

National Center for Immunization & Respiratory Diseases



Adult ACIP Updates for Zoster, Hepatitis B, and Pneumococcal Vaccines

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Zoster Vaccine

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ACIP Zoster Recommendations: Immunocompromised Adults

- Persons with altered immunocompetence are at higher risk of zoster and related complications
- ACIP recommends 2 doses of recombinant zoster vaccine (RZV) for the prevention of herpes zoster and related complications in adults aged 19 years and older who are or will be immunodeficient or immunosuppressed because of disease or therapy

(Recommendations for adults aged 50 years and older to receive recombinant zoster vaccine are unchanged)

Anderson T et al. Use of Recombinant Zoster Vaccine in Immunocompromised Adults Aged ≥ 19 Years: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:80–84. DOI: <http://dx.doi.org/10.15585/mmwr.mm7103a2external icon>.

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Safety and Efficacy of Recombinant Zoster Vaccine in Immunocompromised Adults

- Vaccine safety similar in immunocompromised and immunocompetent individuals
 - Serious adverse events related to vaccination: 0-1.6%
 - Grade 3 adverse reactions:
 - Local: 10.7-14.2%
 - Systemic: 9.9-22.3%
 - No increase in graft versus host disease in HCT recipients (one study)
- Vaccine effectiveness in immunocompromised persons:
 - Zoster: 68.2-90.5%
 - Post-herpetic neuralgia: 89%

Anderson T et al. Use of Recombinant Zoster Vaccine in Immunocompromised Adults Aged ≥19 Years: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:80–84. DOI: <http://dx.doi.org/10.15585/mmwr.mm7103a2external icon>.

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Clinical Guidance

- When possible, patients should be vaccinated before becoming immunocompromised
 - Otherwise, providers should consider timing vaccination when the immune response is likely to be most robust (i.e., during periods of lower immunocompromise and stable disease)
- The second recombinant zoster vaccine dose should typically be administered 2–6 months after the first
 - For persons who are or will be immunocompromised and who would benefit from a shorter vaccination schedule, the second dose can be administered 1–2 months after the first

Anderson T et al. Use of Recombinant Zoster Vaccine in Immunocompromised Adults Aged ≥19 Years: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:80–84. DOI: <http://dx.doi.org/10.15585/mmwr.mm7103a2external icon>.

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Clinical Guidance

- Persons with a history of herpes zoster (who are eligible for recombinant zoster vaccine) should receive zoster vaccine
 - Herpes zoster can recur

- People who previously received live zoster vaccine should receive recombinant zoster vaccine
 - Live zoster vaccine effectiveness wanes over time

Anderson T et al. Use of Recombinant Zoster Vaccine in Immunocompromised Adults Aged ≥19 Years: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:80–84. DOI: <http://dx.doi.org/10.15585/mmwr.mm7103a2external icon>.

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Pregnancy and Breastfeeding

- There is currently no ACIP recommendation for zoster vaccine in pregnancy; consider delaying zoster vaccination until after pregnancy
 - No recommendation for pregnancy testing before vaccination

- Consider vaccination without regard to breastfeeding status if zoster vaccine is otherwise indicated
 - No known risk to mothers who are breastfeeding or their infants

Anderson T et al. Use of Recombinant Zoster Vaccine in Immunocompromised Adults Aged ≥19 Years: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:80–84. DOI: <http://dx.doi.org/10.15585/mmwr.mm7103a2external icon>.

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Evidence of Immunity to Varicella (for Immunocompromised Persons)

- Evidence of immunity includes:
 - Documentation of two doses of varicella vaccine, or
 - Laboratory evidence of immunity or laboratory confirmation of disease, or
 - Diagnosis or verification of a history of varicella or herpes zoster by a healthcare provider
- Persons born in the United States prior to 1980 are considered immune to varicella
 - However, this criterion does not apply to immunocompromised persons who must meet one of the above criteria
- **Note: Varicella vaccines contain live virus and are contraindicated for most immunocompromised persons**

[Clinical Considerations for Use of Recombinant Zoster Vaccine \(RZV, Shingrix\) in Immunocompromised Adults Aged ≥19 Years | CDC](#)

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Immunocompromised Persons Who Lack Evidence of Immunity

- For immunocompromised adults with no documented history of varicella, varicella vaccination, or shingles:
 - Refer to the ACIP varicella vaccine recommendations for further guidance, including post-exposure prophylaxis
 - Consider a variety of factors, including a patient's age (e.g., birth prior to 1980), recall (e.g., of prior varicella, varicella vaccination, or herpes zoster), documentation, and serology to determine whether to vaccinate with zoster vaccine
 - There are limited data on the use of zoster vaccine in persons without a history of varicella, with or without a history of varicella vaccination

