



# HEPATITIS

(GIT block , Microbiology: 2019)

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# OBJECTIVES;

- viruses causing enterically transmitted hepatitis

HAV.

HEV.

- viruses that are causing hepatitis during their course of infection ;  
e.g Cytomegalovirus (CMV)  
Epstein-Barr virus (EBV)  
Arbovirus (yellow fever virus )

- structure
- Epidemiology
- clinical presentations
- Lab diagnosis
- Treatment
- prevention

# *HEPATITIS*

## Viral hepatitis

- As part of generalized infection  
(CMV, EBV, Yellow fever virus)
- Infect primarily the liver
  - Faecal-borne hepatitis (A & E)
  - Blood-borne hepatitis (B , C & D)

# ***FECAL-BORNE HEPATITIS***

 **HAV**

 *Picornaviridae*

 **HEV**

 *Hepeviridae*

 *Nonenveloped*

 *Icosahedral*

 *ss, + sense RNA*

 *One serotype*



# *HEPATITIS A VIRUS*

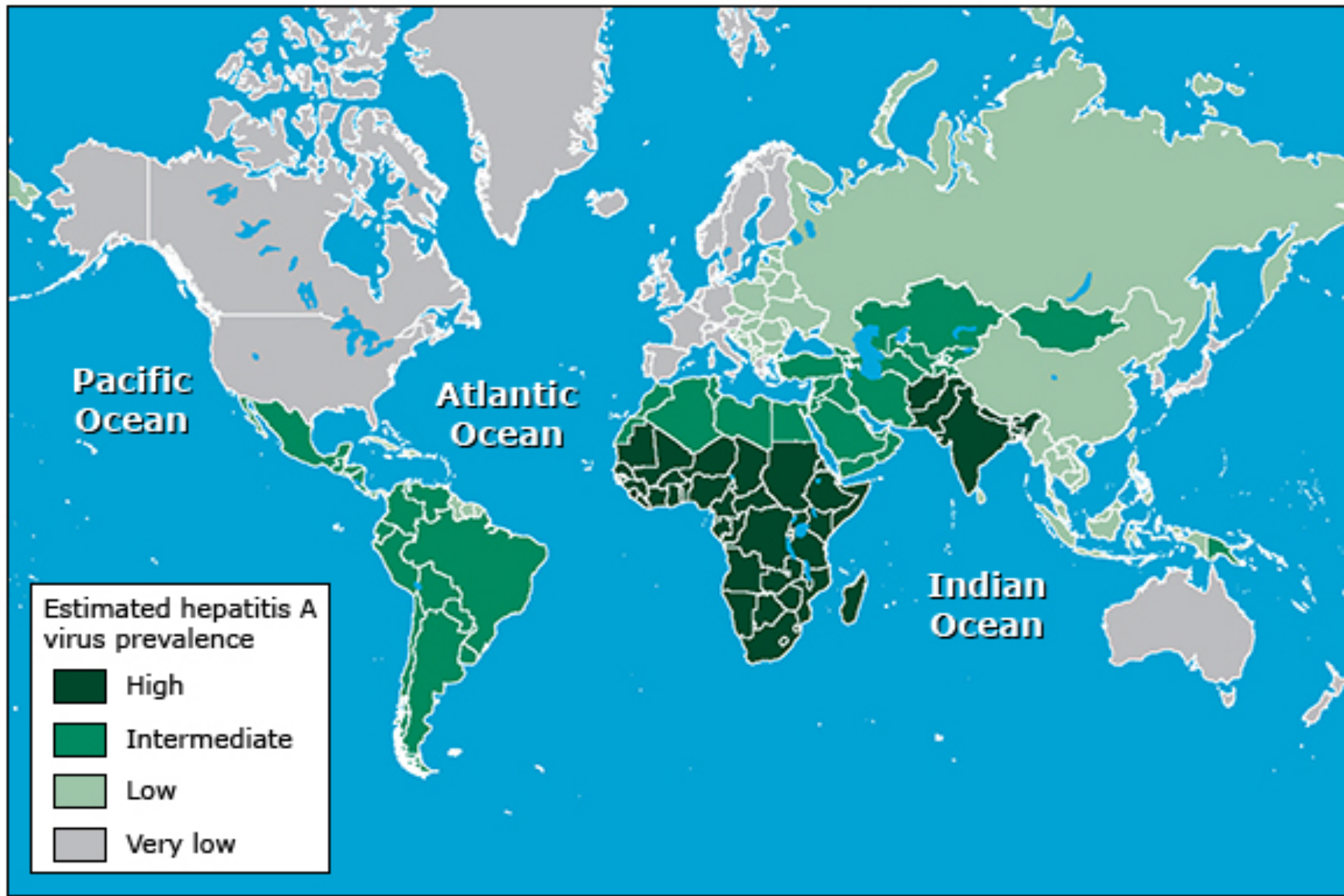
## Hepatitis A

Short incubation hepatitis

Infectious hepatitis

Epidemic hepatitis





# *Epidemiology*



## Distribution:

-  a worldwide, endemic in tropical countries

## Transmission:

-  **Faecal-oral route** [major route]

Contaminated food & water

-  Sexual contact (homosexual men)

-  Blood transfusion (v.rarely)

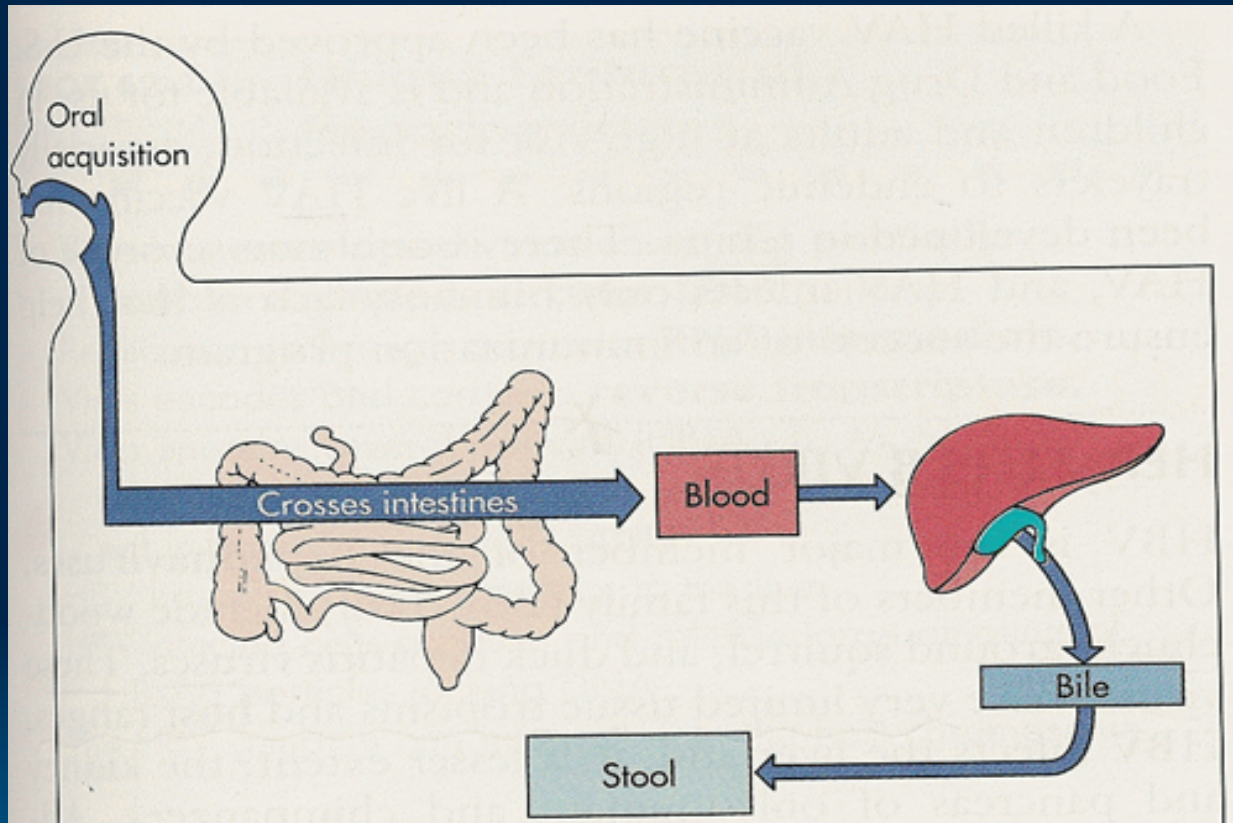
## Age:

