Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States

Reference Materials

- Summary Document for Interim Clinical Considerations
- Summary Document for Interim Clinical Considerations poster
- COVID-19 Vaccine Administration Errors and Deviations
- COVID-19 Vaccine Administration Errors and Deviations Poster

Get Email Updates

To receive email updates about this page, enter your email address:

Email Address

What's this?

Submit

Summary of recent changes (last updated August 31, 2021):

- New Advisory Committee on Immunization Practices (ACIP) recommendation for use of the U.S. Food and Drug Administration (FDA)-approved Pfizer-BioNTech (COMIRNATY) COVID-19 Vaccine in persons aged ≥16 years
- Updated information in Key points to reflect currently available evidence
- Updated information on COVID-19 vaccines in the Background section
- Updated information in the section on Considerations for use of an additional dose of COVID-19 vaccine following a primary vaccine series
- Updated laboratory testing information on timing of immune-based tests for tuberculosis infection in relation to COVID-19 vaccine administration

Key points

- COVID-19 vaccination is recommended for everyone aged 12 years and older in the United States for the prevention of coronavirus disease 2019 (COVID-19).
- COVID-19 vaccines currently approved or authorized by FDA are highly effective in preventing serious outcomes of COVID-19, including severe disease, hospitalization, and death.
- Available evidence suggests that these vaccines offer protection against known variants, including the Delta variant (B.1.617.2), particularly against hospitalization and death. The Delta variant, currently the predominant SARS-CoV-2 variant in the United States, is associated with increased transmissibility.
- Efforts to maximize the proportion of people in the United States who are fully vaccinated against COVID-19 remain critical to ending the COVID-19 pandemic.
- ACIP has recommended the FDA-approved Pfizer-BioNTech (COMIRNATY) COVID-19 Vaccine for use in persons aged ≥16 years.
- ACIP has issued interim recommendations under Emergency Use Authorization (EUA) for the use of:
  - Pfizer-BioNTech COVID-19 vaccine in persons aged 12–15 years
  - Moderna COVID-19 vaccine in persons aged ≥18 years
  - Janssen (Johnson & Johnson) COVID-19 vaccine in persons aged ≥18 years
- These clinical considerations provide additional information to healthcare professionals and public health officials on use of COVID-19 vaccines.

Recommendation of the Advisory Committee on Immunization Practices for use of Pfizer-BioNTech (COMIRNATY) COVID-19 vaccine

On August 23, 2021, the U.S. Food and Drug Administration (FDA) approved COMIRNATY (COVID-19 Vaccine, mRNA), made by Pfizer for BioNTech, as a 2-dose series for prevention of COVID-19 in persons aged ≥16 years. The vaccine is also authorized under an Emergency Use Authorization (EUA) to be administered to:

- Prevent COVID-19 in persons aged 12-15 years
- Provide a third dose (i.e., additional dose) to persons aged ≥12 years with certain kinds of immunocompromising conditions

On August 30, 2021, the Advisory Committee on Immunization Practices (ACIP) met and reviewed data for the Pfizer-BioNTech COVID-19 vaccine using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach and the Evidence to Recommendation Framework. The following proposed recommendation was presented to ACIP: the Pfizer-BioNTech COVID-19 vaccine is recommended for people aged ≥16 years under FDA's Biologics License Application (BLA). After a public comment period, the recommendation was unanimously approved by the voting ACIP members.

The following interim recommendations previously issued by ACIP under EUA for Pfizer-BioNTech COVID-19 vaccine remain in place:

- Use of Pfizer-BioNTech COVID-19 vaccine in adolescents aged 12–15 years to prevent COVID-19
- Use of an additional dose of Pfizer-BioNTech COVID-19 vaccine (for persons aged ≥12 years) or Moderna COVID-19 vaccine (for persons aged ≥18 years) after an initial 2-dose primary mRNA COVID-19 vaccine series for moderately to severely immunocompromised people.

Background

Regulatory terminology for COVID-19 vaccines

Emergency Use Authorization : **(EUA):** mechanism to facilitate the availability and use of medical products, including vaccines, during public health emergencies, such as the current COVID-19 pandemic. Under an EUA, the U.S. Food and Drug Administration (FDA) can make a product available to the public based on the best available evidence, without waiting for all the evidence that would be needed for FDA approval. It is FDA's expectation that following the issuance of an EUA, the manufacturer will continue ongoing trials to obtain additional safety and effectiveness information and also work towards submission of a Biologics License Application (BLA) as soon as possible.

FDA Approved : FDA-approved vaccines have undergone the agency's standard process for reviewing the quality, safety and effectiveness of medical products included in a manufacturer's submission of a BLA . A BLA is a comprehensive document that is submitted to FDA providing very specific requirements. FDA conducts its own analyses of the information in the BLA to ensure the vaccine meets the FDA's standards for approval.

COVID-19 vaccines approved or authorized for use by the Food and Drug Administration

On August 23, 2021, the FDA approved the licensure of COMIRNATY (COVID-19 Vaccine, mRNA), made by Pfizer for BioNTech, as a 2-dose series for prevention of coronavirus disease 2019 (COVID-19) in persons aged ≥16 years. The vaccine is also **authorized** under EUA to be administered to:

- Prevent COVID-19 in persons aged 12-15 years
- Provide a third dose (i.e., additional dose) to persons aged ≥12 years with certain kinds of immunocompromising conditions

The FDA-approved Pfizer-BioNTech product COMIRNATY and the FDA-authorized Pfizer-BioNTech COVID-19 vaccine have the same formulation and can be used interchangeably to provide the COVID-19 vaccination series without presenting any safety or effectiveness concerns. Therefore, vaccination providers can use doses distributed under EUA to administer the

safety or effectiveness concerns. Therefore, vaccination providers can use doses distributed under EUA to administer the vaccination series as if the doses were the licensed vaccine.

Unless otherwise stated, in this document the terms "Pfizer-BioNTech COVID-19 vaccine" or "Pfizer-BioNTech" refer to both the FDA-approved Pfizer-BioNTech (COMIRNATY) COVID-19 Vaccine and the FDA-authorized Pfizer-BioNTech COVID-19 vaccine.

In addition, FDA has authorized use of the following vaccines under EUA:

- Moderna COVID-19 vaccine in persons aged ≥18 years
- Janssen COVID-19 vaccine in persons aged ≥18 years

The Pfizer-BioNTech and Moderna vaccines are lipid nanoparticle-formulated, nucleoside-modified mRNA vaccines encoding the prefusion spike glycoprotein of SARS-CoV-2, the virus that causes COVID-19. The Janssen vaccine is a recombinant replication-incompetent adenovirus type 26 (Ad26) vector encoding the stabilized prefusion spike glycoprotein of SARS-CoV-2. None of the currently FDA-approved or FDA-authorized COVID-19 vaccines are live-virus vaccines.

Advisory Committee on Immunization Practices' recommendations for use of COVID-19 vaccines

The Advisory Committee on Immunization Practices (ACIP) makes "standard" recommendations on the use of vaccines that are FDA-approved under a BLA and "interim" recommendations for vaccines that are FDA-authorized under an EUA.

ACIP has **recommended** the FDA-approved Pfizer-BioNTech COVID-19 vaccine for use in persons aged ≥16 years.

ACIP has made **interim recommendations** for the use of:

- Pfizer-BioNTech COVID-19 vaccine in persons aged 12–15 years
- Moderna COVID-19 vaccine in persons aged ≥18 years
- Janssen (Johnson & Johnson) COVID-19 vaccine in persons aged ≥18 years

CDC Interim Clinical Considerations for Use of COVID-19 Vaccines

The CDC Interim Clinical Considerations are informed by data submitted to FDA for BLA or EUA of the vaccines, other data sources, general best practice guidelines for immunization, and expert opinion. These considerations apply only to the vaccine products currently approved or authorized in the United States. These considerations will be updated when additional information becomes available or if additional vaccine products are approved or authorized.

In addition to the following considerations, the BLA or EUA conditions of use and storage, handling, and administration procedures described in the prescribing information should be referenced when using the Pfizer-BioNTech, Moderna, and Janssen COVID-19 vaccines.

Age groups approved or authorized to receive COVID-19 vaccine by vaccine product

COVID-19 vaccination is recommended for all people aged 12 years and older in the United States for the prevention of COVID-19. However, the age groups approved under BLA or authorized under EUA to receive vaccination vary by vaccine product:

- Pfizer-BioNTech: persons aged ≥12 years
- Moderna: persons aged ≥18 years
- Janssen: persons aged ≥18 years

There is currently no FDA-approved or FDA-authorized COVID-19 vaccine for children aged <12 years. Ongoing clinical trials of COVID-19 vaccine in children <12 years are examining a range of vaccine doses that are lower than the standard dose prescribed for people ≥12 years. Data from these trials will be used to determine the optimal dose to protect children aged <12 years while minimizing any potential adverse events. **Children aged <12 years should not receive any COVID-19 vaccine doses (either standard or partial doses) at this time.**

COVID-19 vaccine administration

COVID-19 vaccines are administered intramuscularly as either a 2-dose series (Pfizer-BioNTech, Moderna) or single dose (Janssen).

Vaccine	Dose	Dose volume	Number doses/series	Interval between doses
Pfizer-BioNTech	30 µg	0.3 ml	2	3 weeks (21 days)
Moderna	100 µg	0.5 ml	2	1 month (28 days)
Janssen	5×10^{10} viral particles	0.5 ml	1	Not Applicable

A single, primary vaccination series (i.e., either a 2-dose mRNA COVID-19 vaccine series or a single dose of Janssen COVID-19 vaccine) should be administered. People are not recommended to receive more than one complete primary COVID-19 vaccination series.

A person is considered fully vaccinated against COVID-19 ≥2 weeks after receipt of the second dose in a 2-dose series (Pfizer-BioNTech and Moderna) or ≥2 weeks after receipt of the single dose of the Janssen vaccine.[1] CDC has developed public health recommendations for fully vaccinated people. People who have a contraindication to vaccination or who otherwise do not complete a vaccination series are not considered fully vaccinated.

Interval between mRNA COVID-19 vaccine doses

The second dose of Pfizer-BioNTech and Moderna vaccines should be administered as close to the recommended interval as possible, but not earlier than recommended (i.e., 3 weeks [Pfizer-BioNTech] or 1 month [Moderna]). However, individuals who receive the second dose up to 4 days before or at any time after the recommended date can be considered fully vaccinated.

Vaccine administration errors and deviations

Information on preventing, reporting, and managing COVID-19 vaccine administration errors is found in Appendix A. Vaccine administration errors should be reported to the Vaccine Adverse Event Reporting System (VAERS) .

Interchangeability of COVID-19 vaccine products

Any currently FDA-approved or FDA-authorized COVID-19 vaccine can be used when indicated; ACIP does not state a product preference. However, COVID-19 vaccine products are **not** interchangeable.

mRNA COVID-19 vaccines (Pfizer-BioNTech and Moderna)

Data on the safety and efficacy of a mixed-product series have not been evaluated. Both doses of the series should be completed with the same product.

Strategies to ensure that patients receive the second dose with the appropriate product and interval between doses include:

- Providing COVID-19 vaccination record cards to vaccine recipients, asking recipients to bring their card to their appointment for the second dose, and encouraging recipients to make a backup copy (e.g., by taking a picture of the card with their phone)
- Encouraging vaccine recipients to enroll in **v-safe**, a free smartphone-based tool that uses text messaging and web surveys to provide personalized health check-ins as well as second-dose reminders
- Encouraging vaccine recipients to enroll in VaxText[SM], a free text-message-based platform that provides COVID-19 vaccination second-dose reminders
- Recording each recipient's vaccination in the immunization information system (IIS)
- Recording vaccine administration information in the patient's medical record

- Making an appointment for the second dose before the vaccine recipient leaves, to increase the likelihood that patients will present at the same vaccination site for the second dose

Using the above strategies, every effort should be made to determine which vaccine product was received as the first dose to ensure completion of the vaccine series with the same product. In exceptional situations in which the mRNA vaccine product given for the first dose cannot be determined or is no longer available, any available mRNA COVID-19 vaccine may be administered at a minimum interval of 28 days between doses to complete the mRNA COVID-19 vaccination series. In situations where the same mRNA vaccine product is temporarily unavailable, it is preferable to delay the second dose to receive the same product than to receive a mixed series using a different product. If two doses of different mRNA COVID-19 vaccine products are administered in these situations (or inadvertently), no additional doses of either product are recommended at this time. Such persons are considered fully vaccinated against COVID-19 ≥2 weeks after receipt of the second dose of an mRNA vaccine.