[Clinical Considerations for Use of Recombinant Zoster Vaccine \(RZV, Shingrix\) in Immunocompromised Adults Aged ≥19 Years | CDC](#)

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Hepatitis B Vaccine

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ACIP Hepatitis B Recommendations: Adults

- Unvaccinated adults 19–59 years of age
- Unvaccinated adults aged 60 years and older at risk for hepatitis B virus infection
- Providers should offer hepatitis B vaccination to patients aged 60 years and older, rather than wait for a patient to request vaccination
 - Shifting the responsibility of consideration of hepatitis B vaccination from the patient to the provider

(Recommendations for infants and all other persons aged less than 19 years recommended to receive hepatitis B vaccine are unchanged)

Weng M et al. Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:477–483. DOI: <http://dx.doi.org/10.15585/mmwr.mm7113a1>

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Risk Factors for Hepatitis B Virus Infection

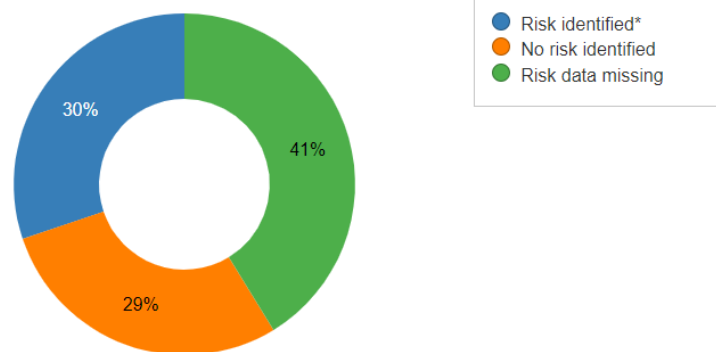
- Sex partners of HBV-infected persons
- Sexually-active persons not in a long-term, mutually monogamous relationship
- Persons seeking evaluation for treatment of STI
- Men who have sex with men
- Persons who use injection drugs
- Household contacts of persons with HBV
- Persons with diabetes
- Persons at risk for occupational exposure to HBV
- Residents and staff of facilities for developmentally disabled persons
- Dialysis patients, including those on predialysis
- Persons with HCV infection
- Persons with chronic liver disease
- Travelers to countries where HBV is endemic
- Persons with HIV
- Persons who are incarcerated

Weng M et al. Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:477–483. DOI: <http://dx.doi.org/10.15585/mmwr.mm7113a1>

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Risk Information* Associated with Reported Acute Hepatitis B Cases — United States, 2020



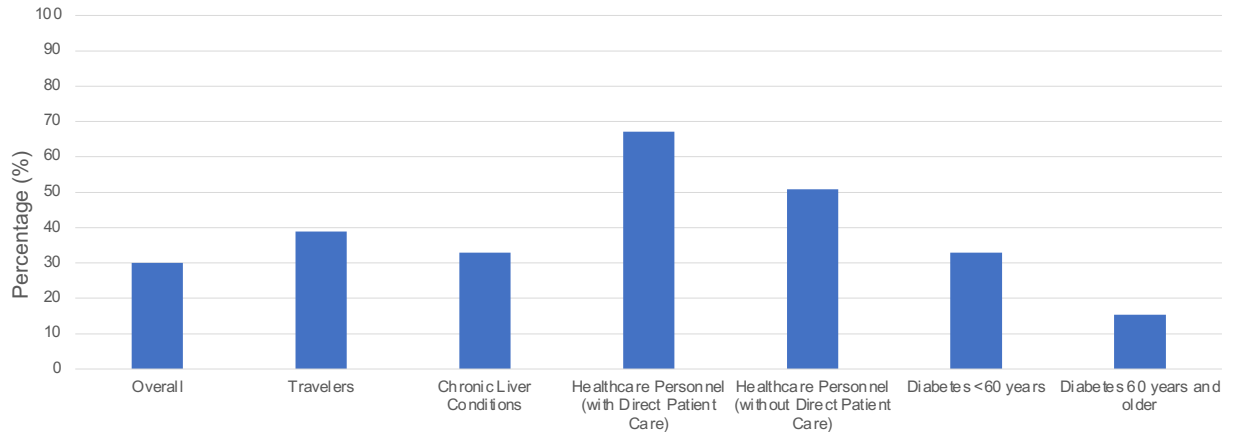
*Case reports with at least one of the following risk behaviors/exposures reported 6 weeks to 6 months prior to symptom onset or documented seroconversion if asymptomatic: 1) injection drug use; 2) multiple sexual partners; 3) underwent surgery; 4) men who have sex with men; 5) sexual contact with suspected/confirmed hepatitis B case; 6) sustained a percutaneous injury; 7) household contact with suspected/confirmed hepatitis B case; 8) occupational exposure to blood; 9) dialysis; and 10) transfusion. Reported cases may include more than one risk behavior/exposure.

