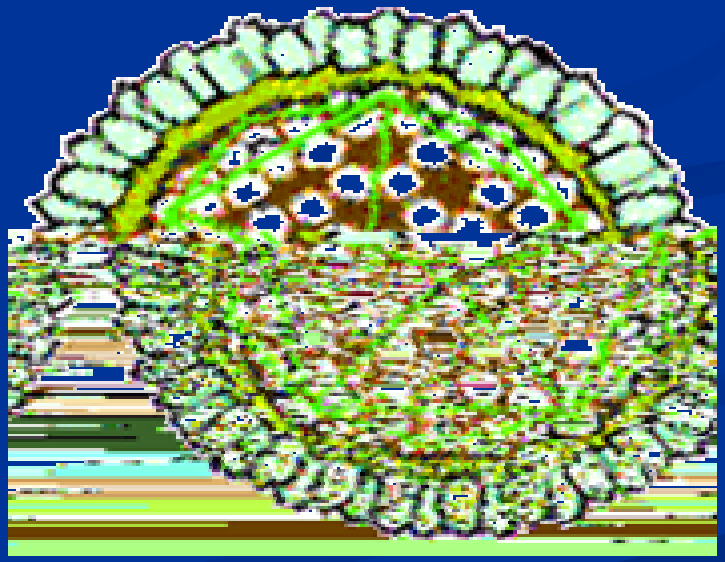
HEPATITIS B VIRUS
INFECTION
&
VACCINATION



What is Hepatitis

- Hepatitis is an inflammation of the liver.
- It is usually caused by viral infections, toxic agents or drugs but may be an autoimmune response.
- It is characterised by jaundice, abdominal pain, liver enlargement and sometimes fever.
- Others, usually viral or alcoholic are chronic, and can lead to cirrhosis and liver cancer.

VIRAL hepatitis

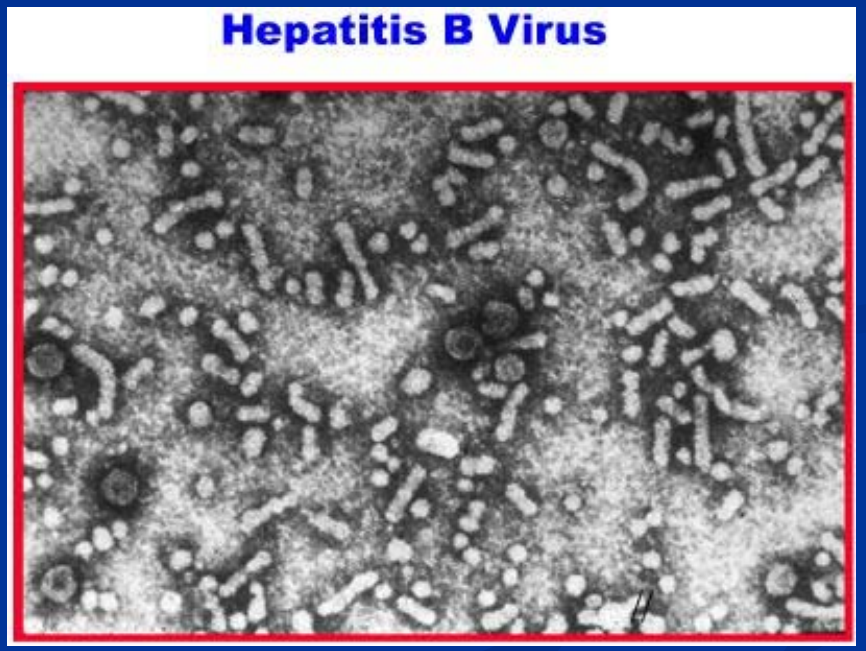
- The different types of VIRAL hepatitis are A (formerly called infectious hepatitis), B (serum hepatitis), C (formerly called non-A, non-B hepatitis), D (delta hepatitis), E (a virus transmitted through the faeces of an infected person), F, G, cryptogenic (Caused by a virus as yet unidentified).
- More hepatitis viruses are being discovered, but may be less common. Other viruses, such as Yellow Fever, Epstien Barr (EBV) and cytomegalovirus (CMV).