Janssen vaccine

The safety and efficacy of Janssen COVID-19 vaccine administered after an mRNA COVID-19 vaccine has not been established. However, in limited, exceptional situations where a patient received the first dose of an mRNA COVID-19 vaccine but is unable to complete the series with either the same or different mRNA COVID-19 vaccine (e.g., due to contraindication), a single dose of Janssen COVID-19 vaccine may be considered at a minimum interval of 28 days from the mRNA COVID-19 vaccine dose. See the Contraindications and Precautions section for additional information on use of Janssen COVID-19 vaccine and additional precautions in people with a contraindication to mRNA COVID-19 vaccines. Patients who receive Janssen COVID-19 vaccine after a dose of an mRNA COVID-19 vaccine should be considered to have received a valid, single-dose Janssen vaccination—not a mixed vaccination series—and are considered fully vaccinated against COVID-19 ≥2 weeks after receipt of the single dose of the Janssen vaccine.

People vaccinated for prevention of COVID-19 outside the United States

People who were vaccinated outside the United States with a currently FDA-approved or FDA-authorized COVID-19 vaccine and who have received all the recommended doses **do not need** any additional doses. People who received the first dose of an FDA-approved or FDA-authorized COVID-19 vaccine that requires two doses do not need to restart the vaccine series in the United States but should receive the second dose as close to the recommended time as possible.

Some people may have received a COVID-19 vaccine that is not currently approved or authorized in the United States. Limited data are available on the safety or efficacy of receiving a COVID-19 vaccine currently approved or authorized in the United States after receipt of a non-FDA-approved or FDA-authorized COVID-19 vaccine. However, in some circumstances people who received a COVID-19 vaccine not currently approved or authorized in the United States may be offered revaccination with an FDA-approved or FDA-authorized vaccine.

- COVID-19 vaccines neither approved nor authorized by FDA but listed for emergency use by the World Health Organization (WHO)[2]
  - People who have received all recommended doses of a COVID-19 vaccine that is listed for emergency use by WHO **do not need** any additional doses with an FDA-approved or FDA-authorized COVID-19 vaccine.
  - People who have not received all the recommended doses of a COVID-19 vaccine listed for emergency use by WHO may be offered a complete, FDA-approved or FDA-authorized COVID-19 vaccine series.
- COVID-19 vaccines neither approved or authorized by FDA nor listed for emergency use by WHO
  - People who received all or some of the recommended doses of a COVID-19 vaccine that is neither approved or authorized by FDA nor listed for emergency use by WHO may be offered a complete, FDA-approved or -authorized COVID-19 vaccine series.

The minimum interval between the last dose of a non-FDA-approved or -authorized vaccine or a WHO-listed vaccine and an FDA-approved or FDA-authorized COVID-19 vaccine is 28 days. Only people who have received all recommended doses of an FDA-approved, FDA-authorized or WHO-listed COVID-19 vaccine are considered fully vaccinated for the purpose of public health guidance.[3]

People vaccinated for prevention of COVID-19 as part of a clinical trial in the United States

Some people in the United States have completed a COVID-19 vaccination series as part of a U.S.-based clinical trial involving a COVID-19 vaccine that is not currently authorized by FDA.

People who received the full series of an active COVID-19 vaccine as part of a U.S.-based clinical trial of a COVID-19 vaccine that is not authorized by FDA but is listed for emergency use by WHO[2]

U.S. clinical trial participants who received all recommended doses of a COVID-19 vaccine that is not authorized for use by FDA but is listed for emergency use by WHO do not need any additional doses of an FDA-authorized COVID-19 vaccine. Once it has been confirmed that a participant in a U.S.-based clinical trial received "active" vaccine, and not placebo, the participant can be considered fully vaccinated 2 weeks after they completed the vaccine series in terms of CDC guidance. Currently, the AstraZeneca COVID-19 vaccine meets these criteria.

People who received the full series of an active COVID-19 vaccine candidate as part of a U.S.-based clinical trial of a COVID-19 vaccine that is neither authorized by FDA nor listed for emergency use by WHO[2]

If a participant in a U.S.-based clinical trial has been documented to have received the full series of an "active" (not placebo) COVID-19 vaccine candidate, and vaccine efficacy has been independently confirmed (e.g., by a data and safety monitoring board), the participant can be considered fully vaccinated 2 weeks after they completed the vaccine series. Currently, the Novavax COVID-19 vaccine meets these criteria. **This does not imply that the vaccine has been authorized by FDA or is recommended by CDC or ACIP.**

Novavax clinical trial participants who did not receive the full 2-dose series of the active COVID-19 vaccine candidate should be counseled by trial investigators to follow current prevention measures to protect themselves against COVID-19 and offered an FDA-authorized COVID-19 vaccine series.

Some people in the United States have completed a COVID-19 vaccination series as part of a clinical trial with sites in the United States involving a COVID-19 vaccine that is not currently approved or authorized by FDA.

People who participated in a clinical trial in the United States and received the full series of a COVID-19 vaccine that is neither approved nor authorized by FDA but is listed for emergency use by WHO

Clinical trial participants from U.S. sites who received all recommended doses of a COVID-19 vaccine that is neither approved nor authorized for use by FDA but is listed for emergency use by WHO do not need any additional doses of an FDA-approved or FDA-authorized COVID-19 vaccine. Once it has been confirmed that a U.S. participant in a COVID-19 vaccine trial received "active" vaccine, and not placebo, the participant can be considered fully vaccinated 2 weeks after they completed the vaccine series. Currently, the AstraZeneca COVID-19 vaccine meets these criteria.

People who participated in a clinical trial in the United States and received the full series of a COVID-19 vaccine candidate that is neither approved nor authorized by FDA nor listed for emergency use by WHO

If a clinical trial participant from a U.S. site has been documented to have received the full series of an "active" (not placebo) COVID-19 vaccine candidate, and vaccine efficacy has been independently confirmed (e.g., by a data and safety monitoring board), the participant can be considered fully vaccinated 2 weeks after they completed the vaccine series . Currently, the Novavax COVID-19 vaccine meets these criteria. **This does not imply that the vaccine has been approved or authorized by FDA or is recommended by CDC or ACIP.**

Novavax clinical trial participants who did not receive the full 2-dose series of the active COVID-19 vaccine candidate should follow current prevention measures to protect themselves against COVID-19 and be offered an FDA-approved or FDA-authorized COVID-19 vaccine series.

Coadministration of COVID-19 vaccines with other vaccines

Although data are not available for COVID-19 vaccines administered simultaneously with other vaccines, extensive experience with non-COVID-19 vaccines has demonstrated that immunogenicity and adverse event profiles are generally similar when vaccines are administered simultaneously as when they are administered alone. COVID-19 vaccines

vaccines are administered simultaneously as when they are administered alone. COVID-19 vaccines were previously recommended to be administered alone, with a minimum interval of 14 days before or after administration of any other vaccines. This was out of an abundance of caution during a period when these vaccines were new and not due to any known safety or immunogenicity concerns. However, substantial data have now been collected regarding the safety of COVID-19 vaccines currently approved or authorized by FDA.

COVID-19 vaccines may **now be administered without regard to timing of other vaccines**. This includes simultaneous administration of COVID-19 vaccine and other vaccines on the same day, as well as coadministration within 14 days. It is unknown whether reactogenicity of COVID-19 vaccine is increased with coadministration, including with other vaccines known to be more reactogenic, such as adjuvanted vaccines or live vaccines. When deciding whether to coadminister an(other) vaccine(s) with a COVID-19 vaccine, vaccination providers should consider whether the patient is behind or at risk of becoming behind on recommended vaccines, their risk of vaccine-preventable disease (e.g., during an outbreak or occupational exposures), and the reactogenicity profile of the vaccines.

If multiple vaccines are administered at a single visit, administer each injection in a different injection site. For adolescents and adults, the deltoid muscle can be used for more than one intramuscular injection administered at different sites in the muscle.

Best practices for multiple injections include:

- Label each syringe with the name and the dosage (amount) of the vaccine, lot number, the initials of the preparer, and the exact beyond-use time, if applicable.
- Separate injection sites by 1 inch or more, if possible.
- **Administer the COVID-19 vaccines and vaccines that may be more likely to cause a local reaction (e.g., tetanus-toxoid-containing and adjuvanted vaccines) in different limbs, if possible.**

COVID-19 vaccination and SARS-CoV-2 infection

People with prior or current SARS-CoV-2 infection

People should be offered vaccination regardless of their history of symptomatic or asymptomatic SARS-CoV-2 infection; this includes people with prolonged post-COVID-19 symptoms. Data from clinical trials indicate that the currently approved or authorized COVID-19 vaccines can be given safely to people with evidence of a prior SARS-CoV-2 infection. Viral testing to assess for acute SARS-CoV-2 infection or serologic testing to assess for prior infection is not recommended for the purposes of vaccine decision-making.

Vaccination of people with known current SARS-CoV-2 infection should be deferred until the person has recovered from the acute illness (if the person had symptoms) and they have met criteria to discontinue isolation. This recommendation applies to people who experience SARS-CoV-2 infection before receiving any vaccine dose and those who experience SARS-CoV-2 infection after the first dose of an mRNA vaccine but before receipt of the second dose.

While there is no recommended minimum interval between infection and vaccination, current evidence suggests that the risk of SARS-CoV-2 reinfection is low in the months after initial infection but may increase with time due to waning immunity.

People with a history of multisystem inflammatory syndrome in children (MIS-C) or adults (MIS-A)

Currently, there are no data on the safety and efficacy of COVID-19 vaccines in people with a history of multisystem inflammatory syndrome in children (MIS-C) or in adults (MIS-A). The mechanisms of MIS-C and MIS-A are not well understood but include a dysregulated immune response to SARS-CoV-2 infection. It is unclear if people with a history of MIS-C or MIS-A are at risk of recurrence of the same dysregulated immune response following reinfection with SARS-CoV-2 or in response to vaccination. These theoretical concerns should be weighed against the known risks of COVID-19 from reinfection and the benefits of protection from a COVID-19 vaccine. Children with MIS-C have high antibody titers to SARS-CoV-2 ; however, it is unknown if this correlates with protection against reinfection and for how long protective antibody levels persist.

People with a history of MIS-C or MIS-A may choose to be vaccinated. Considerations for vaccination may include:

- Clinical recovery from MIS-C or MIS-A, including return to normal cardiac function
- Personal risk of severe acute COVID-19 (e.g., age, underlying conditions)

- Level of COVID-19 community transmission and personal risk of reinfection
- Lack of safety data of COVID-19 vaccines following these illnesses
- Timing of any immunomodulatory therapies (ACIP's general best practice guidelines for immunization can be consulted for more information)

A conversation between the patient, their guardian(s), and their clinical team or a specialist may assist with decisions about the use of a COVID-19 vaccine, though a conversation with a healthcare professional is not required before vaccination.

Current evidence suggests that the risk of SARS-CoV-2 reinfection is low in the months after initial infection but may increase with time due to waning immunity. Thus, people with a history of MIS-C or MIS-A should consider delaying vaccination until they have recovered from their illness and for 90 days after the date of diagnosis of MIS-C or MIS-A, recognizing that the risk of reinfection and, therefore, the benefit from vaccination, might increase with time following initial infection.

For people who develop MIS-C or MIS-A that is associated with a confirmed SARS-CoV-2 infection but occurs after receipt of a COVID-19 vaccine, referral to a specialist in infectious diseases, rheumatology, or cardiology should be considered. Healthcare professionals and health departments may also request a consultation from the Clinical Immunization Safety Assessment COVIDvax. In addition, information about these cases should be reported to VAERS .

