Frequent Asked Questions for Healthcare Personnel: COVID-19 Vaccines

General Vaccination Questions	
What is the indication for the COVID-19 vaccines? (Last reviewed/updated on 2021-03-03)	• Pfizer-BioNTech (BNT162b2): Authorized emergency use in all individuals who are ages 16 years or older unless contraindicated. • Moderna (mRNA-1273): Authorized emergency use in all individuals who are ages 18 years or older unless contraindicated. • Janssen (Ad26.COV2.S): Authorized emergency use in all individuals who are ages 18 years or older unless contraindicated.
What are the contraindications for the COVID-19 vaccines? (Last reviewed/updated on 2021-03-05)	• The Pfizer-BioNTech and Moderna mRNA COVID-19 vaccines should not be given to those individuals who have had an immediate allergic reaction of any severity or anaphylactic reaction after a previous dose of a mRNA COVID-19 vaccine, to any component of the vaccine, or PEG/polysorbate, unless already evaluated and approved by an allergist. • The Janssen COVID-19 vaccine should not be given to those individuals who have had an immediate allergic reaction of any severity or anaphylactic reaction to any component of the vaccine. • Allergic reactions not related to vaccines, injectable therapy, components of any of the COVID-19 vaccines, such as allergic reactions to food, pet, venom, environmental allergens, or oral medications, are not contraindication to vaccination by the COVID-19 vaccine.
Are there any testing requirements, e.g., testing for COVID-19 or pregnancy, prior to vaccination? (Last reviewed/updated on 2021-02-07)	• No prior testing is recommended for vaccine eligibility.
How are the vaccines administered? (Last reviewed/updated on 2021-03-03)	• Pfizer-BioNTech (BNT162b2): 30 µg (0.3 mL) intramuscularly (deltoid muscle preferably, or alternatively, anterolateral thigh); 21 days apart. • Moderna (mRNA-1273): 100 µg (0.5 mL) intramuscularly (deltoid muscle preferably, or alternatively, anterolateral thigh); 28 days apart. • Janssen (Ad26.COV2.S): 5×10^{10} viral particles (0.5 mL) intramuscularly, one time dose (deltoid muscle, or alternatively, anterolateral thigh).
Will booster doses be needed? (Last reviewed/updated on 2021-03-07)	• It is not known at this time if booster doses will be needed to provide sustained immunity. • Moderna is clinically trialing a “booster” vaccine to address certain variants of concern.
What are the differences between the COVID-19 vaccines developed by Pfizer-BioNTech, Moderna, and Johnson & Johnson/Janssen? (Last reviewed/updated on 2021-03-04)	• The COVID-19 vaccines developed by Pfizer-BioNTech and Moderna are based on the mRNA technology and uses a lipid nanoparticle as the delivery vehicle. • The COVID-19 vaccine developed by Johnson & Johnson/Janssen is based on recombinant gene technology that uses a replication-incompetent adenovirus as the delivery vehicle.

Is there a preferred COVID-19 vaccine? (Last reviewed/updated on 2021-03-08)	• No. • There are no clinical trials that directly compare the COVID-19 vaccines. • Regardless of the reported efficacies of the COVID-19 vaccines, it should be emphasized that all three available COVID-19 vaccines are effective in reducing the number of severe COVID-19 cases, hospitalizations and deaths due to COVID-19. • Eligible individuals should be encouraged to get whichever COVID-19 vaccine that is readily available to them.
Special Populations Questions	
Can children receive any of COVID-19 vaccines? (Last reviewed/updated on 2021-03-03)	• The Pfizer-BioNTech is currently authorized for use for ages 16 years and older. • The Moderna vaccine is currently authorized for use for ages 18 years and older. • The Janssen vaccine is currently authorized for use for ages 18 years and older
Should the COVID-19 vaccine be offered to women who are planning to be pregnant? Is it safe to administer any of the vaccines to women who are planning to be pregnant? (Last reviewed/updated on 2021-03-05)	• There are very limited clinical data on the effect of the COVID-19 vaccines on fertility, or on the ability for women to get pregnant. • It is recommended, at this time, that planned pregnancy is delayed until after they have been vaccinated.
Should the COVID-19 vaccines be offered to pregnant and breastfeeding women? What is the safety profile of the COVID-19 vaccines in pregnant or breastfeeding women? (Last reviewed/updated on 2021-03-05)	• There are limited safety data for COVID-19 vaccines in this population. Thus far, no significant adverse reactions have been observed. • Animal studies of the COVID-19 vaccines have shown no safety concerns. • Prior studies of other vaccines using the adenovirus serotype 26 vector did not show any adverse pregnancy-related outcomes. • It is recommended that pregnant women should be considered to be vaccinated and may choose to receive the COVID-19 vaccine. • Because pregnant women are at higher risk for developing severe COVID-19, a discussion with these patients about the benefits of vaccination may be helpful in making the decision. • Please review the attached the pregnancy counseling toolkit.
Are the COVID-19 vaccines safe for use in women who are breastfeeding? (Last reviewed/updated on 2021-03-05)	• There are no safety data on any of the COVID-19 vaccines in lactating women or breastfed infants as well as milk production. • CDC does not feel that these vaccines pose any risks for lactating women or their infants. • Breastfeeding women may be considered to receive the mRNA COVID-19 vaccines if they are part of the group that is eligible to receive them.
Should individuals who are immunosuppressed or immunocompromised, including those with HIV, receive the COVID-19 vaccine? What is the safety profile of the vaccines in individuals in this population? (Last reviewed/updated on 2021-03-05)	• Because individuals in this population are considered to be at higher risk for developing severe illness due to COVID-19, they should be considered to receive the vaccine unless they have contraindications to vaccination. • Although there are limited efficacy and safety data of the COVID-19 vaccines in this population, individuals in this population may receive COVID-19 vaccine. Because the

