

**Recommendations for
Identification and Public Health
Management of Persons with
Chronic Hepatitis B Virus Infection**

Guest Speaker

- Geoff Beckett, PA-C, MPH
- Chief, Prevention Branch
Division of Viral Hepatitis, Centers
for Disease Control and Prevention

Thanks to our Sponsors:

- School of Public Health, University at Albany
- NYS Department of Health
- NYS Community Health Partnership
- Special Thanks to
- NYS Association of County Health Officials
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Viewer Call-In

**Phone: 800-452-0662
Fax: 518-426-0696**

Evaluations

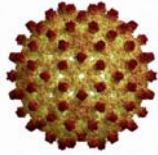
Please visit
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**Nursing Contact Hours, CME, CHES
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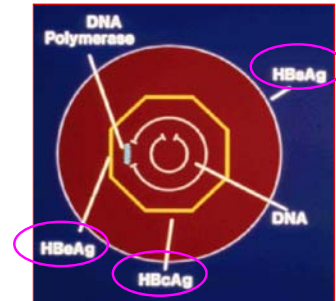
Thank you!

Outline

- Purposes of HBsAg testing
- HBsAg prevalence in the United States
- HBsAg testing recommendations
- Implementation issues



Hepatitis B Virus



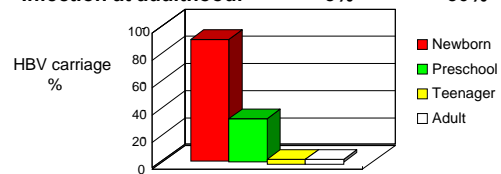
Clinical Features of Hepatitis B

Incubation period	Mean: 60-90 days Range: 45-180 days
Clinical illness (jaundice)	Children: <10% Adults: 30-50%
Case-fatality rate	0.5-1.0% (acute disease)
Chronic infection	YES
<p>15-25% of persons with chronic infection will die from HBV-related cirrhosis and liver cancer</p>	

Chronicity and Age at Infection

Chronicity is related with age when HBV infection occurs.

Age at infection	Chronicity	Symptomatic
• Perinatal infection:	90%	rare
• Infection at preschool age:	25%	~10%
• Infection at adulthood:	< 3%	~30%



Early Identification of Chronic HBV Infection Allows for:

Primary prevention

- Prevent nosocomial HBV transmission
- Manage exposures to HBV infected persons




Purposes of HBsAg Testing

- Previous testing recommendations have been made for primary prevention purposes
- New recommendations considered secondary prevention, with improved treatment available
- Recommendations based on:
 - Prevalence in population
 - Serious outcomes from undetected infection

Serologic Markers of HBV Infection (I)	
Marker	Indication in Serum
HBsAg (surface antigen)	<ul style="list-style-type: none"> Active infection Infectious Acute or chronic infection
Anti-HBs (surface antibody)	<ul style="list-style-type: none"> Protective antibody Resolved infection or previously vaccinated
Anti-HBc Total (total core antibody)	<ul style="list-style-type: none"> Marker of past or current infection Acute infection
Anti-HBc IgM (IgM core antibody)	

Serologic Markers of HBV Infection (II)	
Marker	Indication in Serum
HBeAg (E antigen)	<ul style="list-style-type: none"> Variably present Active infection Infectious High viral titer and increased infectivity Acute or chronic infection
Anti-HBe (E antibody)	<ul style="list-style-type: none"> Resolved or chronic infection

Summary of Basic Hepatitis B Markers
<ul style="list-style-type: none"> Hepatitis B Surface Antigen: <ul style="list-style-type: none"> Indicates <u>current active</u> infection (acute or chronic) Hepatitis B Core Antibody (Total): <ul style="list-style-type: none"> Indicates current acute <u>or</u> chronic infection <u>OR</u> past resolved infection Hepatitis B Core Antibody (IgM): <ul style="list-style-type: none"> Indicates <u>acute</u> infection Hepatitis B Surface Antibody: <ul style="list-style-type: none"> Indicates <u>immunity</u> (either from vaccine or from past resolved infection)

Early Identification of Chronic HBV Infection Allows for:
<p>Secondary prevention</p>  <ul style="list-style-type: none"> Reduce risks for chronic liver disease in infected persons by providing medical management and antiviral treatment

Prevalence of Hepatitis B Virus (HBV) Infection, by Risk Population		
Population	Chronically infected with HBV* %	Ever infected with HBV** %
General U.S. population	0.3 (95% CI : 0.2-0.4)	4.8% (95% CI: 4.2%-5.5%)
HIV-positive persons	4 – 17	24 – 76
Injection-drug users	3 – 6	20 – 70
Men who have sex with men	1 – 3	10 – 40
Sexual contacts of HBsAg+ persons	3.5 – 9	25 – 59
Household contacts of HBsAg+ persons	3 – 20	15 – 60