-  In developing countries; children\*

-  In developed countries ; young adults

# Pathogenesis

HAV



- CMI → Damage of virus-infected hepatocyte
- → ↑ ALT ,AST & Bilirubin








# **Manifestations**



## Hepatitis





-  IP=2-6 Ws
-  Pre-icteric phase: fever, fatigue, N, V, & RUQP
-  Icteric phase: dark urine, pale stool, jaundice



-  Asymptomatic & anicteric inf  $\longrightarrow$  common
-  Symptomatic illness  $\longrightarrow$   age

# *Prognosis*



-  Self-limited disease
-  Fulminant hepatitis → rare
-  Mortality rate ~ 0.1 - 0.3%
-  No chronicity or malignancy changes

# *Lab. Diagnosis*



## Serology:

 Anti-HAV IgM  Current inf

 Anti-HAV IgG  previous inf

 immunity






# *Management*



## Treatment:

-  Supportive therapy

## Prevention:

-  Sanitation & hygiene measures
-  Hlg
-  Vaccine

# *Prevention*



## **HIg:**

- Given before or within 2 Ws of exposure
- Indication : travelers  
unvaccinated , exposed p

# Prevention

HAV

## Vaccine:

- inactivated
- Given IM at [0,6-12 M]
- >1 Y of age
- S/E : mild local reaction

➤ Indication : P at high risk of inf (travelers)

P at high risk of severe dis

- A combination vaccine (HAV & HBV)



# *HEPATITIS E VIRUS*

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## Hepeviridae

## Epidemiology:

 outbreak of waterborne & sporadic cases of VH

 **Age**; young adults

 **4 routes of transmission;**

 Waterborne\*

 Zoonotic foodborne

 Bloodborne

 Perinatal

# **HEPATITIS E VIRUS**

## **Clinical features:**

 ~ HAV infection & exceptions:

 Longer IP =4-8 Ws

 Chronic hepatitis and cirrhosis  
(not HCC)

 Fulminant disease



 Mortality rate ~10 times > HAV

~ (1-3%)

~ 20% in pregnancy

# **HEPATITIS E VIRUS**

## **Lab diagnosis:**

 ELISA  Anti-HE IgM

## **Treatment:**

 Not specific

## **Prevention:**

 Sanitation & hygiene measures

 No Ig

 No vaccine

# FECAL-BORNE HEPATITIS

## VIRAL HEPATITIS: A GLOBAL VIEW

### SIX WAYS TO HELP PREVENT HEPATITIS A & E

1

Talk to your doctor about the hepatitis A vaccine



2

Cook food well & eat it while it's hot



3

Avoid raw shellfish and raw meat



4

Always wash hands with soap & water after using the toilet, changing a diaper, and before preparing & eating food



5

Peel fruit & vegetables and wash salads in clean water



6

Only drink safe water



Source: Based on information from the World Health Organization  
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# Herpesviridae

- |                                 |       |
|---------------------------------|-------|
| 1- Herpes simplex virus type -1 | HSV-1 |
| 2- Herpes simplex virus type -2 | HSV-2 |
| 3- Varicella –Zoster virus      | VZV   |
| 4- Epstein- Barr virus          | EBV   |
| 5- Cytomegalovirus              | CMV   |
| 6- Human herpes virus type-6    | HHV-6 |
| 7- Human herpes virus type-7    | HHV-7 |
| 8- Human herpes virus type-8    | HHV-8 |



dsDNA , Icosahedral & Enveloped Virus



# Epstein – Barr Virus EBV

- It is lymphotropic .
- It has oncogenic properties ;

Burkitt's lymphoma  
Nasopharyngeal carcinoma

## Epidemiology

- Distribution :worldwide
- Transmission:
  - Saliva [kissing disease]
- Age:

