

Hepatitis B and Hepatitis B Vaccine

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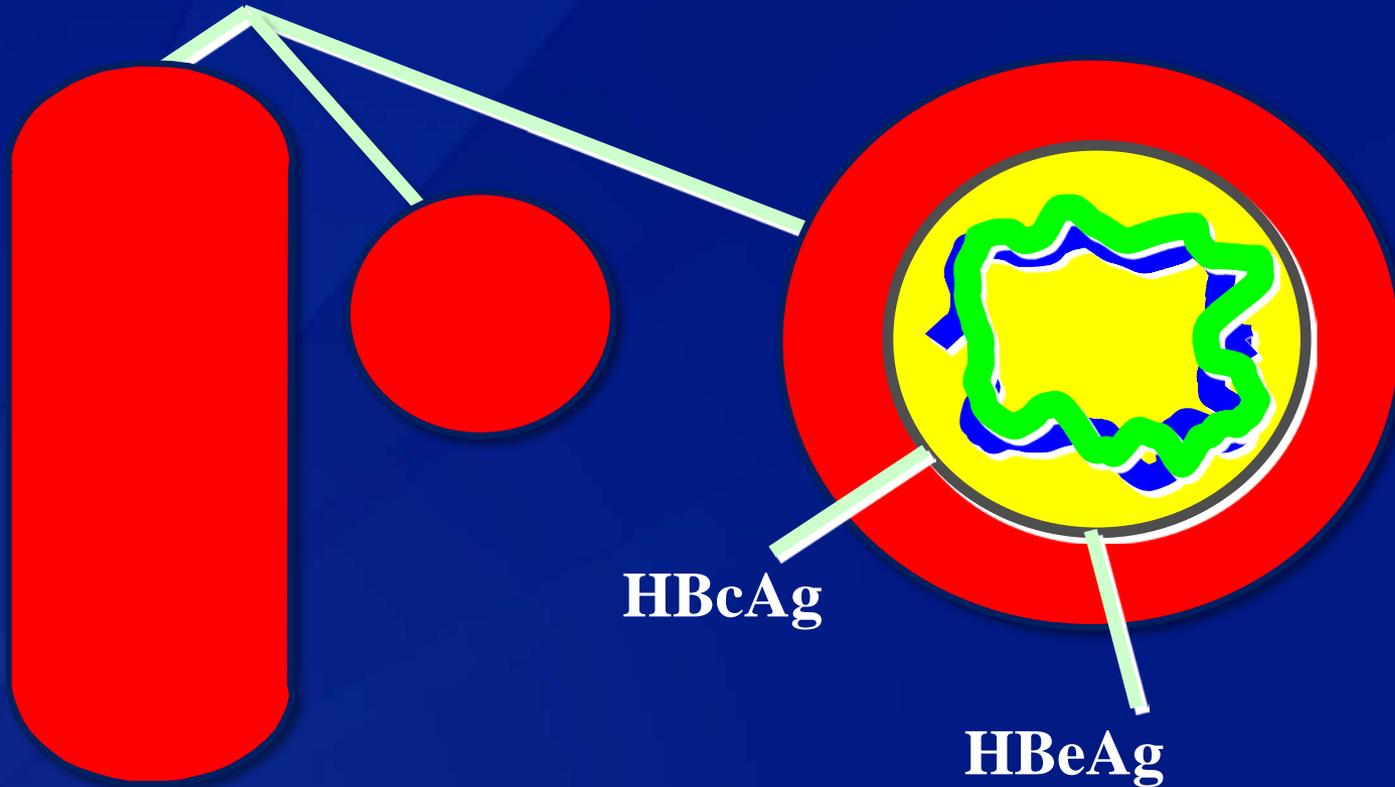


Hepatitis B Virus

- ❑ **Hepadnaviridae family (DNA)**
- ❑ **Numerous antigenic components**
- ❑ **Humans are only known host**
- ❑ **May retain infectivity for more than 7 days at room temperature**

Hepatitis B Virus

HBsAg (Australia antigen)