People who previously received passive antibody therapy

Currently, there are no data on the safety and efficacy of COVID-19 vaccines in people who received monoclonal antibodies or convalescent plasma as part of COVID-19 treatment or post-exposure prophylaxis. Based on the estimated half-life of such therapies and evidence suggesting that reinfection is uncommon within the 90 days after initial infection, vaccination should be deferred for at least 90 days after receiving monoclonal antibodies or convalescent plasma. This is a precautionary measure until additional information becomes available, to avoid potential interference of the antibody therapy with vaccine-induced immune responses. This recommendation applies to people who receive passive antibody therapy before receiving any vaccine dose; any vaccine dose after the initial vaccine dose should be deferred for at least 90 days following receipt of the antibody therapy. Receipt of passive antibody therapy in the past 90 days is not a contraindication to receipt of COVID-19 vaccine. COVID-19 vaccine doses received within 90 days after receipt of passive antibody therapy do not need to be repeated.

For people receiving antibody therapies not specific to COVID-19 treatment (e.g., intravenous immunoglobulin, RhoGAM), administration of COVID-19 vaccines either simultaneously with or at any interval before or after receipt of an antibody-containing product is unlikely to substantially impair development of a protective antibody response. Thus, there is no recommended minimum interval between antibody therapies not specific to COVID-19 treatment and COVID-19 vaccination.

Vaccinated people who subsequently develop COVID-19

For people who have received one or more doses of COVID-19 vaccine and subsequently experience SARS-CoV-2 infection, prior receipt of a COVID-19 vaccine should not affect treatment decisions (including use of monoclonal antibodies, convalescent plasma, antiviral treatment, or corticosteroid administration) or timing of such treatments.

If a person has SARS-CoV-2 RNA or antigen detected on a respiratory specimen collected ≥14 days after they complete all recommended doses of a currently FDA-approved or FDA-authorized COVID-19 vaccine (defined as a COVID-19 vaccine breakthrough case), CDC encourages local health departments, healthcare professionals, and clinical laboratories to:

- Request the respiratory specimen be held for further testing
- Report the case to the state health department where the individual resides for further investigation and reporting to the national system

COVID-19 vaccine breakthrough cases that result in hospitalization or death should be reported to VAERS .

Antiviral therapy and COVID-19 vaccination

Administration of an antiviral drug at any interval before or after vaccination with any of the currently FDA-approved or FDA-authorized COVID-19 vaccines, including the adenovirus vector Janssen COVID-19 vaccine, is unlikely to impair development of a protective antibody response.

Vaccinating people with a known COVID-19 exposure or during COVID-19 outbreaks

COVID-19 vaccines are not currently recommended for outbreak management or for post-exposure prophylaxis to prevent SARS-CoV-2 infection in a person with a known exposure. Because the median incubation period of COVID-19 is 4–5 days, it is unlikely that a dose of COVID-19 vaccine would provide an adequate immune response within the incubation period for effective post-exposure prophylaxis.

People in the community or in outpatient settings who have had a known COVID-19 exposure should not seek vaccination until their quarantine period has ended to avoid potentially exposing healthcare personnel and others during the vaccination visit. This also avoids causing diagnostic confusion between possible adverse effects of vaccination and symptoms of a new COVID-19 diagnosis. This recommendation also applies to people with a known COVID-19 exposure before receipt of the second mRNA vaccine dose.

Residents or patients with a known COVID-19 exposure or undergoing screening in congregate healthcare settings (e.g., long-term care facilities) or congregate non-healthcare settings (e.g., correctional and detention facilities, homeless shelters) may be vaccinated. In these settings, exposure to and transmission of SARS-CoV-2 can occur repeatedly for long periods of time, and healthcare personnel and other staff are already in close contact with residents. People residing in congregate settings (healthcare and non-healthcare) who have had an exposure and are awaiting SARS-CoV-2 testing results may be vaccinated if they do not have symptoms consistent with COVID-19. Vaccinators should employ appropriate infection prevention and control procedures.

Considerations for use of an additional dose of COVID-19 vaccine following a primary vaccine series

There are two distinct potential uses for an additional dose of COVID-19 vaccine:

- **Additional dose after an initial primary vaccine series:** an additional dose of vaccine administered when the immune response following a primary vaccine series is likely to be insufficient. An additional mRNA COVID-19 vaccine dose is recommended for moderately to severely immunocompromised people after an initial 2-dose primary mRNA vaccine series.
- **Booster dose:** an additional dose of vaccine administered when the initial sufficient immune response to a primary vaccine series is likely to have waned over time. FDA is conducting an independent evaluation and determination of the safety and effectiveness of a booster dose following receipt of a primary COVID-19 vaccine series, and ACIP will be issuing booster dose recommendations based on a thorough review of the evidence.

Considerations for use of an additional mRNA COVID-19 vaccine dose after an initial 2-dose COVID-19 mRNA vaccine series for immunocompromised people

People with immunocompromising conditions or people who take immunosuppressive medications or therapies are at increased risk for severe COVID-19 illness. The currently FDA-approved or FDA-authorized COVID-19 vaccines are not live vaccines and therefore can be safely administered to immunocompromised people.

COVID-19 vaccine immune response and effectiveness in moderately and severely immunocompromised people

Studies have found evidence of reduced immune response to a 2-dose primary mRNA COVID-19 vaccine series in some groups of immunocompromised people. In addition, reduced vaccine effectiveness has been observed in immunocompromised participants compared to participants who are not immunocompromised in a limited number of studies. Immunocompromised people also may have a higher rate of breakthrough SARS-CoV-2 infections than the general population. Small studies have demonstrated that an additional mRNA COVID-19 vaccine dose in some immunocompromised people who received a primary mRNA COVID-19 vaccine series may enhance antibody response, increasing the proportion of people who respond. However, the exact correlation between antibody level and protection against COVID-19 severe outcomes as well as infectiousness remains unclear. The reactogenicity profile of the additional dose was similar to prior doses.

.

Although the clinical benefit of an additional dose of an mRNA COVID-19 vaccine in immunocompromised people who received a primary mRNA COVID-19 vaccine series is still under investigation, the potential to increase immune response coupled with an acceptable safety profile, supports use of an additional mRNA COVID-19 vaccine dose after an initial 2-dose primary mRNA COVID-19 vaccine series in this population.

On August 12, 2021 FDA modified the EUAs for Pfizer-BioNTech COVID-19 vaccine and Moderna COVID-19 vaccine to allow for administration of an additional dose (i.e., a third dose) of an mRNA COVID-19 vaccine after an initial 2-dose primary mRNA COVID-19 vaccine series for certain immunocompromised people (i.e., people who have undergone solid organ transplantation or have been diagnosed with conditions that are considered to have an equivalent level of immunocompromise). Pfizer-BioNTech (COMIRNATY) COVID-19 Vaccine is authorized under EUA for this purpose as well. The age groups authorized to receive the additional dose are unchanged from those authorized to receive the primary vaccination series:

- Pfizer-BioNTech: aged ≥12 years
- Moderna: aged ≥18 years

Considerations for use of an additional dose of mRNA COVID-19 vaccine in moderately and severely immunocompromised people

For public health purposes, immunocompromised people who have completed a primary vaccine series (i.e., 2-dose mRNA vaccine series [Pfizer-BioNTech and Moderna] or single dose of the Janssen vaccine) are considered fully vaccinated ≥2 weeks after completion of the series. However, an additional dose of an mRNA COVID-19 vaccine after an initial 2-dose primary mRNA COVID-19 vaccine series should be considered for people with moderate to severe immune compromise due to a medical condition or receipt of immunosuppressive medications or treatments. These conditions and treatments include but are not limited to:

- Active treatment for solid tumor and hematologic malignancies
- Receipt of solid-organ transplant and taking immunosuppressive therapy
- Receipt of chimeric antigen receptor (CAR)-T-cell or hematopoietic stem cell transplant (within 2 years of transplantation or taking immunosuppression therapy)
- Moderate or severe primary immunodeficiency (e.g., DiGeorge syndrome, Wiskott-Aldrich syndrome)
- Advanced or untreated HIV infection (people with HIV and CD4 cell counts <200/mm^3, history of an AIDS-defining illness without immune reconstitution, or clinical manifestations of symptomatic HIV)
- Active treatment with high-dose corticosteroids (i.e., ≥20mg prednisone or equivalent per day when administered for ≥2 weeks), alkylating agents, antimetabolites, transplant-related immunosuppressive drugs, cancer chemotherapeutic agents classified as severely immunosuppressive, tumor-necrosis (TNF) blockers, and other biologic agents that are immunosuppressive or immunomodulatory.

Factors to consider in assessing the general level of immune competence in a patient include disease severity, duration, clinical stability, complications, comorbidities, and any potentially immune-suppressing treatment. Age or place of residence alone (e.g., residence in a long-term care facility), independent of a patient's medical condition, should not be used to determine the level of immune competence, as the balance of benefits and risks of an additional dose for people who are not moderately to severely immunocompromised is currently unknown.

Additional information about the level of immune suppression associated with a range of medical conditions and treatments can be found in general best practices for vaccination of people with altered immunocompetence, the CDC Yellow Book, and the Infectious Diseases Society of America policy statement, 2013 IDSA Clinical Practice Guideline for Vaccination of the Immunocompromised Host .

Whenever possible, mRNA COVID-19 vaccination doses (including the primary series and an additional dose) or the single dose Janssen COVID-19 vaccine should be completed at least two weeks before initiation or resumption of immunosuppressive therapies, but timing of COVID-19 vaccination should take into consideration current or planned immunosuppressive therapies and optimization of both the patient's medical condition and response to vaccine.

A patient's clinical team is best positioned to determine the degree of immune compromise and appropriate timing of vaccination.

The utility of serologic testing or cellular immune testing to assess immune response to vaccination and guide clinical care (e.g., as part of need assessment for an additional dose) has not been established. Serologic testing or cellular immune testing outside of the context of research studies is **not recommended at this time**.

The additional mRNA COVID-19 vaccine dose should be the same vaccine product as the initial 2-dose mRNA COVID-19 primary vaccine series (Pfizer-BioNTech or Moderna). If the mRNA COVID-19 vaccine product given for the first two doses is not available, the other mRNA COVID-19 vaccine product may be administered. A person should not receive more than three mRNA COVID-19 vaccine doses.

Until additional data are available, the additional dose of an mRNA COVID-19 vaccine should be administered at least 28 days after completion of the initial 2-dose mRNA COVID-19 vaccine series, based on expert opinion.

Currently there are insufficient data to support the use of an additional mRNA COVID-19 vaccine dose after a single-dose Janssen COVID-19 vaccination series in immunocompromised people. FDA and CDC are actively working to provide guidance on this issue.

As new data become available, these interim considerations may be updated.

Reinforcement of the need for prevention measures among immunocompromised people

People who are immunocompromised **(including people who receive an additional mRNA COVID-19 vaccine dose after an initial 2-dose primary mRNA COVID-19 vaccine series)** should be counseled about the potential for a reduced immune response to COVID-19 vaccines and **the need to continue to follow current prevention measures** (including wearing a mask, staying 6 feet apart from others they don't live with, and avoiding crowds and poorly ventilated indoor spaces) to protect themselves against COVID-19 until advised otherwise by their healthcare professional. Close contacts of immunocompromised people should also be strongly encouraged to be vaccinated against COVID-19 to protect these people.

Considerations for vaccination of people with certain underlying medical conditions

Any currently FDA-approved or FDA-authorized COVID-19 vaccine can be administered to people with underlying medical conditions who have no contraindications to vaccination; ACIP does not state a product preference. Clinical trials demonstrated similar safety and efficacy profiles in people with some underlying medical conditions, including those that place them at increased risk for severe COVID-19 symptoms, compared to people without comorbidities. Additional information for people with specific underlying medical conditions is included below. Healthcare professionals or health departments in the United States can request a consultation from the Clinical Immunization Safety Assessment COVIDvax project if they have complex COVID-19 vaccine safety questions not readily addressed by CDC guidance.

People with a history of myocarditis or pericarditis

Myocarditis (inflammation of the heart muscle) or pericarditis (inflammation of the lining around the heart) have occurred rarely in some people following receipt of mRNA COVID-19 vaccines (Pfizer-BioNTech and Moderna). The mechanisms that cause myocarditis or pericarditis following vaccination with an mRNA COVID-19 vaccine are not well understood. Cases of myocarditis or pericarditis have occurred predominantly in males aged 12-29 years within a few days after receiving the second dose of vaccine. Most patients have been hospitalized for short periods, with the majority achieving resolution of acute symptoms. Follow-up is ongoing to identify and understand potential long-term outcomes among cases.