	COVID-19 vaccines are not live vaccines, CDC considers the COVID-19 vaccines to be safe for use in this population. • Individuals in this population who choose to receive the vaccine should be advised that they may not be able to produce the same degree of immunity as those who are immunocompetent. • Serologic antibody testing to confirm immunity, however, is not recommended.
Should individuals with autoimmune diseases receive any of the COVID-19 vaccine? What is the safety profile of the vaccines individuals in this population? (Last reviewed/updated on 2021-03-05)	• There are no efficacy and safety data on the COVID-19 vaccines on individuals with autoimmune diseases. • The clinical trials did not report increased recurrence of autoimmune diseases in the trials. • Individuals with autoimmune diseases should still be considered to receive the COVID-19 vaccines unless they have contraindications to vaccination.
Should the COVID-19 vaccine be administered to individuals with history of severe allergies or anaphylaxis? (Last reviewed/updated on 2021-03-05)	• None of the COVID-19 vaccines should not be given to individuals with documented history of allergic reaction of any severity or anaphylaxis to a previous dose of the vaccine or to any components of the COVID-19 vaccines unless approved by an allergist. See Figure 1 for the components of the mRNA COVID-19 vaccines. • The COVID-19 vaccines should not be given to individuals with documented history of allergy to polyethylene glycol (PEG) or polysorbate until they have been evaluated by an allergist for an immediate-type hypersensitivity to PEG. See Figure 2 for a list of medications and vaccines containing PEG. • The vaccines may be given to individuals regardless of history of allergic reactions of any severity to foods, medications, insects, latex, vaccine, or other injectable therapy except as noted above.
Should individuals with history of Guillain-Barre syndrome receive the mRNA COVID-19 vaccine? (Last reviewed/updated on 2021-03-05)	• Guillain-Barre syndrome has not been reported in either clinical trials. • Individuals with history of GBS may receive either mRNA COVID-19 vaccine unless they have contraindications to vaccination.
Should individuals with history of Guillain-Barre syndrome receive the Janssen COVID-19 vaccine? (Last reviewed/updated on 2021-03-05)	• The reported number of cases of GBS in recipients of this vaccine is the same as those in the placebo (1/21895 vs 1/21888 respectively). CDC considers the incidence of GBS in the vaccine group to be similar to that of the general population. • Individuals with history of GBS may receive this vaccine unless they have contraindications to vaccination.
Should individuals with a history of dermal fillers receive the mRNA COVID-19 vaccine? (Last reviewed/updated on 2021-03-04)	• Yes, if they have no contraindications to receiving the vaccine. No additional precautions are needed.
Other Vaccine-Related Questions	
Will fully vaccinated individuals require booster vaccine doses? (Last reviewed/updated on 2021-03-04)	• The need and timing for booster vaccine doses have not been established. • Currently, no additional doses have been recommended.

Can individuals who had COVID-19 and recovered receive any of the COVID-19 vaccines? (Last reviewed/updated on 2021-03-04)	• Yes. Individuals who recovered from COVID-19 may receive the vaccine once they have recovered from their illness and met the criteria for discontinuation of isolation.
Can individuals who received antibody therapy for the treatment of COVID-19, i.e., monoclonal antibody or convalescent plasma, receive any of the COVID-19 vaccines? (Last reviewed/updated on 2021-03-04)	• Yes. Individuals who received antibody therapy should wait at least 90 days after the treatment before receiving any of the vaccines.
When should the second dose of a mRNA COVID-19 vaccine be given if an individual develops COVID-19 after the first dose? (Last reviewed/updated on 2021-03-04)	• The second dose should be given once the individual has recovered from COVID-19 but still has met the minimum dose interval period recommended by the manufacturer.
If a vaccine recipient developed COVID-19 after the first dose of a mRNA COVID-19 vaccine and received antibody therapy, e.g., convalescent plasma or monoclonal antibody, when should the second dose of the vaccine be given? (Last reviewed/updated on 2021-03-04)	• The second dose of either mRNA COVID-19 vaccine should be given at least 90 days after receiving antibody therapy for COVID-19.
Should individuals who are acutely ill, including fever alone, receive the COVID-19 vaccine? (Last reviewed/updated on 2021-03-04)	• Individuals who are acutely ill should defer vaccination until they have recovered. • Individuals with fever but without other symptoms should defer vaccination until the fever has resolved. • Individuals with active tuberculosis or being evaluated for tuberculosis may receive the vaccine.
What is the recommended time interval between the first and second doses of the mRNA COVID-19 vaccines? (Last reviewed/updated on 2021-03-04)	• Vaccine recipients should be scheduled to receive the second dose as close as the recommended interval: 21 days for Pfizer-BioNTech vaccine and 28 days for Moderna vaccine. • It is allowable that the second dose may be scheduled to be administered up to 4 days before the manufacturer's recommended interval time. • If it is not feasible for the vaccine recipients to receive the second dose at the recommended time interval, they can be scheduled to receive the dose up 42 days after the first dose.
If a vaccine recipient misses the second mRNA COVID-19 vaccine dose, does the vaccination series needs to be restarted? (Last reviewed/updated on 2021-03-08)	• No. The vaccination series does not need to be restarted. • The second dose should be given as soon as possible after missing the recommended time interval.
Are the mRNA COVID-19 vaccines interchangeable? (Last reviewed/updated on 2021-03-08)	• There are no data on the interchangeable use of the two mRNA COVID-19 vaccines. In general, vaccine recipients should receive the same vaccine for both doses.
Can the Janssen COVID-19 vaccine be used as the second dose in recipients who received a mRNA COVID-19 vaccine as the first dose?	• No. The Janssen COVID-19 vaccine should not be used as part of the vaccination series of either mRNA COVID-19 vaccines.

