

2013

# Diseases [Malaria]

## Malaria Day 25th April.

MAY

June 2013 Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo

Thursday

20th Week • 136-229

16

Species of Malaria Parasites :-

1. Plasmodium falciparum [Most Dangerous]

2. " Vivax

3. " ovale

4. " Malariae

5. " knowlesi (knowlesi)

Liver Erythrocytic Cycle	
X	
✓	
✓	
X	
~	

### LIFE CYCLE

Sexual

Female Anopheline Mosquito

Asexual

Human

Liver

[Pre-erythrocytic/Exoerythrocytic Cycle]

Blood

[Erythrocytic Cycle]

Sporozoites

Liver Schizont

Blood Schizont (Feeding stage)

(Rest in liver cells) Hypnozoites

(Come out from liver cells) Merozoites

(Trophozoites)

Merozoites

RBC

(Schizogony process)

Gametocyte

Male Gamete

Female Gamete

Vector Mosquito

Important

Next day Program :

MAY

# Antimalarial Drugs

2013

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Friday

20th Week • 137-228

We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

May  
2013

## Classification

A. ✓ 4 - Aminoquinoline  $\Rightarrow$  1. Chloroquine / 2. Amodiaquine  
 \* (4-AC) Quinine

B. ✓ 8 - Aminoquinoline  $\Rightarrow$  1. Primaquine / 2. Bulaquine  
 3. Etaquine / 4. Tafenquine  
 Eight  $\rightarrow$  Plate  
 \* (Bull ko primarily <sup>Et</sup> Tuff Plate me khana do)

C. Quinolone-Methanol  $\Rightarrow$  Mefloquine

D. Phenanthrene-Methanol  $\Rightarrow$  Halofantrine  
 Hallo, \* (Fanta me machhar girgayahi phena ~~nehi~~ Khana  
 Through kanna hai)

E. Sulfonamides  $\Rightarrow$  1. Sulfadoxine / 2. Sulfamethopyrazine

F. Sulfones  $\Rightarrow$  Dapsone

G. Chinchona Alkaloids  $\Rightarrow$  Quinine

H. Sesquiterpene Lactone  $\Rightarrow$  1. Artesunate / 2. Artemether /  
 3. Arteether

\* Artemisinin Derivates  $\rightarrow$  Qinghaosu (Chinese)  
 B/S - Artemisia Annua Plant = Drug

Used  $\rightarrow$  Agent - P' falciparum

Important

Next day Program :

I. ✓ Diaminopyrimidines  $\Rightarrow$  Pyrimethamine

\* Domino ka pyra & metha khana me machhar



2013 ④ DEC → Di Ethyl Carbamazepine (Anti Filarial Drug)

MAY

June  
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Saturday

20th Week - 138-217

18

J. Acridine ⇒ 1. Mepacrine 2. Atabrine 3. Quinacrine

K. Bignanides ⇒ 1. Proguanil (Prodrug) → 2. Cycloguanil (Active)  
• Chloroquinamide

L. Tetracyclines ⇒ 1. Tetracycline 2. Doxycycline (daily dose)

M. Hydroxy naphthoquinone ⇒ Atovaquone

Sunday 19

Important

Next day Program :

MAY

## Malaria → MOA

2013

20

Monday

21st Week • 140-225

We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

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1. Proguanil } Inhibition of } 1. Protozoa ✓  
 Pyrimethamine } DHFRase } 2. Human → X side effect.  
 ↳ ⊗ Folic Acid } cause Megaloblastic Anaemia

2. Atovaquone } Protozoa ✓ - inhibition of  $e^-$  transport system  
 (ATP) } production ↓ of (ATP)

3. Quinghaosu } Protozoa ✓ - Damage cell membrane by  
 ⊗ Glis Glis ke cell } c-centred free radicals.  
 membrane damage  
 kar raha hai

4. Chloroquine } Protozoa ✓ - ↑ vesicular pH ⇒ interfere with degradation  
 Hb by lysosome.  
 Heme } Chloroquine-heme complex → Hemazoin  
 (toxic if accumulated) } (Non-toxic)  
 ↑  
 Chloroquine

5. Mefloquine } Protozoa ✓ - Inhibit heme polymerase

6. Primaquine } Destroy Protozoa ✓ - destroy Hypozoites in  
 Liver cells.

7. ⊗ (2p) 1. Proguanil } Protozoa ✓ - destroy Gametocytes  
 2. Primaquine } & prevents transmission.  
 3. Pyrimethamine }

8. Pyonaridine → Against - P. Falciparum, vivax

Important

Next day Program :

9. Lumefantrine → Against - P. Falciparum ,



2013

Side Effects & Drug of Choice MAYJune  
2013

Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo

Tuesday  
21st Week • 141-224

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1. Pyrimethamine — Megaloblastic Anaemia
2. Primaquine — Methemoglobinemia (Oxidized form of haemoglobin)  
Elevated condition of methemoglobin
3. Quinine — ① ↑ Insulin → Hypoglycemia  
② Haemolysis → Haemoglobinuria  
i.e. Black water Fever  
③ Kidney damage  
④ Cinchonism — i) Hearing loss ii) Tinnitus iii) Dizziness  
iv) Flushing v) Blurry vision  
vi) Nausea
4. Chloroquine — ① Ocular toxicity  
② Loss of hearing
5. Mepacrine — Discoloration of skin & eye.

