Dr Abhishek Gupta's HYT

Week 1 · Topic 1 · Monday

Malaria

Subject: Microbiology (with Community Medicine and Medicine angles)

Asked 53 times

Exam	PYQs
FMGE	17
UPSC CMS	11
AIIMS PG	9
NEET PG	9
INI-CET	7
Total	**53**

Years asked (15): 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026

Asked from 2021 onwards: 21

Decided by PYQs. Not by me.

2. PYQ Map - Malaria

#	Exam	Year	Angle tested
1	UPSC CMS	2026	NFME 2016-2030: milestone for 2027
2	FMGE	2025	Fever + altered sensorium + rings: drug of choice
3	UPSC CMS	2025	NFME 2016-2030: milestone for 2027
4	FMGE	2024	Mechanism of sequestration (image): cytoadherence
5	INI-CET	2024	Best test for speciation: thin smear, Giemsa
6	INI-CET	2024	A-R: no schizonts in smear due to cytoadherence
7	INI-CET	2024	Uncomplicated Pf: drug NOT used (chloroquine)
8	INI-CET	2024	Field diagnosis: RDT (HRP-2)
9	NEET PG	2024	Mixed Pv+Pf, 50 kg adult: Day-2 regimen
10	FMGE	2023	Child: fever, seizures, coma, Pf = cerebral malaria
11	NEET PG	2023	HRP-2 positive RDT = falciparum
12	UPSC CMS	2023	Duffy antigen = receptor for P. vivax
13	UPSC CMS	2023	Primaquine kills hypnozoites in the liver
14	INI-CET	2022	Severe Pf: which is NOT a complication (pH >7.2)
15	INI-CET	2022	Image of ACT pack: used for malaria
16	INI-CET	2022	Fever, altered sensorium, seizures (smear): IV artesunate
17	FMGE	2021	Smear (rings + crescents) with shock: Pf
18	FMGE	2021	Pf from North-East India: artemether-lumefantrine
19	FMGE	2021	Recent transmission: infant parasite rate
20	FMGE	2021	Smear (multiple delicate rings) with shock: Pf
21	FMGE	2021	Severe Pf (seizures, shock) from Assam: DOC
22	FMGE	2020	Traveller with shock and jaundice: Pf
23	FMGE	2020	Smear with crescent gametocytes: Pf
24	FMGE	2020	Incubation period of Pf: 12 days
25	FMGE	2020	Vector control under the programme: false statement
26	NEET PG	2020	Dehydrated boy, smear picture: Pf
27	AIIMS PG	2019	Cerebral malaria is caused by Pf
28	FMGE	2019	Travel chemoprophylaxis (among options): chloroquine
29	FMGE	2019	Giemsa smear: malaria (crescent gametocyte)
30	FMGE	2019	Repeated attacks of malaria: P. vivax
31	NEET PG	2019	ABER, API, AFI are all epidemiological indicators
32	FMGE	2018	Urban Malaria Scheme: which statement is untrue

33	FMGE	2018	Who examines the malaria smear: lab technician
34	NEET PG	2018	Africa traveller, multiple rings, normal RBC size: Pf
35	AIIMS PG	2017	Relapse in vivax is caused by hypnozoite
36	UPSC CMS	2017	Vivax recurrence 3 weeks after chloroquine: relapse
37	AIIMS PG	2016	No late trophozoites/schizonts in Pf smear: adherence
38	AIIMS PG	2016	Dehydrated boy, smear picture: Pf
39	AIIMS PG	2016	Transfusion malaria: short IP (trophozoites in blood)
40	UPSC CMS	2016	Not a complication of malaria: hyperglycaemia
41	UPSC CMS	2016	Proportional case rate: all 3 statements true
42	AIIMS PG	2015	WHO: primaquine contraindicated in infants, pregnancy
43	NEET PG	2015	Recrudescence after inadequate treatment: Pf
44	UPSC CMS	2015	Pf: mortality rises above 3% parasitaemia; hypoglycaemia
45	AIIMS PG	2014	Most effective drug for severe malaria: artesunate
46	AIIMS PG	2014	Definition of recrudescence
47	NEET PG	2014	Band forms across RBC: P. malariae
48	NEET PG	2014	Recent transmission in a village: infant parasite rate
49	AIIMS PG	2013	Severe malaria criteria: haematocrit >15 is the exception
50	UPSC CMS	2013	Most sensitive index of transmission: infant parasite rate
51	NEET PG	2012	Renal failure in malaria: falciparum
52	UPSC CMS	2012	Drowsy, icteric Pf patient: parenteral drug (IV quinine)
53	UPSC CMS	2012	Gravest complication of Pf: cerebral malaria

What examiners keep asking

1. **Identify the species (smear picture / clinical / HRP-2)** - 10 PYQs
2. **Severe & cerebral malaria: features, criteria, complications** - 8 PYQs
3. **Uncomplicated malaria: national drug policy & prophylaxis** - 6 PYQs
4. **Relapse vs recrudescence; hypnozoite; primaquine** - 6 PYQs
5. **Severe malaria treatment: IV artesunate** - 5 PYQs
6. **Malariometric indices (infant parasite rate, API, ABER)** - 5 PYQs
7. **Programme: NFME 2027 target, vector control, UMS** - 4 PYQs
8. **Cytoadherence & sequestration (no schizonts in smear)** - 3 PYQs
9. **Diagnosis: thin vs thick smear, RDT, who examines** - 3 PYQs
10. **Parasite biology: Duffy, incubation, transfusion** - 3 PYQs

Counts from the question bank: 53 PYQs, 15 years (2012-2026). Each PYQ is counted under one angle.

3. Full Concept Notes - Malaria

PYQ marks a fact that a past question has tested.

1. Basics

- Malaria is a protozoal infection by *Plasmodium*, transmitted by the bite of the **infected female *Anopheles*** mosquito (night biter).
- Five species infect humans: *P. falciparum* (Pf), *P. vivax* (Pv), *P. ovale* (Po), *P. malariae* (Pm) and the monkey parasite *P. knowlesi* (24-hour cycle; South-East Asia; can be severe).
- In India, Pv and Pf cause almost all cases; Pf causes nearly all severe disease and deaths.
- History: Laveran saw the parasite in blood (1880). **Ronald Ross** showed the oocyst in the stomach wall of *Anopheles* in Secunderabad on 20 August 1897 (World Mosquito Day) and received the Nobel Prize in 1902. World Malaria Day: 25 April.



Sir Ronald Ross, who proved mosquito transmission of malaria (Nobel Prize, 1902).

2. The agent and the vector

2a. Hosts and infective forms

- **Definitive host = female *Anopheles*** (sexual cycle). **Intermediate host = man** (asexual cycle).
- Form infective to man = **sporozoite**. Form infective to mosquito = **gametocyte**.
- Other routes: blood transfusion, shared needles, congenital (transplacental). Transfusion delivers **erythrocytic (trophozoite) forms** PYQ , so there is no liver stage: short incubation and **no relapse** PYQ ; primaquine is not needed.

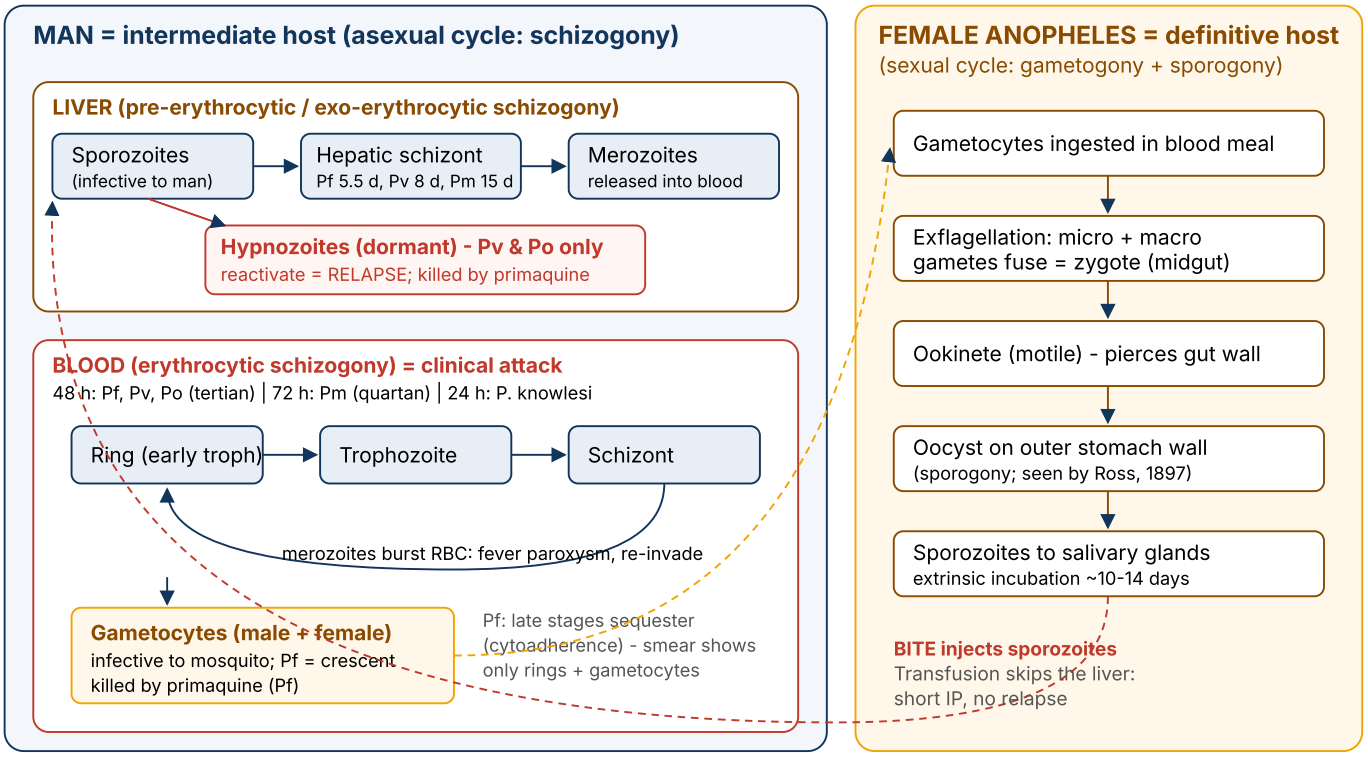
2b. Indian vectors

Vector	Setting
An. culicifacies	Main rural vector of plains (largest share of cases)
An. stephensi	Urban vector; breeds in overhead tanks, wells, construction sites (target of the Urban Malaria Scheme)
An. fluviatilis	Foothills, streams
An. minimus, *An. baimaii (dirus)*	North-East, forests
An. sundaicus	Brackish coastal water, Andaman & Nicobar



Anopheles mosquito: slender body, spotted (mottled) wings; rests at an angle to the surface.

3. Life cycle



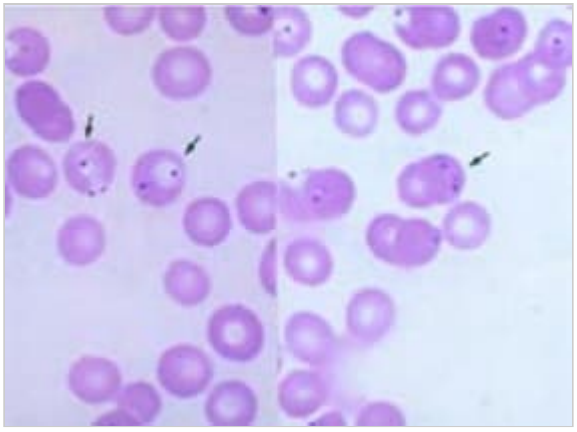
Fresh diagram: life cycle of Plasmodium - liver stage, blood stage, and the sexual cycle in the female Anopheles mosquito.

