

Live Vaccines After Liver Transplant

Frequently Asked Questions

Live vaccines, specifically measles, mumps, rubella (MMR), and varicella, also called chickenpox (VZV), are recommended for some patients after liver transplant. The vaccines can prevent infection with measles and chickenpox and all their risks. This guide will give you more information about this recommendation.

1. Why should some liver transplant patients now get live vaccines?

- We now have a lot of scientific studies that show **live-attenuated vaccines** are safe and helpful in children who have a liver transplant.
- In the past, we thought that outbreaks of measles were uncommon and would continue to decrease.
- Immunocompromised children are more at risk of getting very sick from vaccine-preventable infections, including infection-related organ rejection. If they aren't vaccinated, these children may need post-exposure medicine that may or may not help treat the virus.
- Fewer people are getting vaccinated around the world, so measles outbreaks and chickenpox are more common. Vaccination rates have also decreased during the COVID-19 pandemic.

A **live-attenuated vaccine** is a vaccine where live, weakened viruses are used in the vaccine itself. These vaccines are used to help prevent diseases such as measles and chicken pox.

2. What are the risks of a liver transplant patient getting chickenpox or measles?

- The chickenpox virus is always out there in the community.
- In severe disease with measles, people can get lung and brain infections.
- In a bad chickenpox case, people can get more than 200 skin lesions on their bodies and damage their liver, lungs, and brain.
- Immunocompromised patients with chickenpox often need to go to the hospital and get IV medicine called acyclovir. There are no anti-viral medicines to treat measles.
- Travel increases the risk for chickenpox and measles.

3. Are other transplant centers and hospitals doing this?

- Yes. At least 11 other liver transplant centers in the US are now giving live vaccines. There are large transplant centers in Europe and Asia giving live vaccines as well.



4. Do these vaccines work in post-liver transplant patients?

- Research of the MMR and VZV vaccines shows that these vaccines do work in most liver transplant patients. The vaccine may not work as well compared to non-liver transplant patients. Post liver transplant patients may also need to continue getting booster shots for these vaccines. We check our patients' antibody levels to decide if they will need boosters.

5. Have any patients had complications?

No, liver transplant patients have not had more complications than other children. You can see the CDC vaccine information sheet (VIS) for more health and safety information on the vaccine.

6. When is it possible for post-liver transplant patients to get these vaccines?

- Working with our doctor and pharmacy teams, we suggest that patients get these vaccines when they are:
 - Healthy without any symptoms of illness
 - At least **1 year** post-transplant
 - At least **1 year** after liver rejection
 - Prescribed and only taking:
 - 1 immunosuppression medicine
OR
 - 1 immunosuppression medicine and low dose prednisone
 - The patients' blood levels stay at the following for two months:
 - a. Tacrolimus less than 8ng/mL
 - b. Cyclosporine less than 100ng/mL
 - c. Sirolimus less than 8ng/mL
 - Blood work suggests good immune system function when we check:
 - Absolute Lymphocyte Count
 - CD4 Count, or a type of white blood cells, if available
 - Total immunoglobulin level (IgG level)



7. Why would a post-liver transplant patient not get a live vaccine like for measles and chickenpox?

- They would not receive a live vaccine if they are:
 - On high-level immunosuppression
 - Being treated for rejection
 - On a biological agent
 - Being treated with anti-thymocyte globulin (ATG) or rituximab within the last 12 months
 - Being evaluated or treated for post-transplant lymphoproliferative disorders (PTLD)
 - Suspected to have an underlying immune deficiency
 - Recent treatment with immunoglobulin (IVIG, VZIG, etc.) or blood transfusion
- If it is safe, they may receive the vaccine even if they have:
 - A persistently high Epstein-Barr virus (EBV) level

8. What happens if a person already has antibodies to measles or chickenpox?

Our infectious disease specialists still suggest getting a booster dose of the vaccine to strengthen immunity. This is because immunity may be weaker in patients who have had a transplant and are on immunosuppressive medicine.

Antibodies are proteins that the body makes to fight off germs, like viruses.

9. How many doses are given, and when?

- We will recheck the antibody levels at least **1 month** after the vaccine is given to see if there is a response to the vaccine or if another dose is needed.
- Chickenpox (VZV) vaccine doses can be given **12 weeks apart**.
- Measles, mumps, and rubella (MMR) vaccine doses can be given **4 weeks apart**.

10. How often will we have to do labs after vaccination?

Once we see an antibody response, we will **recheck the antibody test in 1 year** to see if antibodies are still present. At this time, we will help you decide if another dose is needed.

11. Where should we get the vaccines?

We suggest you get the vaccine with your primary care doctor. If you prefer to receive the vaccine with us, please let us know, and **we can schedule this in advance**.



12. **Can the live vaccines be given at the same time?**

- **We do not recommend** giving the live vaccines at the same time.
- **We do not recommend** giving the combined MMRV vaccine. It has not been researched.
- If both are needed, we recommend giving the VZV, also called the live chickenpox vaccine, first.

13. **What symptoms should we look out for after the vaccines are given?**

Contact Your Care Team

Call your pediatrician and your transplant team if your child has any of the following at any time within **4 weeks of live-virus vaccination**. **Our team will check in with you two times after your child gets their vaccine to see how they are doing. We will call you first 1 week after the vaccine and then at 4 weeks.**

- Fever that is over 38°C or 100.4°F
- Rash
- Signs of infection like pus, pain, or redness near or at the injection area

14. **Is this being done for research?**

- No. We are not asking any of our patients to get these vaccines for research.
- This vaccine is to help protect your child from diseases.
- We want to learn as much as we can about vaccines and immune function in people who have received liver transplants.
- Your coordinator may ask you if you are interested in a research study.

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