Immunization Protocol

Adult Hepatitis B Vaccines and Combos: ENGERIX-B®, HEPLISAV-B®, RECOMBIVAX HB®, TWINRIX®	
Last Reviewed	10 September 2021
Last Revised	10 September 2021
This order expires	30 September 2023

Table of contents

1. What's new

Non-substantive edits and formatting.

2. Oregon immunization protocol

A. Check the ALERT Immunization Information System (IIS) to determine whether the patient needs this vaccine and any other vaccines.

B. Screen clients for contraindications and precautions.

C. Provide a current Vaccine Information Statement (VIS), answering any questions.

D. Record all required data elements in the client's permanent health record.

E. Verify needle length for intramuscular (IM) injection into the deltoid muscle.

F. To avoid injury related to vaccine administration, make sure staff who administer vaccines recognize the anatomic landmarks for identifying the deltoid muscle and use proper IM administration technique.

G. Give hepatitis B vaccine to persons according to risk group, age, type of vaccine and vaccine status. See section 3 for schedule.

H. Record all required data elements in the client's permanent health record.

I. May be given with all ACIP-recommended child and adult vaccinations.

J. Ask client to remain seated on the premises for 15 minutes after vaccination to decrease the risk of injury should they faint.

Health Officer Signature Date

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3. Vaccine schedule for Hepatitis B

Minimum age and vaccine schedule varies by product. See section 5, below.

4. Licensed Hepatitis B vaccines

Product Name	Vaccine Components	Presentation	Acceptable Age Range	Thimerosal
ENGERIX-B, adult formulation[1]	Hepatitis B	1.0-mL single-dose vials and prefilled syringes	≥20 years	None
HEPLISAV-B[2]		0.5-mL prefilled syringes	≥18 years	
RECOMBIVAX HB, adult formulation[3]		1.0-mL single-dose vials and prefilled syringes	≥20 years	
RECOMBIVAX HB Dialysis[3]		1.0-mL single-dose vials	≥20 years	

TWINRIX[4]	Hep. A – Hep. B	1.0-mL prefilled syringes	≥18 years	

5. Recommendations for use

Routine Adult Hepatitis B Vaccine Schedule[5]			
Dose	**Preferred Age**	**Minimum Acceptable Age**	**Minimum Acceptable Spacing**
1	≥20 years	≥20 years	
2			1 month dose 1 to 2
3			2 months dose 2 to 3 and 4 months after dose 1

HEPLISAV-B Vaccine Schedule[2]			
Dose	**Preferred Age**	**Minimum Acceptable Age**	**Minimum Acceptable Spacing**
1	≥18 years	≥18 years	
2			1 month dose 1 to 2

TWINRIX Vaccine Schedule[4]			
Dose	**Preferred Age**	**Minimum Acceptable Age**	**Minimum Acceptable Spacing**
1	≥18 years	≥18 years	
2			1 month dose 1 to 2
3			5 months dose 2 to 3 and 6 months dose 1 to 3

TWINRIX Accelerated Schedule[4]			
Dose	**Preferred Age**	**Minimum Acceptable Age**	**Minimum Acceptable Spacing**
1	≥18 years	≥18 years	
2			7 days dose 1 to 2
3			14–21 days dose 2 to 3
4			11 months dose 3 to 4 and 12 months after dose 1

ENGERIX-B Accelerated Schedule[1]			
Dose	**Preferred Age**	**Minimum Acceptable Age**	**Minimum Acceptable Spacing**
1	≥20 years	≥20 years	
2			1 month dose 1 to 2
3			1 month dose 2 to 3

4			10 months dose 3 to 4 and 12 months after dose 1
ENGERIX-B Dialysis Schedule[1]			
Dose	**Minimum Acceptable Age**	**Dose Volume**	**Minimum Acceptable Spacing**
1	≥20 years	One 2.0-mL dose or two 1.0-mL doses	
2			1 month dose 1 to 2
3			1 month dose 2 to 3
4			4 months dose 3 to 4
RECOMBIVAX HB Dialysis Schedule[3]			
Dose	**Minimum Acceptable Age**	**Dose Volume**	**Minimum Acceptable Spacing**
1	≥20 years	1.0 mL (40-mcg formulation)	
2			1 month dose 1 to 2
3			2 months dose 2 to 3 and 4 months after dose 1

