* and *P. falciparum*. The most common infections are those caused by *P. vivax* and *P. falciparum*. The *P. vivax* and *P. ovale* parasites can lie dormant in the body, only to reactivate and cause symptoms after a number of years. Falciparum malaria can be life threatening without prompt medical treatment.

### Falciparum malaria can be fatal

The typical symptoms of malaria described above can lead to further symptoms and complications in the case of *P. falciparum* infection, including:

- Jaundice
- Coagulation defects (blood doesn't clot)
- Rupture of the spleen
- Haemolytic anaemia (the red cells don't live a normal life span)
- Shock
- Kidney failure
- Liver failure
- Pulmonary oedema
- Cerebral malaria, producing coma
- Death.

### Modes of transmission and incubation periods

Malarial parasites are carried by the female anopheles mosquito, which tends to be active at dusk and early evening. When an infected mosquito bites a human, the parasites roam in the bloodstream for around one hour before entering the liver and multiplying.

After six to 16 days (depending on the species), the parasites return to the bloodstream to invade and multiply inside red blood cells until they burst. The released parasites then invade fresh red blood cells and the destruction continues.

The incubation period (the time between the mosquito bite and the onset of symptoms) ranges from eight to 30 days, once again depending on the parasite species. Other less common modes of transmission include blood transfusion, sharing needles or syringes, and congenital infection.

## **Avoid mosquito bites**

When in malarial areas, suggestions include:

- Avoid outdoor activity around dusk and dawn when mosquitoes are most active.
- Wear loose, long, light-coloured clothing.
- Use mosquito repellents on exposed skin and clothing.
- Don't wear perfumes, colognes or aftershave.
- Use 'knockdown' sprays, mosquito coils and plug-in vaporising devices indoors.
- Sleep under mosquito nets treated with repellents or insecticides if you don't have flyscreens on windows.

## **Anti-malarial drugs**

Travellers who visit malarial locations should avoid mosquito bites and take anti-malarial drugs. Unfortunately, drugs are becoming increasingly ineffective as the parasites develop resistance. There are different drugs available such as chloroquine, mefloquine and doxycycline. Recent drug management includes atovaquone-proguanil, artemether-lumefantrine and artesunate.

The choice of drug used depends on a number of factors, including:

- The age, health and medical history of the traveller
- The type of malaria parasites present at the intended location
- The parasites' drug resistance status (the parasites in many areas are now resistant to chloroquine)
- Length of intended stay
- Local health care facilities.

## **Pregnant women are at risk**

Pregnant women are advised to avoid malarial areas. While it is relatively rare for malaria to pass from infected mother to unborn child, the disease increases the risk of miscarriage or premature labour. Fetal development may also be affected. Treatment options for malaria in pregnant women are limited.

## **Diagnosis of malaria**

If you experience symptoms, seek prompt medical treatment, even if you took all precautions against mosquito bites and used anti-malarial medications. Enlargement of the liver (hepatomegaly) and spleen (splenomegaly) may be apparent during a physical examination. Malaria is principally diagnosed with a blood test that screens for the presence of malaria parasites.

## **Treatment of malaria**

Treatment consists of anti-malarial medications; the particular medication used depends on the species of parasite and any associated drug resistance. In severe cases, hospitalisation and intravenous treatment may be needed.

## **Where to get help**

- Your doctor
- Travel Clinics Australia Tel. (03) 9528 1222 or 1300 369 359

## Things to remember

- Malaria is an infection characterised by fever, shivering, chills and malaise, but may also present in a less typical manner.
- It is caused by any of four different species of the *Plasmodium* parasite, passed on via the bite of an infected mosquito.
- Australia is free of endemic malaria, but Australians can catch the disease when travelling to tropical regions in Asia, Africa, and Central or South America.
- Malaria can be life threatening – early treatment is paramount.
- Treatment consists of anti-malarial medications; the particular medication used depends on the species of parasite and any associated drug resistance.

**This page has been produced in consultation with, and approved by:**

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