

2022 Immunization Update: Mpox, HepB, Influenza, COVID-19, Pneumococcal, Zoster

January 27, 2023



Each year, the California Medi-Cal Drug Use Review (DUR) program issues an annual summary of updates on immunization guidelines, products, and/or research in collaboration with the California Department of Public Health (CDPH) Immunization Branch. For

reference, the recommended immunization schedules for 2022 in the United States can be accessed on the Centers for Disease Control and Prevention (CDC) website:

- [Persons 18 years of age or younger](#)
- [Persons 19 years of age or older](#)

Learning Objectives

- Understand where to find current resources and information regarding mpox, including when vaccination is recommended.
- Review updated Advisory Committee on Immunization Practices (ACIP) recommendations for mpox, hepatitis B virus, influenza, coronavirus disease 2019 (COVID-19), pneumococcal disease, and herpes zoster (shingles) vaccines.
- Describe the primary and booster vaccines currently available for SARS-CoV-2, the virus that causes coronavirus disease 2019 (COVID-19).
- Discuss strategies for improving vaccination rates and vaccine confidence.

Mpox Vaccine

Mpox is a rare disease caused by infection with the mpox virus, which is related to the smallpox virus. On August 1, 2022, mpox was proclaimed a [public health emergency in California](#) and a [nationwide public health emergency](#) declaration was made on August 4, 2022. Although mpox virus is in the same family of viruses as smallpox, it is less transmissible and

typically less severe than smallpox. Mpox is primarily spread by close physical contact (hugging, kissing, sexual/intimate contact) or sharing items (bedding, clothing, towels) with someone who has symptoms. While anyone can get mpox, risk to the general public remains low. Mpox cases in the U.S. have also declined since mid-August 2022, although new – and sometimes clinically severe – cases continue to occur.

Vaccination helps protect against mpox when given before or shortly after an exposure and is highly recommended for high-risk patients. In the U.S., two vaccines (JYNNEOS and ACAM2000) are approved to prevent mpox in the U.S. The JYNNEOS vaccine was developed to protect against both mpox and smallpox and is the primary vaccine being used during this outbreak in the U.S. The JYNNEOS vaccine is given as a 2-dose series given 28 days apart. The CDC recommends getting both doses of JYNNEOS vaccine. The level of protection provided by only one dose is not known. The ACAM2000 vaccine is also approved to help protect against smallpox and has been made available to prevent mpox, although it has more side effects and contraindications than JYNNEOS.

As of November 15, 2022, there is adequate vaccine supply of JYNNEOS in California, and vaccine providers can offer vaccine to any patients who may be at risk, and persons who request vaccination should receive it without having to attest to specific risk factors.

Vaccination as post-exposure prophylaxis (PEP) is recommended for known or presumed exposure to someone with mpox, ideally within four days of exposure. Additionally, people with certain risk factors and recent experiences that might make them more likely to have been recently exposed to mpox can be considered for expanded post-exposure prophylaxis (PEP++). People at higher risk of exposure to mpox include men who have sex with other men or transgender or gender-diverse people who have sex with other men and in the past 2 weeks have had sex with multiple partners or group sex, have had sex at a commercial sex venue (like a sex club or bathhouse), or have had sex at an event, venue, or in an area where mpox transmission is occurring.

For the most current information about mpox and vaccine recommendations, providers may refer to the [Interim Clinical Considerations for Use of JYNNEOS and ACAM2000 Vaccines during the 2022 U.S. Mpox Outbreak](#), which is available on the CDC website. Additional resources for California providers are also available on the [Division of Communicable Disease Control \(DCDC\) MPOX](#) page on the CDPH website.

Hepatitis B (HepB) Vaccine

ACIP now recommends HepB vaccination for all adults 19-59 years of age regardless of risk factors. Hepatitis B vaccination continues to be recommended for adults 60 years of age or older with risk factors including chronic liver disease, HIV infection, sexual exposure risk, injection drug use, incarceration, or percutaneous or mucosal risk for exposure to blood. For additional information about the HepB vaccine recommendations, providers may refer to the [Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022](#), published in the MMWR, which is available on the CDC website.

