

Implementation of HBV Vaccination

Camilla S. Graham, MD, MPH

Division of Infectious Disease

Beth Israel Deaconess Medical Center

Harvard Medical School

Disclosures

- None for hepatitis B

Topics

- HBV vaccination
- HBV screening
- Challenges interpreting HBV serologies and how to support providers





Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022

Weekly / April 1, 2022 / 71(13);477–483

- Hep B vaccination is recommended for all eligible adults aged 19–59 years and adults aged ≥ 60 years **with risk factors** for hepatitis B.
- Adults aged ≥ 60 years without known risk factors for hepatitis B **may** also receive Hep B vaccines
 - “The new language for adults aged ≥ 60 years without known risk factors is intended to prompt all providers to offer Hep B vaccination to patients in that cohort, rather than wait for a patient to request vaccination, thus **shifting the responsibility** of initiating the consideration of Hep B vaccination from the patient to the provider.”

Implementing Adult Hepatitis B Immunization and Screening Using Electronic Health Records: A Practical Guide

by H. Nina Kim ^{1,*} , Kelly L. Moore ^{2,3}, David L. Sanders ², Michaela Jackson ⁴, Chari Cohen ⁴ , Richard Andrews ^{5,6} and Camilla S. Graham ⁷

¹ Division of Allergy & Infectious Diseases, Department of Medicine, University of Washington, Seattle, WA 98104, USA

² Immunize.org, St. Paul, MN 55116, USA

³ Department of Health Policy, Vanderbilt School of Medicine, Nashville, TN 37232, USA

⁴ Hepatitis B Foundation, Doylestown, PA 18902, USA

⁵ Houston Viral Hepatitis Task Force, Houston, TX 77040, USA

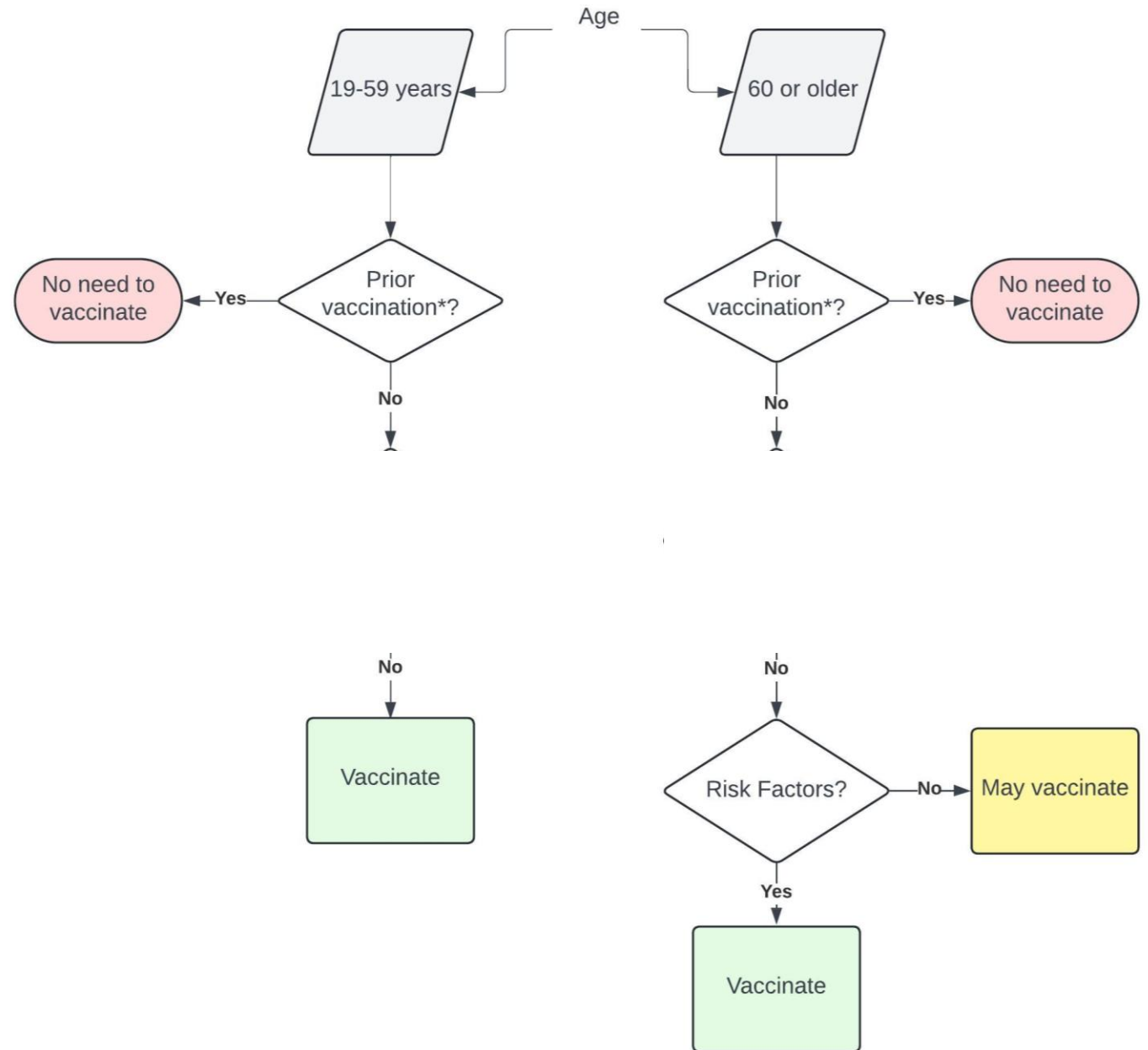
⁶ Advisory Panel, Hep B United, Doylestown, PA 18902, USA