Drug of choice [DOC] :-

Radical Cure → Primaquine

Clinical Cure → Chloroquine

Cerebral Malaria → Quinine

\* Uses of Quinine (Other) :-

- 1) Nocturnal muscle cramps
- 2) Myotonic congenita
- 3) Spermicidal (vaginal creams)
- 4) Varicose veins

Important

Next day Program :

MAY

Miscellaneous Informations

2013

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Wednesday

21st Week - 142-223

We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr
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May  
2013# Malaria in Pregnancy  $\Rightarrow$  Chloroquine# Quinine  $\Rightarrow$  Levo rotatory  $\Rightarrow$  AntimalarialQuinidine  $\Rightarrow$  dextro rotatory  $\Rightarrow$  Antiarrhythmic# General Protoplasmic poison  $\Rightarrow$  Quinine## Chloroquinide is  $\rightarrow$  Proguanil# Primaquine is contraindicated #

a) Pregnancy b) Infant- c) G-6-PD deficiency

# Congener of Primaquine = Bulaquine

# Artemether Soluble in = Oil

# Artesunate Soluble in = Water

# Quinolone-methanol = Quinine, Mefloquine

# # Naphthoquinone = Atoquinone Contraindicated in —  
a) Pregnancy b) breast feeding woman# # Doxycycline 100mg daily in Chemoprophylaxis in epidemic Area is  $\rightarrow$ Journey  $< 6$  weeks  $\Rightarrow$  2 days  $\leftarrow$  Journey  $\rightarrow 4$  days.

Important

Next day Program:

Journey  $> 6$  weeks  $\Rightarrow$  1-2 week  $\leftarrow$  Journey  $\rightarrow 4$  weeks.



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Friday

21st Week • 144-221

We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr

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May  
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Causative Organism → Micobacterium tuberculosis

- a) is a Acid Fast Bacteria (AFB)
- b) Staining done with Ziehl Nelson Stain (ZN stain)
- c) Identification Test depends on presence of Mycolic Acid

### Anti TB drugs

1<sup>st</sup> Line drugs (↑ Efficacy ↓ Side effect/Toxicity)

 I —	Isoniazid (INH) (H)
P —	Pyrazinamide (Z)
E —	Ethambutol (E)
R —	Rifampin / Rifampicin (R)
S —	Streptomycin (S)

2<sup>nd</sup> Line drugs (↓ Efficacy ↑ Side effect/Toxicity)

- Thiacetazone
- Para amino Salicylic acid [PAS]
- Ethionamide
- Cycloserine
- Kanamycin
- Amikacin
- Capreomycin

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Saturday  
21st Week • 145-220

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Newer drugs

- Ciprofloxacin
- Ofloxacin
- Clarithromycin
- Azithromycin
- Rifabutin

MOA & Side Effects

<u>1st Line</u>	<u>MOA</u>	<u>S/E</u>
* Isoniazid	Inhibit Synthesis of mycolic Acid	i) Peripheral Neuritis ii) Hepatitis
* Pyrazinamide	— " —	i) Hyperuracemia (Gout) ii) Hepatotoxicity
* Ethambutol	— " — (by Arabinosyl Transferase inhibition)	i) Optic neuritis (vision) ii) Red & Green Urine iii) Hyperuracemia (Gout)
* Rifampin/Rifampicin	Inhibit DNA-dependent RNA-Synthesis	i) Respiratory ii) Cutaneous iii) Flu like iv) Hepatitis
* Streptomycin (Low use)	Inhibit protein Synthesis 30s Units of Ribosome	i) Ototoxicity ii) Nephrotoxicity

Important

Next day Program:

Sunday 26



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Monday

22nd Week • 147-218

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- # Isoniazid (INH)(H) + Vit B<sub>6</sub> (Pyridoxine) ✓
- # Tuberculosis Meningitis ⇒ Pyrazinamide (crosses BBB) ←
- # 1<sup>st</sup> line therapy for Brucellosis ⇒ Doxycycline + Rifampin

# DOTS → Directly Observed Treatment — short term — course.

↓

① IP = Intensive Phase HRZE 2 Mon/hs.  
(Firstline Drug Combi) 4 FDC

② CP = Continue Phase HRE 4 Mon/hs.  
3 FDC

Total — 6 Months.

③ Age Group ⇒ 25-39 40-54 55-69 70+

Tab/day ⇒ (2) (3) (4) (5)

# MDR ⇒ Multi drug Resistance (R, H) :- Kanamycin  
XDR ⇒ Extended Drug Resistance :- Kapreomycin  
(R/H, Fluoroquinolones & 2<sup>nd</sup> line injectables)

# Diagnostic Test :- i) Tuberculin Test ii) Mantoux Test  
iii) Haef Test iv) X-ray Test  
v) Sputum Test

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 Tuesday  
 22nd Week • 148-217

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# RNTCP = Revised National Tuberculosis Control Programme

# MAC = Mycobacterium avium complex - Infection particularly in AIDS-patients. (co-infection - TB + HIV)

↓  
Drug Regimen -

Rx Azithromycin/Clarithromycin + Ethambutol  
⊕ Rifabutin

↓  
Prophylaxis -

Rx Clarithromycin/Azithromycin

# Software ("NIKSHAY") - Online portal - 7<sup>th</sup> May, 2012  
NI-BT

# Gold Standard Test for AFB (Acid Fast Bacteria) (Mycobacterium Tuberculi)

↳ Solid Culture = LJ-Medium  
(Lowenstein Jensen medium - 6-8 weeks)

# CBNAAT (Cartridge based nucleic Acid Amplification Test)

↳ Rifampicin Resistance Testing

Important

Next day Program :