HBcAg

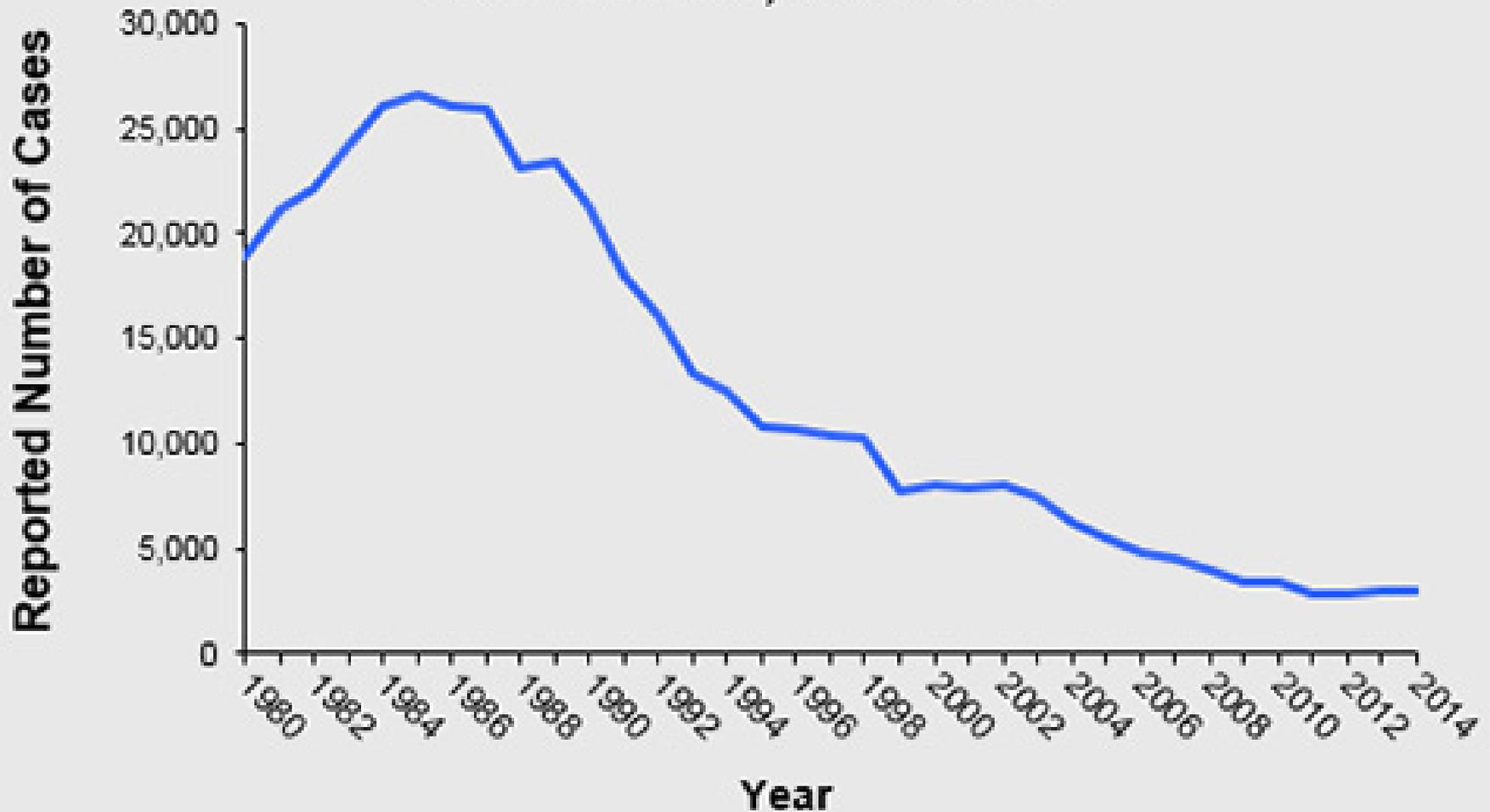
HBeAg

(presence indicates high infectivity)

Hepatitis B Virus Infection

- ❑ **850,000 – 2.2 million chronic infections in US**
- ❑ **240 million chronically infected worldwide**
- ❑ **Established cause of chronic hepatitis and cirrhosis**
- ❑ **Human carcinogen—cause of up to 50% of hepatocellular carcinomas**
- ❑ **Causes about 786,000 deaths worldwide**

Incidence of acute hepatitis B, by year United States, 1980-2014



Hepatitis B clinical Features

- ❑ Incubation period 45-160 days (average 120 days)
- ❑ Illness not specific for hepatitis B
- ❑ Nonspecific prodrome of malaise, fever, headache, myalgia
- ❑ At least 50% of infections asymptomatic

Hepatitis B Complications

- ❑ **Fulminant hepatitis (1%-2%)**
- ❑ **Hospitalization**
- ❑ **Cirrhosis**
- ❑ **Hepatocellular carcinoma**
- ❑ **Death**



Chronic Hepatitis B Virus Infection

- ❑ **Responsible for most mortality**
- ❑ **3,000–4,000 HBV cirrhosis deaths**
- ❑ **1,000–1,500 HBV related liver cancer deaths**
- ❑ **Often asymptomatic**