There are limited data on the safety and efficacy of COVID-19 vaccines in people with a history of myocarditis or pericarditis. The interim considerations for the clinical scenarios detailed as follows may be updated as new information is obtained.

Myocarditis or pericarditis after receipt of the first dose of an mRNA COVID-19 vaccine series but before administration of the second dose

It is unclear if people who developed myocarditis or pericarditis after a first dose of an mRNA COVID-19 vaccine may be at increased risk of further adverse cardiac effects following a second dose of the vaccine. **Until additional safety data are available, experts recommend that people who develop myocarditis or pericarditis after a first dose of an mRNA COVID-19 vaccine defer receiving the second dose.**

Administration of the second dose of an mRNA COVID-19 vaccine series can be considered in certain circumstances. Considerations for vaccination may include:

- Personal risk of severe acute COVID-19 (e.g., age, underlying conditions)
- Level of COVID-19 community transmission and personal risk of infection
- Additional data on the risk of myocarditis or pericarditis following an occurrence of either condition after the first dose of an mRNA COVID-19 vaccine
- Additional data on the long-term outcomes of myocarditis or pericarditis that occurred after receipt of an mRNA COVID-19 vaccine
- Timing of any immunomodulatory therapies; ACIP's general best practice guidelines for immunization can be consulted for more information

People with a history of myocarditis or pericarditis who choose to receive the second dose of an mRNA COVID-19 vaccine should wait at least until their episode of myocarditis or pericarditis has completely resolved. This includes resolution of symptoms attributed to myocarditis or pericarditis, as well as no evidence of ongoing heart inflammation or sequelae as determined by the person's clinical team, which may include a cardiologist, and special testing to assess cardiac recovery. Decisions about proceeding with the second dose should include a conversation between the patient, their parent, guardian, or caregiver (when relevant), and their clinical team.

Clinicians should consult current clinical guidance for information on the evaluation and management of myocarditis.

History of myocarditis or pericarditis prior to COVID-19 vaccination

People who have a history of myocarditis or pericarditis unrelated to mRNA COVID-19 vaccination may receive any currently FDAapproved or FDA-authorized COVID-19 vaccine after the episode of myocarditis or pericarditis has completely resolved. This includes resolution of symptoms attributed to myocarditis or pericarditis, as well as no evidence of ongoing heart inflammation or sequelae as determined by the person's clinical team, which may include a cardiologist, and special testing to assess cardiac recovery.

CDC is continuing to investigate cases of myocarditis or pericarditis after mRNA COVID-19 vaccination; this guidance may be updated as new information is obtained. All cases of myocarditis or pericarditis following COVID-19 vaccination should be reported to VAERS .

People with autoimmune conditions

People with autoimmune conditions were enrolled in COVID-19 vaccine clinical trials. Safety and efficacy of vaccines in this population were similar to the general population. People with autoimmune conditions may receive any currently FDA-approved or FDA-authorized COVID-19 vaccine. If people with these conditions are immunocompromised because of medications such as high-dose corticosteroids or biologic agents, they should follow the considerations for immunocompromised people.

People with a history of Guillain-Barré syndrome

Guillain-Barré syndrome (GBS) is a neurological disorder in which the body's immune system damages nerve cells, causing muscle weakness and sometimes paralysis. ACIP's general best practices for immunization do not include a history of GBS as a contraindication to vaccination; a history of GBS is a precaution for influenza vaccines and tetanus-toxoid containing vaccines in limited situations.[1] Reports of adverse events following use of the Janssen COVID-19 vaccine under EUA suggest an increased risk of GBS during the 42 days following vaccination. No increased risk of GBS has been identified with mRNA vaccines during use under EUA.

People with a history of GBS can receive any currently FDA-approved or FDA-authorized COVID-19 vaccine. However, given the possible association between the Janssen COVID-19 vaccine and an increased risk of GBS, a patient with a history of GBS and their clinical team should discuss the availability of mRNA COVID-19 vaccines to offer protection against COVID-19.

Any occurrence of GBS following COVID-19 vaccination should be reported to VAERS . CDC and FDA will continue to monitor and review cases of GBS among people who receive any currently FDA-approved or FDA-authorized COVID-19 vaccine in the United States and may update this guidance in the future.

People with a history of Bell's palsy

Cases of Bell's palsy (acute peripheral facial nerve palsy) were reported following vaccination of participants in the COVID-19 vaccine clinical trials. Available data were insufficient for FDA to conclude that these cases were causally related to vaccination. Post-authorization safety surveillance will be important to further assess any possible causal association. In the absence of such evidence, people with a history of Bell's palsy may receive any currently FDA-approved or FDA-authorized COVID-19 vaccine. Any occurrence of Bell's palsy following COVID-19 vaccination should be reported to VAERS .

People with a history of dermal filler use

Infrequently, people who have received dermal fillers might experience swelling at or near the site of filler injection (usually face or lips) following administration of a dose of an mRNA COVID-19 vaccine (no similar occurrences were observed in the Janssen COVID-19 vaccine clinical trials). The swelling appears to be temporary and resolves with medical treatment, including corticosteroid therapy. Any currently FDA-approved or FDA-authorized COVID-19 vaccines can be administered to people who have received injectable dermal fillers who have no contraindications or precautions for vaccination. However, these people should be advised to contact their healthcare professional for evaluation if they experience swelling at or near a dermal filler site following vaccination.

Considerations for use of the Janssen COVID-19 vaccine in certain populations

Thrombosis with thrombocytopenia syndrome

Thrombosis with thrombocytopenia syndrome (TTS) is a rare syndrome that involves acute venous or arterial thrombosis and new onset thrombocytopenia in patients with no recent known exposure to heparin. In the United States, the majority of people with TTS that occurred after Janssen COVID-19 vaccination had clots located in cerebral venous sinuses; clots also occurred in other unusual locations, including in the portal vein and splenic vein, and included a combination of venous and arterial thromboses. FDA updated the Janssen COVID-19 vaccine EUA Fact Sheet for Health Care Providers Administering Vaccine (Vaccination Providers) and Fact Sheet for Recipients and Caregivers to include information about rare clotting events that might occur after vaccination, primarily among women aged 18–49 years.

Women aged <50 years

The highest rates of TTS per vaccine doses administered were identified in women <50 years of age. Women aged <50 years can receive any currently FDA-approved or FDA-authorized COVID-19 vaccine. However, they should be made aware of the rare risk of TTS after receipt of the Janssen COVID-19 vaccine and the availability of other currently FDA-approved or FDA-authorized COVID-19 vaccines (i.e., mRNA vaccines). At the time of ACIP's review, TTS reporting rates to VAERS were 7.0 cases per million Janssen COVID-19 vaccine doses administered to women aged 18−49 years and 0.9 per million to women aged≥50 years.

People with a history of thrombosis or risk factors for thrombosis

Although the etiology of TTS associated with the Janssen COVID-19 vaccine is unclear, it appears to be similar to another rare immune-mediated syndrome, heparin-induced thrombocytopenia (HIT). Until more information becomes available, experts advise that people with a history of an episode of an immune-mediated syndrome characterized by thrombosis and thrombocytopenia, such as HIT, should be offered another currently FDA-approved or FDA-authorized COVID-19 vaccine (i.e., mRNA vaccine) if it has been ≤90 days since their TTS resolved. After 90 days, patients may be vaccinated with any currently FDA-approved or FDA-authorized COVID-19 vaccine.

Venous thromboembolism (VTE), defined as deep vein thrombosis, pulmonary embolism, or both, are common. The biologic mechanisms for VTE (as well as arterial thrombi) differ from the underlying immune-mediated mechanism for HIT. Based on current knowledge, experts believe that people with risk factors for VTE (e.g., inherited or acquired thrombophilia including Factor V Leiden; prothrombin gene 20210A mutation; antiphospholipid syndrome; protein C, protein S or antithrombin deficiency), or a prior history of other types of thromboses (including cerebral venous sinus thrombosis [CVST]) not associated with thrombocytopenia are unlikely to be at increased risk for TTS. Likewise, although the risk of thrombosis is increased during pregnancy and the postpartum period, and with certain hormonal contraceptives (e.g., combined oral contraceptives,

patch, and ring), experts believe that these factors do not make people more susceptible to TTS after receipt of the Janssen COVID-19 vaccine. People with risk factors for VTE can receive any currently FDA-approved or FDA-authorized vaccine, including the Janssen COVID-19 vaccine.

Use of aspirin or anticoagulants

It is not recommended that people take aspirin or an anticoagulant before vaccination with the Janssen COVID-19 vaccine or any other currently FDA-approved or FDA-authorized COVID-19 vaccine (i.e., mRNA vaccine) unless they take these medications as part of their routine medications.

People with a history of Guillain-Barré syndrome

Reports of adverse events following use of the Janssen COVID-19 Vaccine under EUA suggest an increased risk of GBS during the 42 days following vaccination. Investigations to assess whether there is a causal relationship between GBS and Janssen vaccine are ongoing. People with a history of GBS can receive any currently FDA-approved or FDA-authorized COVID-19 vaccine. However, given the possible association between the Janssen COVID-19 vaccine and an increased risk of GBS, a patient with a history of GBS and their clinical team should discuss the availability of mRNA COVID-19 vaccines to offer protection against COVID-19.

Considerations involving pregnancy, lactation, and fertility

COVID-19 vaccination is recommended for all people aged 12 years and older, including people who are pregnant, lactating, trying to get pregnant now, or might become pregnant in the future. Any of the currently FDA-approved or FDA-authorized COVID-19 vaccines can be administered to people in these groups; ACIP does not state a product preference. However, all women aged <50 years should be aware of the rare risk of TTS after receipt of the Janssen COVID-19 vaccine and the availability of other currently FDA-approved or FDA-authorized COVID-19 vaccines (i.e., mRNA vaccines) for which this risk has not been seen. See also People with a history of thrombosis or risk factors for thrombosis. There is no evidence that any of the COVID-19 vaccines affect current or future fertility.

Pregnancy

Pregnant and recently pregnant people with COVID-19 are at increased risk for severe illness when compared with non-pregnant people. Severe illness includes illness that requires hospitalization, intensive care unit admission, mechanical ventilation, or extracorporeal membrane oxygenation; or illness that results in death, although the absolute risk for these outcomes is low. Additionally, pregnant people with COVID-19 are at increased risk for preterm birth and might be at increased risk for other adverse pregnancy complications and outcomes, such as preeclampsia, coagulopathy, and stillbirth.

A growing body of evidence on the safety and effectiveness of COVID-19 vaccination – in both animal and human studies – indicates that the benefits of vaccination outweigh any known or potential risks of COVID-19 vaccination during pregnancy.

- *No safety signals in animal studies:* No female reproduction or fetal, embryonal, or postnatal development safety concerns were demonstrated in animals that received Pfizer-BioNTech, Moderna, or Janssen COVID-19 vaccines before or during gestation.
- *No adverse outcomes in previous trials of the adenovirus platform that included pregnant people:* The adenovirus vector platform used in the Janssen COVID-19 vaccine has been used for other Janssen vaccine development programs in which pregnant people were vaccinated during any trimester, including a large-scale Ebola vaccine trial. No adverse pregnancy-related outcomes—including infant outcomes—were determined to be related to the vaccine in these trials.
- *COVID-19 vaccines do not cause infection in the pregnant person or the fetus:* The currently FDA-approved or FDA-authorized COVID-19 vaccines (i.e., mRNA vaccines and a non-replicating viral vector vaccine) are not live vaccines and cannot cause infection in either the pregnant person or the fetus.
- *Reassuring early safety data on mRNA COVID-19 vaccines during pregnancy:* CDC released the first U.S. data on the safety of mRNA COVID-19 vaccines administered during pregnancy. The report analyzed data from three vaccine safety-related databases: VAERS , the v-safe active surveillance system, and the v-safe pregnancy registry, which collects additional detailed data on pregnant people and their infants. Early data from these systems did not identify any safety concerns for pregnant people who were vaccinated or their infants. Among pregnant people enrolled in the v-safe pregnancy registry who were vaccinated before 20 weeks' gestation, miscarriage rates following vaccination were similar to the background incidence of miscarriage .