*HBsAg+; **Total anti-HBc+

Estimated HBsAg-positive Persons in the U.S. Resident Population*, 2006				
Group	Estimated 2006 population* (in millions)	Estimated HBsAg Prevalence (%)	Number in thousands (range)	(%)
U.S.- born non-institutionalized	254.3	0.14 (95% CI: .09 - .21)	356 (229-534)	(30-50)
Foreign-born	37.5	1 - 2.6	375 – 975	(47-70)
Correctional institutions	2.2	2.0	44	(3-5)
Other group living quarters	6	0.5	30	(2-3)
Total	300	0.3 - 0.5	805 - 1,405	

*Source: Population estimates from the American Community Survey, US Census Bureau, 2006, and Bureau of Justice Statistics, 2007.

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HBV Has Multiple Routes of Transmission



Disease Burden

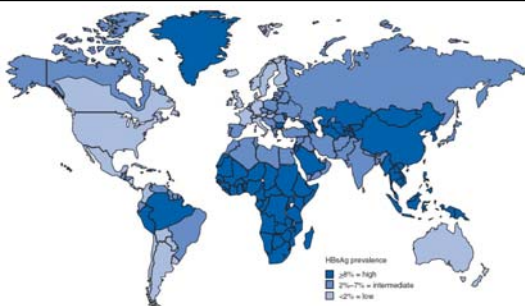


- **NHANES 1999–2004 estimates:**
 - HBsAg prevalence 0.3% (95% CI: 0.2% - 0.4%)
 - Prevalence of lifetime HBV infection in the U.S. population 4.8% (95% CI: 4.2%-5.5%)

Hepatitis B Disease Burden : United States

- 1 of 20 persons have been infected with hepatitis B virus (HBV) during their lifetime (12.5 million)
- 46,000 persons were newly infected with HBV in 2006
- 800,000 – 1.4 million persons are living with chronic HBV infection
 - Contributes to health disparities
 - Underlying cause of 2,000 – 4,000 deaths /yr.

Geographic Distribution of Chronic HBV Infection – Worldwide, 2006



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Previously recommended or required HBsAg testing



- Blood supply
- Organ donors
- Hemodialysis patients
- Pregnant women in risk groups
- All pregnant women
- Infants born to HBsAg+ mothers

Previously recommended or required HBsAg testing

- Household contacts and sex partners of HBV-infected persons
- Source of blood or body fluid exposures that might warrant postexposure prophylaxis



Previously recommended or required HBsAg testing



- Persons born in countries with HBsAg prevalence $\geq 8\%$
- Human immunodeficiency virus (HIV)-infected persons

New CDC Recommendations

- Persons born in countries with HBsAg prevalence $\geq 2\%$, independent of history of vaccination
- Persons with behavioral exposures to HBV
- Persons with select medical conditions



New CDC Recommendations

- US-born persons not vaccinated as infants whose parents were born in regions $\geq 8\%$ HBsAg prevalence
- Persons who received hepatitis B vaccination as adolescents or adults after the initiation of risk behaviors

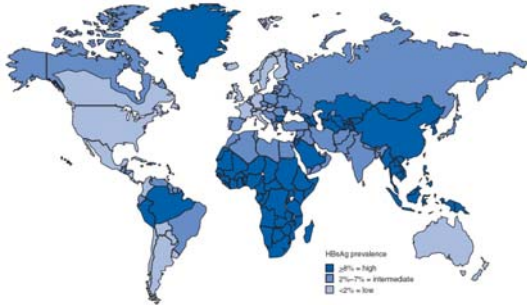


New Recommendations

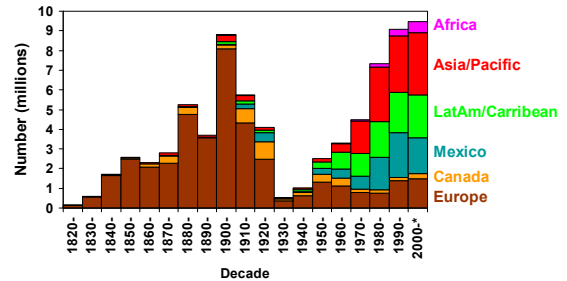
- Persons born in countries with HBsAg prevalence of $\geq 2\%$. (as well certain indigenous populations from countries with overall low HBV endemicity ($< 2\%$))
- This includes immigrants, refugees, asylum seekers, and internationally adopted children born in these regions, regardless of vaccination status in their country of origin