- **Pre-erythrocytic (liver) stage**: sporozoites enter hepatocytes and form hepatic schizonts; no symptoms in this phase.
- **Hypnozoites**: dormant liver forms of **Pv and Po only**; reactivation causes **relapse** PYQ . Primaquine kills them in the **liver** PYQ .
- **Erythrocytic stage**: ring - trophozoite - schizont - merozoites; RBC rupture causes the fever paroxysm. Some merozoites become gametocytes.
- **RBC invasion is receptor-specific**: Pv uses the **Duffy antigen (DARC)** PYQ ; Duffy-negative West Africans resist vivax. Pf uses glycophorins and invades RBCs of **all ages** (very high parasitaemia); Pv/Po prefer young RBCs (reticulocytes); Pm prefers old RBCs.
- Host factors protecting against Pf: sickle cell trait (HbAS), thalassaemia trait, G6PD deficiency, HbF in early infancy, South-East Asian ovalocytosis.

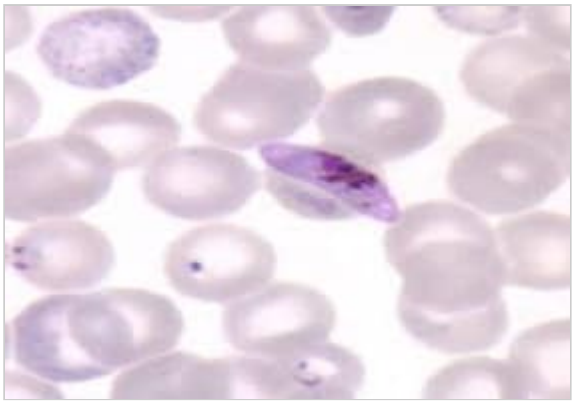
4. Species comparison

Feature	*P. falciparum*	*P. vivax*	*P. ovale*	*P. malariae*
Incubation period PYQ	**12 days** (shortest)	14 days	17 days	28 days (longest)
Fever	Malignant tertian (48 h, often irregular)	Benign tertian (48 h)	Ovale tertian (48 h)	Quartan (72 h)
RBC age infected	All ages	Young	Young	Old
Infected RBC	Normal size; Maurer's dots/clefts	Enlarged, pale; Schuffner's dots	Enlarged, oval with fimbriated edge; James's dots	Normal or small; Ziemann's dots
Ring	Fine, delicate; **multiple rings per RBC**, double chromatin dot, **appliqué (accolé)** forms PYQ	Large, thick ring	Compact ring	Compact ring
Trophozoite	Rarely seen (sequestered)	Amoeboid	Compact	**Band form** across RBC PYQ
Schizont	Not seen in smear (sequestered) PYQ ; 18-32 merozoites	12-24 merozoites	About 8 merozoites	6-12, **rosette / daisy-head**
Gametocyte	**Crescent (banana)** - pathognomonic PYQ	Round, fills RBC	Round	Round
Hypnozoite / relapse	No	**Yes** PYQ	**Yes**	No (but recrudescence for decades)
Typical complication	Severe malaria: cerebral PYQ , AKI PYQ , ARDS, hypoglycaemia	Splenic rupture; severe disease possible but uncommon	Mild	Nephrotic syndrome (immune complex)

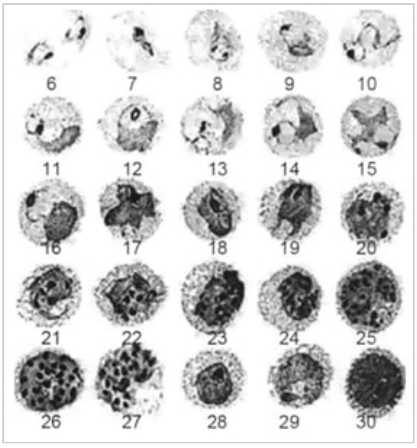
Trap: *P. malariae* causes **nephrotic syndrome** (quartan malarial nephropathy, chronic), whereas acute **renal failure** is a **falciparum** complication PYQ . Band forms = malariae PYQ ; crescents = falciparum PYQ .



P. falciparum: crescent (banana-shaped) gametocytes on a Giemsa-stained smear - seen in no other human species.



P. falciparum: delicate rings, several in one red cell, with appliqué (accolé) forms on the red-cell margin; red cells not enlarged.

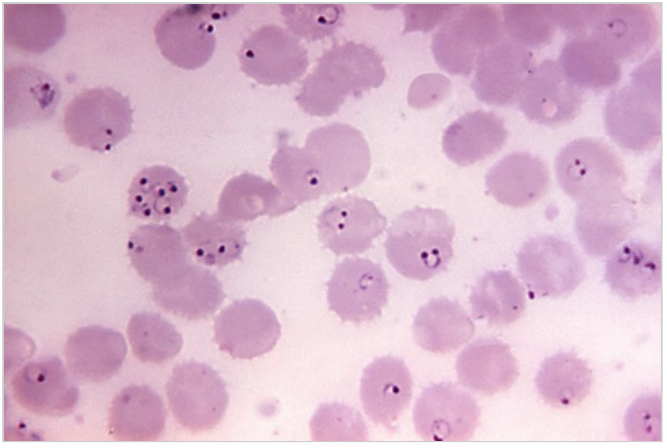


P. vivax: parasitised red cells are enlarged, with large irregular (amoeboid) trophozoites.

5. Pathogenesis

- **Fever paroxysm**: synchronous RBC rupture releases pyrogens (GPI, haemozoin) - TNF-alpha, IL-1. Classic sequence: cold stage - hot stage - sweating stage.
- **Anaemia**: haemolysis of infected and uninfected RBCs, splenic removal, marrow suppression (dyserythropoiesis).
- **Cytoadherence** PYQ : Pf-infected RBCs develop **knobs** carrying **PfEMP1** (coded by *var* genes), which bind endothelial receptors - **CD36** (most organs), **ICAM-1** (brain), **chondroitin sulphate A** via VAR2CSA (placenta).
- **Sequestration** PYQ : mature trophozoites and schizonts stay in deep capillaries (brain, gut, kidney, placenta) and so **avoid splenic clearance**. Hence the smear shows only rings and gametocytes PYQ .

- **Rosetting**: infected RBCs bind uninfected RBCs; **agglutination**: infected RBCs bind each other via platelets. Both add to microvascular obstruction.
- Result: microvascular obstruction, tissue hypoxia, lactic acidosis, and cytokine injury - the basis of cerebral malaria and other organ failure.



Cytoadherence in P. falciparum: parasitised red cells with knob-like protrusions adhering to the vessel wall (image used in FMGE 2024).

Must know: Cytoadherence (PfEMP1 binding endothelium) causes sequestration - the reason schizonts are absent in a falciparum smear and the reason falciparum alone causes cerebral malaria. PYQ (asked as a picture, an assertion-reason and a direct question)

6. Clinical features

6a. Uncomplicated malaria

- Fever with chills and rigors, headache, myalgia, nausea, vomiting; hepatosplenomegaly, pallor, mild jaundice; thrombocytopenia is common.
- Periodicity (tertian/quartan) is often absent early, and is irregular in falciparum.

6b. Severe malaria (WHO / national criteria)

Asexual parasitaemia (usually Pf) plus one or more of the following:

Criterion	Cut-off
Impaired consciousness / **cerebral malaria** PYQ	GCS <11 (adults), Blantyre coma score <3 (children); unrousable coma
Prostration; multiple convulsions	More than 2 seizures in 24 h
Acidosis PYQ	Base deficit >8 mEq/L, bicarbonate <15 mmol/L, lactate ≥5 mmol/L; pH <7.25
Hypoglycaemia PYQ	Blood glucose <40 mg/dL (<2.2 mmol/L)
Severe anaemia PYQ	Children: Hb <5 g/dL or Hct <15%; adults: Hb <7 g/dL or Hct <20%
Renal impairment PYQ	Creatinine >3 mg/dL or urea >20 mmol/L
Jaundice	Bilirubin >3 mg/dL with parasite count >100,000/µL
Pulmonary oedema / ARDS PYQ	SpO2 <92% on room air with RR >30/min
Shock (algid malaria) PYQ	Systolic BP <80 mmHg (adults), <70 mmHg (children)
Significant bleeding	Including DIC
Hyperparasitaemia	>10% of RBCs (WHO). Mortality rises steeply above about 3% parasitaemia in non-immune patients PYQ

Trap: Malaria causes **hypoglycaemia, never hyperglycaemia** PYQ . The cause is the disease itself (parasite glucose use, failed hepatic gluconeogenesis) **and** quinine (insulin release); it can occur even without quinine PYQ . Severe anaemia means a **low** haematocrit (<15%), so "Hct more than 15" is the odd one out PYQ ; "pH above 7.2" is the odd one out among complications PYQ .

6c. Special forms

- **Cerebral malaria** PYQ : caused only by Pf PYQ ; diffuse symmetrical encephalopathy, seizures, coma, usually **no focal deficit** PYQ ; malarial retinopathy. The **gravest complication** of falciparum malaria PYQ . Exclude hypoglycaemia and meningitis.
- **Blackwater fever**: massive intravascular haemolysis - haemoglobinuria (dark urine) - acute kidney injury PYQ ; linked to Pf, quinine and G6PD deficiency.
- **Algid malaria**: circulatory collapse/shock, often with Gram-negative septicaemia.
- **Malaria in pregnancy**: placental sequestration (CSA), severe anaemia, hypoglycaemia, abortion, low birth weight; primigravidae most affected.
- **Hyperreactive malarial splenomegaly** (tropical splenomegaly syndrome): massive spleen, very high IgM, responds to long-term antimalarials.
- **Quartan malarial nephropathy**: Pm, nephrotic syndrome in children.

7. Recurrence: relapse vs recrudescence

	Relapse PYQ	Recrudescence PYQ	Reinfection
Source	Liver **hypnozoites**	Surviving **blood** forms	New infective bite
Species	Pv, Po only	Pf (drug resistance / inadequate treatment), Pm (can be decades later)	Any
Prevented by	Primaquine 14 days (radical cure)	Correct, complete ACT course	Vector control, bed nets

Must know: Recrudescence = recurrence of asexual parasitaemia after treatment, from blood forms PYQ ; it is most commonly a falciparum event PYQ . Vivax recurring weeks after chloroquine = **relapse** PYQ .

8. Investigations

Test	Key points
Thick smear	RBCs lysed; parasites concentrated; 20-40 times more sensitive - best for **detection** and parasite count
Thin smear (Giemsa) PYQ	RBCs intact - best for **species identification** PYQ . Stains: Giemsa, JSB, Leishman, Field's
QBC (acridine orange)	Fluorescent staining of buffy coat; fast and sensitive; poor for speciation
RDT PYQ	Antigen detection, 15-20 min, no microscope - test of choice in the **field** PYQ . **HRP-2 = Pf only** PYQ (persists 2-4 weeks after cure); pLDH (pan or Pf-specific; clears with the parasite); aldolase (pan). India uses **bivalent RDTs** (Pf HRP-2 + pan-pLDH).
PCR	Most sensitive; for research, mixed or low-density infections
Other	Thrombocytopenia, anaemia, high LDH and bilirubin; glucose, lactate, creatinine in severe disease

- In the programme, slides are collected by ASHA/ANM/MPW, but staining and examination are by the **laboratory technician** PYQ .
- Gold standard: microscopy (thick + thin smear).

Method	Usefulness in Field Settings	Strengths	Limitations
Buffy Coat Examination	Low	Good sensitivity for certain infections	Requires specialized equipment.
Thin Blood Smear	Moderate	Species identification	Labor-intensive, less sensitive.
Thick Blood Smear	Moderate	High sensitivity	Skilled microscopy required.
HRP2/Rapid Diagnostic Test	High	Quick, easy, portable	Limited species differentiation.