Hepatitis B

- **Hepatitis B:** is a serious disease caused by a virus that attacks the liver. The virus, which is called hepatitis B virus (HBV), can cause lifelong infection, cirrhosis (scarring) of the liver, liver cancer, liver failure, and death.
- HBV is a bloodborne pathogen, transmitted by percutaneous or permucosal (e.g., sexual) exposure to infectious blood or body fluids (e.g., semen or saliva). HBV circulates in high titers in the blood and lower titers in other body fluids (e.g., semen, vaginal fluid, or saliva), and is approximately 100 times more infectious than HIV and 10 times more infectious than HCV.

Hepatitis B

- HBV is a 42nm, double-shelled deoxyribonucleic acid (DNA) virus of the class Hepadnaviridae.
- The outer surface membrane contains hepatitis B surface antigen (HBsAg), which also circulates in blood as 22-nm spherical and tubular particles
- The inner core of the virus contains hepatitis B core antigen (HBcAg), hepatitis B e antigen (HBeAg), a single molecule of partially double-stranded DNA, and DNA-dependent DNA polymerase.



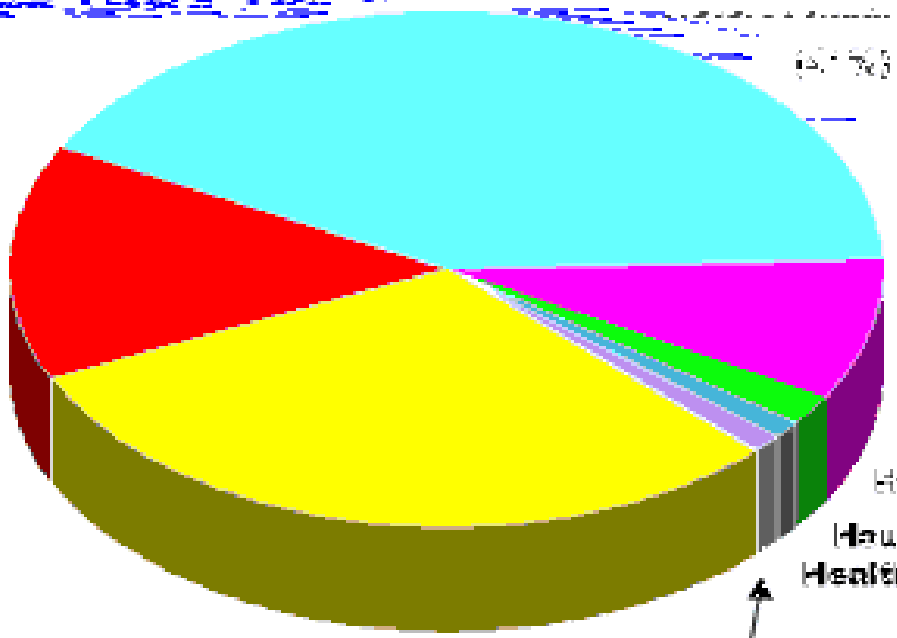
How is Hepatitis B Transmitted

- Hepatitis B (HB) is transmitted by the exchange of body fluids e.g. Blood, Semen, Breast Milk and in some circumstances saliva.
- . People most at risk include: Anybody who has unprotected sexual intercourse; IV drug users who share needles and syringes; Health care workers in contact with potentially contaminated blood or body fluids; Babies born to mothers with the virus; Anyone in intimate contact with the infected person.

RISK GROUPS

- areas with high rates of HBV infection
- Health care and public safety workers
- Injection drug users
- Household contacts of chronically infected persons
- Hemodialysis patients
- Infants born to infected mothers
- Persons with multiple sex partners or diagnosis of a sexually transmitted disease