(Last reviewed/updated on 2021-03-04)	• In exceptionally rare situations where vaccine recipients who are not able to complete the mRNA COVID-19 vaccination series with the same or a different mRNA COVID-19 vaccine, a single dose of the Johnson & Johnson/Janssen COVID-19 may be considered at a minimum interval of 28 days from the first mRNA COVID-19 dose.
Do the vaccines have any reported interactions with other medications or therapy? (Last reviewed/updated on 2021-03-04)	• There are no known medication or vaccine interactions with any of the COVID-19 vaccines.
Should any of the COVID-19 vaccines be co-administered or administered around the same time as other vaccines? (Last reviewed/updated on 2021-03-04)	• There are no clinical data to determine if the efficacy of any of the COVID-19 vaccines are affected by other vaccines. Therefore, the COVID-19 vaccines should be administered at a minimum of 14-day interval from other vaccines. For most vaccines, they can be delayed until the COVID-19 vaccination is complete. • If there is clinical benefit to administer another vaccine around the time of COVID-19 vaccine, e.g., Td after a dog bite or HBV after a needlestick injury, it may be given. The vaccination series does not need to be repeated.
When should individuals who are receiving immune-based therapy, e.g., allergy shots and infusion of biologics, receive the COVID-19 vaccine? (Last reviewed/updated on 2021-03-07)	• There are limited clinical data to determine if the efficacy of any of the COVID-19 vaccines are affected by immune-based therapy. As such, it may be good practice to administer the vaccine and immune-based treatments at least 48 hours apart to help avoid confusion if a potential adverse reaction occurs.
What concomitant medications or diseases may inhibit or prevent the COVID-19 vaccines from inducing immune response? (Last reviewed/updated on 2021-03-08)	• The following populations may have reduced or lack of immune response to the COVID-19 vaccines: o Immunodeficiencies involving adaptive immunity o Asplenia o B-cell directed therapy o T-cell directed therapy o Many chemotherapy regimens o Hematopoietic cell transplantation o Underlying aberrant immunity, e.g., graft-vs.-host disease, graft rejection, absent or incomplete immune reconstitution, neutropenia, lymphopenia o High-dose corticosteroids, ≥20 mg per dose or >2 mg/kg/d daily of prednisone or equivalent • Immunocompromised and immunosuppressed individuals should be considered for vaccination. • If possible, it is suggested that immunosuppressive therapies are deferred until at least 2 weeks after completing the vaccination series. • However, being on immunosuppressive therapy is not a contraindication to vaccination. Individuals receiving immunosuppressive therapy should be given the COVID-19 vaccine.

Will vaccinated individuals be able to travel by air internationally to the US without the need to be tested for SARS-CoV-2 prior to departure? (Last reviewed/updated on 2021-03-04)	• CDC has not listed vaccination as an acceptable alternative to a negative SARS-CoV-2 test result to meet the requirement to allow entry into the U.S. • Individuals who are planning to travel internationally will be required to have proof of a negative SARS-COV-2 test that is performed up to 3 days prior to their departure to the U.S. • Recovered individuals with previous diagnosis of COVID-19 within 90 days of departure and met the criteria to end isolation do not need to be tested but will require "documentation of recovery" from public health or a healthcare provider stating that that they have recovered with a copy of the test result attached.
Will the COVID-19 vaccines affect SARS-CoV-2 test results? (Last reviewed/updated on 2021-03-04)	• Vaccination will not affect the results of molecular diagnostic tests, i.e., PCR- or antigen-based tests. • Serologic anti-SARS-CoV-2 antibody tests against the spike (S) protein, however, will be positive in vaccinated individuals.
Should serologic antibody tests be performed after completing the vaccination series to ensure immunity? (Last reviewed/updated on 2021-02-07)	• There are no data that establishes serological antibody titers and immunity yet. Therefore, routine serologic testing for anti-SARS-CoV-2 antibodies to confirm vaccine-induced immunity is not recommended at this time.
How should fully vaccinated individual be evaluated for possible past infection with SARS-CoV-2? (Last reviewed/updated on 2021-03-05)	• Fully vaccinated individuals may be assessed for past infection with SARS-CoV-2 by serologic tests that specifically detect anti-SARS-CoV-2 nucleocapsid protein antibody. • The use of tests that detect anti-SARS-CoV-2 spike protein antibody will not differentiate between immunity from natural infection and vaccine.
When should individuals who are receiving the COVID-19 vaccine undergo screening for tuberculosis? (Last reviewed/updated on 2021-03-05)	• The use of either tuberculin skin test (TST) or interferon gamma releasing assay (IGRA) for administrative purposes, e.g., new employee screening, should be performed before or during the same encounter as the administration of the Johnson & Johnson/Janssen COVID-19 vaccine or first dose of a mRNA COVID-19 vaccine. Furthermore, the use of these tests in individuals who are in the midst of or completed their vaccination should be deferred until at least 4 weeks after the completion of vaccination. • The use of either TST or IGRA for medical care, e.g., contact investigation after exposure to active pulmonary tuberculosis or required screening before starting immunomodulating therapy, when less than 4 weeks after the completion of vaccination is at the discretion of the responsible medical provider. If a test is performed during this period which was found to have a negative result, it is recommended that the individual is considered to be retested at least 4 weeks after the completion of vaccination. • Nota Bene: individuals with symptoms or findings suggestive of active pulmonary tuberculosis should undergo further medical evaluation, such as chest radiograph and sputum AFB culture, rather than using TST or IGRA.
Vaccine Administration Error/Deviation Questions	

If the vaccine was administered in the incorrect site, i.e., site other than the deltoid or anterolateral thigh, what should be done? (Last reviewed/updated on 2021-03-05)	• Do not repeat dose. • Inform the vaccine recipient for the potential of local and systemic adverse events.
If the vaccine was administered via the incorrect route, e.g., subcutaneous, what should be done? (Last reviewed/updated on 2021-03-05)	• Do not repeat dose. • Inform the vaccine recipient for the potential of local and systemic adverse events.
If the vaccine was administered to someone who did not meet the age requirement, i.e., age younger than what was approved for use, what should be done? (Last reviewed/updated on 2021-03-06)	• If the recipient is less than 16 years old, do not administer additional doses. • If the recipient is 16 or 17 years old and received a COVID-19 vaccine other than the one developed by Pfizer-BioNTech: o If the first dose administered was the Moderna vaccine, you may administer the Moderna vaccine as the second dose (as off-label use). o If the first dose administered was the Janssen vaccine, do not repeat dose with the Pfizer-BioNTech vaccine.
If a vaccine recipient was administered the second mRNA COVID-19 vaccine dose earlier than the 4-day grace period from the recommended interval time, what should be done? (Last reviewed/updated on 2021-03-07)	• Do not repeat dose or restart vaccination series. • The vaccine recipient should be considered vaccinated at this point.
If the vaccine recipient has not yet received the second dose of mRNA COVID-19 vaccine 42 days after the first dose, what should be done? (Last reviewed/updated on 2021-03-07)	• Administer the second dose of the vaccine as soon as possible, preferably with the same vaccine as the first dose. • The vaccination series does not need to be restarted. • This also applies to individuals who received the first dose and developed COVID-19 and was treated with antibody therapy before receiving the second dose.
If the vaccine recipient was inadvertently administered two different mRNA COVID1-9 vaccines during the vaccination series, what should be done? (Last reviewed/updated on 2021-03-07)	• Do not repeat dose. • The vaccination series does not need to be restarted. • This individual is to be considered vaccinated.
If the vaccine recipient was administered higher-than-authorized vaccine dose or volume, what should be done? (Last reviewed/updated on 2021-03-07)	• Do not repeat dose. • Inform the vaccine recipient of potential for local and systemic adverse reactions.
If a vaccine recipient was administered lower-than-authorized vaccine dose or volume, e.g., leaked out, syringe failure, etc., what should be done? (Last reviewed/updated on 2021-03-07)	• If at least half of the dose was administered, do not repeat dose. • If less than half of the dose was administered, or unable to assess the volume administered, then repeat the full dose in the opposite arm. • There is no change in dosing interval, if the action performed is the first dose.
If a vaccine recipient was administered the vaccine dose without diluent, what should be done (Pfizer-BioNTech only)? (Last reviewed/updated on 2021-03-07)	• Do not repeat dose. • Inform the vaccine recipient of potential for local systemic adverse reactions.