Comparison of malaria diagnostic methods (buffy coat, thin smear, thick smear, RDT) for field use, strengths and limits.

9. Management (national drug policy, NCVBDC)

Treat only after parasitological confirmation (microscopy or RDT). Drug classes: **blood schizonticides** (chloroquine, artemisinins, quinine, mefloquine, lumefantrine, SP) end the attack; **tissue schizonticide** (primaquine) kills hypnozoites; **gametocytocides** (primaquine for Pf) cut transmission.

Situation	Treatment
P. vivax / ovale	Chloroquine 25 mg/kg over 3 days (10, 10, 5 mg/kg) + **primaquine 0.25 mg/kg daily x 14 days** (radical cure) PYQ
Uncomplicated P. falciparum PYQ	**ACT-SP**: artesunate 4 mg/kg/day x 3 days + sulfadoxine-pyrimethamine (25/1.25 mg/kg) on **Day 1 only** + primaquine 0.75 mg/kg single dose on Day 2 (gametocytocidal). Chloroquine is **not** used PYQ .
Pf in North-Eastern states PYQ	**ACT-AL**: artemether-lumefantrine x 3 days (SP resistance) + primaquine 0.75 mg/kg on Day 2
Mixed Pv + Pf PYQ	Full ACT (as for Pf) + primaquine 0.25 mg/kg x 14 days. Adult (≥15 yrs) Day 2 = artesunate 4 × 50 mg + primaquine 15 mg (6 × 2.5 mg) PYQ
Severe malaria (any species) PYQ	**IV artesunate 2.4 mg/kg at 0, 12 and 24 h, then once daily** PYQ ; switch to full oral ACT once oral intake is possible (after at least 24 h). Alternatives: IM artemether, IM arteether, or IV quinine (20 mg/kg loading, then 10 mg/kg 8-hourly) PYQ . Artesunate lowered mortality vs quinine (SEAQUAMAT, AQUAMAT).
Pregnancy	Vivax: chloroquine (no primaquine). Uncomplicated Pf: national guideline - quinine in the 1st trimester, ACT in 2nd/3rd; WHO now also accepts artemether-lumefantrine in the 1st trimester. Severe: IV artesunate in all trimesters.
Supportive (severe)	Check glucose 4-hourly and correct hypoglycaemia; treat seizures; careful fluids; transfuse for severe anaemia; dialysis for AKI. Avoid steroids and mannitol in cerebral malaria.

Trap - primaquine: contraindicated in **pregnancy, infants and G6PD deficiency** PYQ (oxidant haemolysis). For falciparum it is a **single** dose, not 7 days PYQ . In mixed infection the SP is Day 1 only, so any "Day 2" option with SP is wrong PYQ .

Drug resistance: chloroquine resistance in Pf (pfcrt gene) first reported in India from Assam (Karbi Anglong), 1973. Artemisinin partial resistance (kelch13 mutations) emerged in the Greater Mekong region - reason for always using combinations, never artemisinin alone.

Treatment algorithm (fresh flowchart)

Step 1	Step 2	Step 3
Fever in an endemic area or after travel: RDT / smear	Danger signs or severity criterion?	**YES - severe:** IV artesunate (pre-referral rectal artesunate / IM artemether at peripheral level) - then full oral ACT
	No - uncomplicated: which species?	**Pv/Po:** chloroquine 3 days + primaquine 14 days
		Pf: ACT-SP (ACT-AL in North-East) + primaquine single dose Day 2
		Mixed: ACT + primaquine 14 days

Chemoprophylaxis

- Short stay (<6 weeks): **doxycycline** 100 mg daily, from 2 days before to 4 weeks after leaving.
- Long stay (>6 weeks): **mefloquine** 250 mg weekly, from 2 weeks before to 4 weeks after.
- Chloroquine 300 mg base weekly only for chloroquine-sensitive areas; it is the only prophylactic drug when options are lumefantrine, pyrimethamine, chloroquine, quinine PYQ .

10. Complications - quick list

Cerebral malaria PYQ ; acute kidney injury and blackwater fever PYQ ; ARDS/pulmonary oedema PYQ ; hypoglycaemia PYQ ; lactic acidosis PYQ ; severe anaemia PYQ ; algid malaria (shock) PYQ ; DIC and bleeding; jaundice; splenic rupture (vivax); in pregnancy - abortion, LBW, stillbirth.

11. Epidemiology and malariometric indices

Index	Definition / use
Annual Parasite Incidence (API) PYQ	Confirmed cases in a year x 1000 / population under surveillance. Main measure of burden; basis of NFME categories.
ABER PYQ	Slides examined in a year x 100 / population. Measures surveillance effort (target at least 10%).
Annual Falciparum Incidence (AFI) PYQ	Pf cases per 1000 population per year
Slide positivity rate / Slide falciparum rate	Positive (or Pf-positive) slides per 100 examined
Infant parasite rate PYQ	Infants (<1 year) with parasites per 100 examined. **Most sensitive index of recent transmission** PYQ . Zero for 3 consecutive years = no transmission.
Spleen rate	Children 2-10 years with enlarged spleen; measures **endemicity**: hypo- <10%, meso- 11-50%, hyper- >50% (adults also high), holo- >75% (adults low)
Average enlarged spleen; parasite rate; parasite density index	Other community indices
Proportional case rate PYQ	Malaria cases per 100 OPD patients; used because morbidity rates are hard to get; crude index (no time/space relation) PYQ
Vector indices	Human blood index, sporozoite rate, man-biting rate, inoculation rate, mosquito density

Must know: "Recent transmission" = **infant parasite rate**. Asked in UPSC CMS, NEET PG and FMGE PYQ .

12. Prevention and the national programme

12a. Programme timeline

NMCP 1953 - NMEP 1958 - Urban Malaria Scheme 1971 - Modified Plan of Operation 1977 - Enhanced Malaria Control Project 1997 - NAMP 1999 - NVBDCP 2003-04 (now the **National Center for Vector Borne Diseases Control, NCVBDC**) - **National Framework for Malaria Elimination 2016-2030** (launched February 2016).



Emblem of India's national malaria / vector-borne disease programme (used in an FMGE question on vector control).

12b. NFME 2016-2030 PYQ

Category (by API)	Phase
Category 0	Prevention of re-establishment (no indigenous cases)
Category 1	Elimination phase - API <1 in the state and all its districts
Category 2	Pre-elimination - state API <1 but some districts ≥1
Category 3	Intensified control - state API ≥1

By	Milestone
2022	Eliminate malaria from all Category 1 and 2 states/UTs
2024	API <1 per 1000 in all states/UTs and districts
2027 PYQ	**Entire country: zero indigenous cases and zero malaria deaths** (interrupt indigenous transmission) - asked twice in UPSC CMS
2030	Prevent re-establishment; maintain malaria-free status; WHO certification (needs 3 consecutive years of zero indigenous cases)

12c. Vector control

- **Indoor residual spraying (IRS)** - a mainstay of **rural** control PYQ : DDT 2 rounds per transmission season; if DDT resistance, **malathion 3 rounds** PYQ ; synthetic pyrethroids 2 rounds.
- **Long-lasting insecticidal nets (LLINs)** in high-burden, tribal and forest areas; personal protection, repellents.
- **Anti-larval measures**: source reduction, temephos (Abate), larvivorous fish (*Gambusia*, guppy), minor engineering. The **Urban Malaria Scheme** (1971) relies mainly on anti-larval work against *An. stephensi* PYQ .

12d. Case management as prevention

- Early diagnosis and complete treatment (ASHA with RDT and ACT in villages); primaquine for transmission blocking (Pf) and radical cure (Pv).
- Vaccines (pre-erythrocytic, against circumsporozoite protein): **RTS,S/AS01** and **R21/Matrix-M**, WHO-recommended for children in moderate-high transmission areas of Africa; not part of India's programme.

13. Special exam points

- Incubation: Pf 12 days PYQ ; transfusion malaria shorter (trophozoites, no liver stage) PYQ .
- Duffy antigen = Pv receptor PYQ .
- HRP-2 positive = Pf PYQ .
- Smear with crescent gametocytes or multiple rings in normal-sized RBC = Pf - asked as a picture again and again PYQ .
- Band form = Pm PYQ .
- Field diagnosis = RDT PYQ ; speciation = thin Giemsa smear PYQ .
- Severe malaria drug = IV artesunate PYQ ; old papers accepted IV quinine PYQ .
- North-East Pf = artemether-lumefantrine PYQ .

4. High Yield Notes - Malaria

Ordered by how often the examiners asked it.

Angle (PYQs)	One-liners
Species on smear (10)	Crescent/banana gametocyte = **Pf**. Multiple delicate rings in a normal-sized RBC, appliqué forms, double chromatin = **Pf**. Band form = **Pm**. Enlarged RBC + Schuffner dots = **Pv**. HRP-2 positive = **Pf**.
Severe malaria features (8)	Cerebral malaria = Pf only; gravest complication. **Hypoglycaemia** (not hyper) <40 mg/dL, even without quinine. Acidosis pH <7.25. Creatinine >3. Hct <15% (child). Mortality climbs above ~3% parasitaemia. AKI/blackwater = Pf.
Relapse / recrudescence (6)	Relapse = hypnozoite (Pv, Po), killed by primaquine in the **liver**. Recrudescence = surviving blood forms after treatment; Pf (drug resistance).
Uncomplicated treatment (6)	Pf: ACT-SP (SP Day 1 only) + PQ 0.75 mg/kg Day 2; North-East: ACT-AL. Pv: CQ 3 days + PQ 0.25 mg/kg x 14 days. Mixed: ACT + PQ 14 days. No chloroquine for Pf. PQ contraindicated in pregnancy, infants, G6PD deficiency.
Severe treatment (5)	**IV artesunate 2.4 mg/kg at 0, 12, 24 h then daily** - then full oral ACT. IV quinine = alternative.
Indices (5)	Recent transmission = **infant parasite rate**. API = cases/1000/yr. ABER = slides/population x 100. Proportional case rate = cases per 100 OPD patients (crude).
Diagnosis (3)	Speciation = thin smear, Giemsa. Detection = thick smear. Field = RDT (HRP-2). Smear examined by lab technician.
Programme (4)	NFME: **2027 = zero indigenous cases + zero deaths** nationwide; 2030 = stay malaria-free. IRS is a rural mainstay (DDT 2 rounds, malathion 3). UMS = anti-larval, *An. stephensi*.
Cytoadherence (3)	PfEMP1 knobs bind CD36, ICAM-1 (brain), CSA (placenta) - sequestration - no schizonts in Pf smear, escape from spleen.
Biology (3)	Duffy = Pv receptor. IP: Pf 12, Pv 14, Po 17, Pm 28 days. Transfusion malaria: trophozoites, short IP, no relapse.

	Pf	Pv	Po	Pm
Cycle	48 h	48 h	48 h	72 h
RBC	All ages, normal size	Young, enlarged	Young, oval, fimbriated	Old, small
Dots	Maurer	Schuffner	James	Ziemann
Hallmark	Crescent gametocyte	Amoeboid troph	Oval RBC	Band, rosette
Relapse	No	Yes	Yes	No

If you remember one thing: *P. falciparum* sticks to blood vessels (PfEMP1 cytoadherence), so it hides its schizonts, reaches the brain and kills - treat every severe case with **IV artesunate**, and remember that **only vivax and ovale relapse**, because only they leave hypnozoites in the liver.

5. All 53 PYQs - Malaria (newest first)

1. UPSC CMS 2026

As per the National Framework for Malaria Elimination in India (2016–2030), which one of the following has to be achieved by the year 2027?