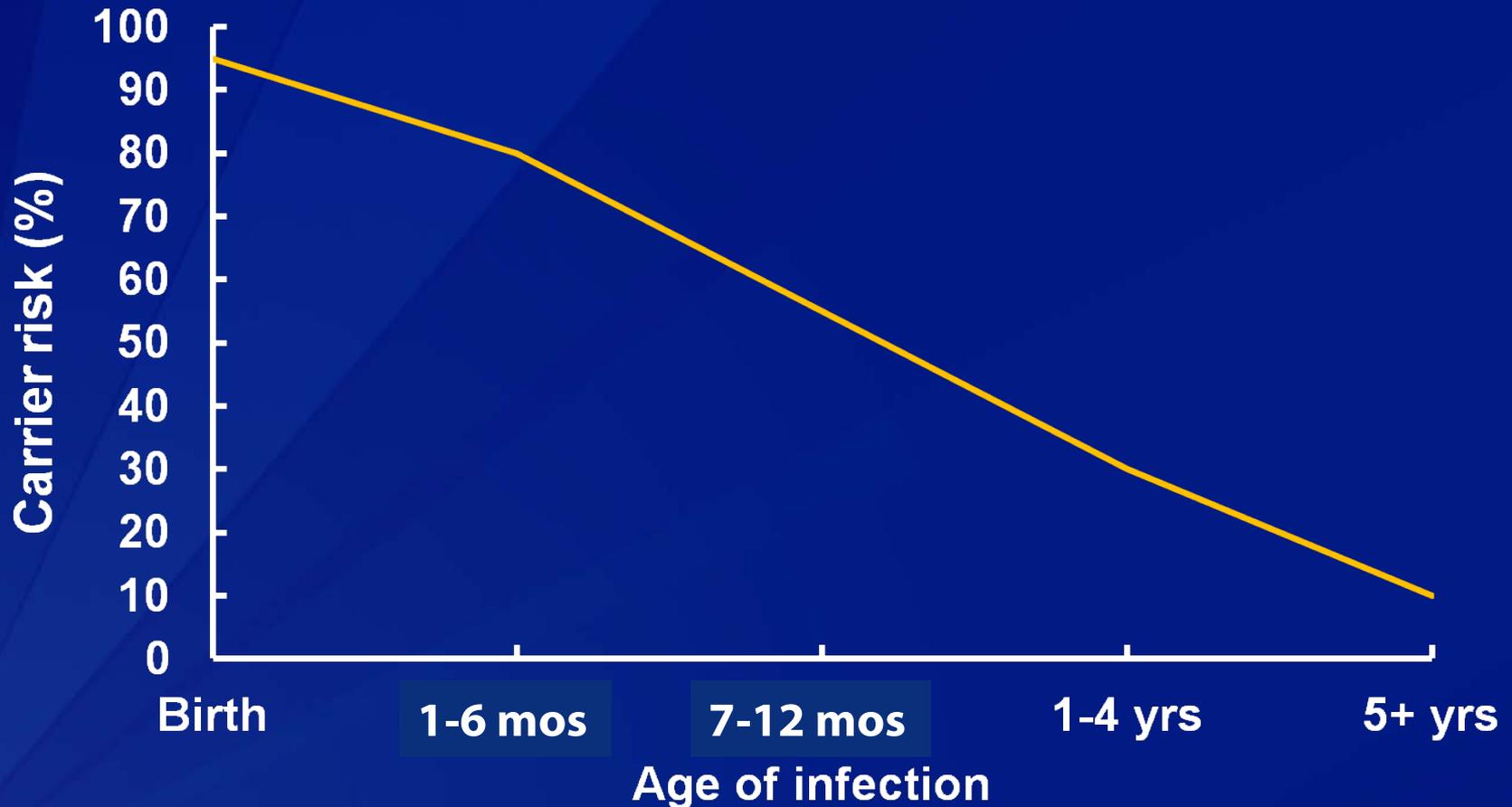
Hepatitis B Perinatal Transmission*

- ❑ **If mother positive for HBsAg and HBeAg**
 - 70%-90% of infants infected
 - 90% of infected infants become chronically infected

- ❑ **If positive for HBsAg**
 - only 10% of infants infected
 - 90% of infected infants become chronically infected

*in the absence of postexposure prophylaxis

Risk of Chronic HBV Carriage



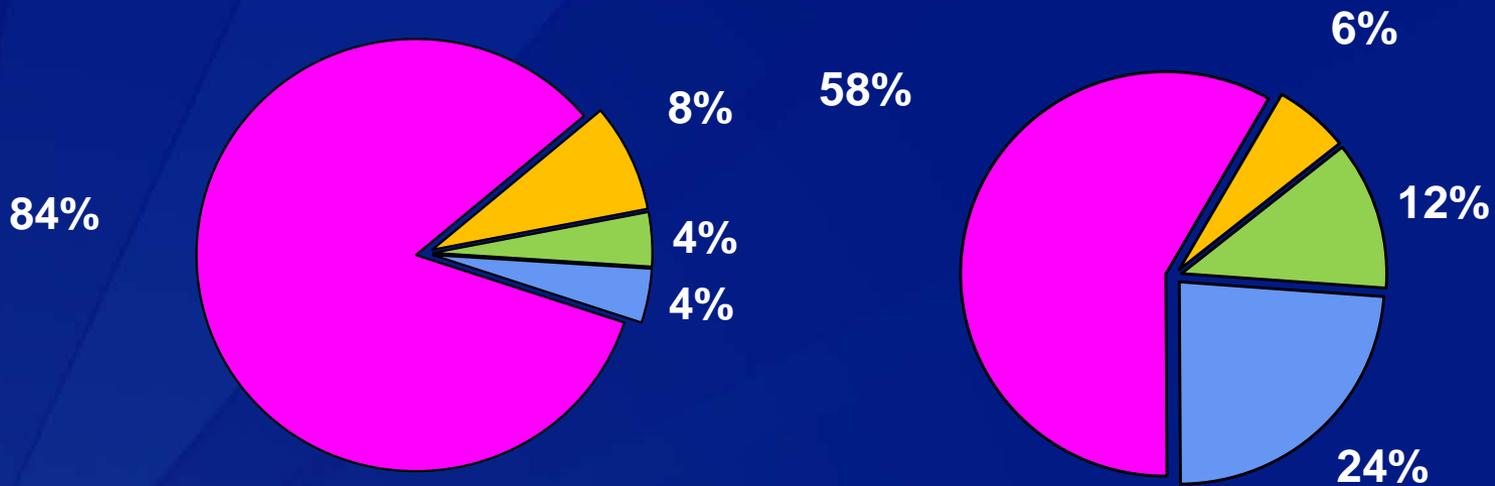
Hepatitis B Epidemiology

- ❑ **Reservoir** Human
- ❑ **Transmission** Bloodborne
Subclinical cases transmit

1-2 months before and
after onset of symptoms
- ❑ **Communicability** Persons with either acute
or chronic HBV infection
with HBsAg present in
blood