- *Early data suggest mRNA COVID-19 vaccines during pregnancy are effective:* A study from a large population-based cohort of pregnant people in Israel compared those who received an mRNA COVID-19 vaccination with those who did not and found vaccination was associated with a significantly lower risk of SARS-CoV-2 infection.
- *Vaccination of pregnant people generates an immune response:* A recent report has shown that mRNA COVID-19 vaccine-induced humoral response was comparable in pregnant women and non-pregnant controls. In the same study, antibodies developed from mRNA COVID-19 vaccination were present in umbilical cord blood, indicating the potential for protection against COVID-19 for neonates and infants.
- *Clinical trials to evaluate the safety and efficacy of COVID-19 vaccines in pregnant people are also under way*: Vaccine manufacturers are also following outcomes in people in the clinical trials who became pregnant.

COVID-19 vaccination is recommended for all people aged 12 years and older, including people who are pregnant. A conversation between the patient and their clinical team may assist with decisions about the use of a COVID-19 vaccine; however, approval by a healthcare professional is not required before vaccination. COVID-19 vaccines and other vaccines may be administered without regard to timing as detailed in Coadministration with other vaccines. If a person becomes pregnant following the first dose of a COVID-19 vaccine that requires two doses (i.e., Pfizer-BioNTech COVID-19 vaccine or Moderna COVID-19 vaccine), the second dose should be administered as indicated for the person to be have maximum protection. Data on uptake of COVID-19 vaccination among pregnant people can be found on CDC's COVID Data Tracker. Pregnant people are encouraged to enroll in v-safe after COVID-19 vaccination.

Side effects can occur after COVID-19 vaccination in pregnant people, similar to those among non-pregnant people. Acetaminophen can be offered as an option for pregnant people experiencing fever (fever has been associated with adverse pregnancy outcomes) or other post-vaccination symptoms.

Lactation

COVID-19 vaccination is recommended for all people aged 12 years and older, including lactating people. There are limited data on the safety of COVID-19 vaccines in lactating people or the effects of COVID-19 vaccines on the breastfed infant, milk production, and secretion. However, the currently FDA-approved or FDA-authorized COVID-19 vaccines (i.e., mRNA vaccines and a non-replicating viral vector vaccine) cannot cause infection in either the lactating person or the infant. Recent reports have shown that the antibodies developed from mRNA COVID-19 vaccination were present in breastmilk samples. More data are needed to determine if these antibodies convey protection against SARS-CoV-2 infection for neonates and infants.

Fertility

COVID-19 vaccination is recommended for all people aged 12 years and older, including people trying to get pregnant now or who might become pregnant in the future. There is no recommendation for routine pregnancy testing before receipt of a COVID-19 vaccine. Those who are trying to become pregnant do not need to avoid pregnancy after COVID-19 vaccination. There is currently no evidence that any vaccines, including COVID-19 vaccines, cause fertility problems. Many women have become pregnant after receiving COVID-19 vaccine. However, results from ongoing long-term studies are not yet available.

Vaccination of children and adolescents

Adolescents aged 12–17 years are eligible to receive the Pfizer-BioNTech COVID-19 vaccine and may be vaccinated with appropriate consent and assent. Sites administering COVID-19 vaccines should follow current state/jurisdictional policies and practices for other routine immunizations in this age group.

Available safety, immunogenicity, and reactogenicity data are similar to those seen in young adults aged 16-25 years. Syncope (fainting) may occur in association with any injectable vaccines, especially among adolescents. Procedures should be in place to prevent falling injuries and manage syncopal reactions. All people are recommended to be observed for 15 minutes after vaccination (including COVID-19 vaccination); patients should be seated or lying down during the observation period to decrease the risk for injury should they faint. If syncope develops, patients should be observed until symptoms resolve.

Children younger than age 12 years are not authorized to receive the Pfizer-BioNTech COVID-19 vaccine at this time. Children and adolescents younger than age 18 years are not authorized to receive the Moderna or Janssen COVID-19 vaccines at this time.

Patient counseling

The vaccine-specific Fact Sheet for Recipients and Caregivers should be provided to all vaccine recipients, parents or guardians, and caregivers (when relevant) before vaccination with any currently FDA-authorized COVID-19 vaccine.

mRNA COVID-19 vaccines (Pfizer-BioNTech and Moderna)

Based on results from manufacturers' clinical trials, data suggest high vaccine efficacy in preventing symptomatic laboratory-confirmed COVID-19 following receipt of two doses of mRNA COVID-19 vaccine: Pfizer-BioNTech: 91.1% (95% CI: 88.8%, 93.1%) for people aged ≥16 years with approximately 6 months of follow-up and 100% (95% CI: 75.3%, 100%) for adolescents aged 12–15 years with 2 months of follow-up; and Moderna: 94.1% (95% CI: 89.3%, 96.8%) for people aged ≥18 years with 2 months of follow-up. Patients should be counseled on the importance of completing the 2-dose series with the same vaccine product to optimize protection. Data on real-world vaccine effectiveness with the Delta variant (B.1.617.2) as the predominant circulating variant continues to be updated, with early data supporting continued high effectiveness against hospitalization and death and lower effectiveness against confirmed infection and symptomatic disease, compared with the Alpha (B.1.1.7) variant.

Before vaccination, vaccination providers should counsel mRNA COVID-19 vaccine recipients about expected local (e.g., pain, swelling, erythema at the injection site, localized axillary lymphadenopathy[1] on the same side as the vaccinated arm) and systemic (e.g., fever, fatigue, headache, chills, myalgia, arthralgia) post-vaccination symptoms.

Most systemic post-vaccination symptoms are mild to moderate in severity, occur within the first three days of vaccinationresolve within 1–2 days of onset. Overall, symptoms are more frequent and severe following the second dose and among younger people compared with older people (i.e., aged >55 or ≥65 years [for Pfizer-BioNTech or Moderna vaccines, respectively]). People with prior SARS-CoV-2 infection may be more likely to experience symptoms such as fever, chills, and myalgia after the first mRNA COVID-19 vaccine dose. Unless people have a contraindication to vaccination, they should be encouraged to complete the series to optimize protection against COVID-19 even if they experience local or systemic symptoms following the first dose.

Myocarditis and pericarditis

In view of reports of myocarditis (inflammation of the heart muscle) and pericarditis (inflammation of the lining outside the heart) after receipt of mRNA COVID-19 vaccines, the fact sheets for the Pfizer-BioNTech COVID-19 vaccine and the Moderna COVID-19 vaccine include information about myocarditis and pericarditis. For each mRNA vaccine, the Fact Sheet for Recipients and Caregivers notes that myocarditis or pericarditis have occurred in some people who have received the vaccine. In most of these people, symptoms began within a few days following receipt of the second dose of the vaccine. The chance of myocarditis or pericarditis occurring after receipt of an mRNA COVID-19 vaccine is very low and can occur in patients with SARS-CoV-2 infection at higher rates than in those who received mRNA vaccines. People should seek medical attention right away if they have any of the following symptoms after receiving the vaccine:

- Chest pain
- Shortness of breath
- Feelings of having a fast-beating, fluttering, or pounding heart

After reviewing benefit-risk assessments for myocarditis and pericarditis after vaccination with mRNA COVID-19 vaccines, ACIP determined that the benefits of using mRNA COVID-19 vaccines clearly outweigh the risks of myocarditis and pericarditis. People receiving mRNA COVID-19 vaccines, especially males aged 12-29 years, should be made aware of both the possibility of myocarditis or pericarditis following receipt of mRNA COVID-19 vaccines and the possibility of myocarditis or pericarditis following SARS-CoV-2 infection, and should be counseled about the need to seek care if symptoms of myocarditis or pericarditis develop after vaccination. Clinicians should consult current clinical guidance for information on the evaluation and management of myocarditis or pericarditis.

Viral vector COVID-19 vaccine (Janssen)

Preliminary data from the manufacturer's clinical trial suggest an overall efficacy of 66.3% (95% CI: 59.9%, 71.8%) against symptomatic, laboratory-confirmed COVID-19 from ≥14 days after vaccination with Janssen COVID-19 vaccine in people aged ≥18 years. Vaccine efficacy for the prevention of COVID-19-associated hospitalization was high; vaccine efficacy against hospitalization ≥14 days after vaccination was 93.1% (95% CI: 71.1%, 98.4%). No COVID-19–associated hospitalizations

occurred ≥28 days after vaccination in the vaccine group, and 16 occurred in the placebo group (vaccine efficacy = 100%; 95% CI = 74.3%, 100.0%). Vaccine efficacy against all-cause death was 75.0% (95% CI: 33.4%, 90.6%). Data on real-world vaccine effectiveness with the Delta variant (B.1.617.2) as the predominant variant continue to be updated.

Before vaccination, vaccination providers should counsel Janssen COVID-19 vaccine recipients about expected local (e.g., pain, swelling, erythema at the injection site) and systemic (e.g., fever, fatigue, headache, chills, myalgia, arthralgia) post-vaccination symptoms. Fifty percent of vaccinated people experience at least one local symptom, with pain at the injection site most common, and approximately 55% experience at least one systemic symptom following vaccination. Most systemic post-vaccination symptoms are mild to moderate in severity resolve within 1–2 days post-vaccination. Overall, symptoms were more frequent in people aged 18–59 years compared to people aged ≥60 years.

Thrombosis with thrombocytopenia syndrome

In view of reports of TTS after receipt of the Janssen COVID-19 vaccine, FDA updated the EUA fact sheets. The Fact Sheet for Recipients and Caregivers notes that blood clots involving blood vessels in the brain, abdomen, and legs along with low levels of platelets have occurred in some people who received the Janssen COVID-19 vaccine and that these symptoms began approximately 1-2 weeks following vaccination. Most people who developed these blood clots were women aged 18-49 years.[1] Although the chances of this occurrence are remote, people should seek medical attention right away if they have any of the following symptoms after receiving the Janssen COVID-19 vaccine:

- Shortness of breath
- Chest pain
- Leg swelling
- Persistent abdominal pain
- Severe or persistent headaches or blurred vision
- Easy bruising or tiny blood spots under the skin beyond the site of the injection.

ACIP reviewed a risk-benefit assessment of TTS events after vaccination with the Janssen COVID-19 vaccine. Based on this risk-benefit analysis, ACIP reaffirmed its interim recommendation for the use of the Janssen COVID-19 vaccine in all persons aged ≥18 years, while still acknowledging the increased risk for TTS in women aged <50 years. These women should be made aware of the increased risk for TTS and the availability of other currently FDA-approved or FDA-authorized COVID-19 vaccines (i.e., mRNA vaccines). Clinicians should consult the Health Alert Network (HAN) notification and guidance from the American Society of Hematology for information on the diagnosis and treatment of suspected cases of TTS.

Guillain-Barré Syndrome

Reports of adverse events following use of the Janssen COVID-19 Vaccine under EUA suggest an increased risk of GBS during the 42 days following vaccination. The Fact Sheet for Recipients and Caregivers includes information about GBS (a neurological disorder in which the body's immune system damages nerve cells, causing muscle weakness and sometimes paralysis) and notes that in most people symptoms began within 42 days following receipt of Janssen COVID-19 vaccine. Although the chance of GBS occurring is very low, vaccine recipients should seek medical attention right away if they develop any of the following symptoms after receiving Janssen COVID-19 vaccine:

- Weakness or tingling sensations, especially in the legs or arms, that is worsening and spreading to other parts of the body
- Difficulty walking
- Difficulty with facial movements, including speaking, chewing, or swallowing
- Double vision or inability to move eyes
- Difficulty with bladder control or bowel function

ACIP reviewed a benefit-risk assessment of GBS events after vaccination with the Janssen COVID-19 vaccine. Based on this benefit-risk analysis, ACIP reaffirmed its interim recommendation for the use of the Janssen COVID-19 vaccine in all persons aged ≥18 years while acknowledging the increased risk for GBS. However, given the possible association between the Janssen COVID-19 vaccine and an increased risk of GBS, a patient with a history of GBS and their clinical team should discuss the availability of mRNA COVID-19 vaccines to offer protection against COVID-19.