⁷ Division of Infectious Diseases, Beth Israel Deaconess Medical Center and Harvard Medical School, Boston, MA 02215, USA

* Author to whom correspondence should be addressed.

Implement Hep B vaccination prompt in EHR: Can be done without HBV screening

“Prior vaccination?” means documented receipt of a full series as defined by a specific brand, population, and dose



Adults aged ≥ 60 years with risk factors for hepatitis B

- Persons at risk for infection by sexual exposure
 - Sex partners of persons testing positive for HBsAg
 - Sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., persons with more than one sex partner during the previous 6 months)
 - Persons seeking evaluation or treatment for a sexually transmitted infection
 - Men who have sex with men
- Persons at risk for infection by percutaneous or mucosal exposure to blood
 - Persons with current or recent injection drug use
 - Household contacts of persons testing positive for HBsAg
 - Residents and staff members of facilities for persons with developmental disabilities
 - Health care and public safety personnel with reasonably anticipated risk for exposure to blood or blood-contaminated body fluids
- Persons on maintenance dialysis, including incenter or home hemodialysis and peritoneal dialysis, and persons who are predialysis
- Persons with diabetes at the discretion of the treating clinician
- Others
 - International travelers to countries with high or intermediate levels of endemic hepatitis B virus infection (HBsAg prevalence of $\geq 2\%$)
 - Persons with hepatitis C virus infection
 - Persons with chronic liver disease (including, but not limited to, persons with cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, and an alanine aminotransferase or aspartate aminotransferase level greater than twice the upper limit of normal)
 - Persons with HIV infection
 - Persons who are incarcerated
- Adults aged ≥ 60 years without known risk factors for hepatitis B may receive hepatitis B vaccines

Hep B Vaccine Options for Age 60+

- Option 1:
 - Identify risk factors or proxys to tie to Hep B vaccine prompt
 - Send letter to **all** patients age 60+ who lack documentation of a full vaccine series or evidence of immunity/exposure informing them of Hep B vaccine option
- Option 2:
 - Add Hep B vaccine prompt to all patients over age 60 who lack documentation of a full vaccine series or evidence of immunity/exposure
- ACA/IRA covers HBV vaccination, including recent Medicare ruling on Part B coverage