A. The entire country to have less than 1 case due to malaria per 1000 population at risk
B. The entire country to have less than 1 indigenous case of malaria per 1000 population at risk and less than 1 death due to malaria per 10000 population at risk
C. The entire country to have no indigenous case of malaria and less than 1 death due to malaria per 100000 population at risk
D. The entire country to have no indigenous case of malaria and no deaths due to malaria

Answer: **D. The entire country to have no indigenous case of malaria and no deaths due to malaria**

NFME milestones: **2022** - eliminate from all Category 1 & 2 states/UTs; **2024** - API <1/1000 in every state, UT and district; **2027** - interrupt indigenous transmission in the whole country; **2030** - prevent re-establishment, stay malaria-free.
2027 therefore = zero indigenous cases and zero malaria deaths across India (D).
A is the 2024 incidence milestone; B and C still allow cases or deaths, so they describe interim positions.

2. FMGE 2025

A patient presents with fever and altered sensorium. Peripheral smear shows multiple ring stages. Best treatment is?

A. Primaquine
B. Artesunate
C. Chloroquine
D. All of the above

Answer: **B. Artesunate**

Fever with altered sensorium and ring forms = cerebral (severe) falciparum malaria.
Drug of choice: **IV artesunate** 2.4 mg/kg at 0, 12 and 24 h, then once daily; switch to a full oral ACT course once the patient can take orally.
Primaquine has no role in the acute attack; chloroquine does not work against resistant falciparum.

3. UPSC CMS 2025

The National Framework for Malaria Elimination in India (2016–2030) has defined certain milestones and targets. Among the following, which is the specific target that has to be met by the year 2027?

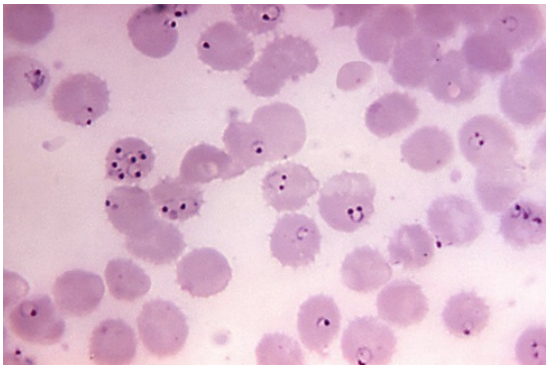
A. All states and UTs must reduce API to less than 1 case per 1000 population at risk.
B. All states and UTs must establish fully functional malaria surveillance to track, investigate and respond to each case.
C. Entire country is to have no indigenous cases and no deaths due to malaria.
D. Entire country has to initiate the process for certification of malaria elimination.

Answer: **C. Entire country is to have no indigenous cases and no deaths due to malaria.**

Same milestone as the 2026 UPSC question: by **2027** the entire country is to have no indigenous case and no malaria death (interruption of indigenous transmission).
A (API <1 in all states/UTs) is the 2024 milestone. Certification of elimination is the 2030 goal, after three years of zero indigenous cases.

4. FMGE 2024

A 28-year-old woman with a recent travel history to Africa presents with fever, confusion and neurological deficits. Laboratory analysis reveals the following findings. This organism exhibits a specific property that facilitates sequestration in vascular beds to avoid splenic clearance. What is the phenomenon called?



A. Rosetting
B. Agglutination
C. Cytoadherence
D. Schizogony

Answer: **C. Cytoadherence**

Binding of parasitised RBCs to vascular endothelium = **cytoadherence**; it sequesters mature parasites in deep vessels so they escape splenic clearance.
Mediator: **PfEMP1** on surface knobs, binding CD36, ICAM-1 (brain) and chondroitin sulphate A (placenta).
Rosetting = infected RBCs binding uninfected RBCs (adds to obstruction, but is not binding to endothelium).
Schizogony is asexual division.

5. INI-CET 2024

What is the best investigation for malaria speciation identification?

A. Thick smear
B. Thin smear with acridine orange
C. Thin smear with Giemsa
D. Quantitative Buffy Coat (QBC)

Answer: **C. Thin smear with Giemsa**

Thin smear keeps RBCs intact, so RBC size, Schuffner/Maurer dots and parasite shape can be seen: best for **species identification**. Giemsa is the standard stain.
Thick smear is 20-40 times more sensitive for **detection** but lyses RBCs, so speciation is poor.
Acridine orange / QBC: rapid fluorescent detection, poor for speciation.

6. INI-CET 2024

Assertion: Plasmodium falciparum doesn't show the schizont stage in the peripheral blood. Reason: This is due to cytoadherence to the cerebral endothelial cells.

A. Assertion is true, reason is true, and reason is the correct explanation of the assertion.
B. Assertion is true, reason is true, and reason is not the correct explanation of the assertion.
C. Assertion is true, reason is false.
D. Assertion is false, reason is true.

Answer: **A. Assertion is true, reason is true, and reason is the correct explanation of the assertion.**

Both true, and the reason explains the assertion (A).
Late trophozoites and schizonts of *P. falciparum* express PfEMP1 knobs and stick to endothelium (brain, other organs, placenta), so the peripheral smear shows only **rings and crescentic gametocytes**.
Schizonts in a falciparum smear indicate very heavy infection and a poor prognosis.

7. INI-CET 2024

All of the following drugs are used in the management of uncomplicated Plasmodium falciparum malaria, except:

A. Artemether
B. Primaquine
C. Chloroquine
D. Sulphadoxine/pyrimethamine

Answer: **C. Chloroquine**

Uncomplicated falciparum = ACT: artesunate + SP (rest of India) or artemether-lumefantrine (North-East), plus single-dose primaquine 0.75 mg/kg on day 2 as gametocytocide.
Chloroquine is not used because *P. falciparum* is widely chloroquine-resistant (first reported in India from Assam, 1973).

8. INI-CET 2024

In a field setting, malaria diagnosis is done by:

A. Buffy coat examination
B. Thin blood smear
C. Thick blood smear
D. HRP2 detection/Rapid Diagnostic Test

Answer: **D. HRP2 detection/Rapid Diagnostic Test**

In the field (no microscope or technician) diagnosis is by **rapid diagnostic test**; India uses bivalent RDTs (HRP-2 for Pf + pan-pLDH for all species), done by ASHAs and health workers.
Result in 15-20 minutes, no electricity needed. Microscopy remains the laboratory gold standard.

9. NEET PG 2024

An 18-year-old boy from Rajasthan weighing 50 kg is diagnosed with mixed Plasmodium vivax and Plasmodium falciparum malaria. What is the appropriate treatment regimen on Day 2?

A. Artesunate 50 mg (4 tablets) + Primaquine 2.5 mg (6 tablets)
B. Artesunate 50 mg (4 tablets) + Primaquine 7.5 mg (6 tablets)
C. Artesunate 50 mg (4 tablets) + Sulfadoxine/pyrimethamine (750/37.5 mg) (2 tablets) + Primaquine 2.5 mg (6 tablets)
D. Artesunate 50 mg (4 tablets) + Sulfadoxine/pyrimethamine (750/37.5 mg) (2 tablets) + Primaquine 7.5 mg (6 tablets)

Answer: **A. Artesunate 50 mg (4 tablets) + Primaquine 2.5 mg (6 tablets)**

Mixed infection = treat as falciparum (ACT-SP for 3 days) + radical cure for vivax (primaquine 0.25 mg/kg daily for 14 days).
SP is given on **Day 1 only**, so it cannot appear on Day 2 - this removes C and D.
Adult primaquine dose for radical cure = 15 mg/day = **6 tablets of 2.5 mg** (6 × 7.5 mg = 45 mg daily would be three times the radical-cure dose). Answer A.

10. FMGE 2023

A 7-year-old child from a malaria-endemic region presents with fever, altered mental status, seizures, and coma. Physical examination reveals no focal neurological deficits. Blood smear shows the presence of Plasmodium falciparum parasites. What is the most likely diagnosis?

A. Tubercular meningitis
B. Viral meningitis
C. Cerebral malaria
D. Fungal meningitis

Answer: **C. Cerebral malaria**

Fever + impaired consciousness/coma + seizures + no focal deficit + *P. falciparum* on smear = **cerebral malaria**.
Diffuse symmetrical encephalopathy from sequestration in cerebral microvessels; always check and correct hypoglycaemia; treat with IV artesunate.

11. NEET PG 2023

A patient presented hepatosplenomegaly. O/E pallor was present. Rapid antigen test was positive for HRP- 2 Ag. Identify the species of plasmodium causing disease?

A. Falciparum
B. Malariae
C. Ovale
D. Vivax

Answer: **A. Falciparum**

HRP-2 (histidine-rich protein 2) is produced only by *P. falciparum*, so a positive HRP-2 line means falciparum.
HRP-2 stays positive 2-4 weeks after cure, so it cannot be used to check treatment response; pLDH clears with the parasite.

12. UPSC CMS 2023

The Duffy antigen system serves as a receptor for which one of the following protozoal parasites?

A. Giardia lamblia
B. Plasmodium vivax
C. Entamoeba histolytica
D. Balantidium coli

Answer: **B. Plasmodium vivax**

P. vivax merozoites enter RBCs through the **Duffy antigen** (DARC) using Duffy-binding protein. *P. knowlesi* also uses it.
Duffy-negative people, Fy(a-b-), common in West Africa, are largely resistant to vivax.

13. UPSC CMS 2023

Primaquine destroys hypnozoites of Plasmodium vivax for radical cure in which one of the following?

A. Liver
B. Peripheral blood
C. Brain
D. Bone marrow

Answer: **A. Liver**

Hypnozoites are dormant forms of *P. vivax* and *P. ovale* inside **hepatocytes**.
Primaquine (8-aminoquinoline, tissue schizonticide) destroys them = radical cure, preventing relapse.
Chloroquine and ACT act only on blood stages.

14. INI-CET 2022

Which of the following is NOT a potential complication in a 40-year-old man with a 15-day history of fever, 1-day history of altered sensorium, and a diagnosis of Plasmodium falciparum infection?

A. Blood glucose
B. Arterial pH >7.2
C. Serum creatinine - 5.2 mg/dL
D. Unarousable coma

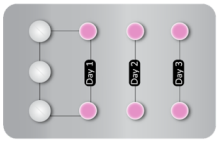
Answer: **B. Arterial pH >7.2**

Severe falciparum causes **metabolic (lactic) acidosis**: pH <7.25 or bicarbonate <15 mmol/L.
An arterial pH above 7.2 is not acidosis of severity, so it is the exception (B).
Hypoglycaemia, creatinine >3 mg/dL (here 5.2) and unrousable coma are all WHO severity criteria.

15. INI-CET 2022

What is the purpose of administering the drug depicted in the accompanying image?





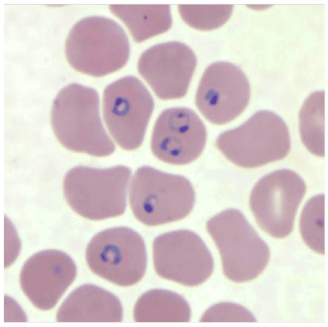
A. Malaria
B. Dengue
C. Sexually transmitted infections
D. AIDS

Answer: **A. Malaria**

The pack is an artemisinin-based combination (artesunate + sulfadoxine-pyrimethamine) blister - the national programme drug for uncomplicated falciparum malaria.
Artesunate clears most parasites quickly; the long-acting partner (SP) removes the rest and protects against resistance.

16. INI-CET 2022

How would you approach the management of a patient who presents with a five-day history of high fever and changes in consciousness, and has experienced two seizures within the past day, based on the findings from the peripheral smear?