Management of post-COVID-19-vaccination symptoms

For all currently FDA-approved or FDA-authorized COVID-19 vaccines, antipyretic or analgesic medications (e.g., acetaminophen, non-steroidal anti-inflammatory drugs) can be taken for the treatment of post-vaccination local or systemic symptoms, if medically appropriate. However, routine prophylactic administration of these medications for the purpose of preventing post-vaccination symptoms is not currently recommended, because information on the impact of such use on COVID-19 vaccine-induced antibody responses is not yet available.

Anaphylactic reactions have been rarely reported following receipt of COVID-19 vaccines. Administration of antihistamines to COVID-19 vaccine recipients before vaccination to prevent allergic reactions is not recommended. Antihistamines do not prevent anaphylaxis, and their use might mask cutaneous symptoms, which could lead to a delay in the diagnosis and management of anaphylaxis. See section on contraindications and precautions to vaccination and interim considerations for anaphylaxis management for more information on management of anaphylaxis.

Infection prevention and control considerations are available for healthcare personnel and long-term care facility residents with systemic signs and symptoms following COVID-19 vaccination.

Contraindications and precautions

Contraindications and precautions to COVID-19 vaccines are described below and summarized in Appendix B. For the purposes of this guidance, an immediate allergic reaction to a vaccine or medication is defined as any hypersensitivity-related signs or symptoms such as urticaria, angioedema, respiratory distress (e.g., wheezing, stridor), or anaphylaxis that occur within four hours following administration.

Healthcare professionals or health departments in the United States can request a consultation from the Clinical Immunization Safety Assessment COVIDvax project about an individual patient residing in the United States for a complex COVID-19 vaccine safety question not readily addressed by CDC guidance.

Contraindications

CDC considers a history of the following to be a contraindication to vaccination with COVID-19 vaccines:

- Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a component of the COVID-19 vaccine
- Immediate allergic reaction of any severity to a previous dose or known (diagnosed) allergy to a component of the COVID-19 vaccine

See Appendix C for a list of ingredients in COVID-19 vaccines. Polyethylene glycol (PEG) is an ingredient in both mRNA COVID-19 vaccines, and polysorbate 80 is an ingredient in Janssen COVID-19 vaccine. PEG and polysorbate are structurally related, and cross-reactive hypersensitivity between these compounds may occur. People with a contraindication to one of the mRNA COVID-19 vaccines should not receive doses of either of the mRNA vaccines (Pfizer-BioNTech or Moderna). However, people with a contraindication to mRNA COVID-19 vaccines may be able to receive Janssen COVID-19 vaccine, and vice versa, provided certain measures are taken (see “precautions” below). Known polysorbate allergy is no longer a contraindication to mRNA vaccination; however, known polysorbate allergy is a contraindication to Janssen COVID-19 vaccine and thus, a precaution to mRNA COVID-19 vaccination.

Healthcare professionals should attempt to determine whether reactions reported following vaccination are consistent with immediate allergic reactions versus other types of reactions commonly observed following vaccination, such as a vasovagal reaction or post-vaccination side effects (Appendix D). This will help determine which patients have a contraindication to vaccination, including to the second dose of an mRNA COVID-19 vaccine.

Precautions

Most people deemed to have a precaution to a COVID-19 vaccine at the time of their vaccination appointment can and should be administered vaccine. CDC considers a history of an immediate allergic reaction to any vaccine other than COVID-19 vaccine or to any injectable therapy (i.e., intramuscular, intravenous, or subcutaneous vaccines or therapies [excluding subcutaneous immunotherapy for allergies, i.e., “allergy shots”]) as a precaution but not a contraindication to vaccination.

People with a history of an immediate allergic reaction to a vaccine or injectable therapy that contains multiple components, one or more of which is a component of a COVID-19 vaccine, have a precaution to vaccination with that COVID-19 vaccine, even if it is unknown which component elicited the allergic reaction.

People with a contraindication to one type of the currently authorized COVID-19 vaccines (e.g., mRNA) have a precaution to the other (e.g., Janssen viral vector). However, because of potential cross-reactive hypersensitivity between ingredients in mRNA and Janssen COVID-19 vaccines, consultation with an allergist-immunologist should be considered to help determine if the patient can safely receive vaccination. Healthcare professionals and health departments may also request a consultation from the Clinical Immunization Safety Assessment COVIDvax project. Vaccination of these individuals should only be undertaken in an appropriate setting under the supervision of a healthcare professional experienced in the management of severe allergic reactions.

- People with a contraindication to mRNA COVID-19 vaccines (including due to a known PEG allergy): Consideration may be given to vaccination with Janssen COVID-19 vaccine. People who have received one mRNA COVID-19 vaccine dose but for whom the second dose is contraindicated should wait at least 28 days after the mRNA vaccine dose to receive Janssen COVID-19 vaccine.
- People with a contraindication to Janssen COVID-19 vaccine (including due to a known polysorbate allergy): Consideration may be given to mRNA COVID-19 vaccination. Of note, polysorbate allergy is no longer a contraindication to mRNA COVID-19 vaccination, it is a precaution.

The following considerations can be used to help the vaccination provider conduct a risk assessment for vaccination in individuals with a precaution to vaccination:

- Risk of exposure to SARS-CoV-2 (e.g., because of residence in a congregate setting such as a long-term care facility, occupation)
- Risk of severe disease or death due to COVID-19 (e.g., because of age, underlying medical conditions)
- The unknown risk of anaphylaxis (including fatal anaphylaxis) following COVID-19 vaccination in a person with a history of an immediate allergic reaction to other vaccines or injectable therapies
- Ability of the patient to be vaccinated in a setting where appropriate medical care is immediately available for anaphylaxis. Note, for people with a contraindication to another type of COVID-19 vaccines (e.g., mRNA vaccines), vaccination with another type (e.g., Janssen viral vector vaccine) should only be undertaken in an appropriate setting under the supervision of a healthcare professional experienced in the management of severe allergic reactions.

Neither contraindications nor precautions to COVID-19 vaccination

Allergic reactions (including severe allergic reactions) not related to vaccines (COVID-19 or other vaccines) or injectable therapies, such as allergic reactions related to food, pet, venom, or environmental allergies, or allergies to oral medications (including the oral equivalents of injectable medications), are **not** a contraindication or precaution to COVID-19 vaccination.

The vial stoppers of COVID-19 vaccines are not made with natural rubber latex, and there is no contraindication or precaution to vaccination for people with a latex allergy. In addition, because the COVID-19 vaccines do not contain eggs or gelatin, people with allergies to these substances do not have a contraindication or precaution to vaccination.

Delayed-onset local reactions have been reported after mRNA vaccination in some individuals beginning a few days through the second week after the first dose and are sometimes quite large. People with only a delayed-onset local reaction (e.g., erythema, induration, pruritus) around the injection site area after the first vaccine dose do not have a contraindication or precaution to the second dose. These individuals should receive the second dose using the same vaccine product as the first dose at the recommended interval, preferably in the opposite arm.

Observation periods following vaccination

CDC recommends the following observation periods after COVID-19 vaccination:

- 30 minutes:
  - History of an immediate allergic reaction of any severity to other vaccines or injectable therapies
  - People with a contraindication to a different type of COVID-19 vaccine (for example, people with a contraindication to mRNA COVID-19 vaccines who receive Janssen viral vector vaccine should be observed for 30 minutes following Janssen vaccination).

    - History of anaphylaxis due to any cause
- 15 minutes: All other people

Management of anaphylaxis after COVID-19 vaccination

Appropriate medical treatment used to manage immediate allergic reactions must be immediately available in the event an acute anaphylactic reaction occurs following administration of COVID-19 vaccine. Further information on anaphylaxis management can be found in the interim considerations for the management of anaphylaxis following COVID-19 vaccination and laboratory evaluation of people who experience anaphylaxis after vaccination.

Reporting of vaccine adverse events

Adverse events that occur in a recipient following COVID-19 vaccination should be reported to VAERS. Vaccination providers are required by the FDA to report the following that occur after COVID-19 vaccination under BLA or EUA:

- Vaccine administration errors
- Serious adverse events
- Cases of Multisystem Inflammatory Syndrome
- Cases of COVID-19 that result in hospitalization or death

Reporting is encouraged for any other clinically significant adverse event, even if it is uncertain whether the vaccine caused the event. Information on how to submit a report to VAERS is available at https://vaers.hhs.gov or by calling 1-800-822-7967.

In addition, CDC has developed a new voluntary, smartphone-based tool, **v-safe**. This tool uses text messaging and web surveys to provide near real-time health check-ins after patients receive COVID-19 vaccination. Reports to **v-safe** indicating a medically significant health impact, including pregnancy, are followed up by the CDC/**v-safe** call center to collect additional information to complete a VAERS report, if appropriate.

Laboratory testing

Interpretation of SARS-CoV-2 test results in vaccinated people

Prior receipt of a COVID-19 vaccine will not affect the results of SARS-CoV-2 viral tests (nucleic acid amplification or antigen tests). Currently available antibody tests for SARS-CoV-2 assess IgM and/or IgG to one of two viral proteins: spike or nucleocapsid. Because COVID-19 vaccines are constructed to encode the spike protein, a positive test for spike protein IgM/IgG could indicate prior infection and/or vaccination. To evaluate for evidence of prior infection in an individual with a history of COVID-19 vaccination, a test that specifically evaluates IgM/IgG to the nucleocapsid protein should be used.

Antibody testing is not currently recommended to assess for immunity to SARS-CoV-2 following COVID-19 vaccination, because the clinical utility of post-vaccination testing has not been established. Antibody tests currently authorized under an EUA have variable sensitivity, specificity, as well as positive and negative predictive values, and are not authorized for the assessment of immune response in vaccinated people. Furthermore, the serologic correlates of protection have not been established, and antibody testing does not evaluate the cellular immune response, which may also play a role in vaccine-mediated protection. Finally, antibody testing against nucleocapsid will not detect immune responses resulting from vaccination, but patients may not always know what type of antibody test was used. If antibody testing was performed following vaccination, additional doses of the same or different COVID-19 vaccines are not recommended based on antibody test results at this time. If antibody testing was done after the first dose of an mRNA vaccine, the vaccination series should be completed regardless of the antibody test result.

Use of immune-based tests for tuberculosis infection, such as the tuberculin skin test and interferon-gamma release assay

COVID-19 vaccination should not be delayed because of testing for tuberculosis (TB) infection. Testing for TB infection with one of the immune-based methods, either the tuberculin skin test (TST) or an interferon release assay (IGRA), can be done before, after, or during the same encounter as COVID-19 vaccination.

TSTs and IGRAs were previously recommended to be administered ≥ 4 weeks after completion of COVID-19 vaccination to minimize potential theoretical interference between vaccination and TB testing. This was out of an abundance of caution during a period when these vaccines were new. However, given logistical challenges faced in delaying TB infection testing, the recommendation has been updated so that these tests may now be administered without regard to timing of COVID-19 vaccination.

Footnotes

1. The timing of the evaluation of vaccine efficacy (VE) against COVID-19 in trial participants varied by manufacturer's protocol design: Pfizer-BioNTech's protocol evaluated VE at ≥7 days after dose 2; Moderna's evaluated VE at ≥14 days after dose 2; and Janssen's evaluated VE ≥14 days and ≥28 days after the single dose. For consistency in public health post-vaccination guidance, a single time interval (i.e., ≥2 weeks) is used for the definition of fully vaccinated.
2. As of August 31, 2021, WHO has listed the following COVID-19 vaccines for emergency use:
    - Pfizer-BioNTech COVID-19 vaccines (e.g., COMIRNATY, Tozinameran)
    - AstraZeneca-Oxford COVID-19 vaccines (e.g., Covishield, Vaxzevria)
    - Janssen (Johnson & Johnson) COVID-19 vaccine
    - Moderna COVID-19 vaccine
    - Sinopharm BIBP COVID-19 vaccine
    - Sinovac-CoronaVac COVID-19 vaccine

    This list will be updated as additional COVID-19 vaccines receive an emergency use listing from WHO.
3. For consistency in public health post-vaccination guidance, a single time interval (i.e., ≥2 weeks after receipt of all recommended doses) is used for the definition of fully vaccinated.
4. In a post-marketing observational study of people vaccinated with Shingrix (a vaccine for prevention of herpes zoster [shingles]), ~3-6 excess GBS cases per 1 million doses administered to persons ≥65 years in the 6 weeks after vaccination were observed. Although a causal relationship has not been established, FDA added a new warning about GBS in the Prescribing Information for Shingrix.
5. The Society of Breast Imaging has developed "Recommendations for the Management of Axillary Adenopathy in Patients with Recent COVID-19 Vaccination" which includes considerations for patients and healthcare professionals in scheduling screening exams in relation to the administration of a COVID-19 vaccine.
6. At the time of publication of ACIP's updated recommendations, all cases of TTS after FDA-authorization of the Janssen COVID-19 vaccine occurred in females. One case of CVST with thrombocytopenia occurred in a male, aged 18–49 years, during the Janssen COVID-19 vaccine Phase III clinical trial.

