

The first three COVID-19 vaccines have received emergency authorization for use in the United States.



You may have questions about how the COVID-19 vaccines work in transplant recipients and how safe they are. As of March 1, 2021, there are 3 vaccines that are being used in the United States and Canada to prevent COVID-19. Two are mRNA type vaccines, and one is an adenovirus vector-based vaccine.

- Like all vaccines, COVID-19 vaccines were tested to make sure they are safe.
- Although mRNA is a new way to make vaccines, it has been studied for decades.
- Adenovirus vector-based vaccines have been used for other infections such as Ebola.
- None of the currently authorized COVID-19 vaccines contain live virus and these vaccines carry no risk of causing COVID-19 infection
- Transplant patients were not included in the clinical trials when the vaccines were being studied. However, the vaccination is likely to be beneficial for transplant patients. We are encouraging -transplant patients and people who are waiting for transplant to be vaccinated when vaccines become available.

Vaccine Safety

Have any COVID-19 vaccines been studied in transplant recipients?

Patients with suppressed immune systems were not included in the



initial clinical trials that evaluated the COVID-19 vaccines. Therefore, how well the vaccine will work to protect immune suppressed patients is not known. Some small studies are in progress now. Transplant patients can have severe disease from COVID-19 infection and may be more likely to require hospital or intensive unit care. The benefits of vaccination appear to outweigh any unproven risks.

Which vaccines will be available in the United States and Canada?

As of March 10, 2021, there are 3 vaccines available in the U.S. and 4 in Canada. The Pfizer-BioNTech COVID-19 Vaccine and the Moderna vaccine are currently available in the US and Canada. These are both mRNA vaccines and work the same way. They have similar side effects and similar rates of protection from COVID-19 disease. The Johnson & Johnson/Janssen Vaccine is an adenovirus-vector vaccine available in the US and has been shown to be highly effective in preventing severe COVID-19 disease. None of the currently approved vaccines contain live virus.

We recommend receiving any brand of the currently authorized vaccines. Vaccine centers will not be able to accommodate requests for a specific vaccine type.



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Can transplant recipients receive the currently approved COVID-19 vaccines?

There are no safety concerns specific to transplant recipients. Early studies in transplant recipients show that side effects and safety are similar to those without a transplant. However, it is unknown if transplant recipients will develop less of an immune response to the vaccine due to their immunosuppressive medications. This could result in a decrease in the vaccine's ability to provide protection against COVID-19, but some protection is still expected. Expert opinion is that it is unlikely that the vaccines will cause rejection episodes, and no rejection episodes linked to COVID-19 vaccines have been seen so far.

How the vaccines work

What is an mRNA vaccine?

Pfizer-BioNTech and Moderna vaccines are mRNA vaccines. mRNA is a molecule that tells our body to make harmless proteins only found on the surface of the COVID-19 virus. Our immune system learns from the vaccine to recognize these proteins as foreign. After vaccination, if we get exposed to the COVID-19 virus, our immune system recognizes those same proteins on the virus and then knows to attack and block the COVID-19 virus. mRNA COVID-19 vaccines do not cause COVID-19 infection.

What is an adenovirus-vector vaccine?

The Johnson & Johnson/Janssen vaccine is an adenovirus-vector vaccine. This means that a modified version of an adenovirus (the vector) is used as a delivery system to carry harmless pieces of the COVID-19 surface proteins. The modified adenovirus itself is also harmless as it is not live and cannot multiply in our bodies, and therefore cannot cause adenovirus infection. The vaccine only uses pieces of the COVID-19 virus, and therefore cannot cause

COVID-19 infection. These types of vaccines have most recently been used for Ebola virus outbreaks and have been studied against other diseases such as Zika, flu, and HIV with excellent safety records.

Will the vaccine protect me from getting COVID-19 or just make me less likely to get sick?



In clinical trials, the vaccines proved to be highly effective at completely preventing COVID-19 disease in the majority of people. We also know that the vaccines also reduce the severity of COVID-19 sickness if you do catch it after you are vaccinated. Scientists are currently working to get a firm answer on whether the vaccine can reduce the risk of getting COVID-19 without symptoms (asymptomatic).

