

Vaccinations during pregnancy

Vaccinations during pregnancy protect expectant mothers and their babies.

Vaccination against pertussis (whooping cough), influenza and COVID-19 is strongly recommended during pregnancy to protect pregnant women and their babies against these serious infections. Other inactivated vaccines are not routinely recommended during pregnancy but may be considered in special circumstances. Live attenuated viral vaccines are the only types of vaccines that should not to be given during pregnancy. Some vaccines, like rubella, may be needed when planning pregnancy so the mother is immune before she becomes pregnant.

Pertussis vaccine and pregnancy

Pertussis is a highly contagious infection which is most severe in young babies

Pertussis (whooping cough) is a highly contagious respiratory infection. In Australia, pertussis is most common among infants <6 months old. The youngest infants are most at risk of severe disease. About half of the pertussis deaths in infants are in those aged <6 weeks. Adults can also get pertussis, but in most cases the disease is less severe. This means it can be passed on to others without knowing.

Pertussis vaccine is recommended and funded in every pregnancy

Pertussis vaccine is provided free for pregnant women under the National Immunisation Program (NIP). Pregnant women are strongly recommended to receive a single dose of pertussis vaccine between mid 2nd trimester and early 3rd trimester (between 20 and 32 weeks gestation) of each pregnancy. However, if the vaccine has not been given by 32 weeks, it can be given at any time during the third trimester up to delivery.

If pregnant women receive the vaccine earlier than 20 weeks, they do not need a repeat dose during the same pregnancy. Evidence shows transfer of pertussis antibodies to the infant in women who received dTpa vaccine as early as 13 weeks gestation.¹

The recommended vaccine is the adult formulation of the combined diphtheria-tetanus-pertussis (dTpa) vaccine. The only medical reason a pregnant woman should not receive this vaccine is if she had an anaphylactic reaction after a previous dose.

Benefits of pertussis vaccination during pregnancy are great

Vaccination during pregnancy has been shown to be the most effective way to prevent pertussis infection in newborn infants. Studies have found that 9 out of 10 infants aged <3 months were protected against hospitalised pertussis when their mothers received the pertussis vaccine at least 7 days before delivery.²⁻⁴ This is due to the transplacental transfer of protective antibodies from the mother to the fetus during pregnancy. These antibodies last until the infant can receive their first dose of pertussis vaccine at 6 weeks of age. Women should receive pertussis vaccine during each pregnancy to ensure maximum protection to their newborn infant, because the level of vaccine-induced antibodies declines over time.

If women receive pertussis vaccine while pregnant, it also reduces their risk of contracting pertussis, potentially avoiding the unpleasant side effects of a prolonged severe cough, such as vomiting, sleep disturbance, incontinence, weight loss and fainting.⁵ It also reduces the likelihood that the pregnant women will pass on pertussis to other people, including their children.⁶

Risks from pertussis vaccination during pregnancy are low

Pertussis vaccine is an inactivated vaccine which is considered safe for both pregnant women and their babies. Vaccination of pregnant women against pertussis occurs in many countries, including the United States, the United Kingdom and New Zealand. These countries have reported no evidence of an increased risk of adverse pregnancy outcomes (such as stillbirth, low birth weight or preeclampsia) related to pertussis vaccination during pregnancy.⁷⁻⁹

Pertussis vaccine is well tolerated in adults. Most adults will experience pain at the injection site following vaccination but this is short-lasting. About 1 in 20 adults will experience fever after vaccination.¹⁰

What else can be done to protect infants against pertussis?

The most effective way to protect infants against pertussis is vaccination of the mother while pregnant. Vaccination of other people who will be in close contact with the infant, called 'cocooning', will further reduce the chance of pertussis being transmitted to the infant.

About 80% of infants get pertussis from their parents or siblings.⁶ A booster dose of pertussis vaccine is recommended for adult close contacts, such as fathers and grandparents, who have not had a dose in the previous 10 years. It is also important to ensure siblings are up to date with their recommended pertussis vaccines.

Influenza vaccine and pregnancy

Influenza virus causes severe disease in pregnant women and young infants

Influenza is a contagious respiratory viral infection that circulates each year in winter months. It can cause serious illness in previously healthy people. Pregnant women are 2.5 times more likely to be admitted to hospital with influenza than other women.¹¹ Influenza infection during pregnancy can lead to other complications such as premature delivery and even neonatal and perinatal death.¹²

Young infants, especially those aged <6 months, are more likely to be hospitalised or die from influenza than older children.¹³ Aboriginal or Torres Strait Islander children and children with some medical conditions are even more likely to have severe influenza than other children.¹⁴

Influenza vaccine is recommended in every pregnancy

Quadrivalent influenza vaccines (QIVs) are provided free for pregnant women under the NIP. Pregnant women are strongly recommended to receive a single dose of influenza vaccine in every pregnancy, preferably before the onset of the influenza season.