When should I contact the vaccine manufacturer for more information and instructions? (Last reviewed/updated on 2021-03-07)	• When the vaccine administered was improperly stored and handled. • When the vaccine administered was past the expiration/beyond use date. • When the incorrect diluent type was used. If the manufacturer recommends repeating the vaccine dose, the repeat dose should be administered immediately in the opposite arm.
If a vaccine recipient was administered a COVID-19 vaccine within 14 days of receiving another (non-COVID-19) vaccine(s), what should be done? (Last reviewed/updated on 2021-03-07)	• Do not repeat dose. • Do not restart vaccination series.
If a vaccine recipient was administered a COVID-19 vaccine within 90-days of receiving antibody therapy for the treatment of COVID-19, what should be done? (Last reviewed/updated on 2021-03-07)	• Do not repeat dose. • If it was the dose of vaccine was the first in the vaccination series, please wait 90 days after receiving the antibody therapy before administering the second dose.
Vaccination Benefit Questions	
What are the benefits of vaccination? (Last reviewed/updated on 2021-03-07)	• All three COVID-19 vaccines significantly reduce the risk of developing symptomatic COVID-19. • All three COVID-19 vaccines significantly reduce the risk of developing severe illness, hospitalization, and death due to COVID-19.
Can vaccinated individuals still develop COVID-19? (Last reviewed/updated on 2021-03-07)	• It is still possible for vaccinated individuals to develop COVID-19. • The risk, however, of developing symptomatic COVID-19 is significantly lower, even after the first dose.
Are the current COVID-19 vaccines effective against the reported variants of concern, i.e., B.1.1.7, B.1.135, and P.1? (Last reviewed/updated on 2021-03-07)	• Currently available mRNA COVID-19 vaccines seem to be effective against B.1.1.7 and B.1.135 variants based on *in vitro* virus neutralization assays from sera collected from vaccinated individuals. Because the clinical trials were performed when the predominant strain was the Wuhan/D614G variant, there are no clinical data on these vaccines' efficacy against the newer variants. • The Janssen COVID-19 vaccine seems to be effective against all three major variants of concern, although when comparing vaccine efficacy in different worldwide geographic regions where different variants predominate, there are observed differences.
Will vaccination prevent asymptomatic COVID-19? (Last reviewed/updated on 2021-03-07)	• There are limited preliminary data that suggest reduction in the incidence of asymptomatic infection with SARS-CoV-2. • However, it is still important to emphasize that infection with SARS-CoV-2 can still occur.
Will vaccination prevent transmission of SARS-CoV-2? (Last reviewed/updated on 2021-03-07)	• It is still not known at this time if vaccination will prevent the spread of SARS-CoV-2. • This is the primary reason that vaccinated persons should still continue to follow transmission-based mitigation and prevention practices.

When are vaccine recipients considered fully vaccinated? (Last reviewed/updated on 2021-03-07)	• Vaccine recipients are considered fully vaccinated 2 weeks after completing the vaccination series.
What is the expected duration of immunity after vaccination? (Last reviewed/updated on 2021-02-07)	• It is not known at this time what is the duration of immunity after vaccination.
Infection Prevention & Control	
Should the COVID-19 vaccine be given after an exposure to known SARS-CoV-2 infection or during an outbreak to prevent infection? (Last reviewed/updated 2021-03-05)	• It is not recommended to administer the COVID-19 vaccine as post-exposure prophylaxis or management of an outbreak because the incubation period of SARS-CoV-2 infection is shorter than the immune response to the vaccine.
What can fully vaccinated individuals safely do? (Last reviewed/updated on 2021-03-08)	• They can visit with other fully vaccinated individuals indoors without wearing masks or physical distancing. • They can visit with unvaccinated individuals from a single household who are at low risk for severe COVID-19 indoors without wearing masks or physical distancing. • The above is applicable to non-healthcare settings.
What should fully vaccinated individuals continue to do? (Last reviewed/updated on 2021-03-05)	• They should continue wearing masks and practice physical distancing while in public. • They should continue wearing masks and practice physical distancing while visiting with any unvaccinated individuals who are at increased risk for severe COVID-19 or who have unvaccinated household member(s) who are at increased risk for severe COVID-19. • They should wear masks and practice physical distancing when visiting with unvaccinated individuals from multiple households. • They should avoid medium- and large-sized in-person gatherings. • They will still need to be tested for SARS-CoV-2 infection if they experience COVID-19 symptoms. • They should continue to follow guidance issued by their employers.

Are fully vaccinated individuals still required to be quarantined if they are exposed to suspected or known COVID-19 cases?
(Last reviewed/updated on 2021-03-05)
	• CDC does not require fully vaccinated individuals with an exposure to suspected or confirmed cases of COVID-19 to be quarantined if they meet all of the following criteria:
	  ○ It has been at least 2 weeks since completion of vaccination, i.e., fully vaccinated.
	  ○ They are within 3 months following completion of vaccination.
	  ○ They remain asymptomatic since the exposure. They will need to monitor for signs and symptoms of COVID-19 for 14 days following the exposure.
	• Exceptions to this recommendation are hospitalized patients and residents in long-term or post-acute healthcare settings, e.g., nursing homes, assisted living facilities, and skilled nursing facilities. These individuals should continue to quarantine after exposure.

