

# INFECTIOUS DISEASES AND PREGNANCY: WHAT YOU SHOULD KNOW

Pregnancy is a time of hope, anticipation — and many questions. Because pregnant women must consider not only how their actions and exposures will affect them but also their unborn babies, infections and vaccinations, in particular, can be a source of concern. Indeed, when it comes to questions related to immunity and health, a mom-to-be should understand how intimately her and her unborn child's immune systems are entwined.

## IMMUNITY: THE BASICS

When women are pregnant, their bodies undergo many changes, including changes to their immune system. A pregnant woman's immune system needs to allow for a "foreign tissue" to grow inside of her without seeing it as foreign and making an immune response against it. Because the immune system is somewhat suppressed during pregnancy (to avoid making an immune response directed against the baby), a woman may be more susceptible to infections that might otherwise be more easily handled.

In addition to the immune system changes, pregnant women undergo physical changes that make them more susceptible to infections. For example, their heart and lungs need to work harder as they accumulate more fluid. This sets the stage for complications that might otherwise be uncommon for healthy, non-pregnant women of the same age. For example, pregnant women are seven times more likely to suffer a severe bout of influenza than women of the same age who aren't pregnant.

Women's immune systems also protect the unborn baby since blood (and, therefore, the immune cells that travel in blood) also circulates in the baby. And, when the baby is born, antibodies introduced through the placenta and breast milk, called maternal antibodies, are responsible for keeping the baby healthy while the baby's own immune system begins generating an immune response to all the natural challenges in the environment.

For these reasons, vaccinations, and their timing, become particularly important.

## ARE THERE VACCINES I NEED BEFORE BECOMING PREGNANT?

If you are thinking about pregnancy, you should check that you are up to date on all your vaccinations, particularly those that are live, weakened viral vaccines, such as the measles-mumps-rubella (MMR) and chickenpox vaccines. These recommendations are important for two reasons. First, these four viruses can be particularly harmful to developing fetuses. Women infected with measles, mumps, rubella or chickenpox during pregnancy can deliver babies with defects resulting from the infection. Second, although the risk is theoretical at best, the fact that the vaccine viruses replicate has led officials to recommend against giving these vaccines during pregnancy if possible. During an outbreak, pregnant women may be advised to get vaccinated because the risk to the baby if the woman is infected is greater than the risk of being vaccinated. However, if women ensure they are immunized before becoming pregnant, this situation will never be realized.

## ARE THERE VACCINES I SHOULD AVOID IF I AM PREGNANT?

Yes. Although vaccines given during pregnancy have not been found to cause harm to unborn babies, theoretical concerns related to live viral vaccines have led officials to recommend against giving them during pregnancy unless the risk of infection is imminent. To this end, MMR and chickenpox vaccines should be avoided, if possible. However, it is important to be aware that when these vaccines have been given to pregnant women inadvertently (such as before a woman knew she was pregnant) or because of a known risk of infection, no harm has been done. On the other hand, pregnant women infected with some of these natural viruses have suffered increased complications, hospitalizations, miscarriages, premature labor or harm to the unborn child.

Find out more about vaccine considerations for new and expectant moms

[vaccine.chop.edu/yourbaby](https://vaccine.chop.edu/yourbaby)

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## ARE THERE VACCINES I SHOULD RECEIVE DURING PREGNANCY?

Yes. Certain vaccines are recommended during pregnancy, including influenza, COVID-19 and Tdap vaccines.

### Influenza vaccine

Influenza virus infects tissues of the lungs. The physical changes to a woman's body when she is pregnant, such as increased fluid retention and greater effort required by the lungs, make a pregnant woman more likely to experience complications that require hospitalization if infected. Women who get influenza are at increased risk for pneumonia and preterm labor.

Since babies cannot get the influenza vaccine until 6 months of age, options for protecting them against influenza are limited to controlling exposure and relying on maternal antibodies that are transferred to the child before delivery. Since people can transmit influenza before the onset of symptoms, controlling exposure may not always be possible. Therefore, maternal antibodies offer an extra level of assurance. Indeed, studies have shown that during influenza season, babies born to women who were immunized against influenza are less likely to become ill from influenza when compared with babies born to women who were not immunized.

### COVID-19 vaccine

As with influenza, COVID-19 virus is a respiratory infection. Pregnant women who get COVID-19 are at higher risk of experiencing severe disease and hospitalization compared with women of the same age who are not pregnant. Likewise, the risk of preterm delivery or stillbirth increases when pregnant women get COVID-19.

COVID-19 vaccines are safe during pregnancy and have also been shown to protect the baby in the months following birth before they can be vaccinated.

### Tdap vaccine

Pregnant women are recommended to receive a single dose of Tdap vaccine between 27 and 36 weeks of gestation during *each* pregnancy. The main reason for this vaccination is to protect unborn babies from getting pertussis in the weeks and months following birth. Babies are not considered to have their own protection against pertussis until they receive the first three doses of the DTaP vaccine, typically given at 2 months, 4 months and 6 months of age. While anytime during the 27- to 36-week window is fine, public health officials suggest getting this vaccine earlier during the window to allow time for antibodies to develop and be transferred to the baby before birth.

Pertussis is a bacterial infection that is particularly dangerous for young infants. The infection causes severe coughing spasms that preclude babies from moving air through their small windpipes. Babies in the midst of a coughing spasm caused by pertussis often make a "whooping" sound as they struggle to breathe and sometimes, if the spasm lasts long enough, they turn blue. In addition to being quite scary for parents to watch, these spasms can be harmful and, sadly, occasionally fatal.

Studies have shown that most babies get pertussis from their moms or siblings who have a cough, but don't realize it's associated with a pertussis infection, making controlling exposure next to impossible. Efforts to control exposure by making sure everyone around the baby has received a Tdap vaccine (known as cocooning) may help but are not foolproof. Therefore, boosting maternal antibodies that will be transferred to the baby through the placenta and in breast milk provides an added measure of protection.

Women who do not receive the vaccine during pregnancy should get it immediately after giving birth. Dads, grandparents, and other teens and adults who will be around the baby should also get a dose if they have not had the Tdap booster.

## IF I AM PREGNANT AND HAVE A YOUNG CHILD IN THE HOME, ARE THERE ANY VACCINES THAT MY CHILD CAN'T GET WHILE I AM PREGNANT?

No. Children and adults in the home can receive any vaccines they may require without fear of harm to the pregnant woman or her unborn child.

## IF I AM GOING TO BREASTFEED, DO I NEED TO AVOID CERTAIN VACCINES?

No. Breastfeeding women can get any vaccines they may need without fear of harm to the baby, including COVID-19 vaccine.

## IF I AM BREASTFEEDING, ARE THERE VACCINES I SHOULD DELAY FOR MY BABY?

No. Infants who are being breastfed can get vaccines according to the recommended immunization schedule. In fact, the recommended schedule is designed to ensure that babies have generated their own antibodies before maternal antibodies wane to a point that they are no longer protective.



*This information is provided by the Vaccine Education Center at Children's Hospital of Philadelphia. The Center is an educational resource for parents, the public and healthcare professionals and is composed of scientists, physicians, mothers and fathers devoted to the study and prevention of infectious diseases. The Vaccine Education Center is funded by endowed chairs from Children's Hospital of Philadelphia. The Center does not receive support from pharmaceutical companies. ©2022 Children's Hospital of Philadelphia. All Rights Reserved. 22196-10-22.*