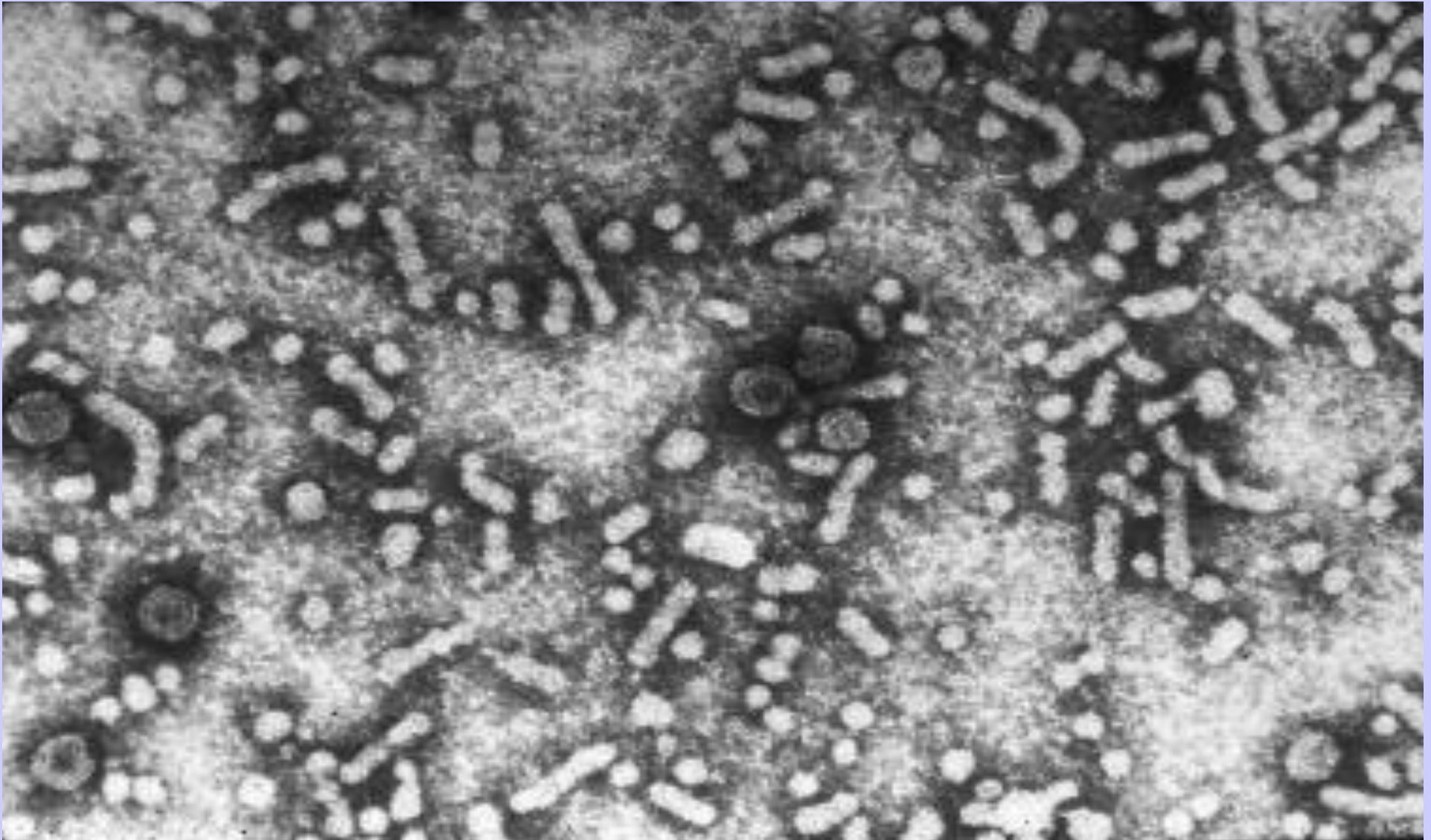


# VIRAL HEPATITIS B

The hepatitis\_B virus is a DNA virus belonging to the Hepadnaviridae family of viruses.