Immunizations

Patient is due for the following immunizations:

- PCV 13 (Prevnar 13 – Conjugate)
- Zoster Recombinant (Shingrix)

* [For date:](#) 04/28/2019

Type	Last entry	Type	Last entry
------	------------	------	------------

Routine Immunizations

- | | | | |
|--|----------------------------|---|----------------------------|
| <input type="checkbox"/> Hepatitis A Vaccination | | <input checked="" type="checkbox"/> Hepatitis B Vaccination
Project-HD Recombivax Engerix Vaccination Flyer <ul style="list-style-type: none"><input checked="" type="radio"/> Heplisav-B (Adult, Routine administration)<input type="radio"/> Recombivax or Engerix, Adult standard dose (1mL/dose) (preferred in pregnancy, Recombivax Age>10, Engerix Age >19)<input type="radio"/> Recombivax, high dose (40mcg = 1mL/dose) (End-stage renal disease, immunocompromised host)<input type="radio"/> Engerix, high dose (40mcg = 2mL/dose) (End-stage renal disease, immunocompromised host)<input type="radio"/> Recombivax (5mcg) or Engerix (10mcg), Pediatric dose (0.5mL/dose) – (Recombivax Age<=10, Engerix <=19) | |
| <input type="checkbox"/> HPV Vaccination (Gardasil) | | <input type="checkbox"/> Influenza Vaccination | 02/27/2019 |
| <input type="checkbox"/> MenACWY (Menveo; Menactra) | | <input type="checkbox"/> MMR Vaccination | |
| <input type="checkbox"/> PCV 13 (Prevnar 13 – Conjugate) | 11/30/2015 | <input type="checkbox"/> PPD | 08/08/2014 |

Provide Hep B Vaccine Decision Support

- Brand of vaccine
 - Different brands have different dosing so don't just list "Hepatitis B vaccine"
 - Selection of preferred brand may involve P&T committee, contracting, etc
- Indicated populations
 - Adult only, pregnancy, hemodialysis
- Appropriate dose and number of vaccines in full series
 - i.e., HD patients receive high dose Engerix-B for four doses
- Pre-populate vaccine schedule and add to dashboard for all providers
- Schedule future appointments for additional vaccines in series
- Send reminders to patient for follow up
- Provide decision-support tables and FAQs

Examples of Common HBV Vaccine Questions

- Do you need to confirm anti-HBs Ab status after completing a full vaccine course?
 - Population level = No
 - In most circumstances we do not check titers to verify response to a vaccine
 - Individual level: If a patient is immunocompromised or is at high risk for HBV acquisition, check anti-HBs Ab 3 -4 months after completion of series
- If you are uncertain about someone's HBV vaccine status, can you give them a first HBV vaccine and then soon after check their anti-HBs Ab status?
 - In general, yes. If using a 3-vaccine series, can spare patients third vaccine if boosting leads to seroprotective levels of anti-HBs



Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022

Weekly / April 1, 2022 / 71(13);477–483

USPSTF and CMS have not updated recommendations so currently only adult risk-based screening is consistently covered by insurance



Simultaneous implementation



Screening and Testing for Hepatitis B Virus Infection: CDC Recommendations — United States, 2023