Very early data looking at results after one dose of a two dose vaccine series [of mRNA vaccine](#) suggest that some transplant patients may not develop as strong of antibody responses to the vaccine as people without transplants. However, these data are incomplete and studies are ongoing to see how well the vaccines prevent symptomatic COVID-19 [or severe disease](#) in transplant patients.

How long will the vaccine protection last?

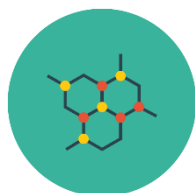
We don't know exactly, because the longer-term results of vaccine clinical trials are not complete. It takes time for your body to build protection after any vaccination.

COVID-19 mRNA vaccines (Pfizer-BioNTech and Moderna) require two shots to take time to build protection, so you will not be protected until a week or two after your second shot.

The J&J/Janssen vaccine only requires one shot, and you can expect to be protected 2 weeks after receiving it. This protection rate may build further over time.

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At this time, experts don't know how long someone remains protected from COVID-19 after being vaccinated. It is also unknown if there is a difference in how long you can be protected between the different vaccine types, but the level of protection (around 72-95%), and its ability to prevent severe disease is among the highest seen with any vaccines.



Who should receive the COVID-19 vaccine and when?

Pre- and post-transplant patients are included in the early stages of the vaccination roll-out in the US. Each state takes instruction from its

Department of Public Health about how and when to carry out the vaccine roll-out schedule. Transplant patients have started to receive the vaccines in many states.

We are encouraging patients to get vaccinated at whichever location is available to them first.

Of note, family members who do not have other reasons to be vaccinated are not currently included in the early phases of vaccine priority and may not be able to be vaccinated at the same time as you.

Is the vaccine safe for people with mild or severe allergies?

If you have had a severe allergic reaction to other vaccines or injectable therapies, you should ask your physician if you should get a COVID-19 vaccine. Your doctor will help you decide if it is safe for you to get vaccinated. If you have ever had a severe allergic reaction to any ingredient in a COVID-19 vaccine (such as polyethylene glycol, which is in both mRNA vaccines, or polysorbate 80, which is in the Johnson & Johnson/Janssen vaccine), the Centers for Disease Control and Prevention (CDC)



recommends that you not get that specific type of vaccine. If you have a severe allergic reaction after getting the first shot, you should not get the second shot. Your primary care provider may refer you to a specialist in allergies and immunology to provide more care or advice. If you have had a severe allergic reaction to the first dose of any of the mRNA vaccines (Pfizer-BioNTech, Moderna) and were unable to receive the second dose, it is safe to receive the J&J/Janssen vaccine.

The CDC recommends that people with a history of severe allergic reactions that are not related to vaccines or injectable medications—such as allergies to food, pets, venom, pollen/environmental substances, or latex—can safely get vaccinated. People with a history of allergies to oral medications or a family history of severe allergic reactions, or who might have a milder allergy to vaccines (no anaphylaxis)—may also still get vaccinated. The only reason to avoid vaccination that is related to allergies is if you've ever had a severe allergic reaction to any ingredient in the COVID-19 vaccine.

When should I be vaccinated?

What is the timing of vaccination relative to different transplant-related events?

Patient Group	Timing of Vaccine	Comments
Pre- Organ Transplant	Ideally at least 2 weeks prior to transplant	Do not delay transplantation because of COVID vaccine schedule
Post-Organ Transplant	1 month after transplant surgery (ask your transplant team for	



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	specific timing)	
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Can someone who has had COVID-19 infection get the COVID-19 vaccine?

Yes. You can get the vaccine once you have completely recovered from COVID



infection and are no longer contagious. Please discuss the timing with your doctor. If you were treated with monoclonal antibodies or convalescent plasma for COVID-19 infection, you should wait at least 90 days before getting vaccinated. Due to the severe health risks associated with COVID-19 and the fact that re-infection is possible, people who previously tested positive can and should receive the COVID-19 vaccine when it is available to them. Currently, scientists don't know how long COVID-19 antibodies protect people after they have been infected but think that the protection after infection is less than the protection after vaccination. People who had proven COVID-19 (or may have had) can and should receive the COVID-19 vaccine when it is available to them because it will give them additional protection. Testing for antibodies to COVID-19 as a marker of past infection is not recommended or needed prior to vaccination.