Risk Factors for Acute Hepatitis B

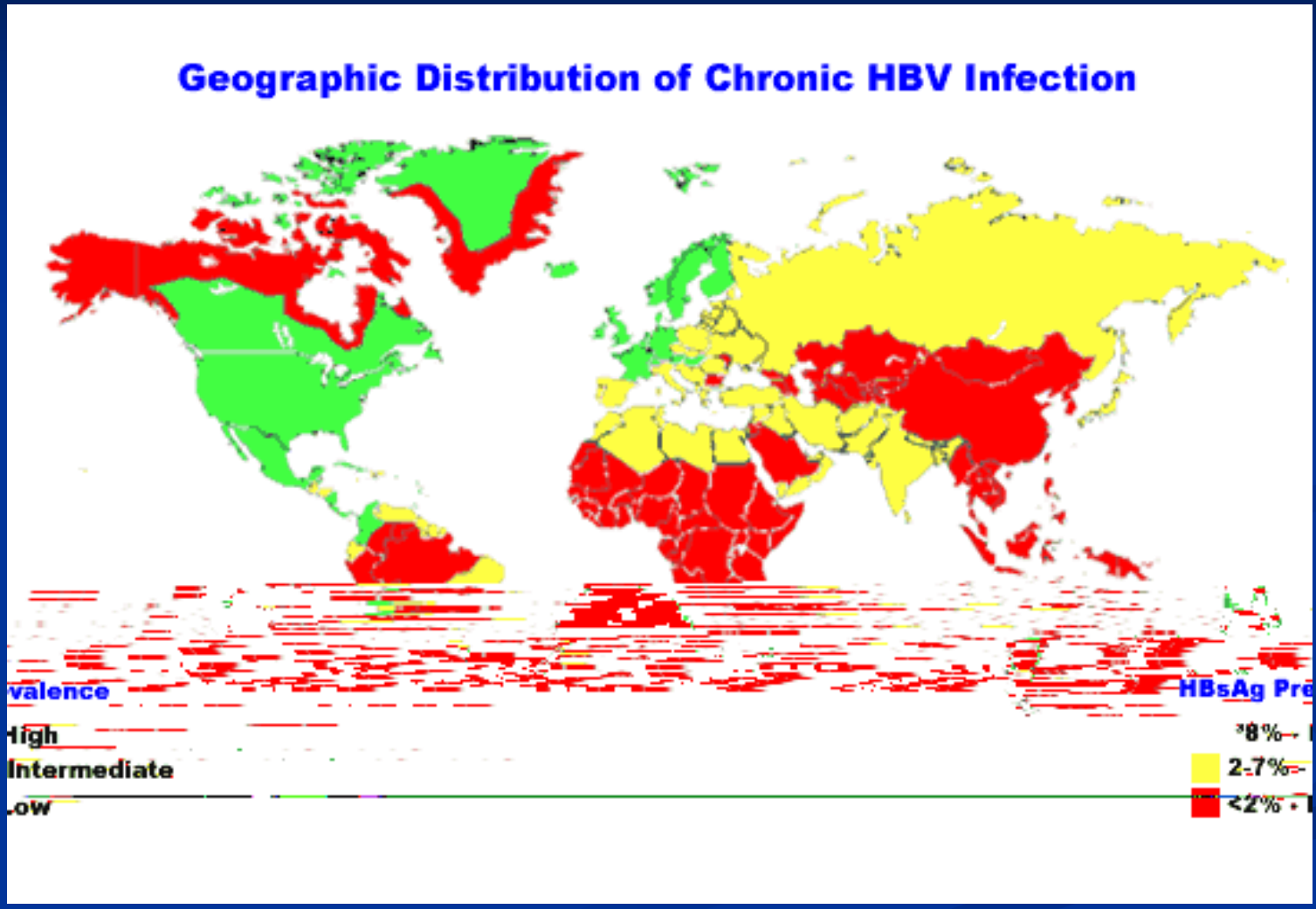


...sexual Activity (9%)
...ehold Contact (2%)
...are Employment (1%)

...ers.

* Includes sexual contact with acute cases, carriers, and multiple partn...