Women who received the previous year's seasonal influenza vaccine early in their pregnancy can receive the current seasonal influenza vaccine later in the same pregnancy.

Pregnant women can receive influenza vaccine at the same time as pertussis vaccine.

For information on influenza vaccines and vaccine recommendations and funding, see the annual statements on the use of influenza vaccines prepared by the Australian Technical Advisory Group on Immunisation (ATAGI).¹⁵

Benefits of influenza vaccination during pregnancy are great

Influenza vaccination during pregnancy protects both the pregnant woman and her fetus from complications from influenza. Studies have shown a 50% reduction in influenza and a 35% reduction in hospital admission for acute respiratory illness among vaccinated pregnant women compared to unvaccinated pregnant women.^{16,17} Babies born to women vaccinated against influenza during pregnancy are no more likely to be born prematurely or have a low birth weight¹⁸ than those born to women who were not vaccinated in pregnancy.¹⁹

Influenza vaccination during pregnancy also prevents influenza in 5 out of 10 infants before they reach 6 months of age – the age when they can start to receive the vaccine themselves.²⁰ This is due to the transplacental transfer of protective antibodies from the pregnant woman to the fetus. These antibodies remain in the infant's blood for the first few months of life.

Risks from influenza vaccination during pregnancy are low

All influenza vaccines in Australia are inactivated vaccines, which are considered safe for both the pregnant woman and her fetus. An extensive review showed that influenza vaccination during pregnancy is safe for both the mother and her infant, and additionally provides protection against preterm birth and low birth weight.²¹ Also, studies of mother–baby pairs have shown that influenza vaccination during pregnancy does not increase maternal or fetal complications.²²

The expected adverse events following influenza vaccines occur as frequently in pregnant women as in women who are not pregnant. Local reactions (such as redness, swelling and pain) occur in about 1 in 10 adults who receive the vaccine and systemic reactions (fever, tiredness and myalgia) occur in fewer people than that. Serious adverse events like Guillain–Barré syndrome are very rare, occurring in about 1 in 1 million vaccinated people.²³

What else can be done to protect against influenza?

Vaccination during pregnancy is the most effective way of preventing influenza in a pregnant woman her newborn. Influenza vaccination of household members who will be in close contact with the newborn will reduce the chance of transmitting the virus to the baby. This is especially important if the infant has other risk factors, like a compromised immune system, which increase their risk of developing severe influenza.

Anyone aged 6 months or older can receive influenza vaccine each year to immunise themselves against influenza, rather than relying on the immunity of others around them. Specific influenza vaccine brands are recommended for use in young children. These are outlined in the annual ATAGI influenza vaccine statements.¹⁵

Frequent hand washing with soap and water and cough etiquette are important hygiene measures to prevent the spread of influenza.

COVID-19 and pregnancy

Pregnant women have a higher risk of severe COVID-19 than non-pregnant women

COVID-19 is a new disease caused by SARS-CoV-2, a coronavirus that causes respiratory infection. Although many people will experience mild to moderate respiratory illness and recover without requiring special treatment, some, including those at increased risk, may develop serious illness.

Pregnant women with COVID-19 are about 5 times more likely to need hospital admission,²⁴ 2–3 times more likely to need admission to an intensive care unit^{25,26} and 3 times more likely to need

invasive ventilation (breathing life support)^{25,26} compared with non-pregnant women of the same age.

Pregnant women older than 35 years who are overweight or obese (body mass index above 30 kg/m²), have pre-existing (pre-pregnancy) high blood pressure or have diabetes (type 1 or type 2) are at further increased risk of severe illness compared with pregnant women without these conditions.

Pregnant women who get COVID-19 during pregnancy are also 1.5 times more likely to deliver preterm (before 37 weeks of pregnancy) and their babies are 3 times more likely to need admission to a neonatal unit.²⁵

Pregnant women are prioritised and recommended to receive the COVID-19 vaccine

Pregnant women are a priority group for COVID-19 vaccination and should be routinely offered a COVID-19 vaccine, which can be administered at any stage during pregnancy. The recommended schedule for both Comirnaty (Pfizer) and Spikevax (Moderna) is two doses, 3–6 weeks apart.

Comirnaty (Pfizer) and Spikevax (Moderna) are preferred over COVID-19 Vaccine AstraZeneca in pregnant women for two reasons:

- a growing body of evidence has shown that Comirnaty (Pfizer) and Spikevax (Moderna) are safe for pregnant women, and early evidence indicates they are effective in this group
- COVID-19 Vaccine AstraZeneca is associated with a rare risk of a clotting condition called thrombosis with thrombocytopenia syndrome (TTS), which appears to be more common in people under 60 years of age.

Pregnant women can consider receiving COVID-19 Vaccine AstraZeneca, two doses 4–12 weeks apart, if they cannot access Comirnaty (Pfizer) or Spikevax (Moderna) vaccines, and if benefits outweigh the risks, such as in an outbreak setting where vaccine availability may be limited.

