Imported tropical diseases

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Malaria 1.

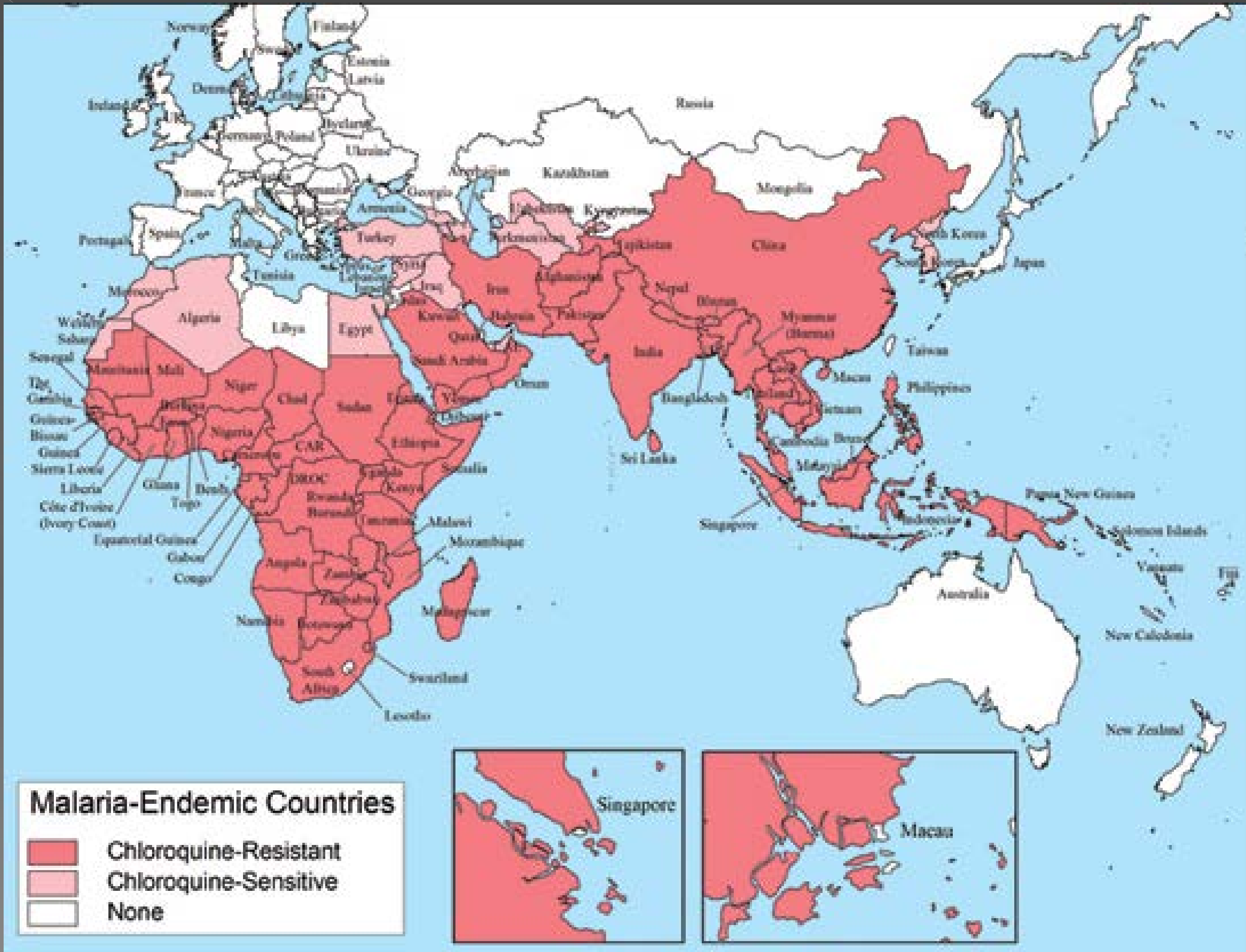
- Malaria in humans is caused by one of five protozoan species of the genus *Plasmodium: P. falciparum, P. vivax, P. ovale*, or *P. malariae*. *P. knowlesi*
- All species are transmitted by the bite of an infected female *Anopheles* mosquito.
- Occasionally, transmission occurs by blood transfusion, organ transplantation, needle-sharing, or congenitally from mother to fetus.
- Although malaria can be a fatal disease, illness and death from malaria are largely preventable.

Anopheles mosquito

Malaria 2.