Source: CDC Sentinel Counties Study of Viral Hepatitis


Geographic Distribution of Chronic HBV Infection
valence
High
Intermediate
ow
HBsAg Pre
8%
2-7%
<2%

Global Patterns of Chronic HBV Infection

*High (³8%): 45% of global population

- lifetime risk of infection >60%

early childhood infections common

*Intermediate (2%-7%): 43% of global population

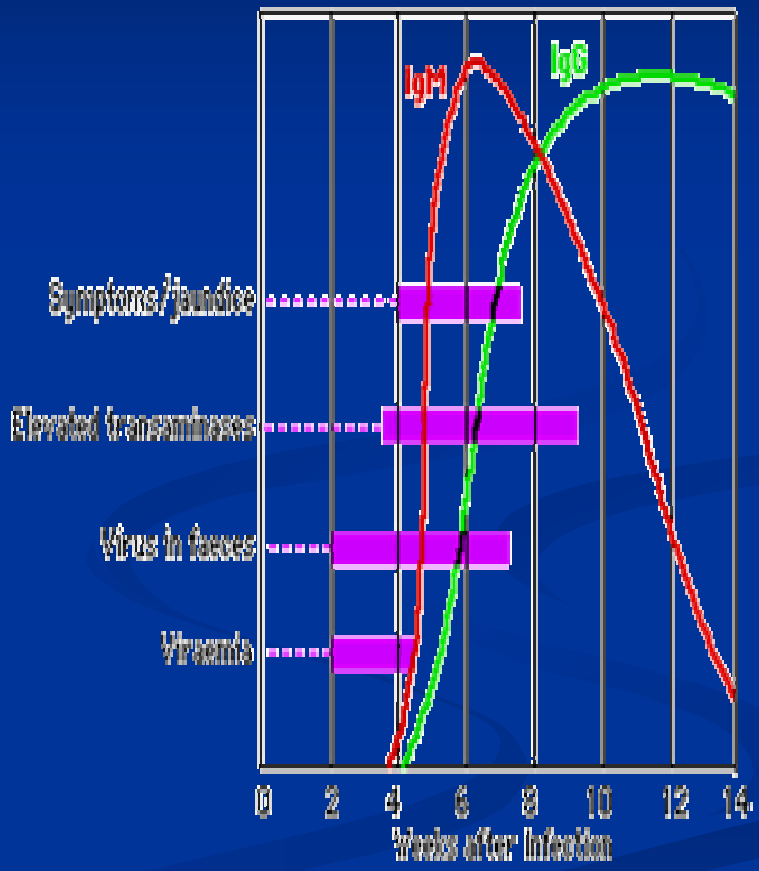
- lifetime risk of infection 20%-60%
- infections occur in all age groups

*Low (<2%): 12% of global population

- lifetime risk of infection <20%
- most infections occur in adult risk groups

What happens when infected with Hepatitis B

- no illness or symptoms whatsoever
- Commonest is an acute attack of hepatitis
- However 10% of people infected with hepatitis B develop chronic infection, may have ongoing symptoms and they continue to be infectious for a variable length of time.