	• Although CDC continues to recommend work restriction for all fully vaccinated healthcare personnel with high-risk exposure to suspected or confirmed COVID-19 cases, UHC has decided that the above guidance is also applicable to all fully vaccinated healthcare personnel who work in acute healthcare settings, i.e., clinics and hospitals, in Yellowstone County. However, healthcare personnel who work in post-acute and long-term care healthcare settings will need to check with their facility's policy regarding work restriction.
Are vaccinated individuals still required to be isolated if diagnosed with COVID-19? (Last reviewed/updated on 2021-03-05)	• Yes. Individuals diagnosed with COVID-19 will still be required to be isolated for the recommended duration, regardless of their vaccination status.
If individuals who have positive results with either PCR- or antigen-based tests after vaccination, should the results be considered as false-positive? (Last reviewed/updated on 2021-03-05)	• Vaccination does not affect the results of any PCR- or antigen-based tests. • Individuals who have received the any of the vaccines and have positive results from either test should be considered infected.
Vaccine-Related Adverse Reactions	
Should vaccine recipients who developed allergic reactions to a prior COVID-19 vaccine be given the second dose? (Last reviewed/updated on 2021-03-05)	• Individuals who had immediate allergic reaction of any severity, including anaphylaxis, to a previous dose of a COVID-19 vaccine should not receive the second dose until they have been evaluated and approved to receive the vaccine by an allergist.
What is the safety profile of either mRNA COVID-19 vaccine? (Last reviewed/updated on 2021-02-07)	• No vaccine-related deaths were reported in the clinical trials. • Most severe adverse reactions are related to vaccine reactogenicity. • The incidence of severe adverse reactions 2 months after the second dose are reported to be similar between the vaccine and placebo groups in the clinical trials.
What are the commonly reported adverse reactions to the COVID-19 mRNA vaccines? (Last reviewed/updated on 2021-03-05)	• Reactogenicity commonly reported to v-safe include pain at the injection site, fatigue, headache, muscle ache, chills, fever, joint pain, and nausea. • Adverse events commonly reported to VAERS for the Pfizer-BioNTech COVID-19 vaccine include headache, fatigue, dizziness, nausea, chills, fever, pain, injection site pain, pain in extremity, and dyspnea. • Adverse events commonly reported to VAERS for the Moderna COVID-19 vaccine include headache, fever, chills, pain, dizziness, fatigue, nausea, injection site pain, pain in extremity, and dyspnea. • Vaccine recipients should also be advised that self-limiting lymphadenopathy following vaccination has been reported. • Most adverse reactions last about 1-2 days but usually not more than 3 days.
What is the safety profile of the Johnson & Johnson/Janssen COVID-19 vaccine? (Last reviewed/updated on 2021-03-05)	• The vaccine has met the safety requirements as part of being granted emergency use authorization. • Most adverse events are reported to be mild to moderate. • No vaccine-related deaths were reported in the clinical trial.

What are the commonly reported adverse reactions to the Johnson & Johnson/Janssen COVID-19 vaccine? (Last reviewed/updated on 2021-03-05)	• Most adverse reactions with this vaccine are mild to moderate in severity. • Injection site pain is the most common injection site reaction, followed by erythema and swelling. All reactions resolve in 2-3 days • Common systemic adverse events include (in decreasing frequency) fatigue, headache, myalgia, nausea, and fever. Most vaccine recipients will experience at least one adverse event. All reactions resolve in 1-2 days.
How should most of the commonly reported adverse reactions be managed? (Last reviewed/updated on 2021-03-05)	• The commonly reported adverse reactions can be managed as needed with either NSAIDs or acetaminophen. • Because of some concerns that vaccine efficacy may be affected by these medications, prophylactic use of NSAIDs or acetaminophen to prevent post-vaccination symptoms is not recommended at this time. • Additionally, prophylactic use of antihistamine to prevent allergic reactions is not recommended as they may mask symptoms of hypersensitivity reactions.
What should be done if a vaccine recipient has persistent reaction symptoms? (Last reviewed/updated on 2021-02-07)	• Since infection with SARS-CoV-2 may still occur, vaccine recipients with persistent fever, fatigue, headache, muscle ache, joint pain, or diarrhea should be evaluated and ruled out for COVID-19.
What should be done if vaccine recipients develop symptoms that are not listed on the commonly reported vaccine-related adverse reactions? (Last reviewed/updated on 2021-02-07)	• Vaccine recipients who developed symptoms should be evaluated for other causes of their symptoms. If no obvious cause has been identified, the symptoms should be reported as a possible vaccine-related adverse reaction. • Individuals who report respiratory symptoms, anosmia and/or dysgeusia should be ruled out for infection with SARS-CoV-2.
Should vaccine recipients who developed delayed-onset local reaction after the first mRNA COVID-19 vaccine dose avoid receiving the second vaccine dose? (Last reviewed/updated on 2021-03-05)	• Delayed-onset local reaction may include erythema, induration, pruritis, and pain that occur on the same arm where the vaccine was administered. It may present as early as few days and through the second week after the injection. This reaction seems to occur more commonly with Moderna mRNA COVID-19 vaccine. • Development of this reaction after the first dose of mRNA COVID-19 vaccine is not considered a precaution or contraindication to receiving the second vaccine dose, preferably given in the opposite arm. • The symptoms are usually self-limited and may be managed with analgesics.
Are the COVID-19 vaccines associated with increased incidence in Bell's palsy? (Last reviewed/updated on 2021-03-05)	• Although cases of Bell's palsy have been reported during the clinical trials of the COVID-19 vaccines, CDC considers the incidence of Bell's palsy of vaccine recipients similar to that of the expected incidence in the general public. Thus, they do not feel that the reported cases are vaccine-related.
How should reactions to dermal fillers be managed? (Last reviewed/updated on 2021-02-07)	• Vaccine-related reactions involving dermal fillers are temporary and may be managed oral corticosteroids and diphenhydramine (Benadryl).
Are there any reported cases of hypersensitivity or anaphylaxis to the vaccines? (Last reviewed/updated on 2021-03-05)	• Yes, but they are rare. • The reported incidences are 5 cases/1M doses administered for Pfizer-BioNTech vaccine and 2.8 cases/1M doses administered for Moderna vaccine.