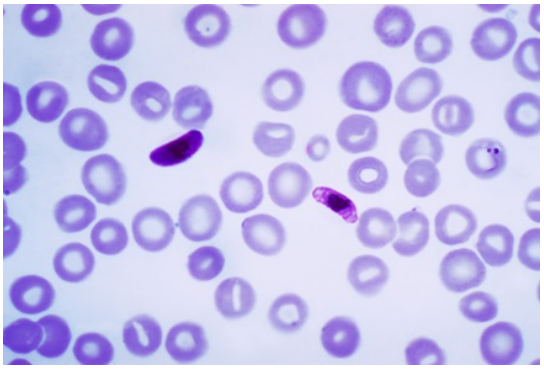
A. Doxycycline 100 mg intravenously for 7 days
B. Clindamycin 600 mg intravenously 8 hourly for 7 days
C. Artesunate 2.4 mg/kg intravenously at 12 and 24 hours, followed by once daily
D. Chloroquine intramuscularly 8 hourly for 3 days

Answer: **C. Artesunate 2.4 mg/kg intravenously at 12 and 24 hours, followed by once daily**

High fever + altered consciousness + seizures + parasites on smear = cerebral malaria.
Treatment: **IV artesunate 2.4 mg/kg at 0, 12 and 24 h, then once daily**, followed by full oral ACT.
Doxycycline and clindamycin are slow partner drugs, never alone; chloroquine is useless for resistant falciparum.

17. FMGE 2021

What is the etiological factor in a 55-year-old male presenting with fever, worsening fatigue, febrility, hypotension, tachycardia, and the following microscopic examination results of peripheral blood smear?



A. Plasmodium vivax
B. Plasmodium falciparum
C. Plasmodium ovale
D. Plasmodium malariae

Answer: **B. Plasmodium falciparum**

Smear: fine rings, multiple rings per RBC and **crescent (banana) gametocytes** - pathognomonic of *P. falciparum*.
Hypotension and tachycardia point to severe malaria, which is a falciparum disease.

18. FMGE 2021

A patient from a North-Eastern state has been diagnosed with P. falciparum malaria. Given the regional considerations for drug resistance and the malaria species, which of the following treatment options should be administered to effectively manage the infection?

A. Artemether plus lumefantrine
B. Sulfadoxine plus pyrimethamine
C. Chloroquine
D. Mefloquine

Answer: **A. Artemether plus lumefantrine**

In the North-Eastern states SP resistance is common, so the ACT used is **artemether-lumefantrine** (ACT-AL) for 3 days + primaquine 0.75 mg/kg on day 2.
Rest of India: artesunate + SP. Chloroquine is not used for falciparum.

19. FMGE 2021

What is the most reliable indicator of recent malaria transmission?

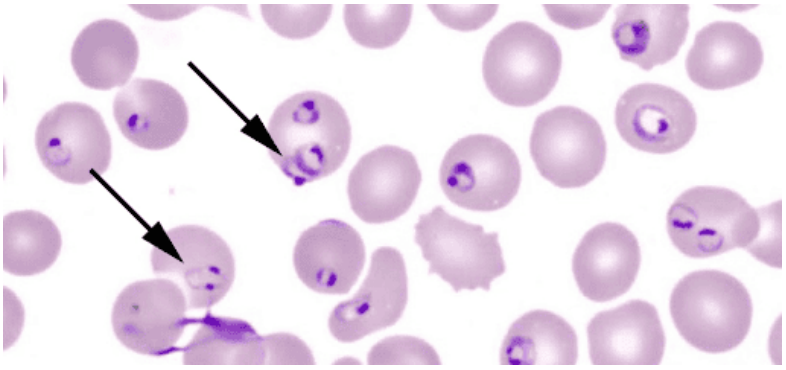
A. Spleen rate
B. Infant parasite rate
C. Parasite density index
D. Slide positivity rate

Answer: **B. Infant parasite rate**

Infant parasite rate (infants <1 year with parasites) is the most sensitive index of recent transmission - an infant can only have been infected locally and recently.
IPR zero for 3 consecutive years = absence of transmission. Spleen rate reflects endemicity, not recent transmission.

20. FMGE 2021

A 55-year-old man presents with fever, increasing fatigue, and is found to be febrile, hypotensive, and tachycardia. A microscopic examination of his peripheral blood smear is conducted. Which species is the likely causative agent given the symptoms and the specific findings on the blood smear?



A. Plasmodium vivax
B. Plasmodium falciparum
C. Plasmodium ovale
D. Plasmodium malariae

Answer: **B. Plasmodium falciparum**

Normal-sized RBCs with multiple delicate rings, double chromatin dots and appliqué forms = *P. falciparum*. Vivax and ovale enlarge the RBC and show Schuffner dots; malariae gives band forms.

21. FMGE 2021

A 32-year-old man who had traveled to Assam recently presents with fever, chills, seizures, and altered sensorium. On examination, his blood pressure was 70/50 mm of Hg and labored breathing was present. A blood smear was sent which revealed plasmodium falciparum. Which of the following is the drug of choice in this condition?

A. Chloroquine
B. Quinine
C. Intravenous artesunate
D. Artemether

Answer: **C. Intravenous artesunate**

Seizures, altered sensorium, BP 70/50 and laboured breathing = severe falciparum malaria.
Drug of choice: **IV artesunate** (lower mortality than quinine in SEAQUAMAT and AQUAMAT trials). Quinine is only the alternative if artesunate is unavailable.
Oral artemether (D) is for uncomplicated disease; chloroquine has no role.

22. FMGE 2020

A 55-year-old man returns from a rural malaria-endemic region with 4 days of high-grade fever, rigors, and profound fatigue. On examination he is tachycardic, hypotensive, and mildly icteric. A peripheral blood smear is examined microscopically. Which organism is the most likely cause of his illness?

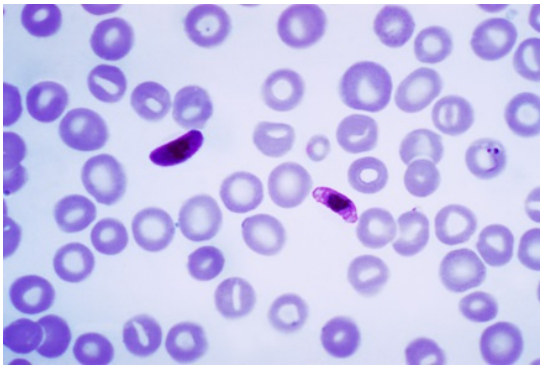
A. Plasmodium vivax
B. Plasmodium falciparum
C. Plasmodium ovale
D. Plasmodium malariae

Answer: **B. Plasmodium falciparum**

High fever, rigors, hypotension and jaundice after travel to an endemic area = severe (complicated) malaria. Severe malaria is essentially *P. falciparum*: it invades RBCs of all ages (high parasitaemia) and sequesters in microvessels.

23. FMGE 2020

What is the etiological factor in a 55-year-old male presenting with fever, worsening fatigue, febrility, hypotension, tachycardia, and the following microscopic examination results of peripheral blood smear?



A. Plasmodium vivax
B. Plasmodium falciparum
C. Plasmodium ovale
D. Plasmodium malariae

Answer: **B. Plasmodium falciparum**

Crescent/banana-shaped gametocytes on smear = *P. falciparum* (no other human species has them). With hypotension and tachycardia, this is severe falciparum malaria.

24. FMGE 2020

What is the typical duration of the incubation period for Plasmodium falciparum?

A. 12
B. 16
C. 30
D. 28

Answer: **A. 12**

Incubation periods (Park): **Pf 12 days** (shortest), Pv 14 days, Po 17 days, Pm 28 days (longest).
Option values are days.

25. FMGE 2020

As a medical officer assigned to rural service, your role includes overseeing the implementation of preventive measures against malaria in your region. Based on the program's logo displayed below, you should provide guidance on all of the following aspects, except for:



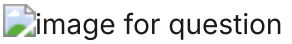
A. Two rounds of spraying with DDT should be done to provide protection during the entire transmission season.
B. Long lasting insecticide nest (LLIN) should be provided in areas with annual parasite index ≥5.
C. Indoor residual sprays are not suitable for vector control in rural areas.
D. In case of DDT resistance, 3 rounds of spraying with Malathion should be done to provide protection during the entire transmission season.

Answer: **C. Indoor residual sprays are not suitable for vector control in rural areas.**

Indoor residual spraying is a mainstay of rural malaria control, so C is the false statement.
DDT: 2 rounds per transmission season; if DDT resistance, malathion: 3 rounds (shorter residual action); synthetic pyrethroids: 2 rounds. LLINs are given in high-burden areas.
The image is the logo of the national vector-borne disease programme.

26. NEET PG 2020

A 15-year-old boy presented with fever and chills for 3 days. On examination, he was found to have delayed skin pinch time and dry oral mucosa. A peripheral blood smear revealed the following picture. Identify the pathogen involved.



A. Babesia
B. Plasmodium vivax
C. Plasmodium falciparum
D. Salmonella typhi

Answer: **C. Plasmodium falciparum**

Smear: multiple fine ring forms per RBC and crescentic gametocytes, RBC not enlarged = *P. falciparum*. Babesia: tiny rings with Maltese-cross tetrads, no pigment, no gametocytes. Vivax: enlarged RBCs with Schuffner dots.

27. AIIMS PG 2019

Cerebral malaria is caused by?

A. Plasmodium falciparum
B. Plasmodium ovale
C. Plasmodium vivax
D. Plasmodium malariae

Answer: **A. Plasmodium falciparum**

Cerebral malaria is caused only by *P. falciparum*: PfEMP1-mediated cytoadherence (ICAM-1) and rosetting sequester parasites in cerebral microvessels.
WHO definition: unrousable coma with falciparum parasitaemia and no other cause of encephalopathy.

28. FMGE 2019

Which is the recommended chemoprophylaxis for an individual traveling to a region endemic for malaria?

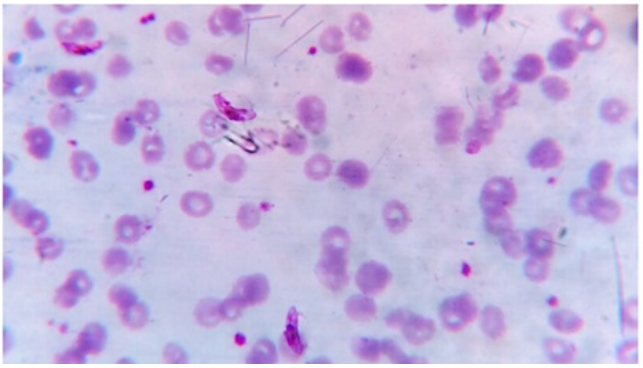
A. Lumefantrine
B. Pyrimethamine
C. Chloroquine
D. Quinine

Answer: **C. Chloroquine**

Of the options, only **chloroquine** is a chemoprophylactic drug (300 mg base weekly in chloroquine-sensitive areas).
India's programme: short stay (<6 weeks) - **doxycycline** 100 mg daily from 2 days before to 4 weeks after; long stay (>6 weeks) - **mefloquine** 250 mg weekly from 2 weeks before to 4 weeks after.

29. FMGE 2019

A Giemsa-stained peripheral blood smear is shown. What is the most likely diagnosis?



A. Malaria
B. Hereditary spherocytosis
C. G6PD Deficiency
D. Thalassemia

Answer: **A. Malaria**

Intra-erythrocytic parasites (crescentic falciparum gametocyte, rings) = **malaria**.
Spherocytosis, G6PD deficiency (bite cells, Heinz bodies) and thalassaemia (target cells, microcytes) show no parasites.

30. FMGE 2019

What is the underlying reason for the repeated occurrence of malaria in this 25-year-old patient who is experiencing severe headache, body aches, irregular fever, nausea and vomiting, loss of taste, hepatosplenomegaly, jaundice, decreased platelet count, and abnormal liver function tests?