Socio-economic status: SE

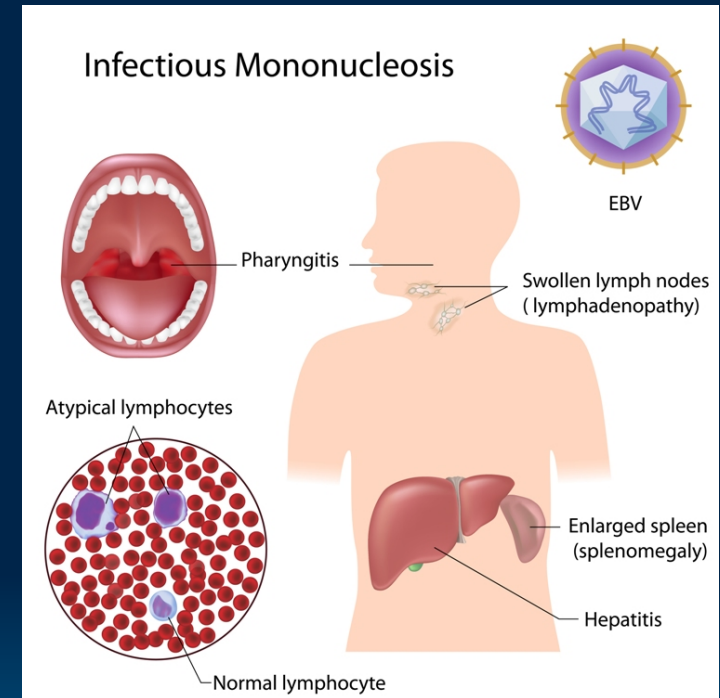
- Low SE class → early childhood
- High SE class → adolescence

# Clinical Features:

EBV

## 1-Immunocompetent host

- ❖ Asymptomatic
- ❖ Infectious mononucleosis [glandular fever]
  - Mainly in teenagers & young adults
  - IP = 4-7 weeks
  - Complications (acute air way obstruction, splenic rupture, CNS inf)



- ❖ Chronic EBV infection

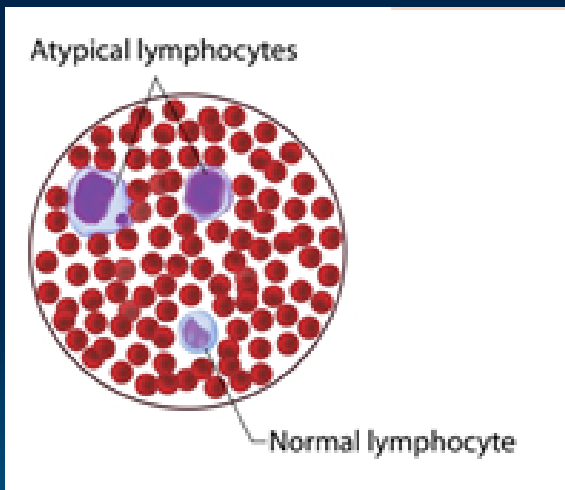
## 2- Immunocompromised host

- Lymphoproliferative disease (LD)

# Dx:

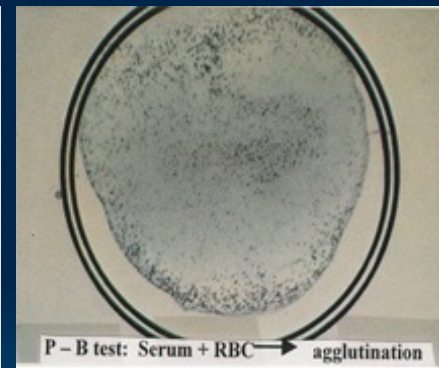
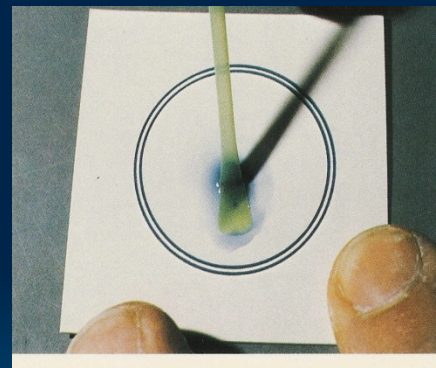
## Hematology:

- **↑ WBC**  
lymphocytosis  
( Atypical lymphocytes )



## Serology:

- **Non-specific AB test ;**
  - Heterophile Abs +ve
  - Paul-Bunnell or mono-spot test



- **EBV-specific AB test:**  
IgM Abs to EBV capsid antigen

# Management:

- Treatment:
  - Antiviral drug is not effective in IMN
- Prevention:
  - No vaccine

# Cytomegalovirus CMV

- Special features ;
  - Infected cell enlarged with multinucleated .  
[cyto=cell, megal=big]
  - Resistant to acyclovir .
  - Latent in monocyte , lymphocyte & other .
- Distribution: worldwide .
- Transmission ;
  - Early in life:
    - Transplacental
    - Birth canal
    - Breast milk
  - Young children: saliva
  - Later in life: sexual contact
  - Blood transfusion & organ transplant .