	• For the Johnson & Johnson/Janssen COVID-19 vaccine, the clinical trial reported 77 cases out of 21,895 participants in the vaccine group while 65 cases out of 21,888 participants were reported. None of the reported cases were due to anaphylaxis.
Should vaccine recipients who had hypersensitivity or anaphylaxis to the first dose receive the second dose? (Last reviewed/updated on 2021-03-05)	• These individuals should be referred to an allergist to for further evaluation to determine if the reaction was related to the vaccine. If the individuals are unable to be evaluated by an allergist, they should not receive the second dose of vaccine.
How should vaccine-related adverse reactions be reported? (Last reviewed/updated on 2021-03-05)	• For individuals who received their vaccine at Billings Clinic, providers are asked to enter all adverse reactions into Safety Net. • For all others, all adverse reactions should be entered into the Vaccine Adverse Events Reporting System (VAERS) at https://vaers.hhs.gov/.
Can vaccine recipients self-report adverse reactions? (Last reviewed/updated on 2021-03-05)	• Yes. All vaccine recipients are encouraged to register with v-safe at https://vsafe.cdc.gov/ to report adverse reactions.
COVID-19 Vaccine Myths	
The COVID-19 vaccines cannot be trusted because their development was rushed.	• The pharmaceutical companies were able to develop the COVID-19 vaccines because of the worldwide effort. • All three COVID-19 vaccines were developed based on existing technology. Their effectiveness and safety profile have been established prior to the development of the COVID-19 vaccines.
The COVID-19 vaccines can make me sick with COVID-19	• None of the available vaccines contain SARS-CoV-2. Therefore, the vaccine cannot cause COVID-19.
The COVID-19 vaccines can alter my DNA.	• The mRNA in the Pfizer-BioNTech and Moderna vaccines do not enter the cell nucleus. It is quickly degraded after entering the cells. • The DNA in the Janssen vaccine is not able to integrate into the host cell DNA.
The COVID-19 vaccines can affect fertility.	• There is no evidence during animal trials that the vaccines affect fertility. • Observational studies have not demonstrated that the vaccines affect fertility.
Since some observational studies have shown substantial immunity after the first dose of mRNA vaccines, a second dose is not necessary.	• We do not know the long-term efficacy of either mRNA vaccines as the clinical trials only evaluated two-dose regimens. • Therefore, everyone who are receiving a mRNA vaccine should get both doses. • To be deemed fully vaccinated, recipients of the mRNA vaccine have to receive two doses.
Because the survival rate is so high, vaccination is not needed.	• Although the death rates from COVID-19 is still around 1.5%, the number of individuals hospitalized for moderate to severe COVID-19 can be high and overwhelm the capacity of many hospitals. • Vaccination can help to reduce the likelihood of hospitalization. • Vaccination can help the development of severe disease. • Vaccination can potentially help the spread of the disease to others who are likely to develop severe disease.

After vaccination, face coverings and physical distancing are not needed.	• Preventative measures are needed because the vaccine is not 100% effective against developing COVID-19. • Until the effectiveness of the vaccines against the variants of concern have been established, it is wise to continue all preventative measures.
If someone had COVID-19, the vaccine is not needed because they will already have immunity.	• If eligible and there are no contraindications, everyone should receive the COVID-19 regardless of prior history of COVID-19. • Re-infection, particularly with variants of concern, is possible.
Immunity through natural infection is always better than through vaccination.	• Although for infections, this may be the case. For other infections, such as measles, a vaccine provides better protection. • Immunity through vaccination is much safer than through natural infection. • Vaccination also do not have the post-infection complications like some natural infections may have, e.g., chickenpox and shingles.
The side effects of the COVID-19 vaccines are severe and serious.	• Most reported vaccine-related symptoms are mild to moderate and well tolerated. • Although hypersensitivity reactions have been reported, they are rare. • Clinical trials demonstrated very few serious adverse events.
The COVID-19 vaccines contain controversial substances.	• The vaccines do not contain implants, microchips, tracking devices, or fetal tissue.
If a vaccine recipient had a “bad reaction” to the first mRNA vaccine, the second dose should not be given.	• Unless the recipient experienced a reaction that was deemed to be a contraindication for the second dose by an allergist, the second dose should be given.
Those with egg allergy should not receive the vaccine.	• None of the COVID-19 vaccines do not contain egg or developed from eggs.

Figure 1. Components of mRNA COVID-19 vaccines.

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
	Sodium chloride	Tromethamine	Sodium chloride
	Monobasic potassium phosphate	Tromethamine hydrochloride	Sodium hydroxide
	Potassium chloride	Acetic acid	Hydrochloric acid
	Dibasic sodium phosphate dihydrate	Sodium acetate	Ethanol
	Sucrose	Sucrose	Water for injection

* None of the vaccines contain eggs, gelatin, latex, or preservatives.
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.

Adapted from https://www.cdc.gov/vaccines/covid-19/info-by-product/clinical-considerations.html

Figure 2. List of medications and vaccines reported to contain polysorbate or PEG.

TABLE II. Polysorbate and PEG excipients in select vaccines[12]

Excipient	Vaccine type	Vaccine	Amount per dose
Polysorbate 20	Influenza	Flublok&Flublock quad	≤27.5 µg (Tween20)
Polysorbate 20	Hepatitis A	Havrix	0.05 mg/mL
Polysorbate 20	Hepatitis A&B	Twinrix	Unknown
Polysorbate 20*	SARS-CoV-2 (Sanofi)		
Polysorbate 80	Tdap	Boostrix	≤100 µg (Tween 80)
Polysorbate 80	Influenza	Fluad	1.175 mg
Polysorbate 80	Influenza	Fluarix quad	≤0.055 mg (Tween 80)
Polysorbate 80	Influenza	Flucelvax quad	≤1500 µg (Tween 80)
Polysorbate 80	Influenza	Flulaval Quad	≤887 µg
Polysorbate 80	HPV	Gardasil and Gardasil -9	50 µg
Polysorbate 80	Hepatitis B	Heplisav-B	0.1 mg/mL
Polysorbate 80	DTaP	Infanrix	≤100 µg (Tween 80)
Polysorbate 80	Japanese encephalitis	JE-Vax	<0.0007%
Polysorbate 80	DTaP + IPV	Kinrix	≤100 µg (Tween 80)
Polysorbate 80	DTaP + HepB + IPV	Pediarix	≤100 µg (Tween 80)
Polysorbate 80	Pneumococcal 13-valent	Prevnar 13	100 µg
Polysorbate 80	DTaP + IPV	Quadracel	10 ppm
Polysorbate 80	Rotavirus	RotaTeq	?
Polysorbate 80	Zoster	Shingrix	0.08 mg
Polysorbate 80	Meningococcal group B	Trumenba	0.018 mg
Polysorbate 80	DTaP + IPV + HepB + Hib	Vaxelis	<0.0056%
Polysorbate 80*	SARS-CoV-2 (AstraZeneca) SARS-CoV-2 (Johnson & Johnson)		
PEG2000	SARS-CoV-2 (Moderna) SARS-CoV-2 (Pfizer)		

