Adult Malaria

Definition

Malaria is life-threatening mosquito-borne disease caused by parasitic Plasmodium species. Transmitted by the Anopheles mosquito in many tropical regions of the world, malaria causes the abrupt onset of fever, rigors, headache and prostration.

Pathogens

P. falciparum is most common and the most deadly species. It is most often acquired in sub-Saharan Africa, but is present worldwide in malaria regions.

P. vivax, P. ovale and ***P. malariae*** cause milder disease, but ***P. vivax*** and ***P.ovale*** can lead to recurrent malaria if not treated appropriately.

P. knowlesi is present only in Southeast Asia, but can be as severe as ***P. falciparum***.

Risk Stratification and Therapy

Uncomplicated malaria - symptomatic malaria without evidence of severe disease or organ dysfunction.

Severe or complicated malaria - symptomatic malaria with hyperparasitemia (>2%) or evidence of organ damage/complications. Adjuvant therapies such as exchange transfusion should be considered after consultation with infectious diseases.

Indication For Therapy	Causative Organisms	Treatment Regimens
Severe falciparum malaria Criteria 🔗 History of recent possible exposure/no other recognized pathology OR 🔗 Asexual forms of *P. falciparum* on blood smear **PLUS** One or more of the following: 🔗 Impaired consciousness/coma 🔗 Prostration with extreme weakness 🔗 Severe normocytic anemia 🔗 Acute Renal failure 🔗 Pulmonary edema or ARDS 🔗 Hypoglycemia 🔗 Circulatory collapse, shock 🔗 Spontaneous bleeding/DIC 🔗 Repeated generalized convulsions 🔗 Acidemia/acidosis 🔗 Macroscopic hemoglobinuria 🔗 Parasitemia >2% in non-immune individuals	*P. falciparum*	**First Line Therapy** **INFECTIOUS DISEASE CONSULT REQUIRED PRIOR TO ORDERING** **Artesunate**(R) **IV** 2.4 mg/kg per dose IV at 0, 12, 24 and 48 hours. First dose to be administered STAT. Give IV push over 1-2 min$. **THEN** Start one of the following 4 hours after the last dose of Artesunate: **Atovaquone†** 250 mg/**Proguanil** 100 mg (**Malarone**) 4 tabs PO daily x 3 days *OR* **Doxycycline††** 100 mg PO BID x 7 days *OR* **Clindamycin*** 10 mg/kg IV load, then 5 mg/kg IV q8h x 7 days **Alternative Therapy** (First line in first trimester of pregnancy) **INFECTIOUS DISEASE CONSULT REQUIRED PRIOR TO ORDERING** **Quinine IV**(R) Loading dose**: 5.8 mg/kg base (7 mg/kg quinine dihydrochloride)[1] Maintenance: 8.3 mg/kg base (10 mg/kg quinine dihydrochloride)[2] When patient is able to swallow, switch to oral quinine tablets to complete 3-7 days of therapy***. For patients requiring >48 h of IV therapy, reduce maintenance dose by 1/3 to 1/2. **PLUS** one of the following (either concurrently with quinine or immediately after): **Atovaquone†** 250 mg/P**roguanil** 100 mg **(Malarone)** 4 tabs PO daily x 3 days *OR* **Doxycycline††** 100 mg PO BID x 7 days *OR* **Clindamycin*** 10 mg/kg IV load, then 5 mg/kg IV q8h x 7 days

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Indication For Therapy	Causative Organisms	Treatment Regimens
Uncomplicated falciparum malaria	Chloroquine-sensitive falciparum	**Chloroquine Phosphate** (**Aralen** 150 mg base/tab) 2 tabs PO BID on Day 1 & 2, then 2 tabs PO on Day 3.
	Chloroquine-resistant falciparum	**Atovaquone†** 250 mg/**Proguanil** 100 mg (**Malarone**) 4 tabs PO daily x 3 days **OR** **Quinine sulfate** (250 mg base/300 mg salt/tab) 2 tabs PO TID x 7 days **PLUS one** of the following (either concurrently with quinine or immediately after): **Doxycycline††** 100 mg PO BID x 7 days **OR** **Clindamycin*** 300 mg PO base q6h x 7 days
Non-falciparum malaria (For non-falciparum malaria acquired outside of New Guinea, chloroquine remains the drug of choice)	*P.ovale* *P.vivax* *P.malariae* *P.knowlesi*	**Chloroquine Phosphate** (**Aralen** 150 mg base/tab) 2 tabs PO BID on Day 1 & 2, then 2 tabs PO on Day 3

[1] In 100 mL of NS or D5W infused by infusion pump over 30 minutes.
[2] Diluted in 10 mL/kg of NS or D5W infused over 4 hours q8h
[$] Hemolysis can occur 1-3 weeks after treatment initiation. CBC should be followed weekly for 4 weeks after treatment initiation.
†Preferred agent unless patient received Malarone prophylaxis, is pregnant, or has a CrCl less than 30 mL/min.
††Contraindicated if age <8 years old or in pregnancy or breastfeeding.
*Use clindamycin only if the patient is unable to take other alternatives (i.e. Malarone or doxycycline). Where IV therapy is recommended, may step-down to PO clindamycin 20 mg/kg/day divided QID once oral therapy is tolerated.
**Do not give IV quinine loading dose if patient received quinine, quinidine or mefloquine within preceding 24 hours.
***7 day duration of quinine therapy is recommended for *P.falciparum* infections acquired in Southeast Asia. 3 day therapy is recommended for all other regions.
(**R**) – This antimicrobial agent is **restricted**; Refer to Osler's antimicrobial restriction policies for more information