Pre-Exposure Prophylaxis[5]

A. Persons at risk for infection through sexual exposure:

- Sexual partners of hepatitis B positive persons;
- Persons seeking evaluation or treatment for a sexually transmitted infection;
- Sexually active persons not in a long-term, mutually monogamous relationship;
- Men who have sex with men.

B. Persons at risk for infection by percutaneous or mucosal exposure to blood:

- Recent or current injection-drug use;
- Household contacts of HBsAg-positive persons;
- Residents and staff of facilities for developmentally disabled persons;
- Healthcare and public-safety personnel with reasonably anticipated risk for exposure to blood or blood-contaminated body fluids;
- Hemodialysis patients and pre-dialysis, peritoneal dialysis, and home dialysis patients;
- Persons with diabetes mellitus aged <60 years; and persons with diabetes

mellitus aged ≥60 years at the discretion of the treating clinician.

C. Persons with:
- Hepatitis C virus infection;
- Human immunodeficiency virus;
- Chronic liver disease (including, but not limited to, those with cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, and an alanine aminotransferase (ALT) or aspartate aminotransferase (AST) level greater than twice the upper limit of normal).

D. Others:
- Travelers to countries with high or intermediate levels of endemic hepatitis B virus (HBV) infection (HBsAg prevalence ≥2%);
- Incarcerated persons;
- Immigrants, refugees, or adoptees from countries where HBV infection is endemic and their household members;
- Other persons seeking protection from hepatitis B virus infection even without acknowledgment of a specific risk factor.

6. Contraindications[1-4]

A. Severe allergic reaction to a previous dose or to a vaccine component.
B. Hypersensitivity to yeast
C. Heplisav-B: Pregnancy
D. Recombivax HB: Hypersensitivity to soy peptones
E. Twinrix: Hypersensitivity to neomycin, polysorbate 80, polymyxin B

Vaccine	Vaccine Excipient Summary[7]
ENGERIX-B	aluminum hydroxide, yeast protein, sodium chloride, disodium phosphate dihydrate, sodium dihydrogen phosphate dihydrate
HEPLISAV- B	yeast protein, yeast DNA, deoxycholate, phosphorothioate-linked oligodeoxynucleotide, sodium phosphate, dibasic dodecahydrate, sodium chloride monobasic dehydrate, polysorbate 80
RECOMBIVAX HB	formaldehyde, potassium aluminum sulfate, amorphous aluminum hydroxyphosphate sulfate, yeast protein

TWINRIX	MRC-5 cellular proteins, formalin, aluminum phosphate, aluminum hydroxide, amino acids, sodium chloride, phosphate buffer, polysorbate 20, neomycin sulfate, yeast protein

7. Warnings and precautions[1-4]

Engerix-B, Recombivax HB, Twinrix**:** Dry natural rubber latex is used in the vial stopper, the syringe plunger stopper and tip cap.

8. Other considerations

A. Vaccine Interchangeability:

- **Heplisav-B[2]:** A 2-dose series only applies when both doses in the series consist of Heplisav-B. Series consisting of a combination of 1 dose of Heplisav-B and a different vaccine should consist of a total of 3 vaccine doses and should adhere to the 3-dose schedule minimum intervals. A series containing 2 doses of Heplisav-B administered at least 4 weeks apart is valid, even if the patient received a single earlier dose from another manufacturer.