TABLE III. Common injectable medications containing PEG[14]

Generic name (brand name)	Molecular weight	General description
Methylprednisolone acetate (Depo-Medrol)	PEG 3350	An anti-inflammatory glucocorticoid for intramuscular, intra-articular, soft tissue or intralesional injection
Methoxy polyethylene glycol-epoetin beta (Micera)	30-kD methoxy PEG butanoic acid	Used to treat anemia in adults with chronic kidney disease
Pegfilgrastim (Neulasta)	20-kD monomethoxy PEG	Used to help reduce the chance of infection due to a low white blood cell count, in people with certain types of cancer (nonmyeloid), who receive anticancer medicines (chemotherapy) that can cause fever and low white blood cell count
Medroxyprogesterone acetate (Depo-Provera)	PEG 3350	Contraceptive and adjunctive therapy and palliative treatment of inoperable, recurrent, and metastatic endometrial or renal carcinoma
Brilliant Blue G Ophthalmic Solution (TissueBlue)	PEG 3350	Disclosing agent indicated to selectively stain the internal limiting membrane
Sulfur hexafluoride (Lumason)	PEG 4000	Ultrasound contrast agent
Biomatoprost implant (Durysta)	PEG, unspecified	Reduction of intraocular pressure in patients with open-angle glaucoma or ocular hypertension
Trastuzumab (Herceptin, Herzuma, Kanjinti, Ogivri, Ontruzant)	PEG 3350	Adjuvant treatment of HER2 overexpressing node-positive or node-negative breast cancer
Rilonacept (Arcalyst)	PEG 3350	IL-1 blocker for treatment of cryopyrin-associated periodic syndromes
Perflutren lipid microsphere (Definity)	PEG 5000	Contrast agent used to brighten and clarify images of the heart during echocardiograms

TABLE IV. Common injectable medications containing polysorbate

Drug class	Generic name (brand name)	Polysorbate
Antiarrhythmic	Amiodarone hydrochloride (generics only)	Polysorbate 80
Antidiabetic	Exenatide (Bydureon Bcise)	Polysorbate 20
	Insuline glargine (Lantus, Semglee)	Polysorbate 20
	Insuline glulisine (Apidra)	Polysorbate 20
	Dulaglutide (Trulicity)	Polysorbate 80
Antidote	Hyaluronidase (Hylenex Recombinant)	Polysorbate 80
Antifungal	Anidulafungin (Eraxis)	Polysorbate 80
Anti-inflammatory	Interferon beta 1a (Avonex, Plegridy)	Polysorbate 20
	Omalizumab (Xolair)	Polysorbate 20
Antineoplastic	Ofatumumab (Kesimpta)	Polysorbate 80
	Siltuximab (Sylvant)	Polysorbate 80
Antipsychotic	Paliperidone palmitate (Invega Trinza, Invega Sustenna)	Polysorbate 20
	Aripiprazole lauroxil (Aristada)	Polysorbate 20
Antiretroviral	Ibalizumab (Trogarzo)	Polysorbate 80
Antipsoriatic	Adalimumab (Humira, Imraldi)	Polysorbate 20 (Imraldi)/ Polysorbate 80 (Humira)
	Golimumab (Simponi)	Polysorbate 80
	Guselkumab (Tremfya)	Polysorbate 80
	Infliximab - dyyb (Inflectra, Remicade, Renflexis)	Polysorbate 80
	Ustekinumab (Stelara)	Polysorbate 80
Antiviral	Interferon alfa-2b (Intron A)	Polysorbate 80
Biological response modifier	Interferon gamma-1b (Actimmune)	Polysorbate 20
Cancer treatment	Ado-trastuzumab emtansine (Kadcyla)	Polysorbate 20
	Atezolizumab (Tecentriq)	Polysorbate 20
	Avelumab (Bavencio)	Polysorbate 20
	Bevacizumab (Avastin, Zirabev)	Polysorbate 20
	Daratumumab/hyaluronidase (Darzalex Faspro)	Polysorbate 20
	Denosumab (Prolia, Xgeva)	Polysorbate 20
	Dinutuximab (Unituxin)	Polysorbate 20
	Enfortumab (Padcev)	Polysorbate 20
	Olaratumab (Lartruvo)	Polysorbate 20
	Palifermin (Kepivance)	Polysorbate 20
	Pertuzumab/trastuzumab/hyaluronidase (Phesgo)	Polysorbate 20
	Polatuzumab vedotin (Polivy)	Polysorbate 20
	Tafasitamab (Monjuvi)	Polysorbate 20
	Trastuzumab (Herceptin, Herceptin Hylecta, Herzuma, Kanjinti, Ontruzant, Trazimera)	Polysorbate 20
	Belantamab (Blenrep)	Polysorbate 80
	Brentuximab vedotin (Adcetris)	Polysorbate 80
	Cemiplimab (Libtayo)	Polysorbate 80
	Docetaxel (Taxotere)	Polysorbate 80
	Durvalumab (Imfinzi)	Polysorbate 80
	Elotuzumab (Empliciti)	Polysorbate 80
	Etoposide (Toposar, VePesid)	Polysorbate 80
	Fam-trastuzumab deruxtecan (Enhertu)	Polysorbate 80
	Fosaprepitant dimeglumine (EMEND, Fosaprepitant)	Polysorbate 80
	Inotuzumab ozogamicin (Besponsa)	Polysorbate 80
	Ipilimumab (Yervoy)	Polysorbate 80
	Isatuximab (Sarclisa)	Polysorbate 80
	Mogamulizumab (Poteligeo)	Polysorbate 80
	Moxetumomab pasudotox (Lumoxiti)	Polysorbate 80
	Nivolumab (Opdivo)	Polysorbate 80
	Ofatumumab (Arzerra)	Polysorbate 80
	Pembrolizumab (Keytruda)	Polysorbate 80