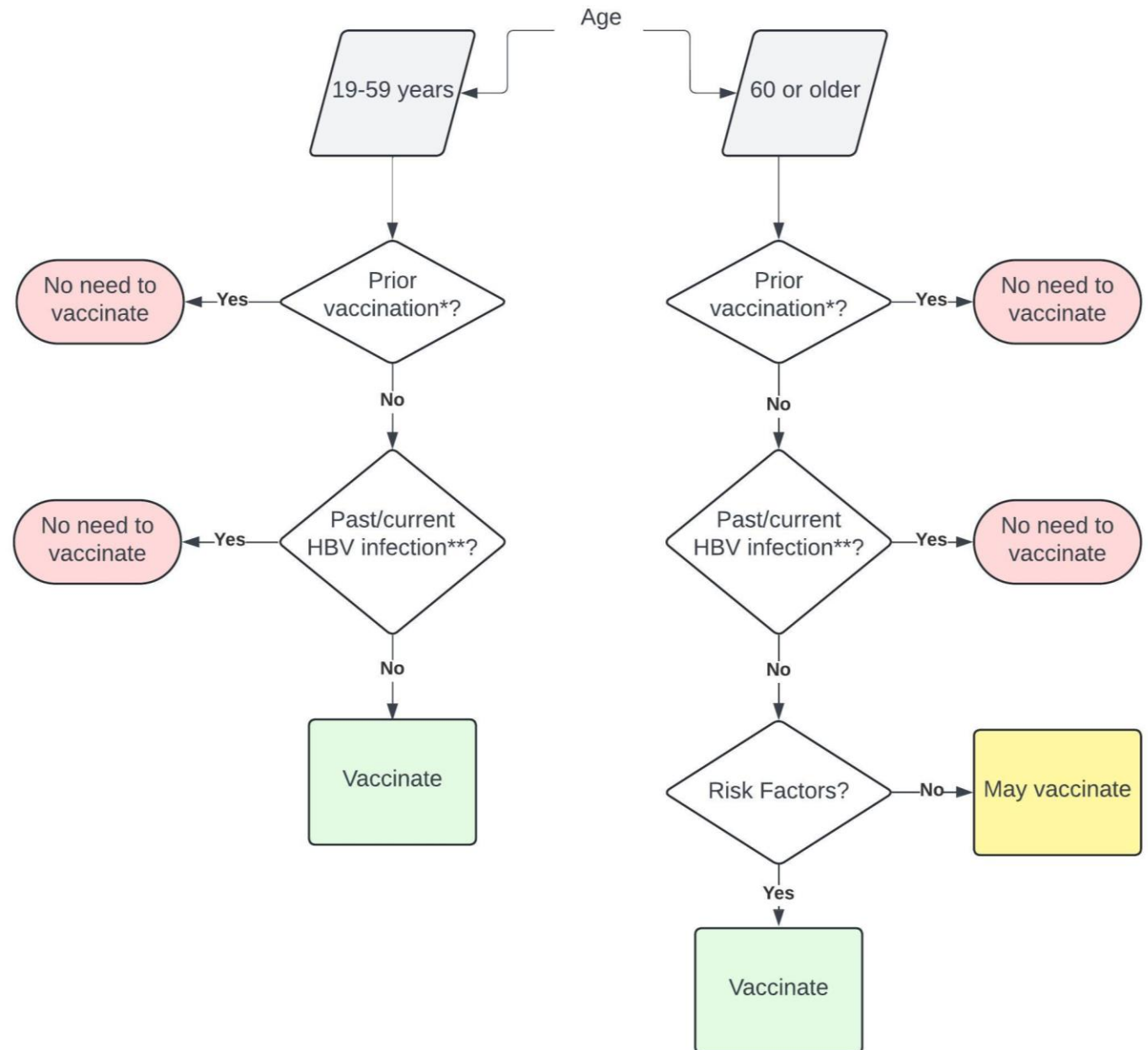
Recommendations and Reports / March 10, 2023 / 72(1);1–25

Implement Hep B Vaccination Prompt in EHR: With Serology Data

“Past/current HBV infection”:

- Hepatitis B surface antigen
- Hepatitis B core antibody (total, IgG, or IgM)
- Hepatitis B surface antibody*
- Hepatitis B e antigen
- Hepatitis B e antibody
- Hepatitis B DNA

Kim HN, Moore KL, Sanders DL, Jackson M, Cohen C, Andrews R, Graham CS. Implementing Adult Hepatitis B Immunization and Screening Using Electronic Health Records: A Practical Guide. *Vaccines*. 2024; 12(5):536.



