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Abstract : Malaria is an insect borne disease widespread in tropical and subtropical regions of the world. It causes about 400–900 million cases of fever and approximately one to three million deaths annually - this represents at least one death every 30 seconds. The vast majority of cases occur in children under the age of 5 years. Preventative medications and personal protection measures against insect bites are important safeguards when travelling to a malaria-endemic areas. Chloroquine is the used in non-resistant areas for prophylaxis. In areas of chloroquine-resistance, Malarone, Doxycycline or Lariam are used.

This document was created by a medical student enrolled in the Primary Care Clerkship at the University of Minnesota Medical School as part of the course project. The aim of the project is to present information on a medical topic in the format of a patient education handout. It does not necessarily reflect the views of the University of Minnesota Medical School physicians and faculty. These materials are provided for informational purposes only and are in no way intended to take the place of the advice and recommendations of your personal health care provider. The information provided may no longer be up to date since it has not been reviewed since the date of creation. The information provided should not be used to diagnose a health problem or disease, or as a means of determining treatment. In the event of a medical emergency, immediately contact a doctor or call 911.

TREATMENT of MALARIA

BASICS of MALARIA

What is it?

Malaria is one of the most common tropical diseases. It is a serious disease and may be fatal if not diagnosed and treated at an early stage. Malaria is caused by parasites called Plasmodium, which are transmitted by some species of Anopheles mosquitoes. The parasites attack the liver cells and red blood cells and may cause blockage of the small blood vessels in human body. These blockages can result in complications such as cerebral malaria — a widespread disease of the brain which is accompanied by fever — which is frequently fatal.

How does a person get infected?

The anopheles mosquito sucks up the parasite when feeding on the blood of an infected person. The parasites multiply in the stomach of the mosquito and after a few days move to the mosquito's salivary glands. When the mosquito feeds again, parasites are released into the blood stream where they develop & may cause malaria.

(See image on the back of this brochure)

Where is it found?

Malaria is found in many parts of the world including Africa, Central and South America, Southeast Asia, the Indian subcontinent, the Middle East, and the islands of the South Pacific.

(View watermark on this page for areas with malaria)

“ABCDE” of MALARIA PREVENTION

- **A: Awareness:** Travelling somewhere? Find out whether there is a risk of getting Malaria in your chosen location(s). The risk is lower during cold and dry seasons. Some regions that were thought to have no malaria now have it – the boundaries change all the time. What's more, while the malaria risk in some areas varies with the seasons, as with weather forecasts, this can be unpredictable. Excellent maps and other resources are available to help your travel health specialist assess where there is a risk of malaria in your destination(s).

B: Bites: Take precautionary measures to prevent mosquito bites in all risk areas. Covering the skin with clothes and using effective mosquito repellents are common sense precautions. One bite can lead to fatal malaria. By avoiding bites you will also reduce the risk of infection from Dengue fever. Suggestions

include remaining indoors between dawn and dusk (mosquito carrying malaria bite at night), wearing long-sleeved clothing - long trousers and socks when going out at night. A suggestion is also to sleep under a mosquito-proof bednet, preferably one that has been treated with approved insecticide. Apply an insect repellent containing DEET to exposed skin at night. Spray inside with an insecticide spray after closing windows and doors.

C:Compliance: There is no prophylaxis that is 100% will reduce your risk of severe illness. Take only the medicine recommended by a health professional. Start before entering the malaria risk area and take the medicine at the same time every day (or week, for weekly medication) with plenty of water, after a meal. Continue while in the area and for 4 weeks after leaving the area

D:Detection: The majority of deaths and cases of complicated malaria results from delayed diagnosis and/or inappropriate treatment. Seek immediate medical attention if you have any “flu-like symptoms for up to 6 months after leaving a malaria area (For example: fever, headache, chills, muscular pain). Confirmation of malaria as a cause of illness is made by examining the blood for parasites, either by blood or a rapid malaria test. Even if you have taken precautions against malaria, if you develop malaria-type symptoms within a year of visiting a malarial area then seek an early and prompt diagnosis to confirm or exclude malaria. Insist on a test. This advice can save your life.

E:Emergency: Malaria must be treated as a medical emergency. The earlier it is diagnosed and treated, the better the prognosis.

The world of malaria is divided into 2 primary areas: places where chloroquine is effective, and those where the malaria is chloroquine-resistant.

If an area has chloroquine resistance – the drugs of choice are either **Malarone, Doxycycline or Lariam**. These provide at least 90% protection.

Malarone (Atovaquone and Proguanil) is the newest drug on the market. Despite being the most expensive drug, it may be ideal for the late traveller, the short-term, late & business . It is taken daily, start the course 1 day before travel & continue the course for 7 days after travel. **Known side-effects include:** mouth ulcers, some looseness of stool, cough, headache, anorexia and/or mild alteration of liver function tests – but incidence of these seems to be low safe for: all ages. **Unsafe for** those with kidney disease

Doxycycline is an antibiotic & it is taken daily with food, start the course 1 day before travel & continue the course for 4 weeks after travel. **Known side-effects include:** thrush in women and so may not be the ideal honeymoon drug; 5-10% of people develop redness in the sun. **Unsafe for** children under 12 years or for pregnant women

Lariam (Mefloquine) is used for long-stay travelers due to convenient regimen. It is taken on a weekly dose, ideally 2-3 weeks before travel & continue the course for 4 weeks after travel. **Known side-effects include:** bad dreams and mouth ulcers, rare mental health problems. **Unsafe for** anyone with a history of anxiety or depression; anyone in the first 3 months of pregnancy.

Chloroquine and Paludrine (proguanil) - These are the drugs of choice in areas with no chloroquine resistance – unlikely in most parts of the world – the drugs of choice are This combination may also provide 60-70% protection in areas of chloroquine resistance, where they are better than nothing and may be useful for someone with contraindications to the three drugs of choice listed above. A daily dose of Paludrine plus a weekly dose of Chloroquine is taken starting 2-3 weeks before travel & continuing for 4 weeks after travel. **Known side-effects include:** bad dreams and mouth ulcers.

Unsafe for epileptics

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The information in this brochure is intended to alert readers to travel-related health and medical issues. Specific advice and recommendations should always be obtained from your health care provider or travel medicine specialist.

Life cycle of parasite that causes malaria (plasmodium)