- Malaria is a major international public health problem, causing 350-500 million infections worldwide and approximately 1 million deaths annually
- Malaria transmission occurs in large areas of Central and South America, the island of Hispaniola (the Dominican Republic and Haiti), Africa, Asia (including South Asia, Southeast Asia, and the Middle East), Eastern Europe, and the South Pacific


United States
Mexico
Cuba
Dominican Republic
Belize
Honduras
Haiti
Guatemala
El Salvador
Nicaragua
Costa Rica
Panama
Venezuela
Guyana
Suriname
French Guiana
Colombia
Ecuador
Peru
Brazil
Bolivia
Paraguay
Chile
Argentina
Uruguay
Falkland Islands
Malaria-Endemic Countries
Chloroquine-Resistant
Chloroquine-Sensitive
None



Malaria-Endemic Countries
Chloroquine-Resistant
Chloroquine-Sensitive
None
Russia
Kazakhstan
Mongolia
China
India
Iran
Sri Lanka
Australia
New Zealand
New Caledonia
Papua New Guinea
Taiwan
Philippines
Japan
Algeria
Libya
Egypt
Sudan
Chad
Ethiopia
Somalia
Angola
Madagascar
Swaziland
Lesotho
Singapore
Macau

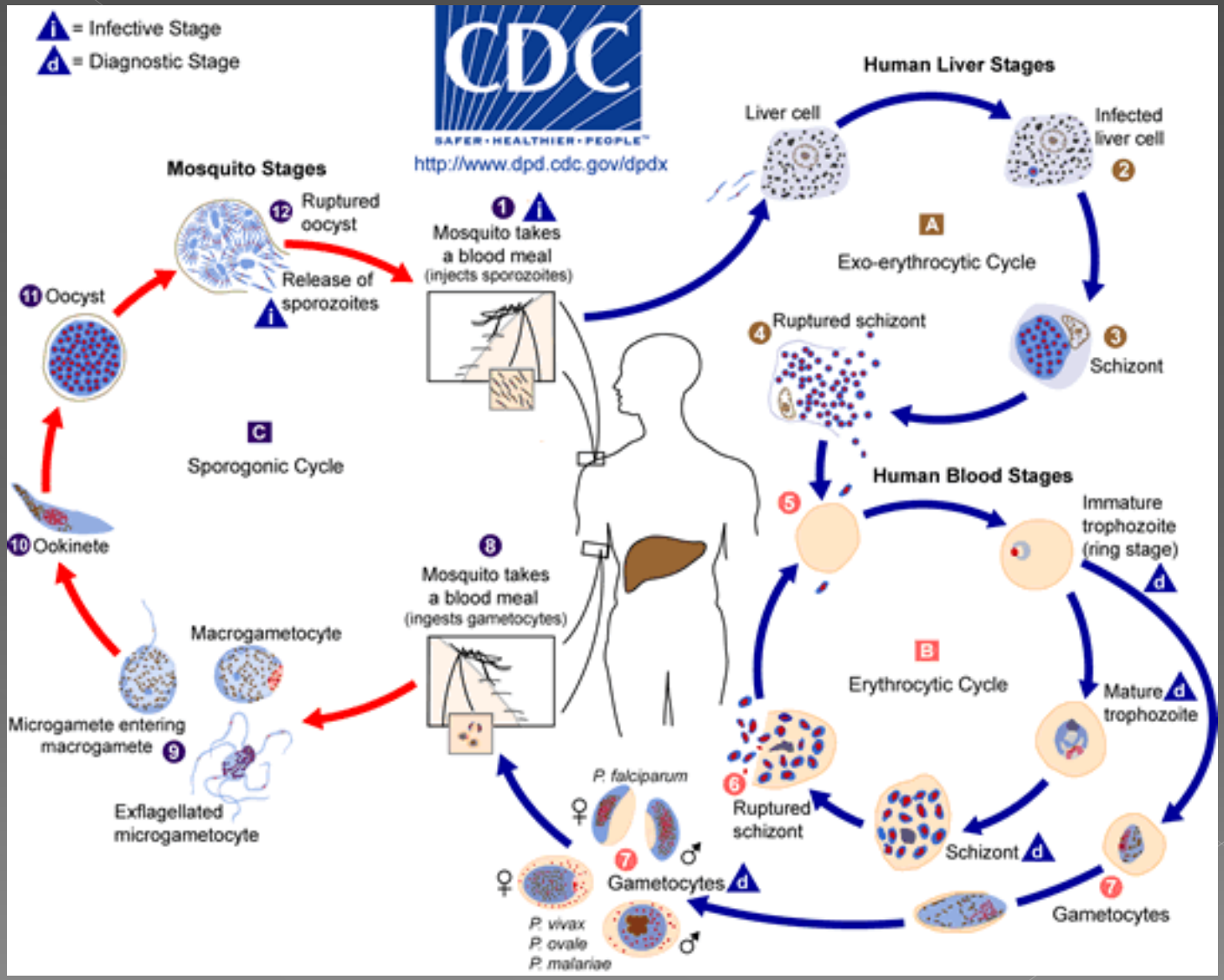
Malaria 3.