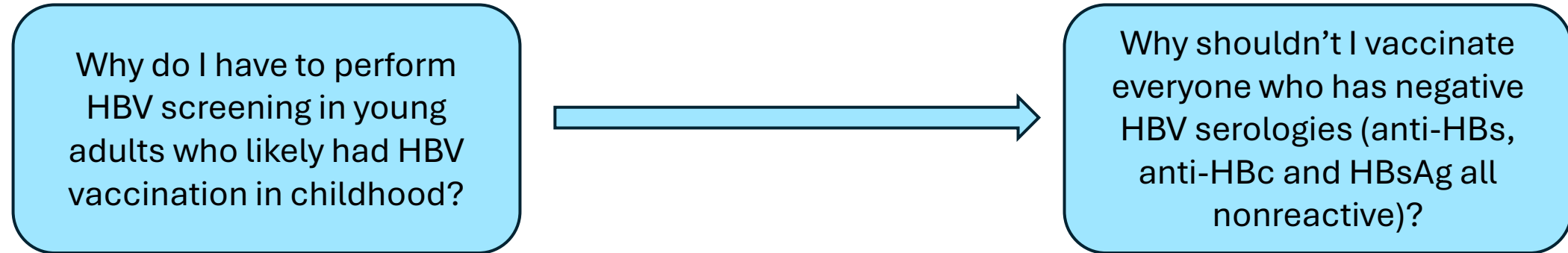
- ☐ [Blastomycosis Antibody \(by CF and ID\)](#)
- ☐ [Cardiolipin Antibodies \(IgG, IgM\)](#)
- ☐ [CMV IgG Ab](#)
- ☐ [CMV IgG/IgM Ab Panel](#)
- ☐ [Coccidioides Ab, Complement Fixation and Immunodiffusion](#)
- ☐ [Cryptococcal Antigen](#)
(w/reflex titer if positive)
- ☐ [EBV Ab Panel](#)
- ☐ [H. pylori IgG Ab](#)
- ☐ [Hepatitis A Antibody](#)
- ☐ [Hepatitis A Antibody, IgM](#)
- ☐ [Hepatitis B Screening Panel](#)
(Includes Hepatitis B Surface Antigen,
Hepatitis B Surface Antibody,
Hepatitis B Core Antibody (Total))
- ☐ [Hepatitis B Core Antibody](#)
- ☐ [Hepatitis B Core Antibody, IGM](#)
- ☐ [Hepatitis B Surface Antibody](#)
- ☐ [Hepatitis B Surface Antigen](#)
- ☐ [Hepatitis Be Antibody](#)
- ☐ [Hepatitis Be Antigen](#)

Use an HBV Screening order set
to reduce ordering errors and
ensure all three HBV serological
tests are performed

Interpreting HBV Serologies: Vaccination

HBsAg	Total Anti-HBc	Anti-HBs	Interpretation	Management	HBV Vaccination
-	-	-	Susceptible	Vaccinate unless documented receipt of full vaccine series and low risk acquisition	YES
+	-	-	False positive	Repeat screening panel in 30 days BEFORE next HBV vaccine given	YES

Understand Causes of Confusion in HBV



- Critical to prompt for vaccination for everyone who meets criteria
- Equally critical to not prompt for vaccination in patients who do not meet criteria
- Risk-based HBV screening (HBsAg) is a USPSTF Grade B recommendation
- Need to account for HBV serologies even if no active screening program since patients may have these lab data
- Provide informational support (vaccine selection, interpret serologies) so providers understand next steps in management

Interpreting HBV Serologies

HBsAg	Total Anti-HBc	Anti-HBs	Interpretation	Management	HBV Vaccination
+	+	-/+	Current infection	Refer to HBV specialists for management of active HBV Reminder to refer household and sexual contacts for HBV screening and vaccination	NO
-	+	+	Prior infection with immune control	Add “risk of HBV reactivation with immune suppression” to problem list	NO
-	+	-	Prior infection or Window period or Occult infection or False positive (1-3%)	Refer to HBV specialists for evaluation	Probably NO
-	-	+	Immune from prior vaccination	No further action - protected for life from chronic HBV infection	NO
-	-	-	Susceptible	Vaccinate unless documented receipt of full vaccine series and low risk acquisition	YES
+	-	-	False positive	Repeat screening panel in 30 days BEFORE next HBV vaccine given	YES