Age of Infection of Acute and Chronic Hepatitis B Virus Infection

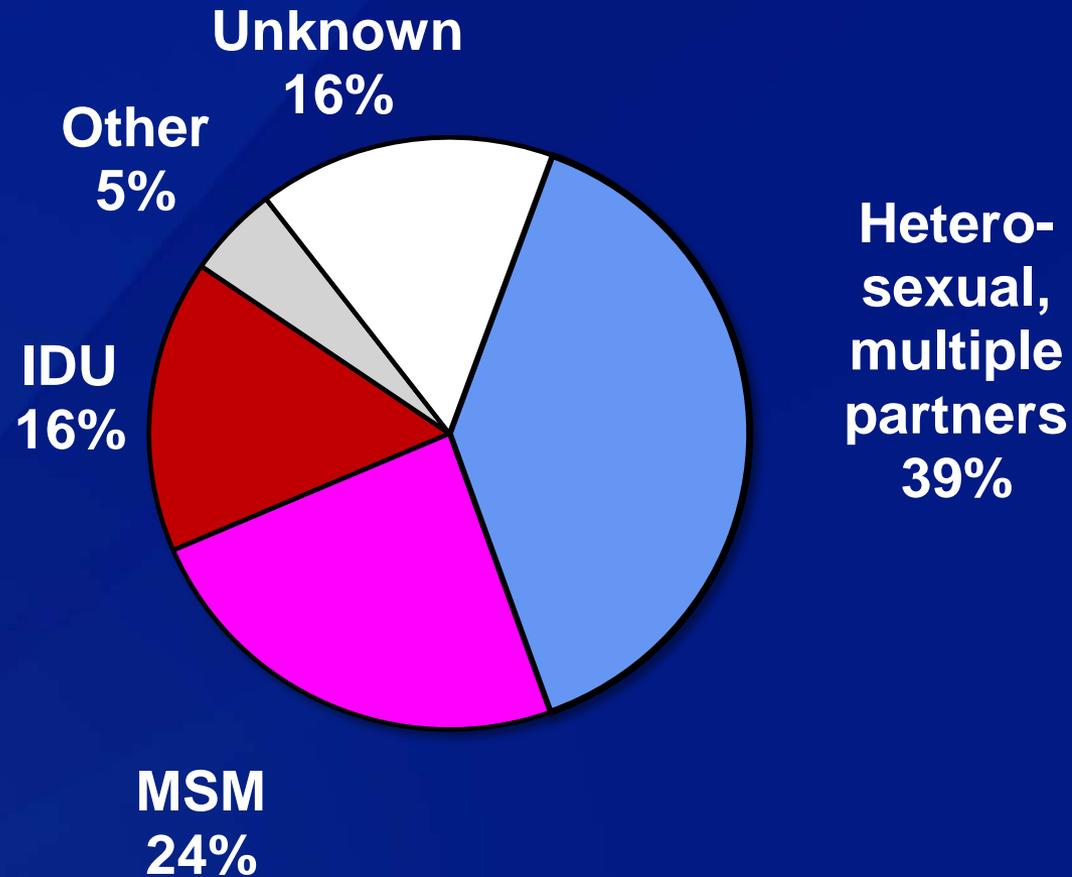
■ Adolescent ■ Children ■ Perinatal ■ Adult



Acute infection

Chronic infection

Risk Factors for Hepatitis B



Strategy to Eliminate Hepatitis B Virus Transmission—United States

- ❑ Prevent perinatal HBV transmission**
- ❑ Routine vaccination of all infants**
- ❑ Vaccination of children in high-risk groups**
- ❑ Vaccination of adolescents**
- ❑ Vaccination of adults in high-risk groups**

Hepatitis B (HepB) Vaccine

- ❑ **Composition** Recombinant HBsAg
- ❑ **Efficacy** 95% (Range, 80%-100%)
- ❑ **Duration of Immunity** 20 years or more
- ❑ **Schedule** 3 Doses
- ❑ **Booster doses not routinely recommended**

HepB Vaccine Indications

- ❑ **All children through 18 years of age beginning at birth**
- ❑ **Persons 19 years and older at increased risk of exposure because of behavior (multiple sexual partners, injection drug use) or occupation (exposure to blood or sharps injury)**

HepB Vaccine Formulations

❑ **Recombivax HB (Merck)**

- 5 mcg/0.5 ml (pediatric)
- 10 mcg/1 ml (adult)
- 40 mcg/1 ml (dialysis)

❑ **Engerix-B (GSK)**

- 10 mcg/0.5 ml (pediatric)
- 20 mcg/1 ml (adult)

Recommended Dosage of HepB Vaccine

	Recombivax HB Dose (mcg)	Enerix-B Dose (mcg)
Infants and children younger than 11 years of age	0.5 mL (5)	0.5 mL (10)
Adolescents 11-19 years	0.5 mL (5)	0.5 mL (10)
Adults 20 years of age and older	1.0 mL (10)	1.0 mL (20)

Figure 1. Recommended Immunization schedule for persons aged 0 through 18 years – United States, 2016.

(FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE (FIGURE 2)).

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are shaded.