- Estimating the risk for infection for various types of travelers is difficult.
- Risk can differ substantially even for persons who travel or reside temporarily in the same general areas within a country.
- For example, travelers staying in air-conditioned hotels may be at lower risk than backpackers or adventure travelers.
- Similarly, long-term residents living in screened and air-conditioned housing are less likely to be exposed than are persons living without such amenities, such as Peace Corps volunteers.
- Travelers should also be reminded that even if one has had malaria before, one can get it again and so preventive measures are still necessary.
- All travelers going to malaria endemic countries, even for short periods of time such as cruise ship passengers, may be at risk for becoming infected with malaria.

Malaria 4.

- Persons who have been in a malaria risk area, either during daytime or nighttime hours, are not allowed to donate blood in the United States for a period of time after returning from the malarious area.
- Persons who are residents of nonmalarious countries are not allowed to donate blood for 1 year after they have returned from a malarious area.
- Persons who are residents of malarious countries are not allowed to donate blood for 3 years after leaving a malarious area.
- Persons who have had malaria are not allowed to donate blood for 3 years after treatment for malaria

Malaria lifecycle



Clinical features

- Incubation time: from 3 days it can be even 9-12 months after sporozoite inoculation
- The cardinal clinical feature of malaria is fever.
- The parasitaemia at which fever occurs is termed the 'pyrogenic density'. This varies widely, some non-immune patients will become febrile before paresites are visible on blood smear, whereas immune adults can on occasions tolerate up to100, 000 parasites/µl without fever
- The pyrogenyc density is generally lower for P. vivax than that of P. falciparum

Uncomplicated malaria

- Fever
- headache,
- muschular ache,
- abdominal dyscomfort,
- lertargy,
- constipation or diarrhoea
- cough

Uncomplicated malaria

- If the infection left untreated the fever in *P. vivax* and *P. ovale* regularizes to a 2-day cycle (tercian), and P. malariae fever spikes occur every 3 days (quartan pattern)
- *P. falciparum* may never regularize to a tertian pattern

Uncomplicated malaria

As the tempereature begins to rise, there is intense headache an muscular discomfort. The patient feels cold and curls up shivering. Within minutes, the limbs begin to shake and the teeth chatter and the temperature climbs rapidly to a peak (39-41,5°C). The rigor usually last 10-30 minutes, but can last up 90 minutes. By the end of rigor there is a periferal vasodilatation and the skin feels hot. A profuse sweat then breaks out. The bloodpressure is relativly low, the patient feels exhausted and my sleep. Deferverscence usually takes 4-8 hours

Relapse

- Both P. vivax and P. ovale have a tendency to relaps after resolution of the primer infection. Relapse results from maturation of persistent hypnozoits in liver.
- Relapse must be distiguished from recrudescence of the primary infection because of incomplet therapy. P. falciparum is the usual cause of recrudescent infection and these tend to arise 2-4 weeks following treatment.
- Relapse occur weeks or months (or even years) after the primary infection. The paren is determined largely by the geographical origion of the infection.

Severe malaria

- Death from acute P. vivax, P. ovale or P. malariae are rare. There is increasing evidence, particulary from India and Indonesia, that P. vivax infections can be sever and life-threatening.
- Falciparum malaria is the major couse of death