## Acquired Infections;

- Immunocompetent host
  - Asymptomatic
  - Self-limited illness
    - Hepatitis
    - Infectious mononucleosis like syndrome  
[Heterophile AB is -ve]
  
- Immunocompromised host
  - Encephalitis , Retinitis , Pneumonia ,
  - Hepatitis\* , Esophagitis, Colitis

## Congenital Infections:

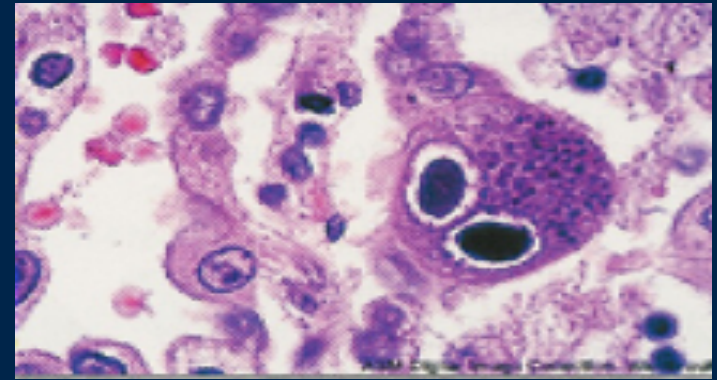
# Lab. Dx

CMV

## ✦ Histology:

Intranuclear inclusion bodies

[Owl's -eye]



## ✦ Culture:

➤ In human fibroblast

1-4 wks → CPE

➤ Shell Vial Assay → 1-3 days

## ✦ Serology:

➤ AB → IgM : current inf

→ IgG : previous exposure

➤ Ag → CMV pp65 Ag by IFA

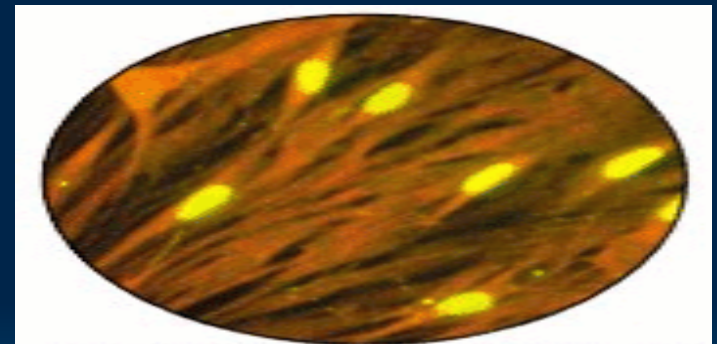


Fig. 2. CMV centrifugation culture fixed and stained 16 hrs after inoculation showing viral proteins in nuclei of infected human fibroblast cells

## ✦ PCR

## Rx.

### ■ *Ganciclovir*

is effective in the Rx of severe CMV inf.

### ■ *Foscarnet*: the 2nd drug of choice .

## Prevention:

- Screening ;
  - Organ donors
  - Organ recipients
  - Blood donors
- Leukocyte-depleted blood .
- Prophylaxis: Ganciclovir , CMVIG .
- No vaccine .