A. P. falciparum
B. P. vivax
C. Heterozygous sickle cell anemia
D. Babesia

Answer: **B. P. vivax**

Repeated attacks without a fresh bite = **relapse** from liver hypnozoites, seen only in *P. vivax* and *P. ovale*.
Sickle cell trait protects against falciparum; it does not cause recurrence.

31. NEET PG 2019

Which of the following is not an epidemiological indicator?

A. ABER
B. Annual parasite index
C. Annual falciparum incidence
D. None of the above

Answer: **D. None of the above**

ABER (slides examined/population x 100) measures surveillance effort; **API** (confirmed cases/1000 population/year) measures burden; **AFI** = falciparum cases/1000/year.
All three are indicators, so the answer is 'None of the above'.

32. FMGE 2018

The proposal to control malaria in towns named as Urban Malaria Scheme. According to Urban Malaria Scheme, Which of the following is not true?

A. SPR between 5% and 10%
B. Slide positivity rate more than 10%
C. Scheme is not based on blood examination
D. Towns having a population more than 40,000

Answer: **B. Slide positivity rate more than 10%**

UMS (1971) controls malaria in towns, mainly against *An. stephensi*, by **anti-larval measures** (source reduction, larvicides, larvivorous fish) rather than mass blood surveys.
Stored answer: B (SPR >10% is not the criterion).
Note for Dr Gupta: check answer - options A and B both describe an SPR above 5%, so the key depends on the exact town-selection criteria in the source text; please confirm before recording.

33. FMGE 2018

Peripheral blood smear sample for malaria is done by?

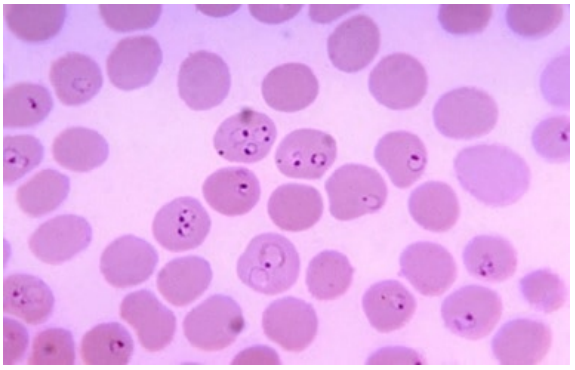
A. Pharmacist
B. ANM
C. Medical officer
D. Laboratory technician

Answer: **D. Laboratory technician**

Slides are collected in the field by ASHA/ANM/MPW, but **staining and examination** are done by the laboratory technician (LT).
ASHAs and ANMs use RDTs where microscopy is not available.

34. NEET PG 2018

A 28-year-old man returns from a trip to sub-Saharan Africa with high-grade fever, chills, headache and jaundice. He is drowsy and hypotensive. A Giemsa-stained thin peripheral blood smear is shown, demonstrating numerous small delicate ring forms, several red cells with more than one ring, and no enlargement of parasitised cells.



Which organism is most likely responsible?

A. Plasmodium falciparum
B. Plasmodium vivax
C. Babesia microti
D. Plasmodium malariae

Answer: **A. Plasmodium falciparum**

Severe illness after sub-Saharan Africa + delicate rings + several rings per RBC + no RBC enlargement = *P. falciparum*.
Vivax enlarges RBCs; malariae gives bands; Babesia gives tetrads and no pigment.

35. AIIMS PG 2017

In plasmodium vivax malaria, relapse is caused by:

A. Sporozoite
B. Schizont
C. Hypnozoite
D. Gametocyte

Answer: **C. Hypnozoite**

Some sporozoites of *P. vivax* and *P. ovale* stay dormant in hepatocytes as **hypnozoites**; their reactivation weeks to months later causes **relapse**.
Treatment to prevent relapse = primaquine 0.25 mg/kg x 14 days (radical cure).

36. UPSC CMS 2017

An 8-year-old boy was diagnosed with Plasmodium vivax malaria and was treated with appropriate dosages of chloroquine. The fever subsided but recurred after 3 weeks, and the peripheral smear again showed P. vivax parasitemia. This child should now be treated as a case of:

A. Relapse
B. Recrudescence
C. Either relapse or recrudescence
D. Fresh infection

Answer: **A. Relapse**

Recurrence of *P. vivax* after adequate chloroquine = **relapse** from hypnozoites (chloroquine does not reach the liver forms).
Recrudescence is from surviving blood forms - typical of falciparum (and malariae). Lesson: always add primaquine for vivax.

37. AIIMS PG 2016

Schizonts and late trophozoite stages of plasmodium falciparum not seen in peripheral blood smear because:

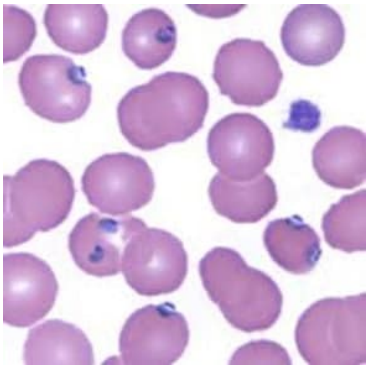
A. They are sequestered in the spleen
B. Due to adherence to the capillary endothelium, they are not seen in peripheral blood
C. Due to antigen-antibody reaction and removal
D. They are seen in mosquito blood

Answer: **B. Due to adherence to the capillary endothelium, they are not seen in peripheral blood**

Late trophozoites and schizonts of *P. falciparum* adhere to **capillary endothelium** (PfEMP1 knobs - CD36, ICAM-1) and are sequestered in deep vessels.
So the smear shows only rings and gametocytes. Sequestration helps the parasite *avoid* the spleen (A is wrong).

38. AIIMS PG 2016

A 15 years old boy presented with fever and chills for 3 days. On examination he was found to have delayed skin pinch time and dry oral mucosa. A peripheral blood smear revealed the following picture. Identify the pathogen involved?



A. Babesia
B. Plasmodium vivax
C. Plasmodium falciparum
D. Salmonella typhi

Answer: **C. Plasmodium falciparum**

Multiple delicate rings, double chromatin dots, appliqué forms, crescentic gametocytes, normal-sized RBCs = *P. falciparum*.
Same clinical stem was repeated in NEET PG 2020.

39. AIIMS PG 2016

Transfusion-associated malaria has a shorter incubation period because of the presence in blood of:

A. Trophozoites
B. Sporozoites
C. Female gametocyte
D. Merozoites

Answer: **A. Trophozoites**

Transfused blood already contains **erythrocytic (trophozoite) forms**, so the liver stage is skipped and incubation is short.
No liver stage = no hypnozoites = **no relapse**; primaquine is not needed in transfusion vivax malaria.

40. UPSC CMS 2016

Which of the following is not a recognized complication of malaria?

A. Acute Respiratory Distress Syndrome (ARDS)
B. Acidosis
C. Hyperglycaemia
D. Coma

Answer: **C. Hyperglycaemia**

Malaria causes **hypoglycaemia**, not hyperglycaemia: parasite glucose use, failed gluconeogenesis, and quinine-induced insulin release.
ARDS, acidosis and coma are recognised severe complications.

41. UPSC CMS 2016

Which of the following statements is/are true about proportional case rate of malaria?1. This indicator is used since morbidity rate is difficult to determine2. This is defined as the number of cases of malaria for every 100 patients seen in hospital OPDs3. It is a crude index since cases are not related to their time and space distributionSelect the correct answer using the code given below:

A. 2 only
B. 2 and 3 only
C. 3 only
D. 1, 2 and 3

Answer: **D. 1, 2 and 3**

Proportional case rate = malaria cases per 100 patients attending hospital OPDs.
Used because true morbidity rates are hard to get; crude because cases are not related to time and place, and the denominator is OPD attendance, not the population. All three true (D).

42. AIIMS PG 2015

According to the new WHO 2013 malaria treatment guidelines, which of the following statements is true?

A. No ACT in falciparum malaria
B. Presumptive treatment with chloroquine should be given
C. Primaquine is contraindicated in infants and pregnant women
D. Primaquine is to be given for 7 days in falciparum malaria

Answer: **C. Primaquine is contraindicated in infants and pregnant women**

Primaquine causes oxidant haemolysis in G6PD deficiency; G6PD status cannot be assured in the fetus or infant, so it is **contraindicated in pregnancy and infants** (also in G6PD deficiency).
ACT is first-line for falciparum (A wrong); treatment needs parasitological confirmation (B wrong); primaquine for falciparum is a single dose, not 7 days (D wrong).

43. NEET PG 2015

Recrudescence of infection following inadequate treatment (e.g. due to drug resistance) is most commonly seen in which malaria?

A. P vivax
B. P ovale
C. P malariae
D. P falciparum

Answer: **D. P falciparum**

Recrudescence = return of parasitaemia from **surviving blood forms** after inadequate or failed treatment. Typical of *P. falciparum*, the species with drug resistance. Vivax and ovale recur by **relapse** (hypnozoites).

44. UPSC CMS 2015

Consider the following statements regarding falciparum malaria: The mortality rises steeply when the proportion of infected erythrocytes increases above 3 percent. The patient may develop hypoglycemia even when not treated with quinine. Which of the statements given above is/are correct?

A. 1 only
B. 2 only
C. Both 1 and 2
D. Neither 1 nor 2

Answer: **C. Both 1 and 2**

Both true. Because falciparum invades RBCs of all ages, parasitaemia can be very high; mortality rises steeply once more than about 3% of RBCs are infected in non-immune patients.
Hypoglycaemia occurs from the disease itself (parasite glucose use, impaired gluconeogenesis) - quinine only adds to it.

45. AIIMS PG 2014

"Which of the following is the most effective treatment of severe malaria?"

A. Doxycycline
B. Primaquine
C. Chloroquine
D. Artesunate

Answer: **D. Artesunate**

Artesunate (IV) is the treatment of choice for severe malaria in all patients, including pregnancy and children.
It lowered mortality compared with quinine in SEAQUAMAT (Asian adults) and AQUAMAT (African children).

46. AIIMS PG 2014

The term 'recrudescence' in malaria refers to:

A. Same as relapse in P.vivax and P ovale malaria
B. Resistance to antimalarial drugs
C. Recurrence of asexual parasitemia after completion of treatment
D. Reinfection with the same species

Answer: **C. Recurrence of asexual parasitemia after completion of treatment**

Recrudescence = **recurrence of asexual parasitaemia after treatment**, from blood forms that were not fully cleared.
It is not the same as relapse (hypnozoites) or reinfection (a new bite). Resistance is one cause, not the definition.

47. NEET PG 2014

"A patient presents with fever. Peripheral smears show bands across the erythrocytes. Diagnosis is -"

A. P Falciparum
B. P vivax
C. P ovate
D. P malariae

Answer: **D. P malariae**

Band form trophozoites stretching across the RBC are typical of *P. malariae*.
Also: older small RBCs, Ziemann's dots, rosette ('daisy-head') schizont with 6-12 merozoites, 72-hour cycle (quartan fever), nephrotic syndrome in children.

48. NEET PG 2014

"An epidemiologist visits a village and wants to collect data for recent parasitic activity. What should be measure -"

A. Spleen rate
B. Infant parasite rate
C. Slide positivity rate
D. Slide falciparum rate

Answer: **B. Infant parasite rate**

The epidemiologist wants **recent** transmission = **infant parasite rate**.
Spleen rate shows endemicity; SPR/SFR are case-detection measures that depend on who gets tested.