Blackwater fever

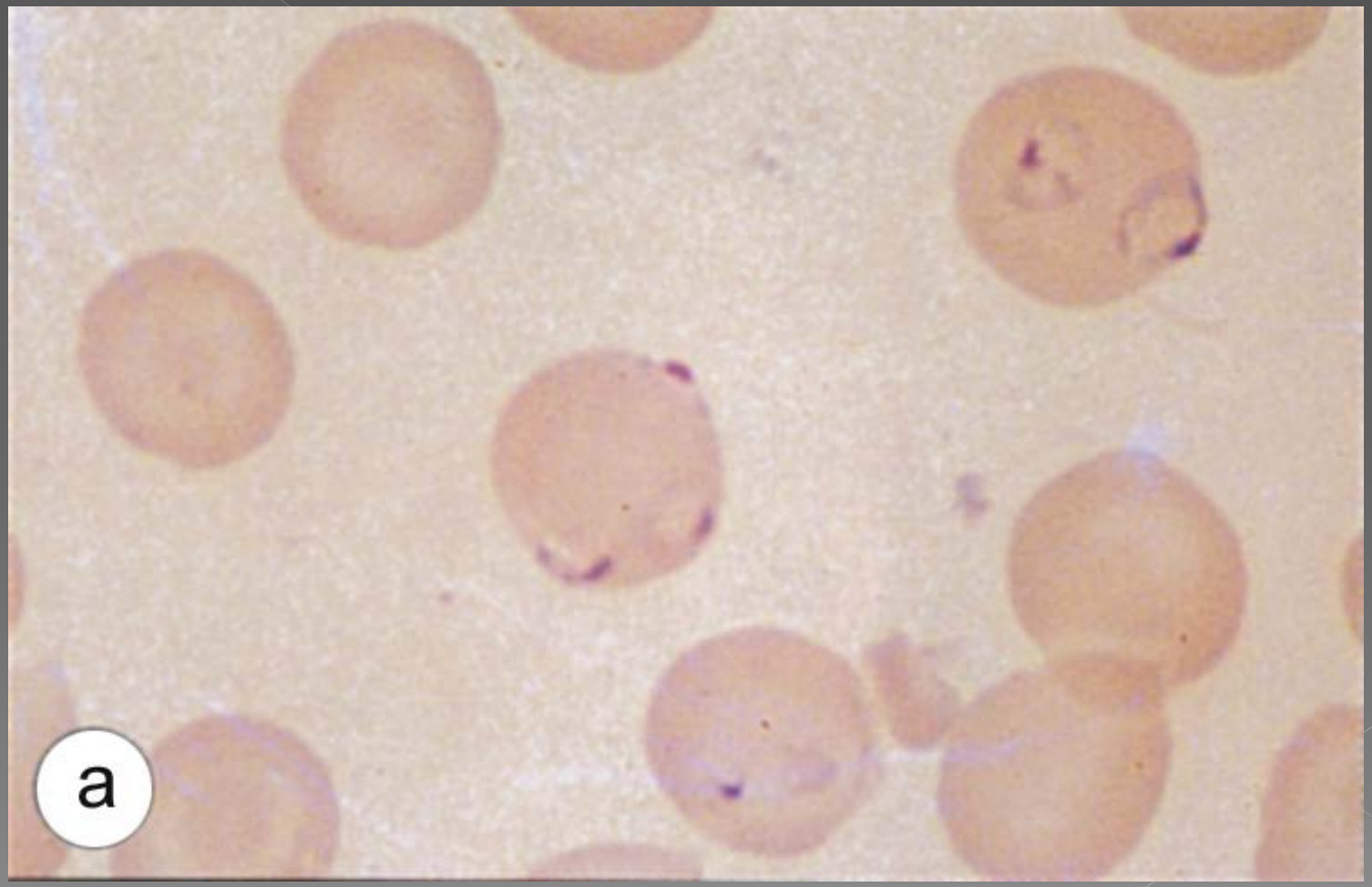
- Massive intravascular haemolysis and the passage of ‘Coca-Cola’- coloured urine
- It was linked to frequent quinin self-medication in expatriates living in malarious area, almost disappeard during the ‘chloroquin’ era
- Black urin occurs in circumtances: (1)when patients with G6PD deficiency take oxidant drugs (primaquin, sulfonamid), (2) patients with G6PD deficiency have malaria and receive quinine treatment, (3)patients with sever falciparum malaria, severe haemolysis

Blackwater fever

Diagnosis

- Bloodsmear
- Malaria quicktest
- PCR for Plasmodium DNA

Diagnosis- P. falciparum



Malaria

- **Prevention**
  - No vaccine is currently available.
  - All travelers to malaria-endemic areas should be advised that taking an appropriate drug regimen and using antimosquito measures will help prevent malaria.
  - Travelers should be informed that no method can protect completely against the risk for contracting malaria.

