

Hepatitis B

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Hepatitis B, today is often overlooked in deference to focusing on hepatitis C, but continues to remain a serious, preventable and treatable disease that costs society and the individual greatly. There are estimated to be 1.25 million sufferers of chronic hepatitis B (CHB) in the US. A 2004 study estimated the following costs per patient per year in these categories: A) CHB \$761, B) compensated cirrhosis \$227, C) decompensated cirrhosis \$11,459, D) liver transplant \$86,552, E) transplant care \$12,560, and F) liver cancer \$7,533.¹ The incidence since the development of vaccination dropped 80% between 1987 and 2004, but more recently has been noted to have risen substantially, possibly because of the increase in IV opioid use. The estimated cost to society of hospitalizations rose from \$357 million in 1990 to \$1.5 billion in 2003.

Even more concerning is the observation that 65% of those chronically infected with hepatitis B are aware of it, fewer than 50% of those are referred for care, and only 5% of those actually receive care. This underscores the importance of education of both patients and staff, testing in high risk populations at first visit, and taking appropriate measures such as vaccination or referral for treatment.

Hepatitis B is transmitted by exposure to body fluids through IV drug use, unprotected sex, and saliva to wounds as examples. It is estimated to be 50-100 times more infectious than HIV. Around 90% of adult will

clear the infection but 5-10% will progress to chronicity. The conversion increases as age decreases from 50% in ages 1-5 years and 90% in infants. The death rates in the acute phase can be 40%.

Evaluation and diagnosis of hepatitis B can usually be accomplished by testing for the surface antigen (HBsAg), the surface antibody (HBsAb), and the core antibody (HBcAb). Liver enzymes are usually included to assess active liver injury. Interpretation is listed in table 1.

Testing for hepatitis B at most laboratories is via enzyme immunoassay, which detects a

protein antigen or antibody produced by the virus. Testing is inexpensive compared to the cost of hepatitis to the individual and society. It is also a reportable disease and, without vigilance at the clinical level, will continue to be a significant cause of disability, loss of work, and economic impact.

Table 1	HBsAg	HBsAb	HBcAb	HBcAb IgM
Susceptible	Neg	Neg	Neg	
Immune from natural causes	Neg	Pos	Pos	
Immune due to vaccination	Neg	Neg	Pos	
Acutely infected	Pos*	Neg	Pos	Pos
Chronically infected	Pos	Neg	Pos	Neg
Unclear**	Neg	Neg	Pos	

*Up to 5 years of infection

**May be either resolved, false positive HBcAb, "low level", or resolving acute infection

??? Did You Know ???

Medications are also increasingly being used to treat substance use disorders. This practice, often referred to as Medication-Assisted Treatment (MAT), is the use of medications, in combination with counseling and behavioral therapies, to provide a whole-patient approach to the treatment of substance use disorders. Medications exist that can reduce the cravings and other symptoms associated with withdrawal from a substance, block the neurological pathways that produce the rewarding sensation caused by a substance, or induce negative feelings when a substance is taken. More information about MAT is available through SAMHSA's Addiction Technology Transfer Center Network (link is external).

Source: SAMHSA

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Question of the Month

Question: How much urine is required for a basic drug screen? Why this amount?

Answer: For the initial Immunoassay testing procedure, each drug on a panel (i.e. Opiates, THC, etc.) has its own volume requirement – typically between 10µL (micro liters) and 50µL. A typical 8-panel screen uses 400µL for testing. In addition, the screening machine requires at least 500µL to detect the sample. Therefore, an 8-panel test requires 900µL for the initial screen only. For visual reference, 1000µL is equivalent to 1mL; this is about 10 drops of urine. If only 1mL of urine is provided, no additional testing can be performed beyond the initial screen. Thus, SDRL requests at least 15 mLs of urine in case retests and confirmatory tests (GC/MS, TLC) need to be performed.

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References

1. Lee, Todd & L Veenstra, David & Iloeje, Uchenna & D Sullivan, Sean. (2004). Cost of Chronic Hepatitis B Infection in the United States. *Journal of clinical gastroenterology*. 38. S144-7.
10.1097/00004836-200411003-00005.