TABLE IV. *(Continued)*

Drug class	Generic name (brand name)	Polysorbate
	Ramucirumab (Cyramza)	Polysorbate 80
	Rituximab (Truxima, Rituxan, Ruxience)	Polysorbate 80
	Rituximab and hyaluronidase (Rituxan Hycela)	Polysorbate 80
	Temsirolimus (Torisel)	Polysorbate 80
	Temozolomide (Temodar)	Polysorbate 80
Contraceptive	Medroxyprogesterone acetate (Depo-Provera, Depo-Provera CI, Depo-subQ provera 104)	Polysorbate 80
Corticosteroid	Methylprednisolone acetate (Depo-Medrol)	Polysorbate 80
	Triamcinolone acetonide (Aristocort Forte, Aristospan, Kenalog-40, Kenalog-10, Protherix, Triesence, Triloan Suik, Triloan II Suik, Zilretta)	Polysorbate 80
Diagnostic	Sincalide (Kinevac)	Polysorbate 20
	Tuberculin purified protein derivative (Aplisol, Tubersol)	Polysorbate 80
Disease-modifying antirheumatic drug	Anakinra (Kineret)	Polysorbate 80
	Tocilizumab (Actemra)	Polysorbate 80
Enzyme	Velaglucerase alfa (Vpriv)	Polysorbate 20
	Imiglucerase (Cerezyme)	Polysorbate 80
	Taliglucerase alfa (Elelyso)	Polysorbate 80
Erythoid maturation agent	Luspatercept (Reblozyl)	Polysorbate 80
Factor Xa inhibitor antidote	Coagulation factor Xa (recombinant), inactivated-zhzo (Andexxa)	Polysorbate 80
Gonadotropin	Follitropin (Menopur, Follistim)	Polysorbate 20
Growth hormone analog	Somatropin (Nutropin AQ Nuspin 5)	Polysorbate 20
Hematopoietic growth factor	Erythropoietin (Retacrit)	Polysorbate 20
	Pegfilgrastim (Fulphila, Neulasta, Nyvepria, Udenyca)	Polysorbate 20
	Romiplostim (Nplate)	Polysorbate 20
	Darbepoetin alfa (Aranesp)	Polysorbate 80
	Filgrastim (Neupogen, Nivestym, Granix, Zarxio)	Polysorbate 80
Hepatitis B/Hepatitis C agent	Peginterferon (Pegasys Pegintron)	Polysorbate 80
Hemostatic	Vitamin K (Phytonadione)	Polysorbate 80
Immune globulin	Hepatitis B immune globulin (HepaGam B, Nabi-HB)	Polysorbate 80
	Rho (d) immune globulin (WinRho)	Polysorbate 80
Immunomodulator	Interferon beta-1a (Avonex, Avonex Pen)	Polysorbate 20
	Emapalumab (Gamifant)	Polysorbate 80
Immunosuppressant	Mycophenolate mofetil (Cellcept IV)	Polysorbate 80
Inflammatory bowel disease agent	Vedolizumab (Entyvio)	Polysorbate 80
Interleukin inhibitor	Sarilumab (Kevzara)	Polysorbate 20
	Dupilumab (Dupixent)	Polysorbate 80
	Mepolizumab (Nucala)	Polysorbate 80
	Secukinumab (Cosentyx)	Polysorbate 80
	Tildrakizumab -asmn (Ilumya)	Polysorbate 80
Kallikrein inhibitor	Lanadelumab (Takhzyro)	Polysorbate 80
Leptin analog	Metreleptin (Myalept)	Polysorbate 20
Macular degeneration agent	Aflibercept (Eylea)	Polysorbate 20
	Ranibizumab (Lucentis)	Polysorbate 20
	Brolucizumab (Beovu)	Polysorbate 80
mAb treatment	Ocrelizumab (Ocrevus)	Polysorbate 20
	Remdesivir (Veklury)	Polysorbate 20
	Romosozumab (Evenity)	Polysorbate 20
	Teprotumumab (Tepezza)	Polysorbate 20
	Atoltivimab/maftivimab/odesivimab-ebgn (Inmazeb)	Polysorbate 80
	Bamlanivimab	Polysorbate 80
	Burosumab (Crysvita)	Polysorbate 80
	Canakinumab (Ilaris)	Polysorbate 80

TABLE IV. *(Continued)*

Drug class	Generic name (brand name)	Polysorbate
	Casirivimab/Imdevimab	Polysorbate 80
	Eptinezumab (Vyepti)	Polysorbate 80
	Fremanezumab (Ajovy)	Polysorbate 80
	Inebilizumab (Uplizna)	Polysorbate 80
	Raxibacumab	Polysorbate 80
Multiple sclerosis treatment	Natalizumab (Tysabri)	Polysorbate 80
Muscle relaxant	Dantrolene sodium (Dantrium, Ryanodex)	Polysorbate 80
P-selectin inhibitor	Crizanlizumab (Adakveo)	Polysorbate 80
Proprotein convertase subtilisin kexin type 9 inhibitor	Alirocumab (Praluent)	Polysorbate 20
	Evolocumab (Repatha)	Polysorbate 80
Rheumatologic	Belimumab (Benlysta)	Polysorbate 80
Thrombolytic	Tenecteplase (Tnkase)	Polysorbate 20
	Alteplase (Cathflo Activase)	Polysorbate 80
	Reteplase (Retavase)	Polysorbate 80
Vitamin infusion	Calcitriol (Calcijex, Rocaltrol)	Polysorbate 20
	Doxercalciferol (Hectorol)	Polysorbate 20
	Vitamins A, B1, B2, B6, C, D3, E, K (Infuvite)	Polysorbate 80

Adapted from Banerji A et al. mRNA Vaccine to Prevent COVID-19 Disease and Reported Allergic Reactions: Current Evidence and Suggested Approach. J Allergy Clin Immunol Pract 2020; Dec 31:S2213-2198(20)31411-2

Figure 3. Recommendations for Special Conditions and Populations.

CONTRAINDICATION TO VACCINATION	PRECAUTION TO VACCINATION	MAY PROCEED WITH VACCINATION
History of the following: • Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to component of the vaccine† • Immediate allergic reaction* of any severity after a previous dose or known (diagnosed) allergy to a component of the 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
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

Adapted from https://www.cdc.gov/vaccines/covid-19/info-by-product/clinical-considerations.html