Hepatitis B Virus Infection

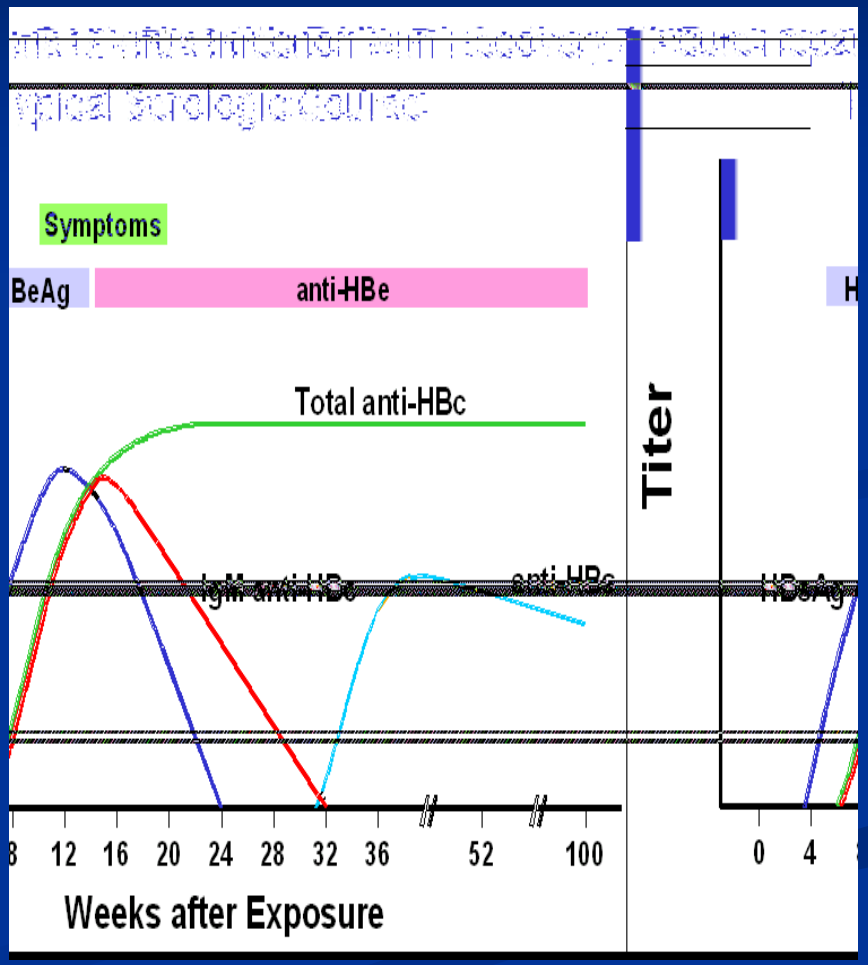
- Acute hepatitis B develops in approximately 30%--50% of adults at the time of initial infection and is characterized by anorexia, nausea, vomiting, and often jaundice.
- The risk of progression to chronic infection varies with age, being highest among young children and infants (30%--90%) and lowest among adolescents and adults (2%--6%).
- Rates of progression to cirrhosis and HCC vary according to age at acquisition of chronic infection; HBeAg status; coinfection with HDV, HIV, HCV; and alcohol abuse

Hepatitis B - Clinical Features

- Incubation period:Average 60-90 days Range 45-180 days
- Clinical illness (jaundice): <5 yrs, <10% ³5 yrs, 30%-50%
- Acute case-fatality rate:0.5%-1%
- Chronic infection: <5 yrs, 30%-90% ³5 yrs, 2%-10%
- Premature mortality from chronic liver disease:15%-25%

Acute Hepatitis B Infection

- The first serologic marker to appear following acute infection is HBsAg, which can be detected as early as 1 or 2 weeks and as late as 11 or 12 weeks (mode, 30-60 days) after exposure to HBV
- HBeAg is generally detectable in patients with acute infection; the presence of HBeAg in serum correlates with higher titers of HBV and greater infectivity.
- A diagnosis of acute HBV infection can be made on the basis of the detection of IgM class antibody to hepatitis B core antigen (IgM anti-HBc) in serum; IgM anti-HBc is generally detectable at the time of clinical onset