Appendix A. Vaccine administration errors and deviations

A vaccine administration error is any preventable event that may cause or lead to inappropriate use of vaccine or patient harm. This appendix provides resources for preventing and reporting COVID-19 vaccine administration errors, as well as actions to take after an error has occurred. For completeness, this includes additional scenarios that deviate from CDC recommendations for vaccine intervals but are not considered administration errors. This document is intended to assist vaccination providers with handling exceptional situations in which a vaccination error or deviation has already occurred and may be updated when additional information becomes available.

The FDA-issued Fact Sheet for Healthcare Providers Administering Vaccines should be referenced for detailed information on storage and handling, dosing and schedule, dose preparation, and administration of COVID-19 vaccines. The information provided below on managing vaccine administration errors should not be interpreted as a recommendation or promotion of unauthorized use of the vaccines.

For all vaccine administration errors:

- Inform the recipient of the vaccine administration error.
- Consult with the state immunization program and/or immunization information system (IIS) to determine how the dose should be entered into the IIS, both as an administered dose and to account for inventory.
- Report the error to the Vaccine Adverse Event Reporting System (VAERS), unless otherwise indicated in the table. Providers are required to report all COVID-19 vaccine administration errors—even those not associated with an adverse

Providers are required to report all COVID-19 vaccine administration errors—even those not associated with an adverse event—to VAERS. To file an electronic report, please see the VAERS website .

- Determine how the error occurred and implement strategies to prevent it from happening again. A discussion on strategies to prevent errors can be found in the "Vaccine Administration" chapter of *Epidemiology and Prevention of Vaccine-Preventable Diseases* (Pink Book). Additional resources can be found on CDC's vaccine administration web page, including a job aid for preventing errors.

Table. Interim recommendations for COVID-19 vaccine administration errors and deviations

Vaccines	Type	Administration error/deviation	Interim recommendation
All currently FDA-approved or FDA-authorized vaccines (Pfizer-BioNTech Moderna, and Janssen COVID-19 vaccines)	Site/route	• Incorrect site (i.e., site other than the deltoid muscle [preferred site] or anterolateral thigh [alternate site])	• Do **not** repeat dose.* Inform the recipient of the potential for local and systemic adverse events.
		• Incorrect route (e.g., subcutaneous)	• Do **not** repeat dose.* Inform the recipient of the potential for local and systemic adverse events.
	Age	• Unauthorized age group	• If received dose at age less than 12 years, do **not** give any additional dose at this time.∞ • If age 12 to 17 years and a vaccine other than Pfizer-BioNTech was inadvertently administered: ◦ If Moderna vaccine administered as the first dose, may administer Moderna vaccine as the second dose (as off-label use, because Moderna vaccine is **not** authorized in this age group). ◦ If Janssen vaccine administered, do **not** repeat dose with Pfizer-BioNTech vaccine.
	Dosage	• Higher-than-authorized dose volume administered	• Do **not** repeat dose.*†
		• Lower-than-authorized dose volume administered (e.g., leaked out, equipment failure, recipient pulled away)	• If equal to or more than half of the dose was administered, do **not** repeat dose.* • If less than half of the dose was administered or the proportion of the dose cannot be estimated, administer the authorized dose immediately (no minimum interval) in the opposite arm.#
	Storage and handling	• Dose administered after improper storage and handling (e.g., temperature excursion, more than allowed time after first vial puncture)	• Contact the manufacturer for guidance. If the manufacturer provides information supporting that the dose should be repeated, the repeated dose may be given immediately (no minimum interval) in the opposite arm.

Vaccines	Type	Administration error/deviation	Interim recommendation
		• Dose administered past the expiration/beyond-use date	• Contact the manufacturer for guidance. If the manufacturer provides information supporting that the dose should be repeated, the repeated dose may be given immediately (no minimum interval) in the opposite arm.
	Administration	• Dose administered within 90 days of monoclonal antibodies or convalescent plasma for COVID-19 treatment	• Do **not** repeat COVID-19 vaccine dose. If person has already received one mRNA COVID-19 vaccine dose, defer administration of second dose for 90 days following receipt of antibody therapy. This deviation from CDC guidance does **not** require VAERS reporting.
		• A single dose of an mRNA COVID-19 vaccine is incorrectly administered either before or after administration of Janssen COVID-19 vaccine	• Do **not** administer a second dose of the mRNA vaccine. § • Person is considered fully vaccinated against COVID-19 ≥2 weeks after receipt of the single dose of Janssen vaccine.
		• The interval between the incorrect administration of a single dose of an mRNA COVID-19 vaccine and Janssen COVID-19 vaccine is fewer than 17 days (Pfizer-BioNTech) or fewer than 24 days (Moderna)	• Do **not** administer a second dose of the mRNA vaccine. § • Person is considered fully vaccinated against COVID-19 ≥2 weeks after receipt of the single dose of Janssen vaccine.
FDA-approved or FDA-authorized mRNA vaccines only (Pfizer-BioNTech and Moderna)	Intervals	• Second dose administered fewer than 17 days (Pfizer-BioNTech) or fewer than 24 days (Moderna) after the first dose (i.e., administered earlier than the 4-day grace period)	• Do **not** repeat dose.
		• Second dose administered more than 42 days after the first dose	• Do **not** repeat dose. This deviation from CDC guidance does **not** require VAERS reporting.
	Mixed series	• Incorrect mRNA COVID-19 vaccine product administered for second dose in 2-dose series	• Do **not** repeat dose. [§]
Pfizer-BioNTech only	Diluent	• ONLY diluent administered (i.e., sterile 0.9% sodium chloride)	• Inform the recipient that no vaccine was administered. Administer the authorized dose immediately (no minimum interval) in the opposite arm.[#]
		• No diluent, resulting in higher than authorized dose (i.e., 0.3 ml of undiluted vaccine administered)	• Do **not** repeat dose[*†] Inform the recipient of the potential for local and systemic adverse events.

Vaccines	Type	Administration error/deviation	Interim recommendation
		• Incorrect diluent type (e.g., sterile water, bacteriostatic 0.9% NS)	• Contact the manufacturer for guidance. If the manufacturer provides information supporting that the dose should be repeated, the repeated dose may be given immediately (no minimum interval) in the opposite arm.
		• Incorrect diluent volume (i.e., the vial contents were diluted with a diluent volume other than 1.8 ml, but a 0.3 ml dose was still administered)	• For doses administered with diluent volume less than 1.8 ml, inform the recipient of the potential for local and systemic adverse events.*† • For doses administered with diluent volume greater than 1.8 ml, do **not** repeat dose. * (Note: Dilution with a volume up to 4.0 ml [which exceeds vial capacity] results in more-than-half of the authorized dose administered.)

Pfizer-BioNTech and Moderna vaccines only:
*If the dose given in error is the first dose, a second dose should be administered at the recommended interval (21 days [Pfizer-BioNTech] or 28 days [Moderna]). If this dose is the second dose, the series is complete, and no additional doses are needed.
∞Do not administer the second dose until the person becomes eligible to receive vaccination (either by reaching the authorized age or if the authorization is extended to include additional age groups), even if this results in the second dose being administered after the recommended interval between doses.
#If the dose given in error is the first dose, the second dose should be administered at the recommended interval (21 days [Pfizer-BioNTech] or 28 days [Moderna]) from the date of receipt of the valid dose (not the date of receipt of the erroneous dose).
†If the administration error resulted in a higher-than-authorized vaccine dose, in general the second dose may still be administered at the recommended interval. However, if local or systemic side effects following vaccination are clinically concerning (outside of the expected side effect profile), lead to serious adverse reactions, or are ongoing at the time of the second dose, the decision to administer the second dose may be assessed on a case-by-case basis.
§Although CDC provides considerations for a mixed series in exceptional circumstances, this is still considered an administration error that requires VAERS reporting as a mixed series is not authorized under the vaccine Emergency Use Authorizations .

Appendix B: Triage of people with a history of allergies or allergic reactions

CONTRAINDICATION TO COVID-19 VACCINATION	PRECAUTION TO COVID-19 VACCINATION	MAY PROCEED WITH COVID-19 VACCINATION
History of the following: • Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a component of the COVID-19 vaccine† • Immediate allergic reaction* of any severity after a previous dose or known (diagnosed) allergy to a component of a COVID-19 vaccine†	**Among people without a contraindication, a history of:** • Any immediate allergic reaction* to other vaccines or injectable therapies‡ Note: people with a contraindication to mRNA COVID-19 vaccines have a precaution to Janssen COVID-19 vaccine, and vice versa. See footnote for additional information on additional measures to take in these people.#	**Among people without a contraindication or precaution, a history of:** • Allergy to oral medications (including the oral equivalent of an injectable medication) • History of food, pet, insect, venom, environmental, latex, etc., allergies • Family history of allergies

CONTRAINDICATION TO COVID-19 VACCINATION	PRECAUTION TO COVID-19 VACCINATION	MAY PROCEED WITH COVID-19 VACCINATION
Actions: • Do not vaccinate. • Consider referral to allergist-immunologist. • Consider other vaccine alternative.†	**Actions:** • Risk assessment • Consider referral to allergist-immunologist • 30-minute observation period if vaccinated	**Actions:** • 30-minute observation period: people with history of anaphylaxis (due to any cause) • 15-minute observation period: all other people

† See Appendix C for a list of ingredients. People with a contraindication to one of the mRNA COVID-19 vaccines should not receive doses of either of the mRNA vaccines (Pfizer-BioNTech or Moderna).
* Immediate allergic reaction to a vaccine or medication is defined as any hypersensitivity-related signs or symptoms consistent with urticaria, angioedema, respiratory distress (e.g., wheezing, stridor), or anaphylaxis that occur within four hours following administration.
‡People with a history of an immediate allergic reaction to a vaccine or injectable therapy that contains multiple components, one or more of which is a component of a COVID-19 vaccine, have a precaution to vaccination with that COVID-19 vaccine, even if it is unknown which component elicited the allergic reaction.
#Polyethylene glycol (PEG) is an ingredient in both mRNA COVID-19 vaccines, and polysorbate 80 is an ingredient in Janssen COVID-19 vaccine. PEG and polysorbate are structurally related, and cross-reactive hypersensitivity between these compounds may occur. People with a contraindication to mRNA COVID-19 vaccines (including due to a known allergy to PEG) have a precaution to Janssen COVID-19 vaccine. Among people who received one mRNA COVID-19 dose but for whom the second dose is contraindicated, consideration may be given to vaccination with Janssen COVID-19 vaccine (administered at least 28 days after the mRNA COVID-19 dose). People with a contraindication to Janssen COVID-19 vaccine (including due to a known allergy to polysorbate) have a precaution to mRNA COVID-19 vaccines. For people with these precautions, referral to an allergist-immunologist should be considered. Healthcare professionals and health departments may also request a consultation from the Clinical Immunization Safety Assessment COVIDvax project. In patients with these precautions, vaccination should only be undertaken in an appropriate setting under the supervision of a healthcare professional experienced in the management of severe allergic reactions.

