

# VACCINES AND SOLID ORGAN TRANSPLANTS

## WHAT YOU SHOULD KNOW

### WHY ARE VACCINES SO IMPORTANT?

Although several of the diseases that vaccines prevent have been dramatically reduced or eliminated, vaccines are still necessary:

- *To prevent common infections*

Some diseases are so common in this country that a choice not to get a vaccine is a choice to get infected. For example, choosing not to get the pertussis (whooping cough) vaccine is a choice to risk a serious and sometimes fatal infection.

- *To prevent infections that could easily re-emerge*

Some diseases in this country can easily re-emerge with relatively small decreases in immunization rates (for example, measles, mumps and *Haemophilus influenzae* type b, or Hib). We are seeing this now with measles and mumps. Unvaccinated children are more likely to be infected.

- *To prevent infections that are common in other parts of the world*

Although some diseases have been completely eliminated (polio) or virtually eliminated (diphtheria) from this country, they still occur commonly in other parts of the world. Children are still paralyzed by polio and sickened by diphtheria in other areas of the world. Because there is a high rate of international travel, outbreaks of these diseases are only a plane ride away.

### ARE VACCINES SAFE?

Because vaccines are given to people who are not sick, they are held to the highest standard of safety. As a result, they are among the safest things we put into our bodies.

How does one define the word safe? If safe is defined as “free from any negative effects,” then vaccines aren’t 100 percent safe. All vaccines have possible side effects. Most side effects are mild, such as fever, or tenderness and swelling where the shot is given. But some side effects from vaccines can be severe. For example, the pertussis vaccine is a very rare cause of persistent inconsolable crying, high fever or seizures with fever. Although these reactions do not cause permanent harm to the child, they can be quite frightening.

If vaccines cause side effects, wouldn’t it be “safer” to just avoid them? Unfortunately, choosing to avoid vaccines is not a risk-free choice — it is a choice to take a different and much more serious risk. Discontinuing the pertussis vaccine in countries like Japan and England led to a ten-fold increase in hospitalizations and deaths from pertussis. Recently, a decline in the number of children receiving measles vaccine in the United Kingdom and the United States led to an increase in cases of measles.

When you consider the risk of vaccines and the risk of diseases, vaccines are the safer choice.

### WHY IS IT IMPORTANT TO VACCINATE SOMEONE WHO WILL RECEIVE A SOLID ORGAN TRANSPLANT?

People who receive organ transplants are at high risk for getting vaccine-preventable diseases, like influenza, because medications given after the transplant weaken their immune system. These individuals may also become sicker than those who have not had a transplant. The highest risk for infection is in the period immediately after the transplant, but the risk continues for months to years. Vaccination before a transplant can help protect against infections or decrease the severity of complications should an infection occur.

### WHICH HEALTHCARE PROVIDER WILL HELP WITH FIGURING OUT WHICH VACCINES MIGHT BE NECESSARY?

The transplant teams and primary care providers partner to ensure your overall health. When it comes to vaccines, most often, the transplant team will be in the best position to answer questions about which vaccines to get, but your primary care provider will give them. In this way, the healthcare providers most familiar with the state of your immune system can provide guidance, but your primary care providers will have complete records related to your vaccinations as part of your health history.

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## WHEN IS THE BEST TIME FOR A TRANSPLANT CANDIDATE OR RECIPIENT TO RECEIVE VACCINES?

This depends on several factors, such as the age of the person, how soon the individual needs a transplant, and the type of transplant. We know that vaccines work best if given before a transplant. And, because the person's immune system will be weak, some vaccines may need to be delayed for weeks or months after a transplant. So, people should receive as many vaccines as they can before the transplant occurs.

Because it takes about two to four weeks after vaccines are given for the immune response to be protective, the transplant team might not want to delay the transplant to give vaccines. And, because the timing of a transplant can be unpredictable, they may try to give as many vaccines as possible while evaluating the person. This may mean giving vaccines sooner than they are recommended for other people. However, altering the schedule allows the person to have as much protection as possible when the transplant occurs.

The transplant team will decide which vaccines can and should be given. These decisions are guided by recommendations from the Centers for Disease Control and Prevention (CDC), Infectious Diseases Society of America (IDSA), American Society of Transplantation, and other experts. The recommendations address things like the minimum age for vaccines and the timing between doses to ensure that vaccines are as safe and effective as possible in transplant candidates.

## WHICH VACCINES SHOULD BE GIVEN BEFORE A TRANSPLANT?

Inactivated vaccines are made using parts of viruses or bacteria or killed viruses. Vaccines made in these ways are safe to give before transplant regardless of when the transplant occurs. These vaccines work best if given at least two weeks before the transplant to allow enough time for an immune response to develop.

In contrast, live, weakened viral vaccines, like the chickenpox and MMR vaccines, are made using viruses that have been weakened in the laboratory. These weakened viruses are less able to grow in people. However, because they can still replicate somewhat, the timing of these vaccines is more important. Live, weakened viral vaccines should be given a few weeks prior to transplant, if possible, to make sure that the virus is no longer replicating in the body when the transplant is performed.

## WHICH VACCINES CAN BE GIVEN AFTER TRANSPLANT?

In general, solid organ transplant recipients can safely receive all inactivated vaccines. Examples include those that protect against hepatitis A, polio (the shot), hepatitis B, human papillomavirus (HPV), influenza (the shot), *Haemophilus influenzae* type b, pneumococcus, meningococcus, diphtheria, tetanus and pertussis. The transplant team will determine when inactivated vaccines should be given after transplant by determining when the person is most at risk of contracting the disease and when the vaccine will work best.

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Live, weakened viral vaccines, such as those for measles, mumps and rubella, influenza (nasal flu mist only), chickenpox, rotavirus, shingles (one version), yellow fever, and typhoid (oral version), are often not recommended after receiving a transplant. Because of their altered immune systems, some transplant recipients might have difficulty controlling viral replication following receipt of live, weakened viral vaccines. This risk varies by patient and the strength of their immune system. Patients should talk to their transplant provider about whether they can receive live, weakened viral vaccines.

## SHOULD FAMILY MEMBERS AND CLOSE CONTACTS OF SOLID ORGAN TRANSPLANT RECIPIENTS RECEIVE VACCINES?

It is important to avoid bringing infections into the home of a transplant recipient. One way to do this is to make sure that all household contacts are fully vaccinated. Children and adults living in the home of those with a solid organ transplant can safely receive all routinely recommended vaccines and are strongly encouraged to do so. In general, if inactivated vaccine options are available for household members, they are preferred. However, when live, weakened viral vaccines are the only option, persons living in the home should still receive these vaccines as the risk of spreading virus to the transplant recipient is small. If a close contact of a transplant recipient needs a live, weakened viral vaccine, they should check with the transplant doctor about any special precautions that are needed to protect the transplant recipient.

## WHAT ELSE CAN CLOSE CONTACTS DO, BESIDES GETTING VACCINES, TO PROTECT TRANSPLANT RECIPIENTS?

Ways to help keep a transplant recipient safe from infection include:

- People who are sick should avoid contact with a transplant recipient. If someone has a fever or signs of infection like a cough, congestion or rash, a transplant recipient should not have contact with that person.
- Family members and transplant recipients should always wash their hands well, properly wash and cook foods, and avoid sharing toothbrushes and drinking glasses.
- Household pets should be fully vaccinated and receive regular veterinary care. Transplant recipients should avoid contact with animal droppings, animal cages and litterboxes or related items.
- Any travel plans, especially outside of the country, should be discussed with the transplant team.
- Keep an open line of communication with the transplant team, including asking questions that may come up after the transplant patient returns home.