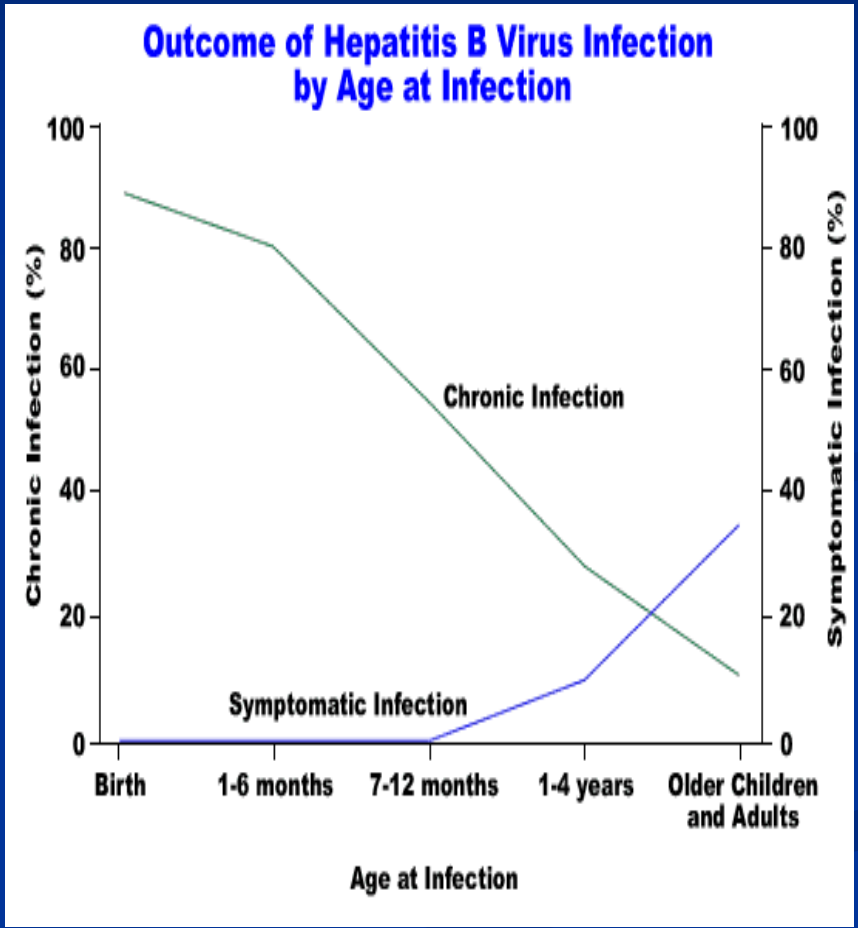


Interpretation of the Hepatitis B Panel

Tests	Results	Interpretation
HBsAg anti-HBc anti-HBs	negative negative negative	susceptible
HBsAg anti-HBc anti-HBs	negative positive positive	immune due to natural infection
HBsAg anti-HBc anti-HBs	negative negative positive	immune due to hepatitis B vaccination
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive positive negative	acutely infected
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive negative negative	chronically infected
HBsAg anti-HBc anti-HBs	negative positive negative	four interpretations possible *

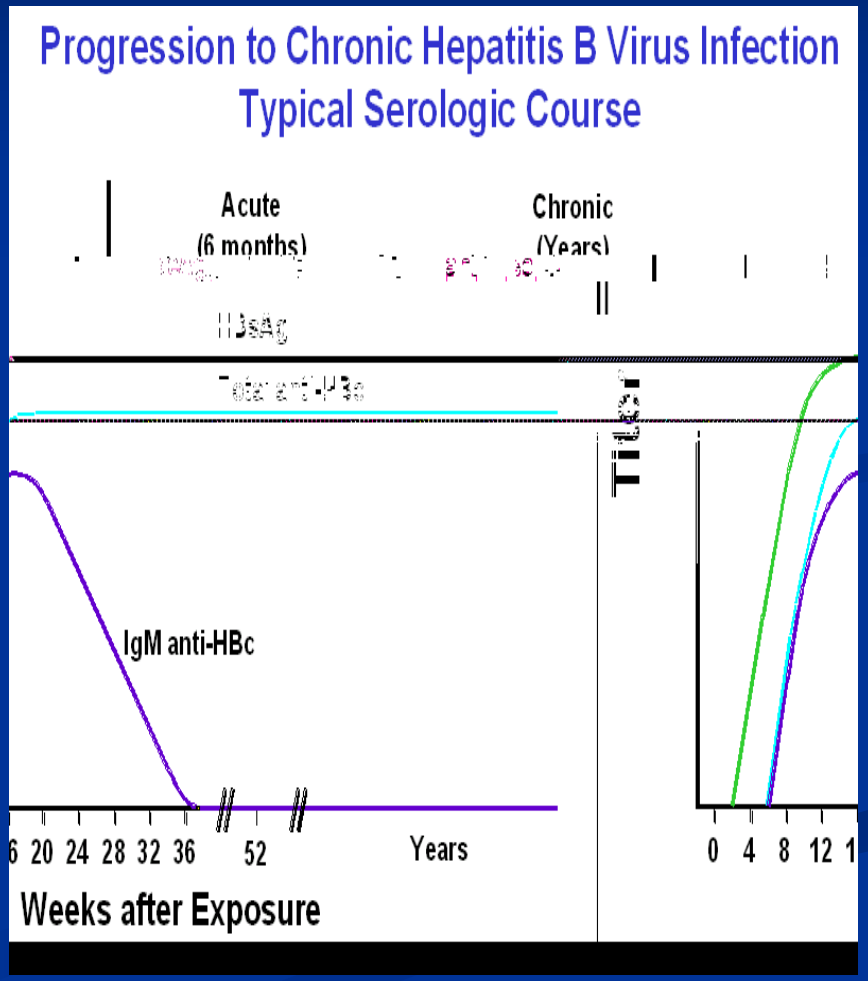
The outcome of acute HBV infection varies substantially depending on the age at which infection occurs