49. AIIMS PG 2013

All of the following are true about severe malaria except:

A. Hypoglycemia, blood sugar level less than 40 mg
B. Creatinine more than 3 mg/dL
C. LDH > 750 U/L
D. Hematocrit more than 15

Answer: **D. Hematocrit more than 15**

Severe anaemia in WHO criteria = haematocrit **below** 15% (Hb <5 g/dL) in children; Hb <7 g/dL / Hct <20% in adults.
A haematocrit 'more than 15' is therefore not a severity criterion (D).
Hypoglycaemia <40 mg/dL and creatinine >3 mg/dL are severity criteria.

50. UPSC CMS 2013

The most sensitive index for surveillance of malaria transmission is:

A. Spleen rate
B. Parasite density index
C. Infant parasite rate
D. Proportional case rate

Answer: **C. Infant parasite rate**

Infant parasite rate is the most sensitive index of recent transmission.
Spleen rate (children 2-10 years) classifies endemicity; proportional case rate is a crude hospital-based index.

51. NEET PG 2012

Which type of malaria is associated with renal failure -

A. Falciparum
B. Vivax
C. Malariae
D. Ovale

Answer: **A. Falciparum**

Acute kidney injury is a complication of *P. falciparum*: sequestration, haemolysis and **blackwater fever** (massive intravascular haemolysis with haemoglobinuria).
Contrast: *P. malariae* causes a chronic immune-complex **nephrotic** syndrome, not acute renal failure.

52. UPSC CMS 2012

A patient is admitted with fever and chills for the last seven days and drowsiness for the last two days. He is febrile, icteric, and semiconscious with a pulse of 110/min and BP 100/70 mmHg. The peripheral smear shows the ring form of Plasmodium falciparum – 10 infected RBCs per 1000. The patient should be started on:

A. Intravenous quinine
B. Quinine through Ryle's tube
C. Intravenous chloroquine
D. Oral primaquine

Answer: **A. Intravenous quinine**

Drowsiness and jaundice with falciparum rings = severe malaria, needing a **parenteral** drug; oral or Ryle's tube routes are unsafe in a drowsy patient.
Among the options, IV quinine is correct. Present-day drug of choice is **IV artesunate**; IV quinine (20 mg/kg loading, then 10 mg/kg 8-hourly) is the alternative.

53. UPSC CMS 2012

The gravest complication of Falciparum malaria is:

A. Cerebral malaria
B. Acute pulmonary oedema
C. Algid malaria
D. Metabolic acidosis

Answer: **A. Cerebral malaria**

Cerebral malaria is the gravest complication of falciparum malaria, with high mortality even with treatment. Algid malaria (shock), pulmonary oedema and acidosis are severe too, but cerebral malaria is the classic answer.

6. Recording Kit - Malaria

Scripts follow the frozen Content Format Spec (sections 2, 4, N1, N3). Name strap "Dr Abhishek Gupta's HYT" throughout; end card "Revise this free on HYT Revision, by Dr Abhishek Gupta."

6a. HYT Concept Video (4-5 min, 16:9)

Title: Malaria in 4 Minutes | Asked 53 Times | Dr Abhishek Gupta's HYT **Thumbnail badge:** Asked 53 times

0:00-0:15 Hook (face, full screen)

"Malaria. Asked 53 times in 15 years. In four minutes, everything the examiners want."

0:15-0:45 PYQ map slide

Exam	FMGE	UPSC CMS	AIIMS PG	NEET PG	INI-CET	Total
PYQs	17	11	9	9	7	**53**

Years: 2012-2026, every year. 21 of the 53 from 2021 onwards.

Angles: identify the species on a smear (10) · severe/cerebral malaria features (8) · relapse vs recrudescence (6) · national drug policy (6) · IV artesunate (5) · indices - infant parasite rate (5) · diagnosis (3) · NFME/programme (4) · cytoadherence (3) · biology (3).

0:45-1:40 Block 1 - Core idea

- Female *Anopheles* injects sporozoites - liver (hepatic schizogony) - blood (ring, trophozoite, schizont; 48 h, malariae 72 h) - gametocytes back to mosquito.
- Vivax and ovale leave hypnozoites in the liver - relapse - primaquine 14 days.
- Falciparum: invades RBCs of all ages + PfEMP1 knobs stick to endothelium (CD36, ICAM-1 in brain, CSA in placenta) = sequestration. That is why it alone causes cerebral malaria, and why the smear shows only rings and crescents.

1:40-2:40 Block 2 - What examiners ask

- Smear pictures: crescent gametocyte / multiple delicate rings in normal-sized RBC = Pf; band form = malariae; HRP-2 = Pf.
- Severe malaria: IV artesunate 2.4 mg/kg at 0, 12, 24 h then daily, then full ACT. Criteria: hypoglycaemia <40, pH <7.25, creatinine >3, Hct <15 (child), coma.
- Programme drug policy: Pf = ACT-SP (SP Day 1 only) + PQ 0.75 mg/kg Day 2; North-East = artemether-lumefantrine; vivax = CQ 3 days + PQ 0.25 mg/kg x 14 days.
- Community medicine: infant parasite rate = recent transmission; NFME - 2027 = zero indigenous cases and zero deaths.

2:40-3:30 Block 3 - Common trap

- Hypoglycaemia, never hyperglycaemia - and it occurs even without quinine.
- Relapse (liver hypnozoite, vivax/ovale) is not recrudescence (surviving blood forms, falciparum).
- Malariae gives nephrotic syndrome; acute renal failure is falciparum.
- Thick smear detects; thin smear (Giemsa) speciates.

3:30-4:10 Rapid recall (ask - pause 2 s - answer)

1. Most sensitive index of recent malaria transmission? - **Infant parasite rate.**
2. RBC receptor used by *P. vivax*? - **Duffy antigen.**
3. Drug of choice for severe malaria? - **IV artesunate.**
4. Where does primaquine kill hypnozoites? - **In the liver.**
5. Band forms across the red cell? - ***P. malariae*.**

4:10-4:20 App drive (end card)

"These five questions and the full card set on malaria are on HYT Revision. Free. By Dr Abhishek Gupta."

6b. PYQ MCQ Videos (4)

MCQ Video 1 - UPSC CMS 2026 (Programme / NFME)

Title: Malaria | UPSC CMS 2026 PYQ | Dr Abhishek Gupta's HYT

Hook

"This was asked in UPSC CMS, 2026. Pause and try it."

Question slide

UPSC CMS 2026

As per the National Framework for Malaria Elimination in India (2016–2030), which one of the following has to be achieved by the year 2027?

A. The entire country to have less than 1 case due to malaria per 1000 population at risk
B. The entire country to have less than 1 indigenous case of malaria per 1000 population at risk and less than 1 death due to malaria per 10000 population at risk
C. The entire country to have no indigenous case of malaria and less than 1 death due to malaria per 100000 population at risk
D. The entire country to have no indigenous case of malaria and no deaths due to malaria

Teaching notes

- NFME launched 2016, runs to 2030; aligned with WHO Global Technical Strategy.
- States/districts in 4 categories by API: 0 (prevention of re-establishment), 1 (elimination, API <1 everywhere), 2 (pre-elimination), 3 (intensified control, API ≥1).
- Ladder: 2022 - Category 1 & 2 eliminated; 2024 - API <1/1000 in every state, UT and district; **2027 - zero indigenous cases, zero deaths, whole country**; 2030 - prevent re-establishment, certification (3 years of zero indigenous cases).
- Key word "indigenous": imported cases may still occur.

Why the wrong options are wrong

- A: "<1 case per 1000" is the 2024 incidence milestone.
- B: still allows indigenous cases and deaths - an interim target.
- C: zero cases but still allows deaths - inconsistent with interrupted transmission.

Correct: D - no indigenous case and no deaths across the country.

How else can the examiner ask this?

1. "By which year does NFME aim to prevent re-establishment and keep India malaria-free?" - 2030.
2. "A state with API <1 but some districts ≥1 falls in which NFME category?" - Category 2 (pre-elimination).
3. "Certification of elimination needs how many consecutive years of zero indigenous cases?" - Three.

App drive

"Ten more questions on malaria are on HYT Revision. Free. By Dr Abhishek Gupta."

MCQ Video 2 - FMGE 2024 (Pathogenesis / cytoadherence, image)

Title: Malaria | FMGE 2024 PYQ | Dr Abhishek Gupta's HYT

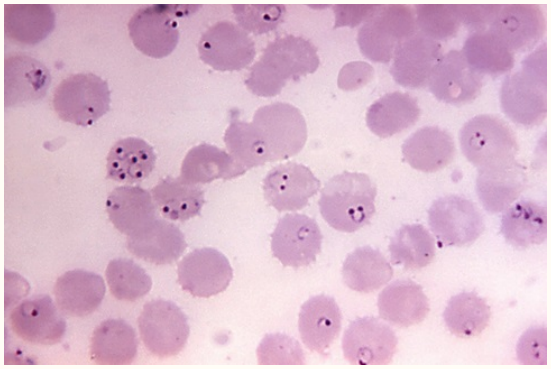
Hook

"This was asked in FMGE, 2024. Pause and try it."

Question slide

FMGE 2024

A 28-year-old woman with a recent travel history to Africa presents with fever, confusion and neurological deficits. Laboratory analysis reveals the following findings. This organism exhibits a specific property that facilitates sequestration in vascular beds to avoid splenic clearance. What is the phenomenon called?



A. Rosetting
B. Agglutination
C. Cytoadherence
D. Schizogony

Teaching notes

- Pf-infected RBC develops knobs carrying PfEMP1 (var genes; antigenic variation).
- PfEMP1 binds endothelium: CD36 (most organs), ICAM-1 (brain - cerebral malaria), CSA via VAR2CSA (placenta).
- Result = sequestration of late trophozoites and schizonts in deep capillaries; the parasite avoids the spleen; the smear shows only rings and crescentic gametocytes.
- Clinical meaning: cerebral malaria, placental malaria, AKI, lactic acidosis - all falciparum.

Why the wrong options are wrong

- A Rosetting: infected RBC binds *uninfected* RBCs, not the vessel wall.
- B Agglutination: infected RBCs clump with each other (via platelets).
- D Schizogony: asexual division of the parasite, not a mechanism of sequestration.

Correct: C - Cytoadherence.

How else can the examiner ask this?

1. "Why are schizonts not seen in a falciparum smear?" - adherence to capillary endothelium (AIIMS 2016, INI-CET 2024).
2. "PfEMP1 binds which receptor in the placenta?" - Chondroitin sulphate A.
3. "Only which species causes cerebral malaria?" - *P. falciparum*.

App drive

"The ten-question quiz on malaria is on HYT Revision. Free. By Dr Abhishek Gupta."

MCQ Video 3 - NEET PG 2024 (Treatment / national drug policy)

Title: Malaria | NEET PG 2024 PYQ | Dr Abhishek Gupta's HYT

Hook

"This was asked in NEET PG, 2024. Pause and try it."

Question slide

NEET PG 2024

An 18-year-old boy from Rajasthan weighing 50 kg is diagnosed with mixed Plasmodium vivax and Plasmodium falciparum malaria. What is the appropriate treatment regimen on Day 2?

A. Artesunate 50 mg (4 tablets) + Primaquine 2.5 mg (6 tablets)
B. Artesunate 50 mg (4 tablets) + Primaquine 7.5 mg (6 tablets)
C. Artesunate 50 mg (4 tablets) + Sulfadoxine/pyrimethamine (750/37.5 mg) (2 tablets) + Primaquine 2.5 mg (6 tablets)
D. Artesunate 50 mg (4 tablets) + Sulfadoxine/pyrimethamine (750/37.5 mg) (2 tablets) + Primaquine 7.5 mg (6 tablets)

Teaching notes

- Rule: mixed Pv + Pf = treat falciparum fully (ACT) + radical cure for vivax.
- ACT-SP: artesunate 4 mg/kg/day Days 1-3; SP 25/1.25 mg/kg **Day 1 only**. North-East: artemether-lumefantrine instead.
- Primaquine 0.25 mg/kg/day x 14 days (adult 15 mg/day = six 2.5 mg tablets); the separate 0.75 mg/kg single dose is not added.
- Adult age band (≥15 years): artesunate 4 × 50 mg daily.
- Check G6PD where possible; no primaquine in pregnancy or infants.