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19–23 mos	2-3 yrs	4-6 yrs	7-10 yrs	11-12 yrs	13–15 yrs	16–18 yrs
Hepatitis B ¹ (HepB)	1 st dose	← 2 nd dose →			← 3 rd dose →											
Rotavirus ² (RV) RV1 (2-dose series); RV5 (3-dose series)			1 st dose	2 nd dose	See footnote 2											
Diphtheria, tetanus, & acellular pertussis ³ (DTaP: <7 yrs)			1 st dose	2 nd dose	3 rd dose			← 4 th dose →				5 th dose				
Haemophilus influenzae type b ⁴ (Hib)			1 st dose	2 nd dose	See footnote 4		← 3 rd or 4 th dose → See footnote 4									
Pneumococcal conjugate ⁵ (PCV13)			1 st dose	2 nd dose	3 rd dose		← 4 th dose →									
Inactivated poliovirus ⁶ (IPV: <18 yrs)			1 st dose	2 nd dose	← 3 rd dose →							4 th dose				
Influenza ⁷ (IIV; LAIV)					Annual vaccination (IIV only) 1 or 2 doses						Annual vaccination (LAIV or IIV) 1 or 2 doses			Annual vaccination (LAIV or IIV) 1 dose only		
Measles, mumps, rubella ⁸ (MMR)					See footnote 8		← 1 st dose →					2 nd dose				
Varicella ⁹ (VAR)							← 1 st dose →					2 nd dose				
Hepatitis A ¹⁰ (HepA)							← 2-dose series, See footnote 10 →									
Meningococcal ¹¹ (Hib-MenCY ≥ 6 weeks; MenACWY-D ≥ 9 mos; MenACWY-CRM ≥ 2 mos)			See footnote 11											1 st dose		Booster
Tetanus, diphtheria, & acellular pertussis ¹² (Tdap: ≥ 7 yrs)														(Tdap)		
Human papillomavirus ¹³ (2vHPV: females only; 4vHPV, 9vHPV: males and females)														(3-dose series)		
Meningococcal B ¹¹														See footnote 11		
Pneumococcal polysaccharide ⁵ (PPSV23)												See footnote 5				

Range of recommended ages for all children
 Range of recommended ages for catch-up immunization
 Range of recommended ages for certain high-risk groups
 Range of recommended ages for non-high-risk groups that may receive vaccine, subject to individual clinical decision making
 No recommendation

This schedule includes recommendations in effect as of January 1, 2016. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at <http://www.cdc.gov/vaccines/hcp/acip-recs/index.html>. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (<http://www.vaers.hhs.gov>) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online (<http://www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm>) or by telephone (800-CDC-INFO [800-232-4636]).

This schedule is approved by the Advisory Committee on Immunization Practices (<http://www.cdc.gov/vaccines/acip>), the American Academy of Pediatrics (<http://www.aap.org>), the American Academy of Family Physicians (<http://www.aafp.org>), and the American College of Obstetricians and Gynecologists (<http://www.acog.org>).

NOTE: The above recommendations must be read along with the footnotes of this schedule.

Prevention of Perinatal Hepatitis B Virus Infection

- ❑ Begin treatment within 12 hours of birth**
- ❑ HepB vaccine (first dose) and HBIG at different sites**
- ❑ Complete vaccination series at 6 months of age**
- ❑ Test for response after completion of at least 3 doses of the HepB series at 9 through 12 months of age (generally at the next well-child visit)**

Preterm Infants

- ❑ Birth dose and HBIG if mother HBsAg positive (within 12 hours of birth)
- ❑ Preterm infants who weigh less than 2,000 grams have a decreased response to vaccine administered before 1 month of age
- ❑ Delay first dose until chronologic age 1 month if mother **documented** to be HBsAg negative **at the time of birth**

HepB Vaccine

Routine Infant Schedule

Dose+	Usual Age	Minimum Interval
Primary 1	Birth	--
Primary 2	1- 2 months	4 weeks
Primary 3+	6-18 months*	8 weeks**

* Infants whose mothers are HBsAg+ or whose HBsAg status is unknown should receive the third dose at 6 months of age

** At least 16 weeks after the first dose

+ An additional dose at 4 months is acceptable if the clinician prefers to use a combination vaccine that contains hepatitis B vaccine

Third Dose of HepB Vaccine

- ❑ **Minimum of 8 weeks after second dose,
and**
- ❑ **At least 16 weeks after first dose,
and**
- ❑ **For infants, at least 24 weeks of age**

Pediarix

- ❑ **DTaP – Hep B – IPV combination**
- ❑ **Approved for 3 doses at 2, 4, and 6 months**
- ❑ **Not approved for booster doses**
- ❑ **Approved for children 6 weeks to 7 years of age**

Pediarix

- ❑ **Minimum age 6 weeks**
 - **Cannot be used for HepB birth dose**

- ❑ **Can be given at 2, 4, and 6 months in infants who received a birth dose of HepB vaccine (total of 4 doses)**

- ❑ **May be used in infants whose mothers are HBsAg positive or status unknown***

*ACIP off-label recommendation

HepB Vaccine

Adolescent Vaccination

- ❑ Routine vaccination recommended through age 18 years**
- ❑ Integrate into routine adolescent immunization visit**
- ❑ Flexible schedules**

HepB Vaccine

Adolescent and Adult Schedule

Dose	Usual Interval	Minimum Interval
Primary 1	---	---
Primary 2	1 month	4 weeks
Primary 3	5 months	8 weeks*