Malaria

- **PERSONAL PROTECTION MEASURES**
  - Because of the nocturnal feeding habits of *Anopheles* mosquitoes, malaria transmission occurs primarily between dusk and dawn.
  - Travelers should be advised to take protective measures to reduce contact with mosquitoes, especially during these hours.
  - Such measures include remaining in well-screened areas, using mosquito bed nets (preferably insecticide-treated nets), and wearing clothes that cover most of the body.
  - Additionally, travelers should be advised to purchase insect repellent for use on exposed skin.
  - The most effective repellent against a wide range of vectors is DEET (N, N-diethylmetatoluamide), an ingredient in many commercially available insect repellents.

Malaria

- **CHEMOPROPHYLAXIS**
  - Chemoprophylaxis is the strategy that uses medications before, during, and after the exposure period to prevent the disease caused by malaria parasites.
  - The aim of prophylaxis is to prevent or suppress symptoms caused by blood-stage parasites. In addition, presumptive anti-relapse therapy (also known as terminal prophylaxis) uses medications towards the end of the exposure period (or immediately thereafter) to prevent relapses or delayed-onset clinical presentations of malaria caused by hypnozoites (dormant liver stages) of *P. vivax* or *P. ovale*.

Chemoprophylaxis

Drug	Usage	Adult dose
Atovaquon/ proguanil (Malarone)	Prophylaxis in areas with chloroquin resistant or mefloquin resistant P. falciparum	Adult tablets contain 250 mg atovaquon and 100 mg proguanil hydrochlorid. 1 adult tabl orally daily
Chloroquin phosphate (Aralen and generic)	Prophylaxis only in areas with chloroquin sensitive P. falciparum	300 mg base (500 mg salt) orally once/week
Doxycyclin (Many brand names and generic)	Prophylaxis in areas with chloroquin resistant or mefloquin resistant P. falciparum	100 mg orally, daily
Hydroxychloroquine sulphate (Plaquenil)	An alternative to chloroquine for prophylaxis only in areas with chloroquin- sensitive p. Falciparum	310 mg base (400 mg salt) orally
Mefloquin (Lariam and generic)	Prophylaxis in areas with chloroquin resistant P. falciparum	228 mg base (250 mg salt) orally once/week
Primaquin	Used for presumptive anti-relapse therapy (terminal prophylaxis) to decrease the risk of relapses of P. vivax and P. ovale	30 mg base (52,6 mg salt) orally, once/day for 14 days after departures from malarious area

Chemoprophylaxis

Készítmény	Alkalmazás	Megjegyzés
Atovaquon/ proguanil (Malarone)	Prophylaxis chloroquin vagy mefloquin rezisztens P. falciparum esetében 1 nappal az utazás előtt, 7 napig a hazaérkezést követően, napi 1 tabl. Terheseknek nem javasolt	veseelégtelenség esetén (GFR < 30 ml/min.) nem adható
Chloroquin phosphate	Prophylaxis chloroquin sensitive P. falciparum esetén 1 héttel az utazás előtt, 4 hétig a hazaérkezés után, hetente 1x Terheseknek adható	Kontraindikáció: epilepszia, psoriasis
Doxycyclin	Prophylaxis chloroquin rezistzens vagy mefloquin rezisztens P. falciparum esetén is Napi 100 mg, utazás előtt egy nappal, visszaérkezés után 4 hétig Terheseknek nem adható	Fotoszenzitivitás, oesophagus iritáció, vaginalis Candida infekció
Mefloquin (Lariam)	Prophylaxis in areas with chloroquin resistant P. falciparum 1 héttel az utazás előtt, visszaérkezés után 4 hétig, hetente 1x, terheseknek nem javasolt	Epilepszia, pszichiátraiai betegségek esetén kontraindikált. Quininnel 12 órán belül nem lehet adni

Therapy

Artemether-lumefandrin

Each tablet contains artemeter 20 mg and lumefandrine 120 mg. The combination is registered in many tropical countries and in Europe. Very effective against multi-drug resistent falciparum malaria and it is remarkable well tolerated.

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Atorvaquon-proguanil

4 tablets each day for 3 days

Therapy

Primaquine given for 14 days will eradicate hypnozoits and prevent relapse in over 80% of patients.