# VIRAL HEPATITIS TYPE B

Hepatitis B virus, HBV, Hepadnavirus, the so-called Dane particle with a core (formed by DNA, DNA polymerase, and a nucleocapsid protein with the hepatitis B core antigen (HBcAg) and a coat of hepatitis B surface antigen (HBsAg) ). The whole virus is infectious with a diameter of 42 nm.

## Etiology:

### The source of infection

**Two months in the end of incubation period, the sick or carriers.**

**Parenteral transmission** - blood, blood products and inoculation of the infectious material are of principal significance in the transmission.

Professional risk to medical personnel (injury by needle - transmission in 7 - 30 %, contaminated instruments, blood transfusions - transmission in 90 %).

i.v. drug addicts - injury during tattooing, possibly other minute injuries of the skin and mucosa.

By **sexual intercourse** in homosexuals, bisexuals, and prostitutes.

**Vertical - perinatal transmission** from mother to child when the mother is the virus carrier or the sick person. About 95 % of newborns infect intranatally and 5 % intrauterinely.

### Route of transmission

### Susceptibility

General

### Preventive measures:



# VIRAL HEPATITIS TYPE B

## Preventive measures:

Health education - **to emphasize the extent of risk**

**Observance of epidemic measures in medical establishments.**

Handling biological material and contaminated instruments, consistent disinfection and sterilization, application of single-use needles and syringes, use of closed hemodialysis systems, smoking and drinking in workplaces with biological material is forbidden.

**Postexposure prophylaxis** - passive and active immunization (newborns)

**Examination of blood-donors** - exclusion of HBsAg carriers from blood donation

Designation and inspection of sanitary-epidemic measures in non-medical establishments (hair-dressing salons, barber shops, etc.)

**Active immunization** in persons with a high risk of infection (stated by public notice)

The disease occurs worldwide with a very high burden among an estimated 280 million carriers. The symptoms can vary greatly and many of those infected with HBV never develop any symptoms at all.

Those who do get symptoms (30-50% of cases) usually suffer from tiredness, loss of appetite, abdominal discomfort, nausea, vomiting and fever. The vast majority of healthy adults who get acute hepatitis B will recover with no liver damage in 4–12 weeks but the death rate can reach 2% in the elderly. Chronic infection is most likely to develop in young babies.

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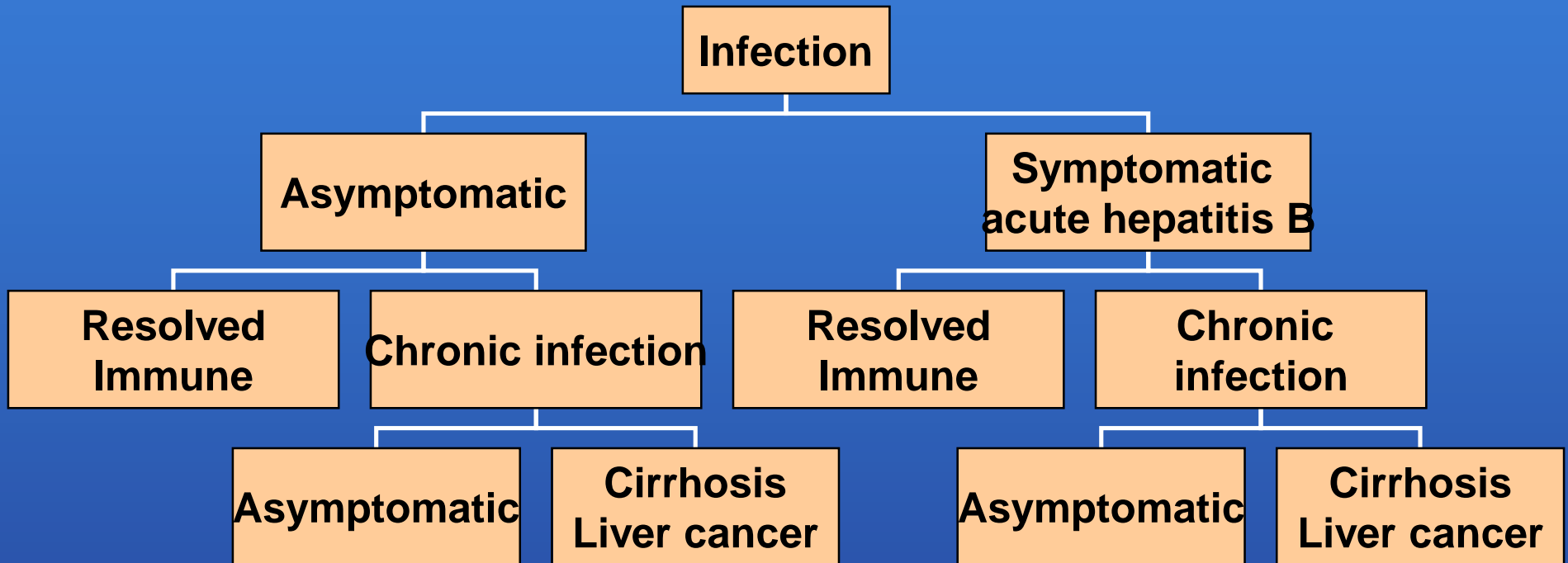
# Hepatitis B – Clinical Features