Examples of HBV Vaccine Questions in Setting of HBV Serology Data

- If someone's HBV serologies are all negative, should you vaccinate them even if they have documentation of a full vaccine series?
 - Population level: No
 - In most circumstances we do not check titers to verify response to a vaccine
 - If someone has previous documentation of anti-HBs with titer >10 IU/mL, even if it wanes, T cell responses prevent the development of chronic active HBV infection
 - Individual level: Consider, esp if vaccinated with older formulations, immunocompromised, at high risk for HBV acquisition
 - >5% of people do not respond to the older HBV vaccines
- Should you vaccinate someone who is isolated anti-HBc Ab positive?
 - Almost always, no
 - 0.2% to 3% false positive in all isolated anti-HBc+ pts.
 - If immunocompromised or other high risk, can try to vaccinate and check anti-HBs titer
 - Can ask lab if anti-HBc Ab result is near cut-off since low titer more likely to be false positive
 - Can check HBeAg and anti-HBe but >50% of true positive pts will be negative and have no other hepatitis B markers
 - Do not want to miss identifying patients at risk for HBV reactivation if immune suppressed

HBV Vaccination Patient Letter Template Example:

No Immunity and Age <60 Years

- Your blood tests show that you do not have hepatitis B infection, but also that you do not have evidence of immunity to hepatitis B or documentation of prior vaccination. Hepatitis B vaccination is recommended for all people under the age of 60.
- Hepatitis B is a virus that infects the liver and can cause damage, and is spread by contact with body fluids, such as through sexual activities, injection drug use, or blood products. There is a vaccine for hepatitis B, which is well tolerated and covered by insurance.
- Please feel free to call the office at XXX or using the patient portal to make an appointment with a nurse, or visit a local pharmacy to receive the hepatitis B vaccine. If you have further questions, I would be happy to *discuss them at your next appointment.*

HBV Vaccination Patient Letter Template

Example: No Immunity and Age ≥ 60 Years

- Your blood tests show that you do not have hepatitis B infection, but also that you do not have evidence of immunity to hepatitis B or documentation of prior vaccination.
- Hepatitis B is a virus that infects the liver and can cause damage, and is spread by contact with body fluids, such as through sexual activities, injection drug use, or blood products.
- There is a vaccine for hepatitis B, which is well tolerated and covered by insurance*. *It is generally recommended for people age 60 years or greater who have certain risk factors but you may decide to get it if you like.* If you have further questions, we can discuss them at your next appointment.


As of Oct 1, 2023, Medicare covers HBV vaccination under Part B for those with risk factors and Part D for those without risk factors. Note CMS and some commercial payers do not cover HBV screening in persons without risks


How Can You Help HBV Elimination Goals?


- If you develop programming to support HBV vaccination and/or screening, share with organizations AND EHR companies
- Ask EHR companies to please integrate HBV decision support into foundational platforms
- If you have non-risk based HBV screening data, please share with USPSTF and CMS (Hepatitis B Foundation can help)
- Publish your data on HBV vaccination and screening to help others develop best-practice initiatives

Universal HBV Vaccination & Screening Resources

Who should be vaccinated?

 Adults < 60

 Adults 60 years and older with risk factors* for HBV


 Anyone who wants the vaccine

Which Vaccine?

- All HBV vaccines are approved for use in the general adult population. There is no official preference for one vaccine over another.
 - Heplisav-B and PreHevbrio are NOT recommended in pregnancy due to a lack of safety data
- Heplisav-B and PreHevbrio have quicker and higher rates of protection including higher rates of protection associated with obesity, smoking, diabetes, and well-managed chronic illnesses over older 3 dose HBV vaccines

Screening Information

- All adults 18 years and older should be screened once in their life for HBV using the triple panel test (HBsAg, HBsAb, HBcAb).
- Recommend patients talk to their doctor about screening if you cannot screen during the visit.



