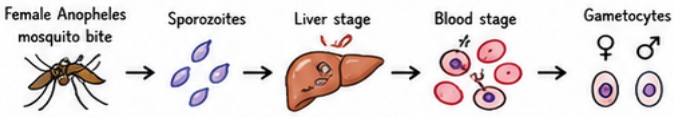
MALARIA

Think exposure. Think parasites. Treat early.



EPIDEMIOLOGY

- Endemic in tropical & subtropical regions: Sub-Saharan Africa, South Asia, SE Asia, Latin America, Oceania

MALARIA PROPHYLAXIS – MATCH DRUG TO DESTINATION

AGENT	WHERE / WHEN	DOSE (ADULTS)	PEARLS
Atovaquone-proguanil (Malarone)	Most regions incl. chloroquine-resistant areas Start 1–2 days pre-travel	250/100 mg daily During travel + 7 days after return	Well tolerated; expensive. Avoid if CrCl < 30 mL/min
Doxycycline	Most regions Start 1–2 days pre-travel	100 mg daily During travel + 4 weeks after return	Photosensitivity, GI upset. Avoid in pregnancy & children < 8 yr
Mefloquine (Lariam)	Most regions (not SE Asia & some areas with resistance) Start ≥ 2 weeks pre-travel	250 mg weekly During travel + 4 weeks after return	Neuropsychiatric AEs; avoid in seizure or psych disorders
Tafenoquine (Arakoda)	*P. vivax* areas Start 1–2 days pre-travel	200 mg daily During travel + 7 days after return	Check G6PD before use; hemolysis risk
Chloroquine	ONLY where chloroquine-sensitive *P. vivax, P. ovale, P. malariae*	500 mg weekly During travel + 4 weeks after return	Resistance is widespread. Use only if confirmed sensitive

General measures: insect repellents (DEET/picaridin), long sleeves, permethrin-treated clothing, bed nets, avoid dusk–dawn bites.

SPECIES PEARLS

- ***P. falciparum*** – most severe; no dormant liver stage
- ***P. vivax / P. ovale*** – dormant liver hypnozoites → relapses
- ***P. malariae*** – chronic low-grade; nephrotic syndrome risk
- ***P. knowlesi*** – zoonotic (SE Asia); can cause severe disease

RED FLAGS (SEVERE / COMPLICATED MALARIA)

- Altered mental status / cerebral malaria
- Respiratory distress / ARDS
- Shock, severe anemia (Hb < 7 g/dL)
- Hypoglycemia, metabolic acidosis
- AKI, jaundice, bleeding / DIC, hemoglobinuria

HIGH-YIELD PEARLS

- ANY fever in a returning traveler from endemic area = malaria until proven otherwise.
- *P. falciparum* can deteriorate rapidly—early diagnosis & treatment save lives.
- Thick smear = sensitive; Thin smear = speciation & parasitemia.

DIAGNOSIS

CLINICAL CLUES

- Fever, chills, sweats (often cyclic)
- Headache, myalgias, malaise
- Nausea/vomiting, diarrhea
- Anemia, jaundice
- History of travel or residence in endemic area

LAB DIAGNOSIS – DO NOT DELAY TREATMENT IF HIGH SUSPICION

1. Thick blood smear – HIGH SENSITIVITY (parasites / µL)
2. Thin blood smear – SPECIES ID & parasitemia
3. Rapid diagnostic tests (HRP2/pLDH) – quick; less sensitive
4. PCR – for low parasitemia, mixed infections, species confirmation

Repeat smears 12–24 h apart x 3 if initial negative but suspicion remains high.

MANAGEMENT

A. UNCOMPLICATED MALARIA (able to take PO)

SPECIES	PREFERRED TREATMENT
P. falciparum	**Artemisinin-based combination therapy (ACT)** for 3 days (e.g., artemether-lumefantrine, DHA-piperaquine) + Single low dose primaquine (0.25 mg/kg) to reduce transmission (if G6PD normal)
P. vivax / *P. ovale*	Chloroquine (where sensitive) for blood-stage clearance THEN Primaquine 14 days (0.25 mg/kg/day) for radical cure (Check G6PD before primaquine)
P. malariae	Chloroquine

B. SEVERE / COMPLICATED MALARIA (or unable to take PO)

IV Artesunate 2.4 mg/kg at 0, 12, 24 hr, then daily until able to take oral ACT → complete 3-day ACT course

- Supportive care: fluids, oxygen, glucose, antipyretics, transfuse PRBCs
- Manage complications in ICU setting