On a related note, effective January 1, 2022, [Assembly Bill \(AB\) 789 \(Low, Chapter 470, Statutes of 2021\)](#) requires primary care providers in California to offer screening tests for hepatitis B and hepatitis C to adult patients based on the latest screening indications recommended by the United States Preventive Services Task Force (USPSTF), to the extent these services are covered under the patient's health insurance unless certain conditions apply that include, among others, the patient lacks the capacity to consent to the screening test.

The law also stipulates that patients whose test results are positive for hepatitis B or C infection should be referred for follow-up care with their primary care provider or a liver specialist and those who test negative for hepatitis B and have not been previously vaccinated should be offered hepatitis B vaccination. More detailed information about the new law is available in a [March 22, 2022 letter from CDPH](#).

Influenza Vaccine

As in prior years, routine annual influenza vaccination is recommended for everyone 6 months of age or older without contraindications. For the current influenza season, widespread influenza vaccination is again critical to reduce the impact of respiratory illnesses in the population and the resulting burdens on the healthcare system.

For the 2022 – 2023 season, inactivated influenza vaccines (IIVs), recombinant influenza vaccine (RIV4), and live attenuated influenza vaccine (LAIV4) are available (all quadrivalent). U.S. IIV4s and LAIV4 (egg-based) influenza vaccines contain hemagglutinin (HA) derived from the following influenza viruses:

- A/Victoria/2570/2019 (H1N1) pdm09-like virus
- A/Darwin/9/2021 (H3N2)-like virus (different strain from last season)
- B/Austria/1359417/2021 (Victoria lineage)-like virus (different strain from last season)
- B/Phuket/3073/2013 (Yamagata lineage)-like virus

U.S. cell culture–based inactivated (cclIV4) and recombinant (RIV4) influenza vaccines contain HA derived from the following influenza viruses:

- A/Wisconsin/588/2019 (H1N1) pdm09-like virus
- A/Darwin/6/2021 (H3N2)-like virus (different strain from last season)
- B/Austria/1359417/2021 (Victoria lineage)-like virus (different strain from last season)
- B/Phuket/3073/2013 (Yamagata lineage)-like virus

New for the 2022-2023 flu season, the following three flu vaccines are preferentially recommended for adults 65 years of age or older: quadrivalent high-dose inactivated influenza vaccine (HD-IIV4), quadrivalent recombinant influenza vaccine (RIV4), or quadrivalent adjuvanted inactivated influenza vaccine (aIIV4). If none of these three vaccines is available at an opportunity for vaccine administration, then any other age-appropriate influenza vaccine should be used. Higher dose vaccines include HD-IIV4 and RIV4, both of which contain a higher dose of HA antigen per virus than standard-dose vaccines (60 μg for HD-IIV4 and 45 μg for RIV4, compared with 15 μg for standard-dose inactivated vaccines). Adjuvanted inactivated influenza vaccine (aIIV4) contains MF59 adjuvant.

In addition, in 2021 there was an expansion in the age indication for cclIV4. While previously approved for children four years of age or older, it is now approved for anyone six months of age or older. This means that all standard-dose unadjuvanted IIV4s are now approved for anyone six months of age or older.

For additional information about influenza vaccine recommendations, providers may refer to the [Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022–23 Influenza Season](#), published in the *MMWR*, which is available on the CDC website.

COVID-19 Vaccine

Children as young as 6 months are now eligible for their primary vaccination series against COVID-19. While some kids may experience only mild symptoms from COVID-19 infections, it is important for infants and toddlers to get vaccinated to protect them against severe disease and hospitalization and to protect others at home and at daycare. Updated (bivalent) Pfizer-BioNTech COVID-19 vaccine became available on December 9, 2022, for children 6 months to 4 years of age for completing the primary series.