FAQ

Q: What should be done if the HBV vaccine series was not completed?
A: If the HBV vaccine series is interrupted, the next dose should be given as soon as possible. The first dose(s) does not need to be repeated.

Universal adult HepB vaccination through age 59 years removes the need for risk factor screening and disclosure.

*See risk factors at the bottom of the page

Billing and Insurance

The HBV vaccine should be covered with no cost-shares for all insured adults with commercial insurance, Medicare, and states with expanded Medicaid.

ICD-10: Z23 - Encounter for immunization
CPT Administrative Code: 90471

CPT Product Codes (adult schedule):

- PreHevbrio (3-dose) - 90759
- Engerix-B (3-dose) - 90746
- Twinrix (Hepatitis A & B - 3 dose) - 90636
- Recombivax HB (3-dose) - 90746
- Heplisav-B (2-dose) - 90739

NOTE: The above codes are for a standard adult patient, and the CPT code may differ based on the dosage/schedule needed for your patient. Please refer to current payer publications for the most up-to-date coding information, as codes may have changed.

Clinical Resources for Implementing Universal Adult Hepatitis B Vaccination and Screening

Guidance on the Clinical Implementation of Adult Universal Hepatitis B Vaccination and Screening -

- This document is intended to aid clinicians in implementing the new adult hepatitis B recommendations. It contains a summary of the updated recommendations, strategies for implementation in different settings, downloadable resources and handouts for providers, and connections to helpful patient and clinical resources.

Call to Action: Eliminating Hepatitis B Virus Through Universal Screening and Vaccination for Adults Ages 19-59

- The Foundation's Hepatitis B Screening & Vaccine Advisory Council has developed guidance on how healthcare providers in various settings can begin implementing universal hepatitis B screening and vaccination.

Adult Hepatitis B Vaccination Information for Providers Handout -

- This handout contains information on who should be vaccinated for hepatitis B, billing and insurance codes, and a provider FAQ.

Hepatitis B Online Lessons

HBV Epidemiology

Reviews United States and global HBV incidence and prevalence, populations at risk for HBV acquisition, and the clinical and laboratory criteria for HBV case definitions.

Quick Reference >

Rapidly access info about HBV Epidemiology

Self-Study 2nd Edition CNE/CME

Track progress and receive CE credit

HBV Screening, Testing, and Diagnosis

Details the groups considered at priority for HBV testing, the recommended screening and diagnostic tests, and how to interpret HBV diagnostic test results.

Quick Reference >

Rapidly access info about Screening, Testing and Diagnosis

Self-Study 2nd Edition CNE/CME

Track progress and receive CE credit

HBV Immunizations

Identifies indications for HBV vaccine, describes dosing schedules and administration of vaccines, and management of vaccine nonresponders.

Quick Reference >

Rapidly access info about HBV Immunizations

Self-Study 2nd Edition CNE/CME

Track progress and receive CE credit

Anyone can be at risk for hepatitis B.

Are you Protected from Liver Cancer?

Most adults born before 1991 were never vaccinated for hepatitis B.

The hepatitis B vaccine is:

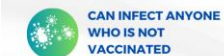
- ✓ Safe
- ✓ Effective
- ✓ Free



IT'S TIME TO GET PROTECTED FROM HEPATITIS B

The CDC recommends hepatitis B screening for all adults and hepatitis B vaccination for all adults ages 19-59.

HEPATITIS B:



YOU CAN PROTECT YOURSELF FROM LIVER CANCER

- 1 Get tested for hepatitis B. It's the only way to know if you have ever been exposed to the virus.
- 2 Get vaccinated for hepatitis B. The hepatitis B vaccine protects you for life!

Visit www.hepb.org for more information.