Geographic Distribution of Chronic HBV Infection – Worldwide, 2006



U.S. Immigrants, 1820-2004



*Projected based on 2001-2004 data

Geographic Regions* with Hepatitis B Surface Antigen (HBsAg) Prevalence $\geq 2\%$

Region	HBsAg prevalence $\geq 2\%$
Africa	All countries
Asia [§]	All countries
Australia and South Pacific	All countries except Australia and New Zealand
Middle East	All countries except Cyprus and Israel
Eastern Europe	All countries except Hungary

Geographic Regions* with Hepatitis B Surface Antigen (HBsAg) Prevalence $\geq 2\%$

Region	Prevalence
Western Europe	Malta, Spain, Greenland
North America	Populations in Alaska and Northern Canada
Mexico and Central America	Guatemala and Honduras
South America	Ecuador, Brazil, etc.
Caribbean	Haiti, Dominica, etc.

New Recommendations

- **Persons with behavioral exposures to HBV**
 - MSM and IDU, now recommended for HBsAg testing have been previously recommended for routine hepatitis B vaccination because of their increased risk for HBV acquisition.
 - The first dose of hepatitis B vaccine should be administered during the same medical visit (however, in settings where testing is not feasible, vaccination of recommended populations should continue).



New Recommendations

- **Persons with select medical conditions**
 - Persons receiving cytotoxic or immunosuppressive therapy
 - Need to be tested for all serologic markers of HBV infection (i.e., HBsAg, anti-HBc, anti-HBs)
 - Persons with elevated ALT or AST levels of unknown etiology need to be tested for HBsAg as part of the medical evaluation of these abnormal laboratory values.

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- Previous HBsAg testing recommendations
- New testing recommendations
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Estimating HBsAg Screening Through Outreach Projects in the United States

- 31 “outreach” HBsAg testing projects identified in 17 states and the District of Columbia
 - 13 projects screened 0 – 300 persons
 - 8 screened 301-700
 - 10 screened ≥ 700
- Median tested per project: 450 persons per year
- ~22,000 persons tested for HBsAg in 2007
 - Chinese
 - Vietnamese
 - Korean

HBsAg Testing in the United States

- While recommendations for testing exist, they may not be fully implemented
- 1/3 – 2/3 HBsAg – positive persons may be aware of their status
- 400,000 – 1,000,000 targeted by recommendations



Public Health Management of HBsAg-positive Persons

- Development of testing programs and networks
- Contact management
- Patient education
- Medical management of chronic hepatitis B
- Development of surveillance registries of persons with chronic HBV infection

Public Health Management of Persons with Chronic HBV Infection (1)

- Report cases to health department
- Screen/vaccinate household, sexual, needle sharing contacts
- Educate patient about chronic HBV infection



Public Health Management of Persons with Chronic HBV Infection (2)

- Vaccinate for HAV if indicated
- Refer for substance abuse treatment if appropriate
- Refer for medical management
-



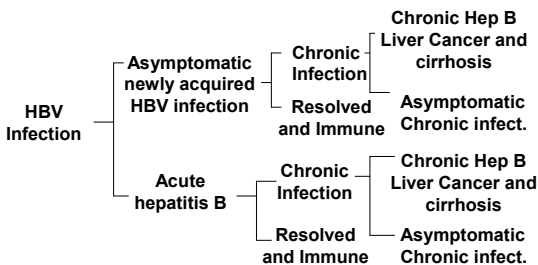
Future Directions: Implementation and Monitoring Recommendations

- Resources for testing/screening programs
- Resources for contact management
- Provider and patient education
- Resources for medical management of chronic hepatitis B
- Development of surveillance registries of persons with chronic HBV infection

Interpretation of Serologic Profiles

<u>Stage of Infection</u>	<u>HBsG</u>		<u>IgM</u>	<u>IgG</u>
	<u>+</u>	<u>-</u>	<u>Anti-HBc</u>	<u>Anti-HBc</u>
Incubation Period (early)	+	-	-	-
Incubation Period (late)	+	-	+	-
Acute Hepatitis B	+	-	+	-
Acute Hep B (window period)	-	-	+	-
Resolved Infection	-	+	-	+
Resolved Infection (Remote)	-	+/-	-	+
Chronic Infection	+	-	-	+
Hepatitis B vaccination	-	+	-	-
Hepatitis B vaccination (immediately)	+/-	-	-	-

Natural History of HBV Infection



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Phone: 800-452-0662

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Contact Information

gbeckett@cdc.gov

www.cdc.gov/hepatitis

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Thank you!