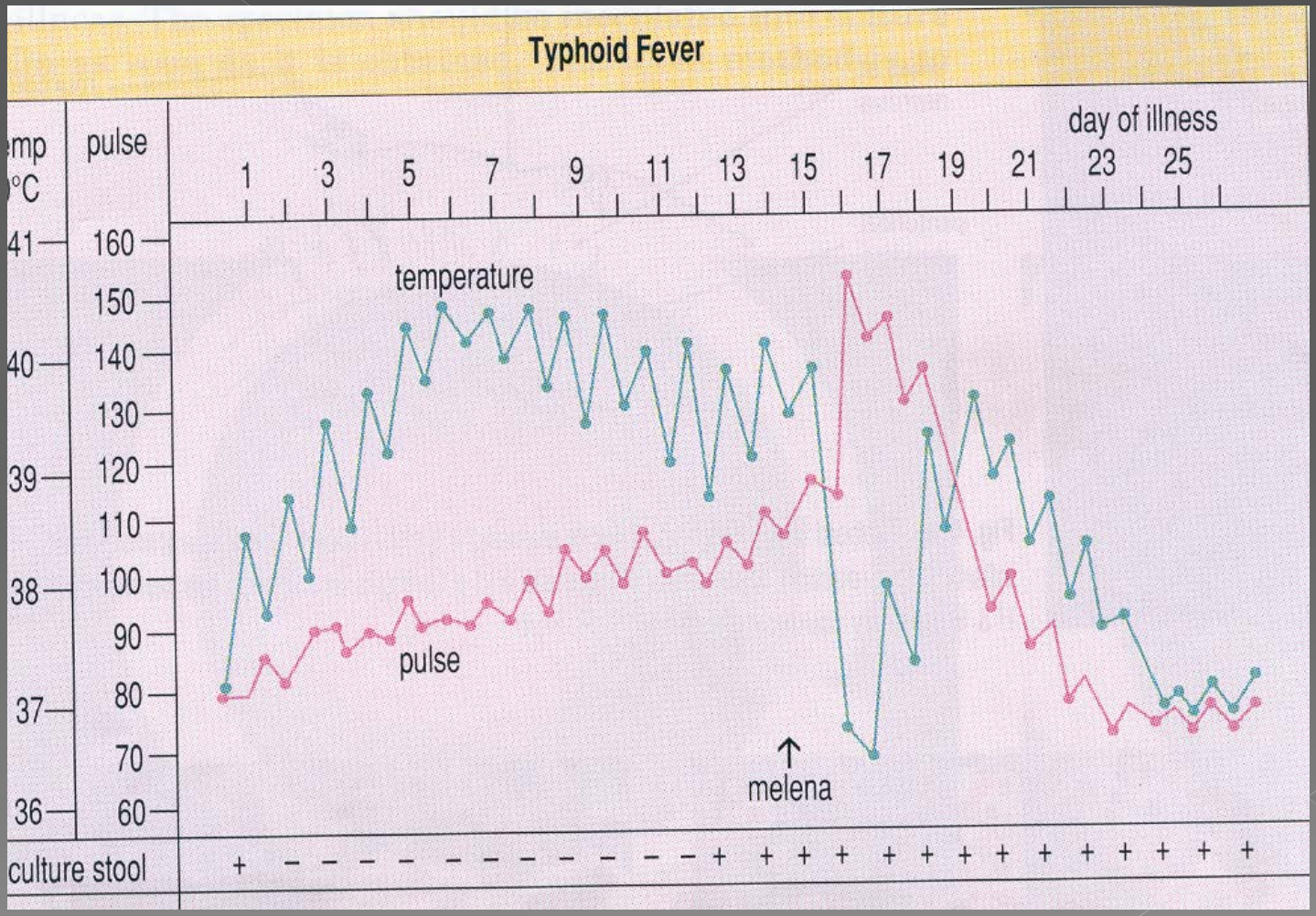
Typhoid fever

- Typhoid fever is a life-threatening illness caused by the bacterium *Salmonella* typhi or paratyphi (6:1).
- In the United States about 400 cases occur each year, and 75% of these are acquired while traveling internationally.
- Typhoid fever is still common in the developing world, where it affects about 21.5 million persons each year.

What are the signs and symptoms of typhoid fever?

- Persons with typhoid fever usually have a sustained fever as high as 103° to 104° F (39° to 40° C).
- They may also feel weak, or have stomach pains, headache, or loss of appetite.
- In some cases, patients have a rash of flat, rose-colored spots.
- The only way to know for sure if an illness is typhoid fever is to have samples of stool or blood tested for the presence of *S. Typhi* .

Typhoid fever chart



Diagnosis and therapy

- Diagnosis: positive blood culture (60-80%), stool sample positivity is only 20%
- Therapy: ciprofloxacin 2x500 mg/d, ceftriaxon 1x2 g/d, azithromycin 500 mg/d; 14 days


Thank you for the attention!