FOLLOW-UP

- Ensure clinical improvement & parasite clearance
- Complete full course of therapy
- For *P. vivax/ovale*: ensure radical cure with primaquine (G6PD safe)
- Counsel on mosquito avoidance for 4–6 weeks after return

SUMMARY

EXPOSURE → FEVER in traveler → THINK MALARIA → THICK & THIN SMEARS (± RDT) → TREAT EARLY → SAVE LIVES

Antimalarial medications — prophylaxis & treatment

Medication	Main use	Countries / regions where used	Adult dose	Key side effects / cautions
Atovaquone–proguanil	Prophylaxis; uncomplicated malaria treatment	Most chloroquine-resistant areas: **sub-Saharan Africa, South Asia, SE Asia, Amazon basin, Oceania**	**Prophylaxis:** 250/100 mg daily; start 1–2 days before travel, continue daily, stop 7 days after return. **Treatment:** 4 adult tabs daily × 3 days	GI upset, headache, ↑LFTs; avoid severe renal impairment; generally well tolerated
Doxycycline	Prophylaxis; partner drug for treatment	Most resistant areas; useful in **SE Asia / border regions**	**Prophylaxis:** 100 mg daily; start 1–2 days before, continue 4 weeks after return. **Treatment adjunct:** 100 mg BID × 7 days with quinine/other regimen	Photosensitivity, esophagitis, GI upset; avoid pregnancy and children <8 yr
Mefloquine	Prophylaxis; alternative treatment	Some resistant areas, but **avoid where mefloquine resistance**: parts of Thailand/Myanmar/Cambodia/Laos/Vietnam	**Prophylaxis:** 250 mg weekly; start ≥2 weeks before, continue 4 weeks after return	Neuropsychiatric effects, vivid dreams, dizziness; avoid seizure disorder, psychiatric disease, conduction disease
Chloroquine	Prophylaxis and treatment only if sensitive	Limited areas: **Central America west of Panama Canal, Haiti/Dominican Republic, parts of Middle East**; not most Africa/Asia/Amazon	**Prophylaxis:** 300 mg base weekly; start 1–2 weeks before, continue 4 weeks after. **Treatment:** 600 mg base, then 300 mg at 6, 24, 48 h	Pruritus, GI upset, headache; retinopathy with long-term use; QT risk; resistance widespread
Hydroxychloroquine	Alternative to chloroquine	Same as chloroquine-sensitive areas	**Treatment:** 620 mg base, then 310 mg at 6, 24, 48 h	Similar to chloroquine; retinal toxicity with prolonged use
Primaquine	Terminal prophylaxis / radical cure for **P. vivax/P. ovale** hypnozoites	Used after exposure/infection in **vivax/ovale regions**: Asia, Latin America, Horn of Africa, Oceania	**Radical cure:** 30 mg base daily × 14 days	Hemolysis in G6PD deficiency; must check G6PD; avoid pregnancy
Tafenoquine	Prophylaxis; radical cure for vivax	Vivax-predominant areas; selected travelers	**Prophylaxis:** 200 mg daily × 3 days before travel, then 200 mg weekly, then 200 mg once after return	Hemolysis in G6PD deficiency; check G6PD; avoid pregnancy, breastfeeding if infant G6PD unknown; psychiatric caution
Artemether–lumefantrine	First-line uncomplicated **P. falciparum** or unknown species	Most falciparum regions, especially chloroquine-resistant areas	6-dose regimen over 3 days: 4 tabs at 0, 8, 24, 36, 48, 60 h	GI upset, headache, QT caution; take with fatty food
Artesunate IV	**Severe / complicated malaria**	Any severe malaria, especially falciparum	2.4 mg/kg IV at 0, 12, 24 h, then daily until able to take PO; follow with full oral regimen	Delayed hemolysis, anemia monitoring; emergency therapy
Quinine + doxycycline / clindamycin	Alternative treatment	Where ACT unavailable or specific circumstances	Quinine 650 mg PO q8h + doxycycline 100 mg BID or clindamycin q8h, usually 3–7 days depending region	Cinchonism, tinnitus, hypoglycemia, QT prolongation; clindamycin preferred in pregnancy/children

Board pearl: choose prophylaxis by **destination resistance pattern**, pregnancy status, renal function, G6PD status, psychiatric/seizure history, and trip duration. CDC provides country-specific prophylaxis tables because risk can vary within a country by region, altitude, and season.