* Third dose must be separated from first dose by at least 16 weeks

Alternative Adolescent Vaccination Schedule

- ❑ Two 1.0 mL (10 mcg) doses of Recombivax HB separated by 4 to 6 months**
- ❑ Approved only for adolescents 11–15 years of age**
- ❑ Only applies to Merck HepB vaccine**

Figure 2. Vaccines that might be indicated for adults aged 19 years or older based on medical and other indications¹

VACCINE ▼	INDICATION ►	Pregnancy	Immuno-compromising conditions (excluding HIV infection) ^{4,6,7,8,13}	HIV infection CD4+ count (cells/ μ L) ^{4,6,7,8,13}		Men who have sex with men (MSM)	Kidney failure, end-stage renal disease, on hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Asplenia and persistent complement component deficiencies ^{8,11,12}	Chronic liver disease	Diabetes	Healthcare personnel
				< 200	\geq 200							
Influenza ^{*2}												1 dose annually
Tetanus, diphtheria, pertussis (Td/Tdap) ^{*3}		1 dose Tdap each pregnancy										Substitute Tdap for Td once, then Td booster every 10 yrs
Varicella ^{*4}			Contraindicated									2 doses
Human papillomavirus (HPV) Female ^{*5}												3 doses through age 26 yrs
Human papillomavirus (HPV) Male ^{*5}												3 doses through age 21 yrs
Zoster ⁶			Contraindicated									1 dose
Measles, mumps, rubella (MMR) ^{*7}			Contraindicated									1 or 2 doses depending on indication
Pneumococcal 13-valent conjugate (PCV13) ^{*8}												1 dose
Pneumococcal polysaccharide (PPSV23) ⁸												1, 2, or 3 doses depending on indication
Hepatitis A ^{*9}												2 or 3 doses depending on vaccine
Hepatitis B ^{*10}												3 doses
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4) ^{*11}												1 or more doses depending on indication
Meningococcal B (MenB) ¹¹												2 or 3 doses depending on vaccine
<i>Haemophilus influenzae</i> type b (Hib) ^{*12}												3 doses post-HSCT recipients only 1 dose

^{*}Covered by the Vaccine Injury Compensation Program

 Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster
 Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)
 No recommendation
 Contraindicated



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly recommended for adults aged \geq 19 years, as of February 2016. For all vaccines being recommended on the Adult Immunization Schedule: a vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/hcp/acip-recs/index.html). Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

Adults at Risk for HBV Infection

□ Sexual exposure

- Sex partners of HBsAg-positive persons
- Sexually active persons not in a long-term, mutually monogamous relationship*
- Persons seeking evaluation or treatment for a sexually transmitted disease
- Men who have sex with men

* Persons with more than one sex partner during the previous 6 months

Adults at Risk for HBV Infection

- ❑ **Percutaneous or mucosal exposure to blood**
 - Current or recent IDU
 - Household contacts of HBsAg-positive persons
 - Residents and staff of facilities for developmentally disabled persons
 - Healthcare and public safety workers with risk for exposure to blood or blood-contaminated body fluids
 - Persons with end-stage renal disease
 - Persons with diabetes mellitus

□ CDC has become increasingly concerned about risks for transmitting HBV during assisted blood glucose monitoring and insulin administration

□ In the last 10 years, at least 15 outbreaks of HBV have been associated with providers failing to follow basic principles of infection control when assisting with blood glucose monitoring, particularly in long-term care settings (e.g. .nursing homes and assisted living facilities)

The screenshot shows the CDC website interface. At the top, it says 'CDC Home' and 'Centers for Disease Control and Prevention' with the tagline 'CDC 24/7: Saving Lives. Protecting People. Saving Money through Prevention.' Below this is an 'A-Z Index' navigation bar. The main content area is titled 'Injection Safety' and features a sidebar with a menu. The menu items include 'CDC's Role', 'Information for Providers', 'Information for Patients', 'Preventing Unsafe Injection Practices', 'Infection Prevention during Blood Glucose Monitoring and Insulin Administration' (which is highlighted), 'FAQs regarding Assisted Blood Glucose Monitoring and Insulin Administration', 'Recent Publications', 'Recent Meetings', and 'The One & Only Campaign'. The main content area has a sub-header 'Infection Prevention during Blood Glucose Monitoring and Insulin Administration' and a 'Summary' section. The summary states that CDC is increasingly concerned about the risks of transmitting hepatitis B virus (HBV) and other infectious diseases during assisted blood glucose (blood sugar) monitoring and insulin administration. It then lists infection control requirements: 1) Fingerstick devices should **never** be used for more than one person. 2) Whenever possible, blood glucose meters should **not** be shared. If they must be shared, the device should be cleaned and disinfected after every use, per manufacturer's instructions. If the manufacturer does not specify how the device should be cleaned and disinfected then it should not be shared. 3) Insulin pens and other medication cartridges and syringes are for single-patient-use only and should **never** be used for more than one person. To the right of the summary is an 'On this Page' section with a list of links: Summary, Blood Glucose Monitoring and Insulin Administration, Unsafe Practices, Best Practices, Fingerstick Devices, Blood Glucose Meters, Insulin Administration, Recommended Practices, Additional Information, and References. Below the summary is a 'Blood Glucose Monitoring and Insulin Administration' section with a paragraph explaining that monitoring of blood glucose levels is frequently performed to guide therapy for persons with diabetes. It notes that blood glucose monitoring and insulin administration can be accomplished in two ways: *self-monitoring of blood glucose and insulin administration*, where the individual performs all steps of the testing and insulin administration themselves, and *assisted monitoring of blood glucose and insulin administration*, where another person assists with or performs testing and insulin administration for an individual. At the bottom right of the page, there is a 'Top of page' link with a circular arrow icon.

