



## The Medical **Bulletin**

# In Infection

## Malaria

### **Definition:**

Malaria is a parasitic infection transmitted by the Anopheles mosquito that leads to acute life-threatening disease.

### **Etiology:**

*The incubation period and therefore time to symptom development varies by species:*

- 8 to 11 days for *P. falciparum*
- 8 to 17 days for *P. vivax*
- 10 to 17 days for *P. ovale*
- 18 to 40 days for *P. malariae*
- 9 to 12 days for *P. knowlesi*.
- The periodicity of the Plasmodium lifecycle creates the classic "malarial paroxysm" of rigors, followed by several hours of fever, followed by diaphoresis, and a drop to normal body temperature.

### **Epidemiology:**

- 40% of the global population resides in or visits malaria-endemic regions annually.
- Of the 125 million travelers who visit endemic locations each year, 10000 to 30000 develop malaria, and 1% of these will die from complications of their disease.

### **Clinical features:**

- Fever is the dominant symptom of malaria—fever, especially for seven or more days.
- Adults may exhibit headaches, malaise, weakness, gastrointestinal distress, upper respiratory symptoms and muscle aches; severe cases may include jaundice, confusion, seizures and dark urine.
- Children are more likely to present with non-specific or gastrointestinal symptoms such as fever, lethargy, malaise, nausea, vomiting, abdominal cramps and somnolence.

### **Diagnosis:**

- Complete blood count, comprehensive metabolic panel, coagulation panel, blood culture, urinalysis, chest radiograph, and thick and thin blood smear.
- In patients with altered mental status, when cerebral malaria is suspected, a lactate level, arterial blood gas, and lumbar puncture may also be indicated.



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- In patients with malaria, complete blood count reveals thrombocytopenia in 60-70% of all cases and varying degrees of anemia in 29% of adults and 78% of children.
- The gold standard for malaria diagnosis is a microscopic evaluation of Giemsa-stained thick and thin smears of a free-flowing venipuncture blood specimen.
- Other diagnostic modalities include rapid diagnostic testing (RDT), microhematocrit centrifugation, and polymerase chain reaction (PCR).

### ***Treatment:***

- Treatment involves combination therapy targeting both the hepatic and erythrocytic forms.
- The chief antimalarials are chloroquine, hydroxychloroquine, primaquine, artemisinin-based combination therapy (ACT), and atovaquone-proguanil.
- Primaquine is contraindicated in pregnant and G6PD deficient patients.

### ***2019 CDC Guidelines:***

- Uncomplicated *P. falciparum*, *P. malariae* or *P. knowlesi* infections - chloroquine phosphate 600 mg (pediatric: 10 mg/kg) loading dose, followed by 300 mg (pediatric: 5 mg/kg) at 6, 24, 48 hours; or a hydroxychloroquine 620 mg (pediatric: 10 mg/kg) loading dose, followed by 310 mg (pediatric: 5 mg/kg) at 6, 24, and 48 hours.
- Uncomplicated *P. falciparum* infections - atovaquone-proguanil 250 mg/100 mg 4 tabs daily for 4 days; or artemether lumefantrine 20 mg/120 mg 4 tabs at initial dose, then 8 hours later, then twice daily for 2 days; or quinine sulfate 542 mg three times daily for 3 days plus either doxycycline 100 mg daily for 7 days (pediatrics 2.2 mg/kg every 12 hours).
- Uncomplicated *P. vivax* or *P. ovale* infections - chloroquine phosphate or hydroxychloroquine as per above, plus either primaquine phosphate 30 mg (pediatric: 0.5 mg/kg) daily for 14 days.

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