In addition, updated (bivalent) boosters became available on:

- September 2, 2022 – For people 12 years of age or older
- October 12, 2022 – For children and adolescents 5 to 11 years of age
- December 9, 2022 – For children 6 months to 4 years of age who completed the Moderna COVID-19 vaccine primary series.

Currently, the CDC recommends one updated (bivalent) booster dose for everyone 5 years of age or older if it has been at least two months since the last dose and for children 6 months to 4 years of age who completed the Moderna COVID-19 vaccine primary series and if it has been at least two months since their last dose. There is no booster recommendation for children 6 months to 4 years of age who got the Pfizer-BioNTech 3-dose primary series, including children who previously received a 3-dose monovalent Pfizer-BioNTech primary series.

For assistance with vaccine selection and timing for both the primary series and boosters, including recommendations for patients who are moderate or severely immunocompromised, providers may consult the [COVID-19 Vaccine Products Guide](#) and the [COVID-19 Vaccination Schedule \(Timing Guide\)](#) located on the [California COVID-19 Vaccination Program](#) website. Providers may also refer to the [Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States](#), which is available on the CDC website.

Pneumococcal Vaccine

ACIP has updated and simplified their pneumococcal conjugate vaccination (PCV) regimen recommendations after both a 20-valent PCV (PCV20) and a 15-valent PCV (PCV15) were licensed by the U.S. Food and Drug Administration (FDA) in 2021 for use in adults 18 years of age or older.

ACIP now recommends use of either PCV20 alone or PCV15 in series with PPSV23 for all adults 65 years of age or older, and for adults between 19 and 64 years of age with certain underlying medical conditions or other risk factors who have not previously received a PCV or whose previous vaccination history is unknown (**Table 1**).

Table 1. Pneumococcal Vaccine Options for All Adults Age 65+ and High-Risk Adults Between 19-64 Years of Age.

Vaccination Status	Option 1	Option 2
No prior history of pneumococcal vaccine or unknown vaccination history	PCV20	PCV15 followed by PPSV23 at least 1 year later. People with a history of immunocompromising conditions, cerebrospinal fluid leak, or cochlear implant may benefit from an 8-week interval.
Prior receipt of PPSV23 more than 1 year ago	PCV20	PCV15
Prior receipt of PCV13 more than 1 year ago	PPSV23	PCV20 (if PPSV23 not available)

For additional information about the PCV recommendations for adults with specific underlying medical conditions or other risk factors, providers may refer to the [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](#), published in the MMWR, which is available on the CDC website. While on the CDC website, providers may also find the [Pneumococcal Vaccine Timing for Adults](#) resource to be a useful guide.

Finally, on June 22, 2022, ACIP recommended use of PCV15 as an option for pneumococcal conjugate vaccination of persons aged <19 years, according to currently recommended PCV13 dosing and schedules. Risk-based recommendations on use of PPSV23 have not changed. For complete PCV recommendations for children and adolescents, providers may refer to the [Use of 15-Valent Pneumococcal Conjugate Vaccine Among U.S. Children: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022](#), published in the *MMWR*, which is available on the CDC website.

Zoster (Shingles) Vaccine

Immunocompromised persons experience a higher incidence of herpes zoster and related complications. On July 23, 2021, the Food and Drug Administration expanded the indication for use of recombinant zoster vaccine (RZV) to include immunodeficient or immunosuppressed adults. Subsequently, ACIP expanded their recommendations for immunodeficient or immunosuppressed adults 19 years of age or older to include two doses of RZV for prevention of herpes zoster.

For additional information about the zoster vaccine recommendations, providers may refer to the [Use of Recombinant Zoster Vaccine in Immunocompromised Adults Aged ≥19 Years: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022](#), published in the *MMWR*, which is available on the CDC website.