- In children less than 5 years of age, <5% of acute HBV infections are symptomatic; however, chronic infection occurs in about 80%-90% of infants infected during the first year of life and in about 30%-50% of children infected between 1-4 years of age
- In comparison, 30%-50% of adults with acute HBV infection are symptomatic, but only 2%-10% develop chronic infection.



Serology in Chronic Infection

- In patients with chronic HBV infection, both HBsAg and IgG anti-HBc remain persistently detectable, generally for life.
- The presence of HBsAg for 6 months or more is generally indicative of chronic infection.
- In addition, a negative test for IgM anti-HBc together with a positive test for HBsAg in a single serum specimen usually indicates that an individual has chronic HBV infection.



Elimination of Hepatitis B Virus Transmission

Objectives

- Prevent chronic HBV Infection
- Prevent chronic liver disease
- Prevent primary hepatocellular carcinoma
- Prevent acute symptomatic HBV infection

Hepatitis B Vaccine

- **First Anti-cancer Vaccine**
- Hepatitis B vaccine prevents hepatitis B disease and its serious consequences
- Prevention of acute and chronic HBV infection and elimination of HBV transmission in all age groups is most effectively achieved through hepatitis B vaccination

Post-exposure Prophylaxis

**After any percutaneous exposure (e.g., sharing injection-drug equipment or human bite) or mucosal exposure (e.g., sexual) to blood, unvaccinated should begin the vaccine series, and the exposure incident should be evaluated to determine if additional postexposure prophylaxis (i.e., HBIG) is required or Strongly recommended.

**The first dose of hepatitis B vaccine should be administered immediately, and the remaining doses, 1 and 6 months later (standard practice).

How is Hepatitis B Vaccine Given?

Hepatitis B is given as a series of three intramuscular doses,
0, 1 and 6 intramuscular injections for population at risk
And few years ago has been added to the routine immunization
Program in Egypt.

Engerix-B
(Glaxo-SmithKline)

Recombivax HB
(Merck & Co.)

More than 95% of children and adolescents develop adequate
Antibody response to the three recommended doses

Is Hepatitis B Vaccine Safe?

- Hepatitis B vaccines have been available since 1982
- Hepatitis B vaccines currently available are made using recombinant DNA technology, and contain only a portion of the outer protein of the virus
- The vaccine does not contain any of live components
- Hepatitis B vaccines have been shown to be very safe when given to infants, children, and adults
- Most common side effects are pain at the injection site and mild to moderate fever that is not more common than among children receiving other vaccines

Post-vaccination Testing

- After routine vaccination of infants, children, adolescents, or adults post-vaccination testing for adequate antibody response is not necessary.
- Post-vaccination testing IS recommended for persons whose medical management will depend on knowledge of their immune status.
- are immunocompromised (e.g., hemodialysis patients)
- received the vaccine in the buttock
- are infants born to HBsAg (hepatitis B surface antigen)-positive mothers
- are healthcare workers who have contact with blood
- are sex partners of persons with chronic hepatitis B virus infection

Booster Doses

- Current data show that vaccine-induced hepatitis B surface antibody (anti-HBs) levels may decline over time; however, immune memory (anamnestic anti-HBs response) remains intact indefinitely following immunization. Persons with declining antibody levels are still protected against clinical illness and chronic disease.
- For health care workers with normal immune status who have demonstrated an anti-HBs response following vaccination, booster doses of vaccine are not recommended nor is periodic anti-HBs testing.

THANK YOU