

Hepatitis B labs

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What do they all mean!

Labs

- Hepatitis B surface antigen (HBsAg)
- Hepatitis B surface antibody (HBsAb)
- Hepatitis B core antibody total (HBcAb total)
- Hepatitis B core IgM (HBc IgM)
- Hepatitis Be antigen (HBeAg)
- Hepatitis Be antibody (HBeAb)
- HBV DNA quantification

Meaning

- Chronic infection
- Immunity from vaccine or past infection
- Prior exposure
- Acute resolving infection (window period)
- Active replicator
- Inactive carrier state
- Amount of virus in the blood

Screening labs

Screen for chronic infection

- Hepatitis B surface antigen (HBsAg)
- Hepatitis B surface antibody (HBsAb)
- Hepatitis B core antibody total (HBcAb total)

Screening for acute infection

- Hepatitis B surface antigen (HBsAg)
- Hepatitis B surface antibody (HBsAb)
- Hepatitis B core antibody total (HBcAb total)
- Hepatitis B core IgM (HBc IgM)

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	Interpretation unclear; four possibilities: 1. Resolved infection (most common) 2. False-positive anti-HBc, thus susceptible 3. "Low level" chronic infection 4. Resolving acute infection

Window phase of acute infection

- Patient is going to clear HBV spontaneously
- Have lost surface antigen but surface antibody is not detectable yet
- Infection is cleared so no HBV DNA is detectable
- This leaves only core antibodies detectable
 - Both IgG and IgM will be present
 - Detectable IgM is what indicates that this is acute

When do I need to order Hep B core IgM?

-Or when should I worry about acute resolving infection-

- **Acute hepatitis**

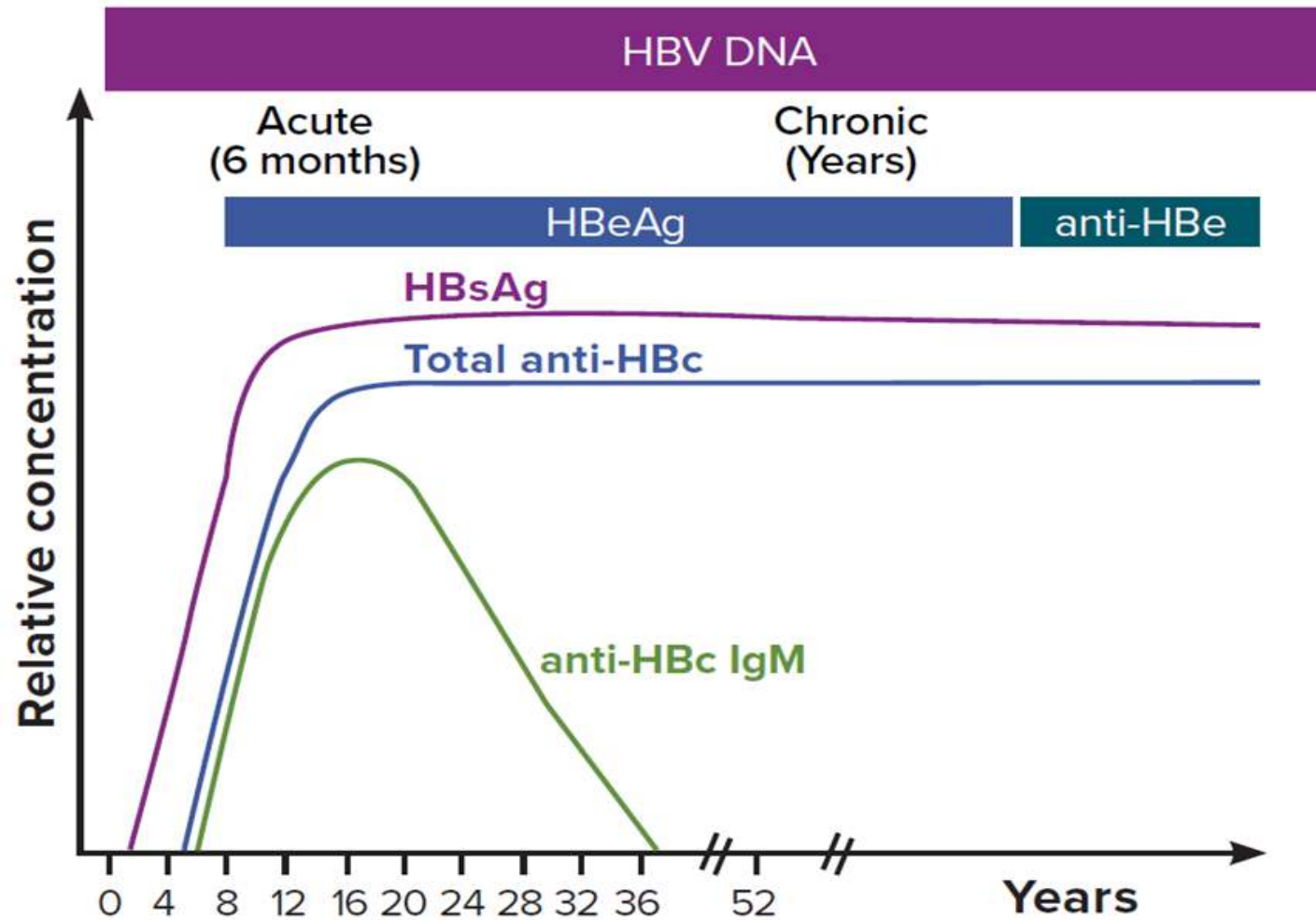
- Most commonly patients present in the ED or hospital with:
 - Marked transaminase elevation
 - Acute viral prodrome
 - Jaundice
 - May report recent possible exposure
 - May have initial negative screening labs
 - Work up for other causes of liver injury negative