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- **Incubation period:** Average 60-90 days  
Range 45-180 days
- **Clinical illness (jaundice):** <5 yrs, <10%  
>5 yrs, 30%-50%
- **Acute case-fatality rate:** 0.5%-1%
- **Chronic infection:** <5 yrs, 30%-90%  
>5 yrs, 2%-10%
- **Premature mortality from chronic liver disease:** 15%-25%

# Outcome of HBV Infection

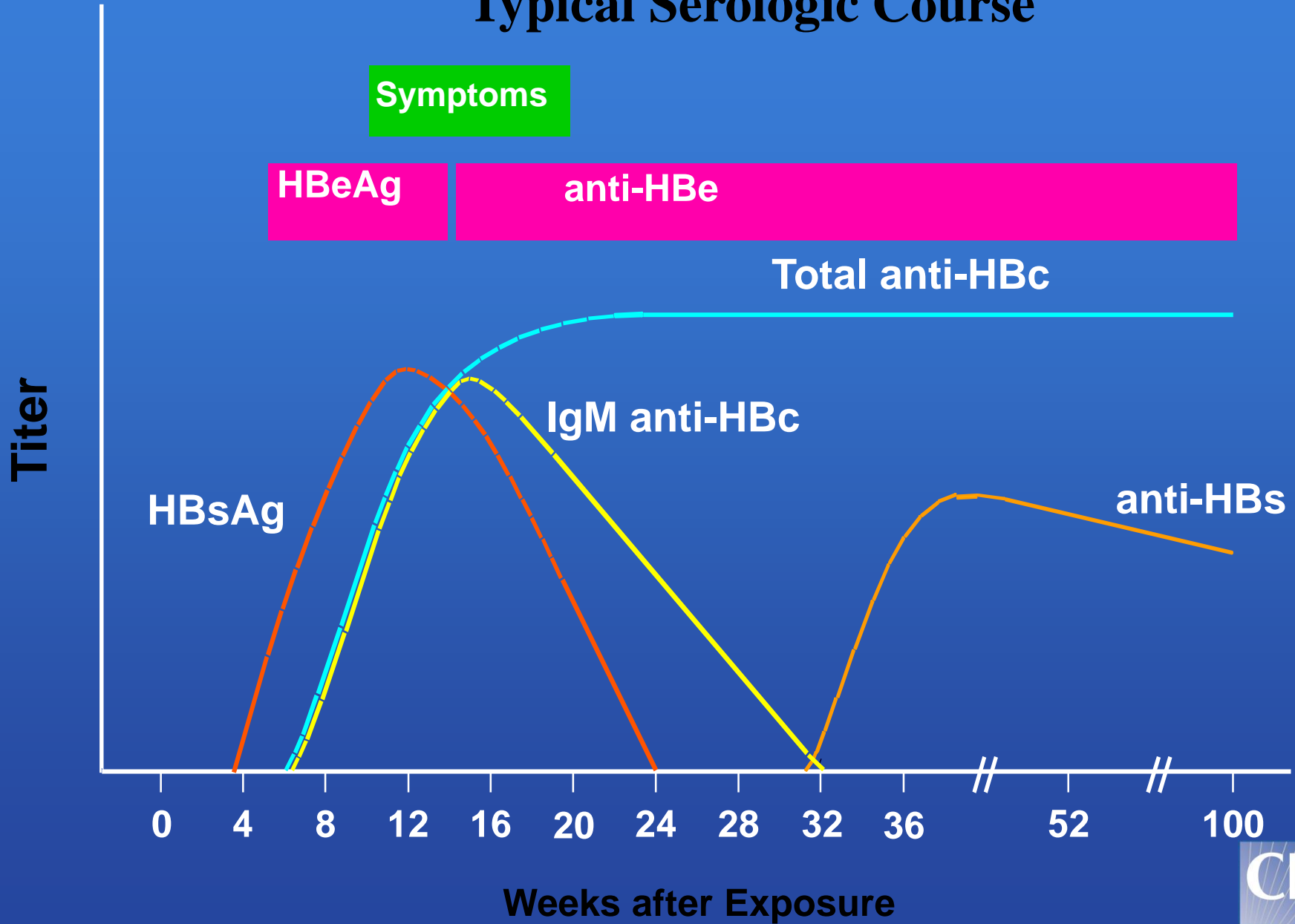
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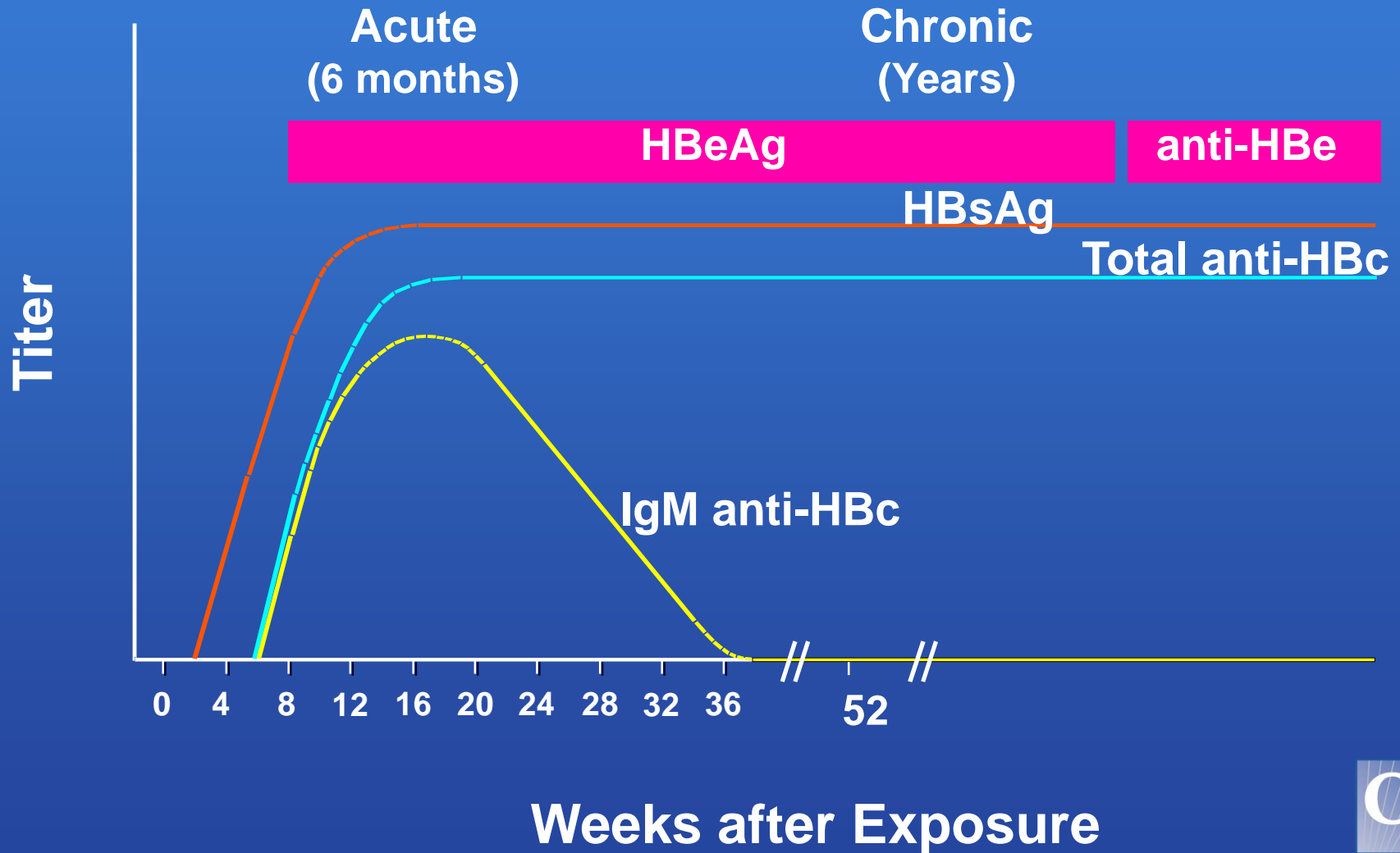
# Acute Hepatitis B Virus Infection with Recovery