CDC, National Notifiable Diseases Surveillance System

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2018 Hepatitis B Vaccine Coverage (≥3 doses) among Adults Aged ≥19 Years



Lu et al. MMWR Surveill Summ 2021;70:1–26. [Surveillance of Vaccination Coverage Among Adult Populations — United States, 2018](#)

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Adult Hepatitis B Vaccines

	Engenix-B	Recombivax HB	Hepelisav-B	PreHevbrio	Twinrix*
Composition	Recombinant HBsAg	Recombinant HBsAg	Novel Adjuvanted Recombinant HBsAg	3 Antigen Recombinant HBsAg	HepA/HepB Combination Vaccine
Schedule	3 doses, 0, 1, 6 mo	3 doses, 0, 1, 6 mo	2 doses, 0, 1 mo	3 doses, 0, 1, 6 mo	3 doses, 0, 1, 6 mo
Route	IM	IM	IM	IM	IM

*Contains Engenix-B for the HepB component

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Pregnancy

- Until safety data are available for PreHevbrio and Heplisav-B, providers should vaccinate pregnant people needing hepatitis B vaccine with either:
 - Engerix-B
 - Recombivax HB
 - Twinrix

Weng M et al. Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:477–483. DOI: <http://dx.doi.org/10.15585/mmwr.mm7113a1>

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Prevaccination Testing

- Testing for immunity or infection prior to vaccination not necessary for most persons
- Testing for hepatitis B virus infection is recommended for some persons
 - Prevaccination testing might reduce costs by avoiding vaccinating immune persons

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Prevaccination Testing

- Most persons who have completed a hepatitis B vaccination series in the past* or who have a history of hepatitis B virus infection should not receive additional hepatitis B vaccine doses
 - Although additional vaccine doses are not harmful

*Exceptions exist (e.g., hemodialysis patients, healthcare personnel)

Weng M et al. Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. *MMWR Morb Mortal Wkly Rep* 2022;71:477–483. DOI: <http://dx.doi.org/10.15585/mmwr.mm7113a1>

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Persons Recommended for Testing for Hepatitis B Virus Infection

- Household, sex, and needle-sharing contacts of HBsAg-positive persons
- HIV-positive persons
- Persons with elevated liver enzymes of unknown etiology
- Hemodialysis patients
- Men who have sex with men
- Injection drug users
- Persons born in countries of high and intermediate hepatitis B virus (HBV) endemicity (HBsAg prevalence $\geq 2\%$)
- U.S.-born persons not vaccinated as infants whose parents were born in countries with high HBV endemicity ($\geq 8\%$)
- Persons needing immunosuppressive therapy, including chemotherapy, immunosuppression related to organ transplantation, and immunosuppression for rheumatologic or gastroenterologic disorders
- Donors of blood, plasma, organs, tissues, or semen

Schillie S et al. Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices. *MMWR Recomm Rep* 2018;67:1–31. DOI: <http://dx.doi.org/10.15585/mmwr.rr6701a1>

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Prevaccination Testing

- Administer vaccine immediately after collection of blood for testing (same visit)
- Lack of access to testing should not be a barrier to vaccination
 - Testing is not a requirement for vaccination
- In settings where testing is not feasible, vaccination of persons recommended to receive the vaccine should continue
- Serologic testing consists of testing for:
 - Hepatitis B surface antigen (HBsAg)
 - Antibody to hepatitis B core antigen (anti-HBc)
 - Antibody to hepatitis B surface antigen (anti-HBs)

Schillie S et al. Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices. MMWR Recomm Rep 2018;67):1–31. DOI: <http://dx.doi.org/10.15585/mmwr.rr6701a1>

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Proposed Recommendations for Hepatitis B Screening

- Universal, one-time hepatitis B screening for adults aged 18 years and older
- Expansion of the list of persons recommended to receive risk-based hepatitis B screening to include:
 - Persons with current or history of sexually transmitted infection
 - Currently or formerly incarcerated persons
 - Persons with HCV infection
- Availability of hepatitis B testing for anyone who requests is, regardless of disclosure of risk
 - May be reluctant to disclose stigmatizing risks
- Periodic testing for all susceptible persons with ongoing risk for exposure(s) will continue per current recommendations

Weng M et al. Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:477–483. DOI: <http://dx.doi.org/10.15585/mmwr.mm7113a1>

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Pneumococcal Vaccine

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Pneumococcal Vaccines

- **1983** ▪ 23-valent polysaccharide vaccine licensed (PPSV23)
- **2010** ▪ 13-valent polysaccharide conjugate vaccine licensed (PCV13)
- **2021** ▪ 20-valent polysaccharide conjugate vaccine licensed (PCV20) – PREVNAR20 (adults only)
- **2021** ▪ 15-valent polysaccharide conjugate vaccine licensed (PCV15) – VAXNEUVANCE