- **Asymptomatic with recent high-risk exposure**

Labs for chronic infection

- Hepatitis Be antigen (HBeAg)
- Hepatitis Be antibody (HBeAb)
- HBV DNA quantification

Chronic HBV Serologies



Phases of chronic infection

- **eAg positive**

- Immune tolerant phase – normal ALT, DNA often >1 million, no active disease on Bx
- immune active phase – ALT elevated DNA >20,000, active disease on Bx

- **eAb positive and eAg negative**

- Inactive phase – Normal ALT, DNA <2,000, no active disease on Bx
- Immune active phase – Elevated ALT, DNA > 2,000, active disease on Bx

Occult HBV infection

- **Hepatitis B core total positive with**
 - Negative surface antigen and negative surface antibody
 - Detectable HBV in the liver with +/- Detectable HBV DNA in serum
- Highest prevalence among parenterally infected
- Reactivation with immunosuppression
 - HCV treatment?

Hepatitis Delta

- Defective RNA virus that requires HBsAg for replication and entry into hepatocytes
- Prevalence is unknown but limited studies suggest 3-5% in the USA
- Screen with Hepatitis D antibody
 - Confirm with quantitative HDV RNA

Who do you screen for HDV?

Table 7. HBsAg-Positive Persons at High Risk of HDV Infection Who Should Be Screened

- Persons born in regions with reported high HDV endemicity^a
 - Africa (West Africa, horn of Africa)
 - Asia (Central and Northern Asia, Vietnam, Mongolia, Pakistan, Japan, Taiwan)
 - Pacific Islands (Kiribati, Nauru)
 - Middle East (all countries)
 - Eastern Europe (Eastern Mediterranean regions, Turkey)
 - South America (Amazonian basin)
 - Other (Greenland)
- Persons who have ever injected drugs
- Men who have sex with men
- Individuals infected with HCV or HIV
- Persons with multiple sexual partners or any history of sexually transmitted disease
- Individuals with elevated ALT or AST with low or undetectable HBV DNA

^a This list is incomplete, because many countries do not report HDV rates.