# Arthropod-borne Viruses (Arboviruses)

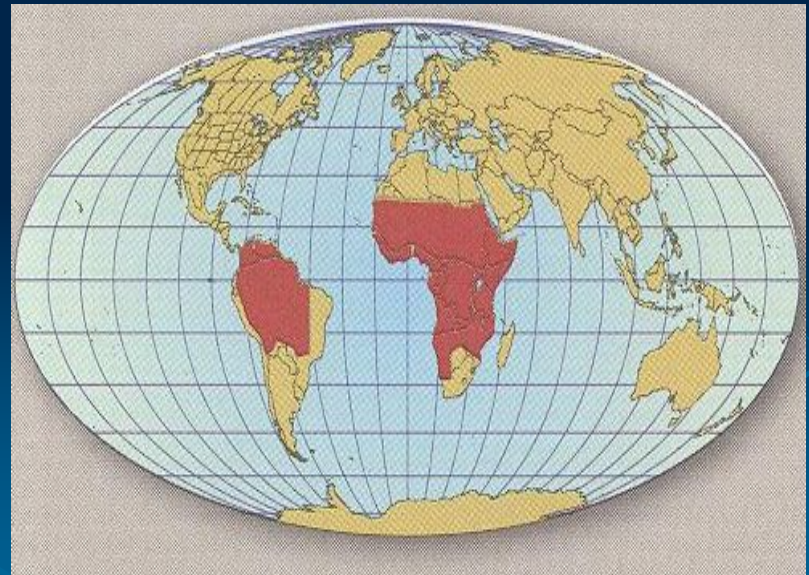
## Yellow Fever virus

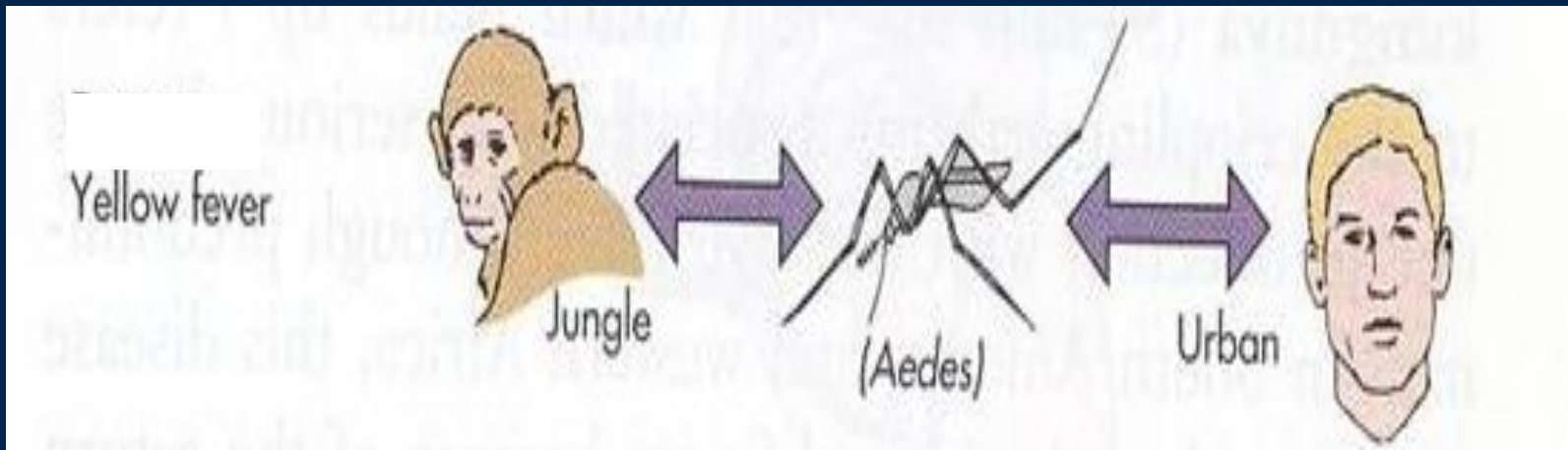
- Flaviviridae
- Asymptomatic to Fever ± Jaundice ± hemorrhage ± renal failure

### ➤ Epidemiology

Tropical Africa  
& South America

1. Jungle Yellow Fever
2. Urban Yellow Fever





## Jungle Yellow Fever:

- Vector: mosquito
- Reservoir: **Monkey**
- Accidental host: **human**
- It is a disease of **Monkeys**

## Urban Yellow Fever:

- Vector: mosquito
- Reservoir: **human**
- It is a disease of **humans**

# Dx.

## ➤ Lab. Methods :

A- Isolation

B - IgM -AB\* - ELISA, IF: (most used)

C – YFV- RNA by RT-PCR

# Prevention

## *1-Vector Control:*

- Elimination of vector breeding sites
- Using insecticides
- Avoidance contact with vectors  
( repellants , net )

## *2-Vaccine:*

Yellow Fever vaccine (LAV, one dose /10 yrs)





## ليكن حجابك ✓

أختي المسلمة ... إذا كانت هذه الشُّروط  
تتوافر في ملابسك ...

- أن يكون ساتراً للبدن
- ألا يصف ولا يشف الجسم
- ألا يكون زينة في نفسه
- ألا يكون معطراً
- أن يكون فضفاضاً واسعاً غير ضيق
- ألا يشبه ملابس الرجال
- ألا يقصد به شهرة بين الناس

فاعلمي أن ...

حجابك ✓

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*Thank you*