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Two Recently Licensed Pneumococcal Conjugate Vaccines

	1	3	4	5	6A	6B	7F	9V	14	18 C	19 A	19 F	23 F	22 F	33 F	8	10 A	11 A	12 F	15 B	2	9N	17 F	20	
PCV13	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow												
PCV15	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green										
PCV20	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Blue	Blue	Blue	Blue	Blue	Blue				
PPSV23	Yellow	Yellow	Yellow	Yellow	White	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Blue	Blue	Blue	Blue	Blue	Blue	Orange	Orange	Orange	Orange

23-valent polysaccharide vaccine licensed (PPSV23) – Pneumovax23®

13-valent polysaccharide conjugate vaccine licensed (PCV13) – Prevnar13®

15-valent polysaccharide conjugate vaccine licensed (PCV15) – Vaxneuvance™

20-valent polysaccharide conjugate vaccine licensed (PCV20) – Prevnar20™ (adults only)

Adapted from slide prepared by M. Kobayashi

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Pneumococcal Conjugate vs. Polysaccharide Vaccines

	PCV	PPSV23
Basic vaccine composition	Capsular polysaccharides conjugated to carrier protein	Capsular polysaccharide antigens
Mechanism of action	T-cell dependent	T-cell independent
Memory B cell production	Yes	No
Reduce pneumococcal carriage	Yes	No

Adapted from slide prepared by M. Kobayashi

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ACIP Pneumococcal Recommendations: Adults With No Previous Pneumococcal Vaccination

- Adults aged 65 years and older who have not previously received any pneumococcal vaccine or whose previous vaccination history is unknown should receive a pneumococcal conjugate vaccine (either PCV20 or PCV15)
 - If PCV15 is used, this should be followed by a dose of PPSV23
- Adults aged 19 through 64 years with certain underlying medical conditions or other risk factors who have not previously received any pneumococcal vaccine or whose previous vaccination history is unknown should receive a pneumococcal conjugate vaccine (either PCV20 or PCV15)
 - If PCV15 is used, this should be followed by a dose of PPSV23

Kobayashi M et al. Use of 15-Valent Pneumococcal Conjugate Vaccine and 20-Valent Pneumococcal Conjugate Vaccine Among U.S. Adults: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:109–117. DOI: <http://dx.doi.org/10.15585/mmwr.mm7104a1external icon>.

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Underlying Medical Conditions or Other Risk Factors

- Alcoholism
- Chronic heart/liver/lung disease
- Chronic renal failure
- Cigarette smoking
- Cochlear implant
- Congenital or acquired asplenia
- CSF leak
- Diabetes mellitus
- Generalized malignancy
- Human immunodeficiency virus
- Hodgkin disease
- Immunodeficiency
- Iatrogenic immunosuppression
- Leukemia, lymphoma, multiple myeloma
- Nephrotic syndrome
- Sickle cell disease or other hemoglobinopathies
- Solid organ transplant

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Spacing

- When PCV15 is used, the recommended interval between administration of PCV15 and PPSV23 is ≥ 1 year
- To minimize the risk for invasive pneumococcal disease caused by serotypes unique to PPSV23, a minimum interval of 8 weeks can be considered for adults with:
 - An immunocompromising condition
 - Cochlear implant
 - Cerebrospinal fluid leak

Kobayashi M et al. Use of 15-Valent Pneumococcal Conjugate Vaccine and 20-Valent Pneumococcal Conjugate Vaccine Among U.S. Adults: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:109–117. DOI: <http://dx.doi.org/10.15585/mmwr.mm7104a1external icon>.

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Adults with Previous PPSV23 Only

- May receive one dose of PCV20 or PCV15 ≥ 1 year after their last PPSV23 dose
 - When PCV15 is used, no need to be followed by another dose of PPSV23
- *October 2022 ACIP updates:* Adults who have only received PPSV23 will be recommended to receive a dose of either PCV20 or PCV15 ≥ 1 year after their last PPSV23 dose

Kobayashi M et al. Use of 15-Valent Pneumococcal Conjugate Vaccine and 20-Valent Pneumococcal Conjugate Vaccine Among U.S. Adults: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:109–117. DOI: <http://dx.doi.org/10.15585/mmwr.mm7104a1external icon>.

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Adults with Previous PCV13

- Previously recommended to complete the series with PPSV23
- *October 2022 ACIP updates:*
 - Adults who have not completed the recommended series: PCV20 an option to PPSV23 to complete the series
 - Adults aged 65 years and older who completed the series with both PCV13 and PPSV23: Shared clinical decision-making for a dose of PCV20

These, and additional updates to clarify the current recommendations, are expected to be published in an MMWR report in the future and presented during an upcoming call

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