Pregnant women who have received a first dose of the COVID-19 Vaccine AstraZeneca can receive a second dose of either the COVID-19 Vaccine AstraZeneca or an mRNA vaccine (Comirnaty or Spikevax), which is preferred.

Booster dose of COVID-19 vaccine

Pregnant women aged 16 years and older who received two doses of the primary course of a COVID-19 vaccine at least 3 months ago are recommended to receive a booster dose. For pregnant women aged 18 years and older, Comirnaty or Spikevax is the preferred vaccine brand for the booster dose, regardless of the vaccine received in the primary schedule. For pregnant women aged 16-17 years, only Comirnaty is recommended as a booster dose.

Interval between COVID-19 vaccine and other vaccines

COVID-19 vaccines can be co-administered with other vaccines (including dTpa and influenza vaccines).

Benefits of COVID-19 vaccination in pregnancy are great

COVID-19 vaccination during pregnancy protects both the pregnant woman and her fetus from complications of the disease. Several studies have found that antibodies from COVID-19 vaccines pass through the placenta in pregnant women who receive two doses before delivery.²⁷⁻³¹ This may provide the newborn with antibodies that will protect them against COVID-19 in the first few months of life.

There have also been some small studies showing that antibodies pass through breast milk^{27,28,32,33} in breastfeeding mothers.

There is emerging evidence of good vaccine effectiveness of both mRNA COVID-19 vaccines in pregnant women. A study in 15,060 pregnant women found the Pfizer vaccine to be 78% effective against COVID-19 infection.³⁴ Clinical trials have shown that Comirnaty vaccine is 95% effective³⁵ and COVID-19 Vaccine AstraZeneca is 62–70%³⁶ effective at preventing the general population from getting sick with COVID-19, noting that these studies were conducted in populations before the emergence of current variant strains of SARS-CoV-2. Although effectiveness of these vaccines against infection is lower for the Delta and Omicron variants, but protection against hospitalisation and death appears to be maintained.

Risks from COVID-19 vaccination during pregnancy are low

A large study in the United States of 35,000 pregnant women who received Comirnaty (Pfizer) or Spikevax (Moderna) showed that the rate of adverse events was similar to that among non-pregnant women.³⁷ Pregnant women were more likely to have pain at injection site but less likely to experience other symptoms such as fever and tiredness, compared with non-pregnant women. Similar findings have been found in smaller studies.²⁷

There appear to be no concerns with pregnancy outcomes for women receiving Comirnaty (Pfizer) or Spikevax (Moderna) vaccine. Within the same study, 827 vaccinated pregnant women delivered babies and there was no difference in the rate of still birth, premature delivery, small for gestational age infants and congenital anomalies compared with these rates in non-pregnant women, noting that numbers were small.³⁷ Other smaller studies have also found no risk of complications during pregnancy in women vaccinated with a COVID-19 vaccine compared with unvaccinated pregnant women.

What else can be done to protect against COVID-19 during pregnancy?

Vaccination against COVID-19 for pregnant women as well as close contacts is a great way to protect the mother as well as the baby against COVID-19 infection. Other prevention measures such as social distancing, restrictions and mask wearing may still be required in settings where there is increased COVID-19 transmission in the community. Individuals should follow the advice outlined by health departments.

Other vaccines and pregnancy

Other inactivated vaccines can be given during pregnancy in certain situations

Influenza and pertussis vaccines are the only vaccines recommended for pregnant women. Other inactivated vaccines are not routinely recommended during pregnancy on precautionary grounds as they haven't been studied for safety in pregnant women specifically. However, there may be circumstances, such as high-risk travel, where the benefits from vaccination during pregnancy outweigh the risks. This should be discussed between each woman and her doctor.

Live attenuated viral vaccines are not to be given during pregnancy

Live attenuated viral vaccines, such as measles-mumps-rubella, should not be given to pregnant women. If a live attenuated viral vaccine has been given before pregnancy, women should be advised not to become pregnant within the next 28 days. This is because live attenuated vaccines contain weakened live viruses and, although they cannot cause disease, there is a theoretical risk that the weakened vaccine virus may be passed on to the fetus. However, there is no evidence of harm to the fetus where a live attenuated vaccine has been inadvertently given during pregnancy.

Some vaccines are needed when a woman is planning pregnancy

The need for vaccination should be assessed as part of any pre-conception health check, particularly for hepatitis B, measles, mumps, rubella and varicella. This is especially important when previous vaccination history is uncertain. For example, ensuring a mother is immune to rubella is important when she is planning a pregnancy. This is because rubella infection during pregnancy can be passed on to the foetus, which leads to congenital rubella syndrome in a high proportion of cases.

Additional resources for more information

- [NCIRS COVID-19 vaccines: Frequently asked questions](#)
- [NCIRS fact sheets, FAQs and other resources](#)
- [Immunisation Australia Government Department of Health](#)

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