Please note: Persons who have active COVID-19 infection should **not** be vaccinated until they are cleared to stop isolation and are no longer contagious.

For mRNA vaccines (Pfizer-BioNTech or Moderna), if I get the first dose of the vaccine and then get infected with COVID-19, can I get the second dose?

Protection from symptomatic infection (meaning you are infected with COVID-19 and showing symptoms)

starts as soon as 12 days after the first dose of the vaccine but is not complete. Even after your second dose, it is still possible to catch COVID-19 (but be protected from severe illness) and become contagious. If you do happen to become symptomatic with COVID-19 after the first dose of the vaccine, you should receive the second dose after the symptoms, such as fever, have completely resolved, and after you have completed a standard period of home isolation.




Please note: Fever, fatigue, sore muscles and joints in the first few days after the vaccine may be vaccine side effects. If these symptoms do not clear within a couple of days or become worse, call your doctor and consider scheduling a COVID-19 test.

What to expect when I get vaccinated

What is the dosing schedule?

- Johnson & Johnson / Janssen Vaccine: There is only one dose.
- Pfizer-BioNTech COVID-19 Vaccine: There are two doses, with the second dose as close as possible to 21 days later, but no earlier than 17 days after the first dose.
- Moderna COVID-19 Vaccine: There are two doses, with the second dose as close as possible to 28 days later, but no earlier than 24 days after the first dose.
- For mRNA vaccines, if it is not possible to adhere to the recommended intervals as above, the second dose of Pfizer-BioNTech and Moderna COVID-19 vaccines may be scheduled for administration up to 6 weeks (42 days) after the first dose.





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Is it safe to take pain relievers before vaccination? Can I take them if I develop side effects from the vaccine?

If you regularly take aspirin, acetaminophen (Tylenol) or ibuprofen (Motrin, Advil) for other medical conditions, continue to do so as directed by your physician or as needed. It is unknown if taking pain relievers before getting vaccinated will reduce the effectiveness of vaccine; therefore, it is recommended to generally avoid taking them before vaccination.

If you have pain or discomfort after receiving the vaccine, it's ok to take pain relievers that you normally take. Side effects should go away in a few days. If you have concerns about what medications are safe for you to take, check with your doctor.

Should I hold any of my immunosuppressive medications/antirejection medications before or after vaccination?

No. We do not recommend that you hold any of your medications to get the vaccine. The effect of specific medications on how well the vaccine works is unknown. You might put yourself and your transplanted organ at harm by holding medications. We strongly suggest that you speak with your transplant team before making any modification to your immunosuppression medications

After vaccination

What are the potential adverse effects of the vaccine?

In the vaccine clinical trials, minor side-effects, which include headache, fatigue, fever and injection site pain (redness, swelling) were seen in the 1-3 days after vaccination. These symptoms are typically more noticeable after the second dose and in younger

patients. Transplant patients should continue to call their transplant team for fever, or any other symptoms experienced in the days after the vaccination as they normally would to see if any further tests or treatments are needed.

At present, there is no information to suggest that transplant recipients would be at higher risk of vaccine adverse effects than anyone else.



Can I stop wearing a mask after I have been vaccinated for COVID-19?

No. At this time, we do not know if the vaccine prevents people from getting

infection without symptoms and spreading it to others. Even after vaccination, patients and their households should continue to practice COVID-19 safety measures including:

- Continue to wear masks around others
- Practice good handwashing
- Maintain physical distancing in public places

Although the CDC has updated their recommendations to say that vaccinated people may be able to be together without masking, we caution that we do not know how well the vaccines protect transplant patients at this time. We recommend that you continue to mask when around others and ask others to wear a mask around you, even after full vaccination until further data are available.

Related Links

- CDC Recommendations <https://www.cdc.gov/vaccines/covid-19/index.html>
- AST Vaccine FAQ Sheet <https://www.myast.org/covid-19-vaccine-faq-sheet>
- ISHLT COVID-19 Information <https://ishlt.org/covid-19-information>
- Johns Hopkins Vaccine Information <https://www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus/coronavirus-vaccines-infographic>



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