Why the wrong options are wrong

- B: primaquine 6 × 7.5 mg = 45 mg/day - three times the radical-cure dose.
- C and D: contain SP, which is given on Day 1 only.

Correct: A - artesunate 4 × 50 mg + primaquine 6 × 2.5 mg.

How else can the examiner ask this?

1. "Pf malaria from Assam - which ACT?" - Artemether-lumefantrine (FMGE 2021).
2. "Day-2 drug for uncomplicated Pf apart from artesunate?" - Primaquine 0.75 mg/kg single dose.
3. "Which drug is not used for uncomplicated Pf?" - Chloroquine (INI-CET 2024).

App drive

"The full malaria drug-policy cards are on HYT Revision. Free. By Dr Abhishek Gupta."

MCQ Video 4 - INI-CET 2024 (Diagnosis)

Title: Malaria | INI-CET 2024 PYQ | Dr Abhishek Gupta's HYT

Hook

"This was asked in INI-CET, 2024. Pause and try it."

Question slide

INI-CET 2024

What is the best investigation for malaria speciation identification?

A. Thick smear
B. Thin smear with acridine orange
C. Thin smear with Giemsa
D. Quantitative Buffy Coat (QBC)

Teaching notes

- Thick smear: RBCs lysed, parasites concentrated - detection and counting (20-40 times more sensitive).
- Thin smear: RBCs intact - RBC size, Schuffner/Maurer dots, parasite shape - **speciation**.
- Giemsa is the standard stain (JSB, Leishman, Field's also used).
- QBC (acridine orange): fast fluorescent detection, poor speciation. RDT: field test; HRP-2 = Pf only.

Why the wrong options are wrong

- A Thick smear: best to detect, poor to speciate.
- B Acridine orange: fluorescent stain - shows parasites, not species detail.
- D QBC: rapid screening, cannot reliably identify species.

Correct: C - thin smear with Giemsa.

How else can the examiner ask this?

1. "Malaria diagnosis in a field setting?" - RDT/HRP-2 (INI-CET 2024).
2. "Most sensitive microscopy method to detect low parasitaemia?" - Thick smear.
3. "Who examines the malaria slide under the programme?" - Laboratory technician (FMGE 2018).

App drive

"Ten more questions on malaria are on HYT Revision. Free. By Dr Abhishek Gupta."

6c. Reels (45-60 s, 9:16)

Reel 1 - Important Concept

Hook (0-2 s): *"Why does a falciparum smear never show schizonts?"*

Body: Beat 1 - Falciparum puts a sticky protein, PfEMP1, on knobs on the red cell. Beat 2 - These knobs grip the vessel wall: ICAM-1 in the brain, CSA in the placenta. That is cytoadherence. Beat 3 - So the mature parasites hide in deep capillaries and escape the spleen. The smear shows only rings and banana-shaped gametocytes - and the hidden parasites block the brain's vessels: cerebral malaria. Badge: FMGE 2024 · INI-CET 2024 · AIIMS PG 2016.

Close: *"If you remember one thing, remember this: falciparum sticks, hides and kills. Revise malaria free on HYT Revision, by Dr Abhishek Gupta."*

Reel 2 - Exam Analysis

Hook: *"Malaria appeared 53 times in 15 years."*

Body (exams and years on screen): FMGE 17, UPSC CMS 11, AIIMS PG 9, NEET PG 9, INI-CET 7 - every year from 2012 to 2026, 21 of them from 2021 onwards. Angles: the smear picture of falciparum - asked ten times. Severe malaria features - eight. Relapse versus recrudescence - six. National drug policy - six. IV artesunate - five. Infant parasite rate - five. The angle to watch: programme questions - the NFME 2027 target appeared in UPSC CMS 2025 and 2026, and mixed-infection dosing in NEET PG 2024.

Close: *"I didn't choose this topic. The examiners did. All 53 malaria PYQs are on HYT Revision. Free. By Dr Abhishek Gupta."*

Reel 3 - 5 Most Important Points

Hook: *"5 things examiners keep asking about malaria."*

1. Crescent gametocyte or many rings in a normal-sized RBC = falciparum.
2. Severe malaria = IV artesunate, 0, 12, 24 hours, then daily.
3. Only vivax and ovale relapse - hypnozoites - primaquine for 14 days.
4. Recent transmission = infant parasite rate.
5. Malaria causes hypoglycaemia, not hyperglycaemia.

Final screen holds all five. **Close:** *"Screenshot this - and revise malaria free on HYT Revision, by Dr Abhishek Gupta."*

Reel 4 - Mnemonic / memory hook

Hook: *"Relapse or recrudescence - everyone mixes them up. Two letters fix it."*

On screen: re**L**apse = **L**iver | **R**ecrudescence = **R**ed cells

Walk-through: Relapse has an L - it comes from the Liver, from hypnozoites, so only vivax and ovale relapse, and primaquine prevents it. Recrudescence starts with R - it comes from Red cells, from blood forms that survived treatment - classically falciparum with drug resistance. "Now look away and say it: reLapse - Liver. Recrudescence - Red cells." Badge: asked 6 times.

Close: *"The malaria memory cards are on HYT Revision. Free. By Dr Abhishek Gupta."*

Reel 5 - My POV prompt idea (Hinglish, face only)

Hook idea: *"Malaria ka ek topic 53 baar aaya hai - aur log abhi bhi poori Microbiology ek saath ratne baithte hain."*

Angle: One opinion - suffering through the whole textbook is not the same as preparing; the examiners themselves show where to start. Story of a student who finally read the PYQ list before the chapter. No slides, no badge. Ends with the standard end card and *"Malaria ke saare PYQs HYT Revision pe hain. Free. By Dr Abhishek Gupta."*

6d. HYT Quiz - Malaria (10 questions, one flow)

1. FMGE 2025 Fever and altered sensorium; smear shows multiple ring stages. Best treatment? A Primaquine B Artesunate C Chloroquine D All of the above. **Answer: B** - severe (cerebral) falciparum malaria is treated with IV artesunate.
2. INI-CET 2024 All are used in uncomplicated *P. falciparum* malaria except: A Artemether B Primaquine C Chloroquine D Sulphadoxine/pyrimethamine. **Answer: C** - falciparum is chloroquine-resistant; ACT + single-dose primaquine is used.
3. NEET PG 2023 Hepatosplenomegaly, pallor, RDT positive for HRP-2 antigen. Species? A Falciparum B Malariae C Ovale D Vivax. **Answer: A** - HRP-2 is made only by *P. falciparum*.
4. UPSC CMS 2023 Primaquine destroys hypnozoites of *P. vivax* in: A Liver B Peripheral blood C Brain D Bone marrow. **Answer: A** - hypnozoites are dormant forms in hepatocytes.
5. FMGE 2021 Most reliable indicator of recent malaria transmission? A Spleen rate B Infant parasite rate C Parasite density index D Slide positivity rate. **Answer: B** - an infant can only have

been infected recently and locally.

6. New PfEMP1 on falciparum-infected RBCs binds which receptor on brain endothelium in cerebral malaria? A CD36 B ICAM-1 C Chondroitin sulphate A D Duffy antigen. **Answer: B** - ICAM-1 in the brain; CSA is placental, Duffy is the vivax receptor on RBCs.
7. New A 60 kg man with *P. vivax* malaria (G6PD normal) gets chloroquine. Which primaquine regimen prevents relapse? A 0.75 mg/kg single dose B 0.25 mg/kg daily for 14 days C 0.25 mg/kg daily for 3 days D Not needed. **Answer: B** - radical cure under the national policy is 0.25 mg/kg x 14 days.
8. New Which RDT antigen can stay positive for weeks after successful treatment? A pLDH B Aldolase C HRP-2 D All clear within 48 h. **Answer: C** - HRP-2 persists 2-4 weeks, so it cannot monitor cure.
9. New A child with *P. malariae* infection develops oedema and heavy proteinuria. The renal lesion is: A Acute tubular necrosis B Blackwater fever C Nephrotic syndrome (immune complex) D Rapidly progressive GN. **Answer: C** - quartan malarial nephropathy; acute renal failure is a falciparum feature.
10. New The main purpose of a thick blood smear in malaria is: A Species identification B Detection of low parasitaemia C Seeing Schuffner's dots D Measuring RBC size. **Answer: B** - thick smear concentrates parasites; thin smear identifies species.

Result screen: score out of 10 + college points. Then links: the Malaria concept video, the four MCQ videos, and the malaria revision cards on HYT Revision.

Summary Note (one screen)

Angle	Remember
Smear	Crescent / multiple rings, normal RBC = Pf; band = Pm; enlarged + Schuffner = Pv
Mechanism	PfEMP1 cytoadherence (ICAM-1 brain, CSA placenta) - no schizonts in smear
Severe	Coma, hypoglycaemia <40, pH <7.25, creatinine >3, Hct <15 - IV artesunate 0, 12, 24 h then daily
Uncomplicated	Pf: ACT-SP (AL in North-East) + PQ Day 2; Pv: CQ + PQ 14 days
Recurrence	reLapse = Liver (Pv, Po); Recrudescence = Red cells (Pf)
Diagnosis	Thin Giemsa = species; thick = detection; field = RDT (HRP-2 = Pf)
Indices	Recent transmission = infant parasite rate
Programme	NFME: 2027 = zero indigenous cases + zero deaths; 2030 = stay malaria-free

Dr Abhishek Gupta's HYT

6e. MCQ Polls (from the 4 MCQ videos)

Poll 1 - UPSC CMS 2026

As per the National Framework for Malaria Elimination (2016-2030), what has to be achieved by 2027?
A. Whole country <1 case per 1000 at risk
B. Whole country <1 indigenous case per 1000 and <1 death per 10,000
C. Whole country no indigenous case and <1 death per 100,000
D. Whole country no indigenous case and no malaria deaths

Answer: D - 2027 is interruption of indigenous transmission nationwide: zero cases, zero deaths. Next: explanation video + "Ten more questions on malaria are on HYT Revision. Free."

Poll 2 - FMGE 2024

Falciparum-infected RBCs stick in vascular beds to avoid splenic clearance. This property is called?
A. Rosetting B. Agglutination C. Cytoadherence D. Schizogony

Answer: C - PfEMP1 knobs bind endothelium (ICAM-1, CD36, CSA). Next: explanation video + "Ten more questions on malaria are on HYT Revision. Free."

Poll 3 - NEET PG 2024

18-year-old, 50 kg, mixed *P. vivax* + *P. falciparum*. Day-2 regimen?
A. Artesunate 50 mg x 4 + Primaquine 2.5 mg x 6
B. Artesunate 50 mg x 4 + Primaquine 7.5 mg x 6
C. Artesunate 50 mg x 4 + SP x 2 + Primaquine 2.5 mg x 6
D. Artesunate 50 mg x 4 + SP x 2 + Primaquine 7.5 mg x 6

Answer: A - SP is Day 1 only; primaquine radical cure is 15 mg/day. Next: explanation video + "Ten more questions on malaria are on HYT Revision. Free."

Poll 4 - INI-CET 2024

Best investigation for identifying the malaria species?
A. Thick smear B. Thin smear with acridine orange C. Thin smear with Giemsa D. QBC

Answer: C - the thin smear keeps RBCs intact, so size, dots and parasite shape can be read. Next: explanation video + "Ten more questions on malaria are on HYT Revision. Free."