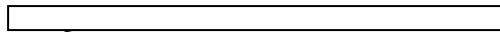


# HEPATITIS VIRUSES



## What is Viral Hepatitis ?

- Viral hepatitis is a systemic disease with primary inflammation of the liver by any one of a heterogenous group of hepatotropic viruses



# symptoms of Hepatitis

- ⑩ flu-like symptoms:
- ⑩ muscle and joint aches,
- ⑩ fever,
- ⑩ feeling sick or vomiting,
- ⑩ diarrhea
- ⑩ Headache
- ⑩ loss of appetite
- ⑩ dark urine
- ⑩ yellowing of the eyes and skin i.e. jaundice .

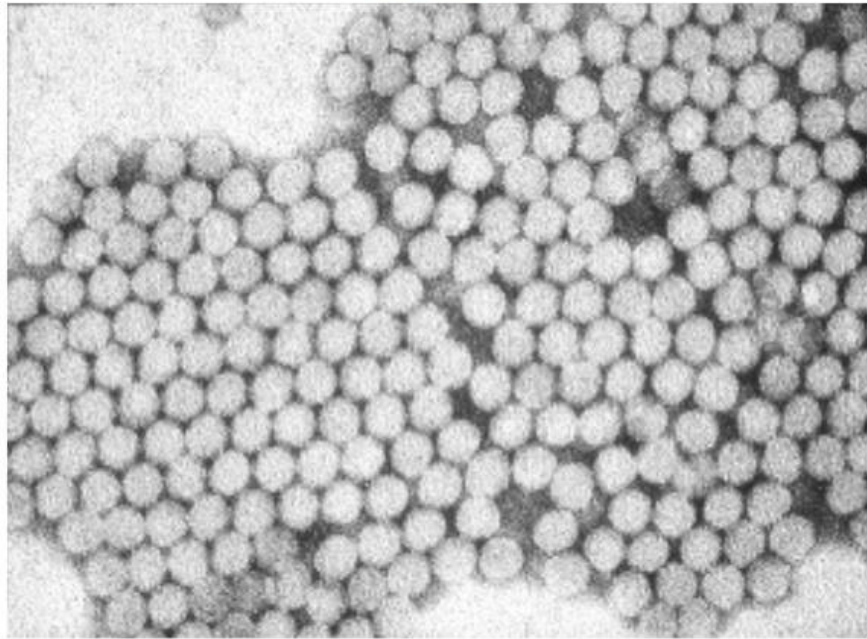


## Type of Hepatitis

	A	B	C	D	E
Source of virus	Feces	Blood Blood derived Body fluids	Blood Blood derived Body fluids	Blood Blood derived Body fluids	Feces
Route of Transmission	Feco-oral	Percutaneous Permucosal	Percutaneous Permucosal	Percutaneous Permucosal	Feco-oral
Chronic Infection	No	Yes	Yes	Yes	No
Prevention	Pre Post Exposure Immunization	Pre Post Exposure Immunization Blood donor screening	Blood donor screening	Pre Post Exposure Immunization	Ensure Safe Drinking water

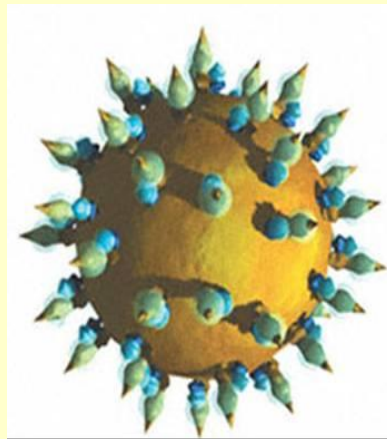


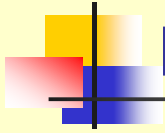
HAV



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## Hepatitis A Virus





# Hepatitis A

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- is caused by a picornavirus.
- non-enveloped
- ssRNA virus with
- a single **serotype** (one surface antigens)



## RESISTANCE ( HAV)

- Resistant to inactivation by heat at 60° C for one hour, ether & acid at pH 3.
- Inactivated by boiling for one minute, 1: 4,000 formaldehyde at 37° C for 72 hours & chlorine 1 ppm for 30 minutes.
- Not affected by anionic detergents.
- Survives prolonged storage at 4° C or below.