Appendix C: Ingredients included in COVID-19 vaccines

The following is a list of ingredients for the Pfizer-BioNTech, Moderna, and Janssen COVID-19 vaccines reported in the prescribing information for each vaccine.*

Description	Pfizer-BioNTech (mRNA)	Moderna (mRNA)	Janssen (viral vector)
Active ingredient	Nucleoside-modified mRNA encoding the viral spike (S) glycoprotein of SARS-CoV-2	Nucleoside-modified mRNA encoding the viral spike (S) glycoprotein of SARS-CoV-2	Recombinant, replication-incompetent Ad26 vector, encoding a stabilized variant of the SARS-CoV-2 Spike (S) protein
Inactive ingredients	2[(polyethylene glycol (PEG))-2000]-N,N-ditetradecylacetamide	PEG2000-DMG: 1,2-dimyristoyl-rac-glycerol, methoxypolyethylene glycol	Polysorbate-80
	1,2-distearoyl-sn-glycero-3-phosphocholine	1,2-distearoyl-sn-glycero-3-phosphocholine	2-hydroxypropyl-β-cyclodextrin
	Cholesterol	Cholesterol	Citric acid monohydrate
	(4-hydroxybutyl)azanediyl)bis(hexane-6,1-diyl)bis(2-hexyldecanoate)	SM-102: heptadecan-9-yl 8-((2-hydroxyethyl) (6-oxo-6-(undecyloxy) hexyl) amino) octanoate	Trisodium citrate dihydrate

Description	Pfizer-BioNTech (mRNA)	Moderna (mRNA)	Janssen (viral vector)
	Sodium chloride	Tromethamine	Sodium chloride
	Monobasic potassium phosphate	Tromethamine hydrochloride	Ethanol
	Potassium chloride	Acetic acid	
	Dibasic sodium phosphate dihydrate	Sodium acetate	
	Sucrose	Sucrose	

* None of the vaccines contain eggs, gelatin, latex, or preservatives. All COVID-19 vaccines are **free from metals** such as iron, nickel, cobalt, lithium, rare earth alloys or any manufactured products such as microelectronics, electrodes, carbon nanotubes, or nanowire semiconductors.
Note: Both the Pfizer-BioNTech and Moderna COVID-19 vaccines contain polyethylene glycol (PEG). PEG is a primary ingredient in osmotic laxatives and oral bowel preparations for colonoscopy procedures, an inactive ingredient or excipient in many medications, and is used in a process called “pegylation” to improve the therapeutic activity of some medications (including certain chemotherapeutics). Additionally, cross-reactive hypersensitivity between PEG and polysorbates (included as an excipient in some vaccines and other therapeutic agents) can occur. Information on active or inactive ingredients for vaccines and medications can be found in the package insert. CDC’s vaccine excipient summary and the National Institutes of Health DailyMed database can also be used as a resource.

Appendix D: Potential characteristics of allergic reactions, vasovagal reactions, and vaccine side effects following COVID-19 vaccination

In patients who experience post-vaccination symptoms, determining the etiology (including allergic reaction, vasovagal reaction, or vaccine side effects) is important to determine whether a person can receive additional doses of the vaccine (including the second dose of an mRNA COVID-19 vaccine). The following table of signs and symptoms is meant to serve as a resource but might not be exhaustive, and patients might not have all signs or symptoms. Vaccination providers should use their clinical judgement when assessing patients to determine the diagnosis and management.

Characteristic	Allergic reactions (including anaphylaxis)	Vasovagal reaction	Vaccine side effects (local and systemic)
Timing after vaccination	Most occur within 15-30 minutes of vaccination	Most occur within 15 minutes	Median of 1 to 3 days after vaccination (with most occurring the day after vaccination)
Signs and symptoms			
Constitutional	Feeling of impending doom	Feeling warm or cold	Fever, chills, fatigue
Cutaneous	Skin symptoms present in ~90% of people with anaphylaxis, including pruritus, urticaria, flushing, angioedema	Pallor, diaphoresis, clammy skin, sensation of facial warmth	Pain, erythema, or swelling at injection site; lymphadenopathy in same arm as vaccination

Characteristic	Allergic reactions (including anaphylaxis)	Vasovagal reaction	Vaccine side effects (local and systemic)
Neurologic	Confusion, disorientation, dizziness, lightheadedness, weakness, loss of consciousness	Dizziness, lightheadedness, syncope (often after prodromal symptoms for a few seconds or minutes), weakness, changes in vision (such as spots of flickering lights, tunnel vision), changes in hearing	Headache
Respiratory	Shortness of breath, wheezing, bronchospasm, stridor, hypoxia	Variable; if accompanied by anxiety, might have an elevated respiratory rate	N/A
Cardiovascular	Hypotension, tachycardia	Variable; might have hypotension or bradycardia during syncopal event	N/A
Gastrointestinal	Nausea, vomiting, abdominal cramps, diarrhea	Nausea, vomiting	Vomiting or diarrhea might occur
Musculoskeletal	N/A	N/A	Myalgia, arthralgia
Vaccine and clinical management recommendations			
If vaccinated with mRNA COVID-19 vaccine as first dose, recommended to receive second mRNA vaccine dose?	No	Yes	Yes

References

- The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Pfizer-BioNTech COVID-19 Vaccine — United States, December 2020
- The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Moderna COVID-19 Vaccine — United States, December 2020
- The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Janssen COVID-19 Vaccine — United States, February 2021
- Updated Recommendations from the Advisory Committee on Immunization Practices for Use of the Janssen (Johnson & Johnson) COVID-19 Vaccine After Reports of Thrombosis with Thrombocytopenia Syndrome Among Vaccine Recipients— United States, April 2021
- The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Pfizer-BioNTech COVID-19 Vaccine in Adolescents Aged 12–15 years — United States, May 2021
- Use of mRNA COVID-19 Vaccine After Reports of Myocarditis Among Vaccine Recipients: Update from the Advisory Committee on Immunization Practices — United States, June 2021
- Use of COVID-19 Vaccines After Reports of Adverse Events Among Adult Recipients of Janssen (Johnson & Johnson) and mRNA COVID-19 Vaccines (Pfizer-BioNTech and Moderna): Update from the Advisory Committee on Immunization Practices — United States, July 2021
- Pfizer-BioNTech COVID-19 Vaccine Fact Sheet for Healthcare Providers (fda.gov)
- Moderna COVID-19 Vaccine EUA Fact Sheet for Healthcare Providers (fda.gov)

- Janssen COVID-19 Vaccine EUA Fact Sheet for Healthcare Providers (fda.gov)
- ACIP General Best Practice Guidelines for Immunization
- Interim considerations: preparing for the potential management of anaphylaxis after COVID-19 vaccination

Previous Updates:

August 25, 2021

- New section on people vaccinated for COVID-19 as part of a clinical trial in the United States
- Updated considerations for use of an additional mRNA COVID-19 vaccine dose after an initial 2-dose COVID-19 mRNA vaccine series for immunocompromised people

August 13, 2021

- New section on considerations for use of an additional dose of COVID-19 vaccine
- New section on considerations for use of an additional mRNA COVID-19 vaccine dose after an initial 2-dose primary mRNA COVID-19 vaccine series for immunocompromised people

August 11, 2021

- Updated considerations for people who are pregnant, lactating, trying to get pregnant now, or might become pregnant in the future

August 6, 2021

- Updated considerations for COVID-19 vaccination in people with a history of Guillain-Barré syndrome
- Updated information on vaccine administration errors and deviations in Appendix A (Table).

July 16, 2021

- Updated considerations regarding mRNA vaccine dosing intervals.
- Updated considerations for immunocompromised people.

July 2, 2021

- New section on considerations for use of mRNA COVID-19 vaccines in people with a history of myocarditis or pericarditis added to considerations for vaccination of people with certain underlying medical conditions.
- New information on the occurrence of myocarditis or pericarditis following vaccination with mRNA COVID-19 vaccines added to patient counseling.

June 1, 2021

- Information on cases of myocarditis and pericarditis occurring after mRNA COVID-19 vaccination, particularly in adolescents and young adults.
- Information on the efficacy of the Pfizer-BioNTech COVID-19 vaccine in adolescents aged 12–15 years in patient counseling section.
- Updated data on local and systemic symptoms following vaccination with mRNA COVID-19 vaccines in patient counseling section.
- Clarification in contraindications and precautions and Appendix B of guidance for people with a history of an immediate allergic reaction to a vaccine or injectable therapy that contains a component also contained in a COVID-19 vaccine.
- Updated list of ingredients in COVID-19 vaccines (i.e., lack of metals) in Appendix C.
- Correction of footnote numbering.

May 14, 2021

- Updated information for authorized age groups to include vaccination of adolescents aged 12–15 years with Pfizer-BioNTech COVID-19 vaccine.
- Updated information on coadministration of COVID-19 vaccines with other vaccines.
- A new section on persons with a history of multisystem inflammatory syndrome added to considerations for vaccination of people with certain underlying medical conditions.
- Updated recommendation for timing of COVID-19 vaccine administration in persons with a history of heparin-induced thrombocytopenia.
- Updated information on vaccination of children and adolescents.

April 27, 2021:

- The Advisory Committee on Immunization Practices' updated interim recommendation for the use of the Janssen (Johnson & Johnson) COVID-19 vaccine.
- Clarification that COVID-19 vaccination is recommended for all people 16 years and older added to key points and vaccine administration.
- Updated information about the Janssen COVID-19 vaccine added to background.
- Requirements to be considered fully vaccinated added to vaccine administration and interchangeability of COVID-19 vaccine products.
- New section added for people vaccinated with COVID-19 vaccines not authorized in the United States.
- Clarification on COVID-19 vaccination and SARS-CoV-2 infection. People with prolonged post-COVID-19 symptoms should be offered COVID-19 vaccination.
- New section added on antiviral therapy and COVID-19 vaccination.
- Information on requesting a consultation from the Clinical Immunization Safety Assessment COVIDvax project added to considerations for vaccination of people with certain underlying medical conditions.
- New section added on considerations for use of the Janssen COVID-19 vaccine in certain populations
- Updated information and recommendations for vaccination of pregnant or lactating people.
- Updated recommendations for vaccination of children and adolescents.
- Updated information related to axillary lymphadenopathy added to patient counseling for mRNA COVID-19 vaccines.
- Updated information on the Janssen COVID-19 vaccine added to patient counseling.
- Updated recommendations related to contraindications (polysorbate allergy) and precautions (most people with a precaution can and should be administered vaccine) for COVID-19 vaccines.

April 16, 2021:

- Recommended pause in the use of Janssen (Johnson & Johnson) COVID-19 vaccine.
- Recommendations for clinicians related to occurrence of cerebral venous sinus thrombosis (CVST) with thrombocytopenia after receipt of Janssen COVID-19 vaccine.

March 5, 2021:

- Public health recommendations for vaccinated people have been moved to: https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated-guidance.html.

March 3, 2021:

- Clinical considerations added for use of Janssen (Johnson & Johnson) COVID-19 vaccine.
- Updated recommendations for fully vaccinated people who subsequently develop COVID-19.
- Updated recommendations related to COVID-19 vaccination timing for immunocompromised people.
- Updated contraindications and precautions to mRNA COVID-19 vaccines.
- Updated information on interpretation of SARS-CoV-2 antibody test results after vaccination.

February 10, 2021:

- New recommendations for preventing, reporting, and managing mRNA COVID-19 vaccine administration errors (Appendix A).
- Clarification on contraindications and precautions. People with a known (diagnosed) allergy to PEG, another mRNA vaccine component, or polysorbate, have a contraindication to vaccination. People with a reaction to a vaccine or injectable therapy that contains multiple components, one of which is PEG, another mRNA vaccine component or polysorbate, but in whom it is unknown which component elicited the immediate allergic reaction have a precaution to vaccination.
- Updated information on delayed, local injection-site reactions after the first mRNA vaccine dose. These reactions are neither a contraindication nor a precaution to the second dose.
- Updated quarantine recommendations for vaccinated people. Fully vaccinated people who meet criteria will no longer be required to quarantine following an exposure to someone with COVID-19. Additional considerations for patients and residents in healthcare settings are provided.
- Additional information and updated recommendations for testing for TB infection. TB testing can be done before or at the same time as mRNA COVID-19 vaccination, or otherwise delayed for ≥4 weeks after the completion of mRNA COVID-19 vaccination.

Page last reviewed: August 31, 2021