## Typical Serologic Course



# Progression to Chronic Hepatitis B Virus Infection

## Typical Serologic Course



# HBV Modes of Transmission

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- Sexual
- Parenteral
- Perinatal



# Concentration of HBV in Various Body Fluids

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**High**

**Moderate**

**Low/Not  
Detectable**

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blood

semen

urine

serum

vaginal fluid

feces

wound exudates

saliva

sweat

tears

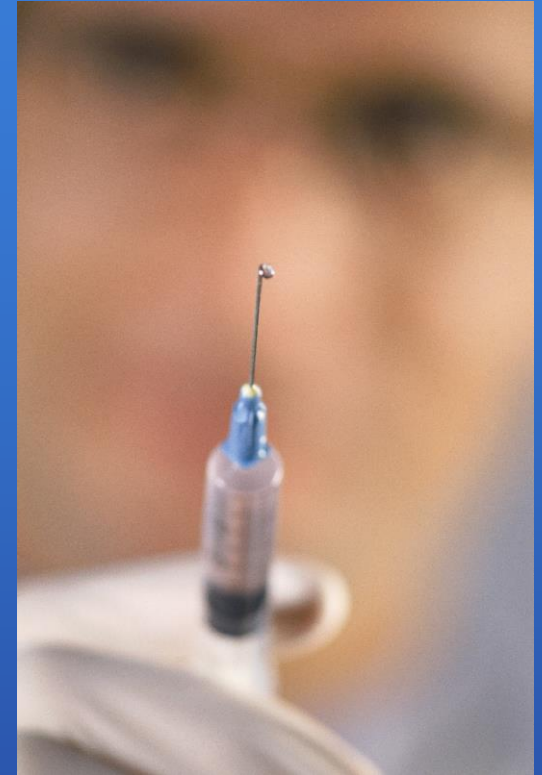
breast milk

# Elimination of HBV Transmission, United States

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## Strategy

- Prevent perinatal HBV transmission
- Routine vaccination of all infants
- Vaccination of children in high-risk groups
- Vaccination of adolescents
  - ⌘ **all children up through age 18**
- Vaccination of adults in high-risk groups



# Hepatitis B Vaccine

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- Licensed in 1982; currently recombinant (in US)
- 3 dose series, typical schedule 0, 1-2, 4-6 months - no maximum time between doses (no need to repeat missed doses or restart)
- 2 dose series (adult dose) licensed by FDA for 11-15 year olds (Merck)
- Protection ~30-50% dose 1; 75% - 2; 96% - 3; lower in older, immunosuppressive illnesses (e.g., HIV, chronic liver diseases, diabetes), obese, smokers

# Hepatitis B Vaccination

## ACIP Recommendations

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- Routine infant
- Ages 11-15 “catch up”, and through age 18(VFC eligible)
- Over 18 – high risk
  - Occupational risk (HCWs)
  - Hemodialysis patients
  - All STD clinic clients
  - Multiple sex partners or prior STD
  - Inmates in Correctional settings
  - MSM
  - IDU
  - Institution for developmental disability
- Pre-vaccination testing – if cost effective
- Post-vaccination testing – 1-2 months after last shot, if establishing response critical (HCW)