# Hepatitis A Virus Transmission

- Close personal contact  
(e.g., household contact, sex contact, child day care centers)
- Contaminated food, water  
(e.g., infected food handlers, raw shellfish)
- Blood exposure (rare)  
(e.g., injecting drug use, transfusion)



## LAB.DIAGNOSIS

1. Demonstration of Virus in feces:  
By: Immunoelectron microscopy
4. Virus Isolation:
5. Detection of Antibody :By ELISA
4. Biochemical tests:
  - i) Alanine aminotransferase (ALT)
  - ii) Bilirubin
  - iii) Protein
5. Molecular Diagnosis : RT PCR of feces



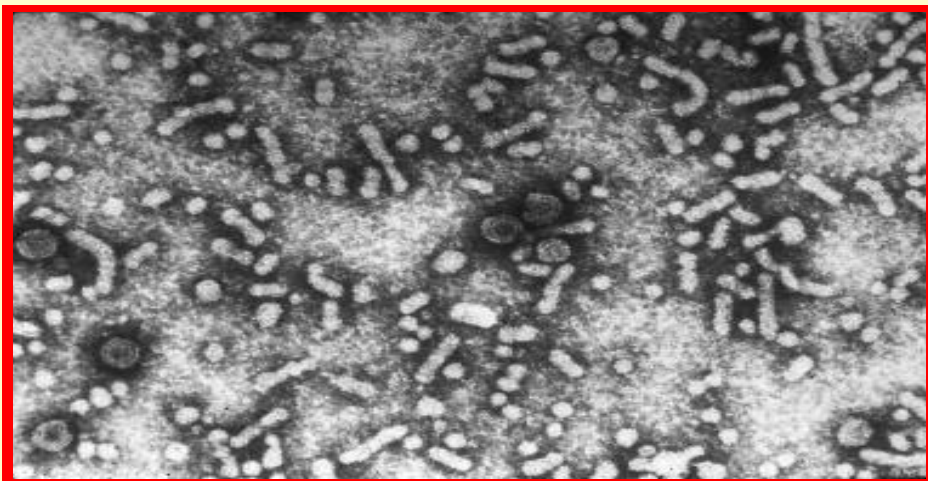


# Hepatitis B

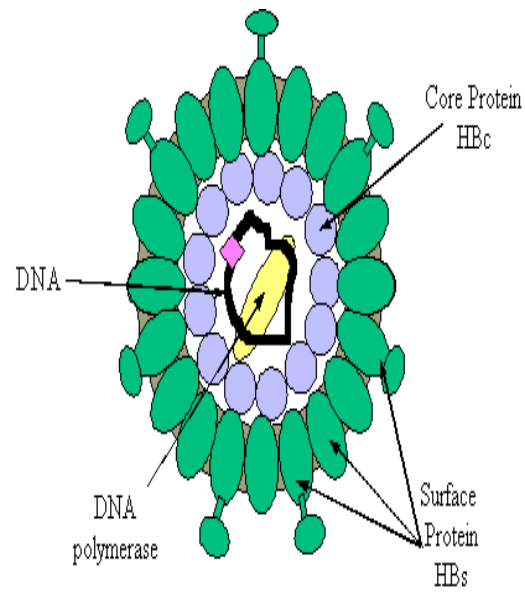
- a member of the Hepadnavirus family
- Symptoms of the acute illness: liver inflammation, vomiting, jaundice, and rarely, death.
- **Chronic hepatitis B** may cause liver cirrhosis which may then lead to liver cancer, a fatal disease with very poor response to current chemotherapy.
- Hepatitis B has an incubation period of about two months and will often last for as long as six months before symptoms diminish.



## Hepatitis B Virus



# HBV - structure



- enveloped
- an icosahedral nucleocapsid,
- The outer envelope contains embedded proteins which are involved in viral binding of, and release into, susceptible cells.
- Virion shape is generally spherical with a diameter of 40 - 48 nanometers (nm) but other forms exist (These are not infectious).
- The DNA genome is not segmented
- partially double-stranded, forms an open circle.
- The virus can be divided into four major serotypes based on antigens present on its envelope



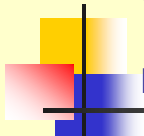
# Concentration of Hepatitis B Virus in Various Body Fluids

High	Moderate	Low/Not Detectable
blood	semen 精液	urine
serum	vaginal fluid 阴道分泌液	feces
wound exudates 伤口渗液	saliva 唾液	sweat
		tears
		Breast milk