ACIP Recommendation for Diabetics

- ❑ HepB vaccine (3-dose series) **should** be administered to unvaccinated adults (19 through 59 years of age) with diabetes (insulin and non-insulin dependent)
- ❑ HepB vaccine (3-dose series) **may** be administered to unvaccinated adults (60 years of age and older) with diabetes (insulin and non-insulin dependent)

Adults at Risk for HBV Infection

❑ Other groups

- International travelers to regions with high or intermediate levels (HBsAg prevalence of 2% or higher) of endemic HBV infection
- Persons with HIV infection

Twinrix

- ❑ **Combination HepA vaccine (pediatric dose) and HepB (adult dose)**

- ❑ **Schedules**
 - **0, 1, 6 months, or**
 - **0, 7, 21- 30 days and a booster dose at 12 months**

- ❑ **Approved for persons 18 years of age and older**

Prevaccination Serologic Testing

- ❑ **Not indicated before routine vaccination of infants or children**
- ❑ **Recommended for:**
 - **All persons born in Africa, Asia, the Pacific Islands, and other regions with HBsAg prevalence of 2% or higher**
 - **Household, sex, and needle-sharing contacts of HBsAg-positive persons**
 - **Men who have sex with men**
 - **Injection drug users**
 - **Certain persons receiving cytotoxic or immunosuppressive therapy**

Postvaccination Serologic Testing

- ❑ **Not routinely recommended following vaccination of infants, children, adolescents, or most adults**

- ❑ **Recommended for:**
 - **Chronic hemodialysis patients**
 - **Other immunocompromised persons**
 - **Persons with HIV infection**
 - **Sex partners of HBsAg+ persons**
 - **Infants born to HBsAg+ women**
 - **Healthcare personnel**

Postvaccination Serologic Testing

- ❑ **Healthcare personnel who have contact with patients or blood should be tested for anti-HBs (antibody to hepatitis B surface antigen) 1 to 2 months after completion of the 3-dose series**

Management of Nonresponse to HepB Vaccine

- ❑ **Complete a second series of 3 doses**
- ❑ **Should be given on the usual schedule of 0, 1, and 6 months**
 - May be given on a 0,1, and 4 month or 0, 2 and 4 month schedule
- ❑ **Retest 1-2 months after completing the second series**

Persistent Nonresponse to HepB Vaccine

- ❑ Less than 5% of vaccinees do not develop anti-HBs after 6 valid doses**
- ❑ May be nonresponder or “hyporesponder”**
- ❑ Check HBsAg status**
- ❑ If exposed, treat as nonresponder with postexposure prophylaxis**

HepB Vaccine and HCP New Recommendations

- ❑ **Management of HCP who have written documentation of a complete series of HepB vaccine doses in the past who were not tested for antibody response following the vaccination series and who now test negative for anti-HBs**
 - **Administer 1 dose of HepB vaccine, then test for anti-HBs 1 to 2 months later**
 - **If positive, stop (the person is immune)**
 - **If negative, complete second series**

HepB Vaccine

- ❑ **Once a person has tested positive for anti-HBs, no additional testing or “booster” doses are recommended**
- ❑ **Provide the person with a copy of the laboratory result and advise that it be kept forever**

Centers for Disease Control and Prevention

MMWR

Recommendations and Reports / Vol. 62 / No. 10

Morbidity and Mortality Weekly Report

December 20, 2013

CDC Guidance for Evaluating Health-Care Personnel for Hepatitis B Virus Protection and for Administering Postexposure Management

www.cdc.gov/mmwr/pdf/rr/rr6210.pdf

TABLE 2. Postexposure management of health-care personnel after occupational percutaneous and mucosal exposure to blood and body fluids, by health-care personnel HepB vaccination and response status

Health-care personnel status	Postexposure testing		Postexposure prophylaxis		Postvaccination serologic testing [†]
	Source patient (HBsAg)	HCP testing (anti-HBs)	HBIG*	Vaccination	
Documented responder [§] after complete series (≥3 doses)	No action needed				
Documented nonresponder [¶] after 6 doses	Positive/unknown	—**	HBIG x2 separated by 1 month	—	No
	Negative	No action needed			
Response unknown after 3 doses	Positive/unknown	<10mIU/mL**	HBIG x1	Initiate revaccination	Yes
	Negative	<10mIU/mL	None		
	Any result	≥10mIU/mL	No action needed		
Unvaccinated/incompletely vaccinated or vaccine refusers	Positive/unknown	—**	HBIG x1	Complete vaccination	Yes
	Negative	—	None	Complete vaccination	Yes

Abbreviations: HCP = health-care personnel; HBsAg = hepatitis B surface antigen; anti-HBs = antibody to hepatitis B surface antigen; HBIG = hepatitis B immune globulin.

* HBIG should be administered intramuscularly as soon as possible after exposure when indicated. The effectiveness of HBIG when administered >7 days after percutaneous, mucosal, or nonintact skin exposures is unknown. HBIG dosage is 0.06 mL/kg.

† Should be performed 1–2 months after the last dose of the HepB vaccine series (and 4–6 months after administration of HBIG to avoid detection of passively administered anti-HBs) using a quantitative method that allows detection of the protective concentration of anti-HBs (≥10 mIU/mL).