- **Twinrix[4]:** Recommended for persons at risk for hepatitis A or hepatitis B. The hepatitis B component of Twinrix is equivalent to a standard adult dose of hepatitis B vaccine, the hepatitis A component has 50% of the adult standard dose. A total of 3 Twinrix doses are required to complete the series. If Twinrix is unavailable or not used to complete the Twinrix series, administer single-antigen vaccine as follows: If 1 dose of Twinrix was given, complete the series with 2 adult doses of hepatitis B vaccine and 2 adult doses of hepatitis A vaccine. If 2 doses of Twinrix were given, complete the schedule with 1 adult dose of hepatitis A vaccine and 1 adult dose of hepatitis B vaccine.

B. Booster Doses

- Hemodialysis patients: Post vaccination serology testing is recommended annually. Booster doses should be provided when anti-HBs levels decline

to <10 mIU/mL.[5] Anti-HBs testing 1–2 months following the booster dose to assess response is not recommended.

- Other immunocompromised persons: In HIV-infected persons, hematopoietic stem-cell transplant recipients, and persons receiving chemotherapy, the need for booster doses has not been determined. Annual anti-HBs testing and booster doses should be considered for persons with an ongoing risk for exposure.

C. Lactation and Pregnancy[5]

- Pregnant women who are identified as being at risk for HBV infection during pregnancy (e.g., having more than one sex partner during the previous 6 months, been evaluated or treated for an STI, recent or current injection-drug use, or having had an HBsAg-positive sex partner) should be vaccinated with Recombivax HB or Engerix-B. Do not use Heplisav-B.
- Lactation: Breast feeding is not a contraindication to vaccination for mother or infant. HBsAg-positive women should be encouraged to breast feed; breast-feeding does not pose any additional risk of exposure to the infant.[10]

D. Prevaccination serological testing* is recommended for:[5]

- Persons born in countries of high and intermediate hepatitis B virus (HBV) endemicity (HBsAg prevalence ≥2%);
- HIV positive persons;
- Household, sex, and needle-sharing contacts of HBsAg-positive persons;
- Men who have sex with men;
- Past or current injection drug users.

Hepatitis B vaccine should be administered immediately after collection of blood for testing.

*Serologic testing comprises testing for hepatitis B surface antigen (HBsAg), antibody to HBsAg (anti-HBs), and antibody to hepatitis B core antigen (anti-HBc).

E. Postvaccination serologic testing[5]

- Postvaccination serologic testing 1–2 months after the final dose of the

complete vaccine series is recommended for:

- Hemodialysis patients and others who might require outpatient hemodialysis (e.g., pre-dialysis, peritoneal dialysis, and home dialysis);
- HIV-infected and other immunocompromised persons;
- Other immunocompromised persons (e.g., hematopoietic stem-cell transplant recipients or persons receiving chemotherapy);
- Health-care personnel and public-safety workers;
- Sex partners of HBsAg-positive persons.

- Postvaccination serologic testing should be performed using a method that allows determination of the protective level of anti-HBs (≥10 mIU/mL).

F. Revaccination for non-responders:

- Persons with anti-HBs <10 mIU/mL following receipt of 2 doses of Heplisav-B (HepB-CpG) should be revaccinated with a second complete Heplisav-B series or any 3-dose hepatitis B series, followed by anti-HBs testing 1–2 months after the final dose.
- Alternatively, revaccination may consist of administration of an additional single hepatitis B vaccine dose (challenge dose) followed by anti-HBs testing 1–2 months later.
- If anti-HBs remains <10 mIU/mL, completion of a second hepatitis B vaccine series followed again by anti-HBs testing 1–2 months after the final dose.
- Administration of more than two complete hepatitis B vaccine series is generally not recommended, except for hemodialysis, and potentially immunocompromised patients.
- Heplisav-B (HepB-CpG) may be used for revaccination following an initial hepatitis B vaccine series that consisted of doses of HepB-CpG or doses from a different manufacturer.
- Healthcare personnel who do not respond to a challenge dose should complete revaccination and retesting for anti-HBs.

See separate Hepatitis B Immune Globulin (HBIG) Oregon Model Standing Order for post-exposure prophylaxis and occupational health recommendations.