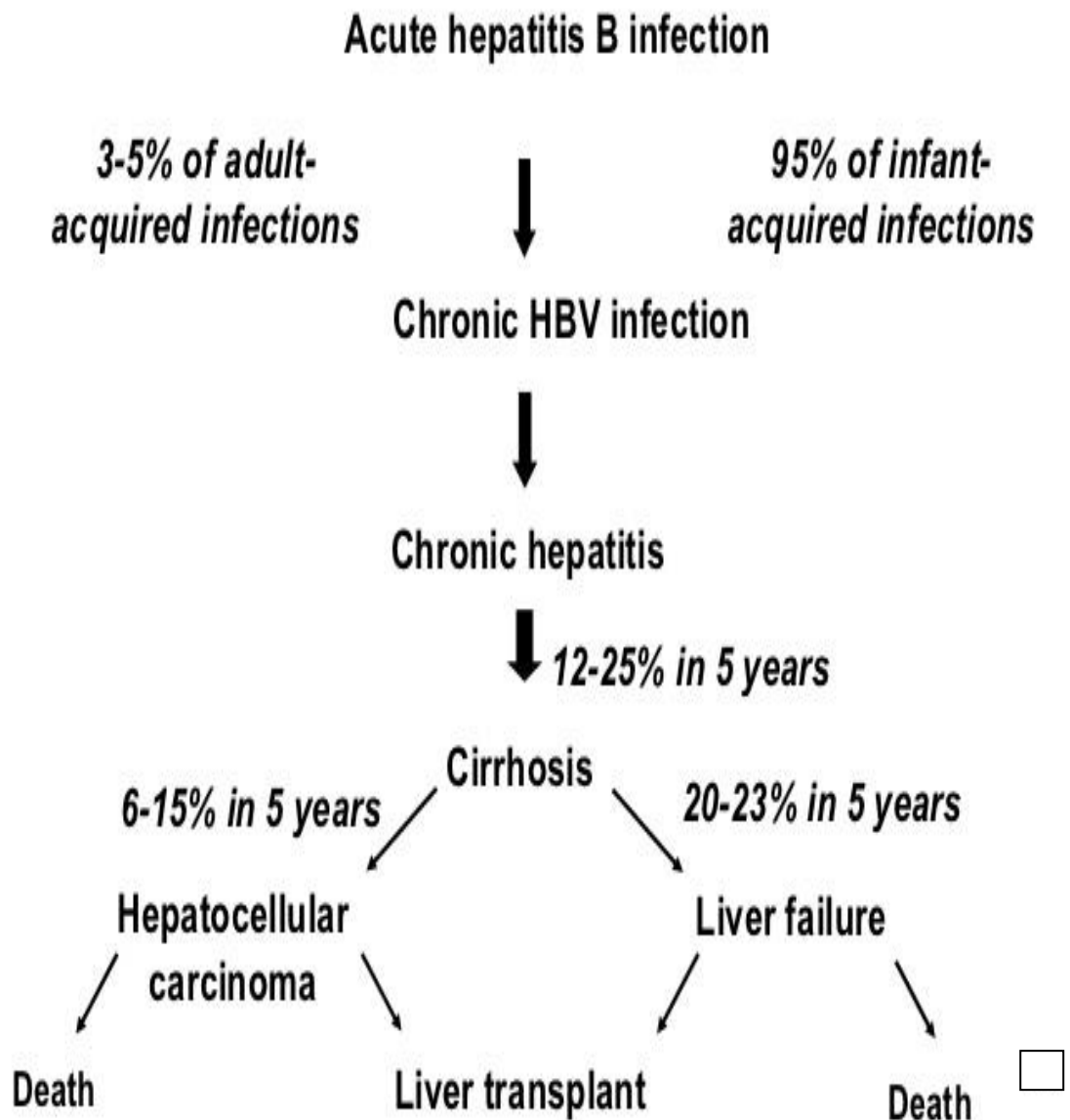
## Hepatitis B Infection Rapid Test (HbsAg) and Hepatitis B Vaccine Rapid Test (HBsAb)

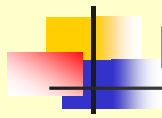
Product Origin:P.R.China





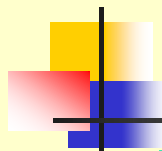
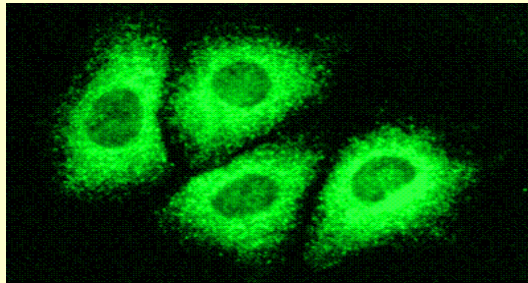
# Possible Outcomes of HBV Infection