§ A responder is defined as a person with anti-HBs ≥10 mIU/mL after ≥3 doses of HepB vaccine.

¶ A nonresponder is defined as a person with anti-HBs <10 mIU/mL after ≥6 doses of HepB vaccine.

** HCP who have anti-HBs <10mIU/mL, or who are unvaccinated or incompletely vaccinated, and sustain an exposure to a source patient who is HBsAg-positive or has unknown HBsAg status, should undergo baseline testing for HBV infection as soon as possible after exposure, and follow-up testing approximately 6 months later. Initial baseline tests consist of total anti-HBc; testing at approximately 6 months consists of HBsAg and total anti-HBc.

HepB Vaccine

Contraindications and Precautions

- ❑ **Severe allergic reaction to a vaccine component or following a prior dose**
- ❑ **Moderate or severe acute illness**

HepB Vaccine Adverse Reactions

	Adults	Infants and Children
Pain at injection site	13%-29%	3%-9%
Mild systemic complaints (fatigue, headache)	11%-17%	0%-20%
Temperature greater 37.7 C	1%	0.4%-6%
Severe systemic reactions	rare	rare

Please note: An erratum has been published for this issue. To view the erratum, please click here and here.



MMWR

Morbidity and Mortality Weekly Report

Recommendations and Reports

December 23, 2005 / Vol. 54 / No. RR-16

A Comprehensive Initiative to Eliminate Transmission of Hepatitis B Virus in the United States

Recommendations of the Advisory Committee on Immunization Practices
Part 1: Immunization of Infants and Children



INSIDE: Continuing Education

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION



MMWR

Morbidity and Mortality Weekly Report

Recommendations and Reports

December 8, 2006 / Vol. 55 / No. RR-16

A Comprehensive Initiative to Eliminate Transmission of Hepatitis B Virus in the United States

Recommendations of the Advisory Committee on Immunization Practices
Part 2: Immunization of Adults

INSIDE:

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

Morbidity and Mortality Weekly Report

Use of Hepatitis B Vaccination for Adults with Diabetes Mellitus: Recommendations of the Advisory Committee on Immunization Practices (ACIP)

Hepatitis B virus (HBV) causes acute and chronic infection of the liver leading to substantial morbidity and mortality. In the United States, since 1996, a total of 29 outbreaks of HBV infection in one or multiple long-term-care (LTC) facilities, including nursing homes and assisted-living facilities, were reported to CDC; of these, 25 involved adults with diabetes receiving assisted blood glucose monitoring (J; CDC, unpublished data, 2011). These outbreaks prompted the Hepatitis Vaccines Work Group of the Advisory Committee on Immunization Practices (ACIP) to evaluate the risk for HBV infection among all adults with diagnosed diabetes. The Work Group reviewed HBV infection-related morbidity and mortality and the effectiveness of implementing infection prevention and control measures. The strength of scientific evidence regarding protection was evaluated using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) methodology,* and safety, values, and cost-effectiveness were incorporated into a recommendation using the GRADE system. Based on the Work Group findings, on October 25, 2011, ACIP recommended that all previously unvaccinated adults aged 19 through 59 years with diabetes mellitus (type 1 and type 2) be vaccinated against hepatitis B as soon as possible after a diagnosis of diabetes is made (recommendation category A). Data on the risk for hepatitis B among adults aged ≥ 60 years are less robust. Therefore,

risk for HBV infection among adults ≥ 60 years was estimated from 865 confirmed infections reported during 2009–2010 from 10 sites constituting 17% of the U.S. population. The analyses included persons aged ≥ 23 years because of high rates among younger persons. In multivariate analyses, risk factors for infection included injection-drug use, male sex with a male sex partner, persons aged 23 through 59 years, and persons aged 23 through 59 years developing acute hepatitis B as the odds were 1.5 (CI = 0.9–2.5) times higher among persons aged ≥ 60 years. The annual incidence of acute HBV infection among adults with 100,000 (CI = 1.5–2.2) (2). Acute HBV infection is underestimated; an additional 10.5% of persons are likely to be infected for each reported, confirmed case.

Data for the period 1999–2010 from the National Health and Nutrition Examination Survey (NHANES) representative sample of the noninstitutionalized U.S. population indicated a 60% ($p < 0.001$) higher seroprevalence to hepatitis B core antigen (indicative of



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December 20, 2013

CDC Guidance for Evaluating Health-Care Personnel for Hepatitis B Virus Protection and for Administering Postexposure Management

Continuing Education Contribution available at <http://www.cdc.gov/mmwr/cer/continuing.html>.



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hepb.html
www.cdc.gov/mmwr/pdf/rr/rr6210.pdf



Hepatitis B Resources

- ❑ **ACIP's Hepatitis B Recommendations web page**
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hepb.html
- ❑ **CDC's Hepatitis B Infection web page**
www.cdc.gov/hepatitis/HBV/index.htm
- ❑ **CDC's Hepatitis B Vaccination web page**
www.cdc.gov/vaccines/vpd-vac/hepb/default.htm
- ❑ **Immunization Action Coalition Hepatitis B web page**
www.immunize.org/hepatitis-b/
- ❑ **Children's Hospital of Philadelphia Vaccine Education Center Hepatitis B web page**
www.chop.edu/service/vaccine-education-center/a-look-at-each-vaccine/hepatitis-b-vaccine.html