9. Side effects and adverse reactions[1-4]

Event	Adults
Pain at the injection site	Up to 41%
Mild systemic complaints (fatigue, headache)	Up to 17%
Temperature up to 37.7 C (≤99.9°F)	Less than 2%
Any severe reaction	Rare

10. Storage and handling[1-4]

All clinics and pharmacies enrolled with the Vaccines for Children (VFC) Program must immediately report any storage and handling deviations to the Oregon Immunization Program at 971-673-4VFC (4823).

Vaccine	Temp	Storage Issues
Engerix-B, Heplisav B, Recombivax HB, Twinrix	Store at 2°–8° C	Do not use if vaccine has been frozen.

11. Adverse events reporting

Public providers are to complete the Vaccine Adverse Events Reporting System (VAERS) report online at https://vaers.hhs.gov/reportevent.html.

A. Save a copy of the report number for your records.

B. Send copies of the report and VAERS ID number to the Oregon Immunization Program Vaccine Safety Coordinator via confidential email at ORVAERS.Reports@state.or.us or fax (971-673-0278).

Private providers are to report events directly to VAERS and can read about options on how to do so at https://vaers.hhs.gov/reportevent.html.

VAERS Reporting Table:
https://vaers.hhs.gov/docs/VAERS_Table_of_Reportable_Events_Following_Vaccination.pdf

A pharmacist who administers any vaccine must report the following elements to the OHA ALERT Immunization Information System in a manner prescribed by OHA within 15 days of administration. This replaces the former requirement to notify the primary health care provider. A pharmacist is not required to notify the primary health care provider. Oregon Administrative Rule 855-019-0290-(2)(3).

Event and interval from vaccination

A. Anaphylaxis or anaphylactic shock (7 days)

B. Shoulder injury related to vaccine administration (7 days)

C. Vasovagal syncope (7 days)

D. Any acute complications or sequelae (including death) of the above event (interval not applicable)

E. Events described in manufacturer's package insert as contraindications to additional doses of vaccine (interval: see package insert).

12. References

1. Engerix-B®. [Package insert]. 2019. Retrieved from www.fda.gov/vaccines-blood-biologics/vaccines/engerix-b. Accessed 26 Aug 2021.
2. Heplisav-B®. [Package insert]. 2020. Retrieved from www.fda.gov/vaccines-blood-biologics/vaccines/heplisav-b. Accessed 26 Aug 2021.
3. Recombivax® HB. [Package insert]. 2018. Retrieved from www.fda.gov/vaccines-blood-biologics/vaccines/recombivax-hb. Accessed 26 Aug 2021.
4. Twinrix®. [Package insert]. 2018. Retrieved from www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM110079.pdf. Accessed 26 Aug 2021.
5. Schillie S, Vellozzi C, Reingold A, et al. Prevention of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices. MMWR 2018; 67(RR-1):1–31. Available at www.cdc.gov/mmwr/volumes/67/rr/rr6701a1.htm?s_cid=rr6701a1_w. Accessed 26 Aug 2021.
6. Schillie S, Harris A, Link-Gelles R, Romero J, Ward J, Nelson N. Recommendations of the Advisory Committee on Immunization Practices for Use of a Hepatitis B Vaccine with a Novel Adjuvant. MMWR 2018;67(15):455–8. DOI: http://dx.doi.org/10.15585/mmwr.mm6715a5. Accessed 26 Aug 2021.
7. Centers for Disease Control and Prevention. Vaccine Excipient Summary. Available at: www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/B/excipien t-table-2.pdf. Accessed 26 Aug 2021.

To request this material in an alternative format (e.g., Braille) or to clarify any part of the above order, contact the Oregon Health Authority Immunization Program at 971.673.0300 and 711 for TTY. For other questions, consult with the vaccine recipient's primary health care provider or a consulting physician.

Electronic copy of this immunization protocol is available at: immunization protocols

Electronic copy of this pharmacy protocol is available at: pharmacy protocols