## Hepatitis C

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## Transmission of Hepatitis C - *"oldies"*

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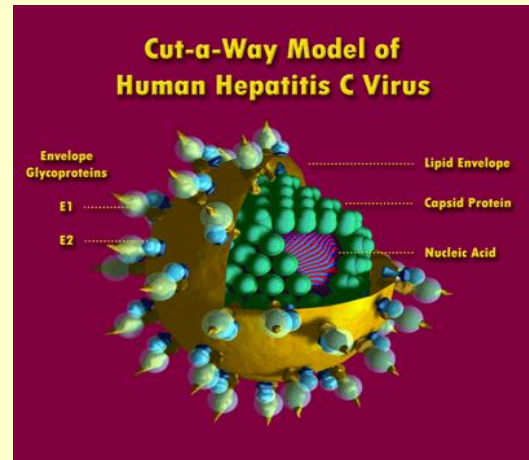
- The infection can cause liver inflammation that is often asymptomatic
- chronic hepatitis can result later in cirrhosis and liver cancer.
- Hepatitis C also spreads via body fluids. The most common routes of infection are **sexual contact and using contaminated needles for intravenous drug abuse**.
- Effective blood-screening procedures have greatly reduced the chances of hepatitis C infection from blood transfusions.
- Unlike hepatitis A and B, there is no vaccine to prevent hepatitis C infection.



# The *Hepatitis C virus* (HCV)

- small (50 nm in size)
- enveloped,
- single-stranded, positive sense RNA
- family *Flaviviridae*

•  
•



## Hepatitis C - Clinical Features

Incubation period:

Average 6-7 wks

Range 2-26 wks

Clinical illness (jaundice):

30-40% (20-30%)

Chronic hepatitis:

70%

Persistent infection:

85-100%

Immunity:

No protective  
antibody  
response identified





## Prevention of Hepatitis C

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- Screening of blood, organ, tissue donors
- High-risk behavior modification
- Blood and body fluid precautions

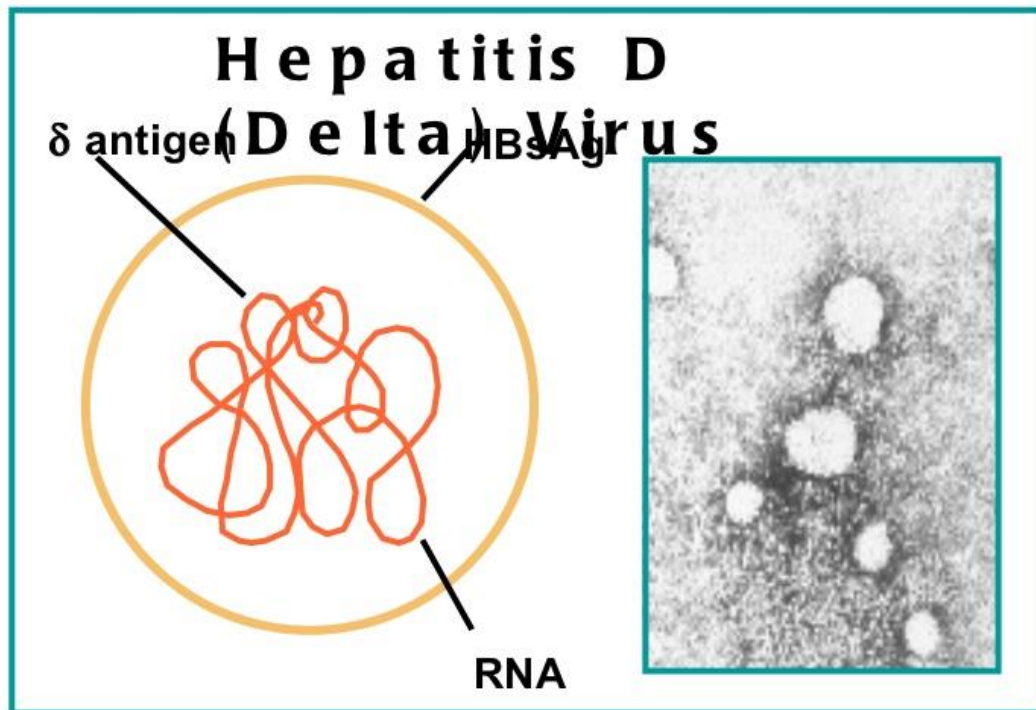


## Hepatitis D Virus - Transmission

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- Percutaneous exposures
  - injecting drug use
- Permucosal exposures
  - sex contact





## Hepatitis E Virus











