

What is chickenpox?

Chickenpox, also known as varicella, is a highly infectious disease caused by the varicella zoster virus. After recovery from chickenpox the virus stays dormant (inactive) in the nerves near the spine. Years later the virus can become active again and cause herpes zoster, which is also known as shingles.

How do you catch chickenpox?

Chickenpox is usually seen in children. In countries where chickenpox is common, very few people avoid getting the disease. Adults who have grown up in tropical countries are much less likely to have had chickenpox.

Although rare, some people get chickenpox more than once. Shingles is more common in older adults and people of any age with an immune system weakness.

The virus is transferred person to person through contact with infected droplets of saliva in the air from coughing, sneezing or laughing, or the liquid from the rash blisters.

A person with chickenpox can pass the virus on from 1–2 days before they get the rash until after the rash blisters have dried up, which usually takes 5–7 days. It is possible for a person with shingles to pass the chickenpox virus on to someone not immune to chickenpox through contact with liquid from the rash blisters.

How serious is chickenpox?

Chickenpox is usually less severe in healthy children than in adolescents and adults. Most healthy children will only need relief from itching and to continue drinking, however some will develop complications as listed below. Complications may be serious enough to require hospitalisation and can occasionally lead to death. Adolescents and adults are more likely to develop complications than children.

Complications of chickenpox include:

- » Difficulty drinking and eating.
- » Changes in skin colour after the crusts fall off that may last for months. Permanent scarring may also occur.
- » Around one in 20 healthy children develop a bacterial skin infection that needs to be treated with antibiotic medicine.
 - » Bacterial skin infections can lead to bacterial infection in other parts of the body, including the blood.
- » Although rare, chickenpox infection can cause inflammation of the central nervous system, joints, bones, liver, blood vessels supplying the brain with blood, or brain.
- » Pneumonia is more likely to occur as a complication in adults, particularly women in the last trimester of pregnancy.

- » Maternal chickenpox during pregnancy can infect the growing baby.
 - » The highest risk period is during the first 20 weeks of pregnancy when up to two in 100 babies will be born with congenital varicella syndrome and may have skin scarring, eye, limb and brain abnormalities, developmental delay and a poor outcome.
- » Maternal chickenpox within the five days before to two days after delivery can infect the newborn baby.
 - » Up to 30 in 100 newborns with chickenpox develop severe disease that can result in death.

What are the symptoms of chickenpox?

The early symptoms of chickenpox may include a mild fever, loss of appetite, headache and feeling tired, followed by the appearance of a red rash that becomes itchy and blisters, mostly on the trunk and face with some on the arms and legs. Blisters can occur in the eyes, mouth/throat, vagina and urinary tract. The blisters release liquid containing the virus, then form crusts/scabs that fall off after 1–2 weeks.

Reducing pain, discomfort and itching associated with the blisters, preventing dehydration and skin infection, and providing early antibiotic medicine if skin infection occurs are the main treatment measures for healthy children.

For healthy adolescents and adults, the use of antiviral medicine should be considered in addition to comfort measures. Antiviral medicine started within 24 hours of the rash appearing may reduce the severity of the disease.

How do you prevent infection?

Children with chickenpox are advised not to attend early childhood services, school or public places for at least one week from the appearance of the rash, until all the blisters are dry and crusted. Adults are advised not to attend work or public places for the same period of time.

Chickenpox vaccine can be given from nine months of age, ideally before but if necessary, after exposure to the disease.

Studies have shown that giving the vaccine to children aged 12 years or younger within 3–5 days of exposure to chickenpox may prevent the disease developing or reduce the severity of the disease. The vaccine can also be given to older children and adults after exposure to chickenpox. However, a single dose after exposure in this age group may not prevent or reduce the severity of disease. Receiving the vaccine after exposure to the disease will not make the disease more severe at any age.

Which vaccines protect against chickenpox?

The chickenpox vaccine contains weakened live chickenpox (varicella zoster) viruses. The vaccines currently used in New Zealand are Varilrix® and Varivax®.

Immunisation against chickenpox may not protect every person completely.

- » After a single chickenpox vaccine dose, 70–90% of children are expected to be fully protected against all chickenpox and more than 95% protected from moderate to severe chickenpox.
- » After two chickenpox vaccine doses, 97–99% of children are protected against all chickenpox and 100% protected from moderate to severe chickenpox.

- » After two chickenpox vaccine doses, 79–91% of adults are protected against moderate to severe chickenpox.

Protection after one dose of vaccine before 13 years of age can provide many years but probably not lifelong protection. It is difficult to study when chickenpox disease continues to circulate in the community. Exposure to the disease boosts protection and extends their protection for longer.

Protection after two doses of vaccine appears to be very long term for most people immunised, however, it is not known if it is lifelong at this stage. Countries that have been giving two vaccine doses to children for a long time have not identified a need for booster doses.

Continued ...

Which vaccine protects against chickenpox? Continued
For the very few people immunised against chickenpox who still get the disease, it is less severe than the disease in an unimmunised person. Available information suggests that chickenpox immunisation may reduce the risk of developing shingles later in life in comparison with those who had wild-type disease.

Should children and adults have one or two chickenpox vaccine doses?

Children aged under 13 years

Parents may choose to purchase a second vaccine dose, which can be administered a minimum of 4 weeks before or after the first dose.

- » One dose gives good protection, two doses give optimal protection.

Children aged 13 years or older and adults

The standard varicella vaccine schedule is two doses administered a minimum of 4 weeks apart for individuals in this age group receiving varicella vaccine for the first time.

Special groups aged 9 months or older

Two vaccine doses are recommended and funded for infants, children and adults who meet the eligibility criteria for one of the 'special groups' described in the Pharmaceutical Schedule.

How safe is the chickenpox vaccine?

The chickenpox vaccine has an excellent safety profile and is well tolerated. Common vaccine responses include redness, swelling and/or pain at the site of injection. Headache, mild fever and tiredness after immunisation are also common. Around five in 100 healthy vaccine recipients develop a mild vaccine-related rash sometime between 6–43 days after immunisation.

It is possible but extremely rare for a person with a vaccine-related rash to transfer the vaccine virus to another person, only 11 cases have been reported from around 150 million vaccine doses in the U.S. There is no risk of the vaccine virus being transferred to another person if there is no vaccine-related rash.

Vaccine recipients who develop a rash should avoid contact with women who are pregnant and not immune to chickenpox, newborn babies and people known to have a weakened immune system, until the rash has gone. If this is not possible, close contacts with a known risk for developing serious complications from chickenpox should contact their doctor.

Although there is no evidence that the vaccine affects a baby's development, women should delay pregnancy for one month after receiving a chickenpox immunisation.

Who can receive free chickenpox vaccine?

- » Children born from 1 April 2016 can have one free chickenpox vaccine dose when they turn 15 months, including those who have previously had one purchased chickenpox vaccine dose.
 - » Children who have had chickenpox disease do not need immunisation against chickenpox.
- » Children born 1 July 2006 to 31 March 2016 can have one free chickenpox vaccine dose when they turn 11 years IF they have not already had chickenpox disease or a chickenpox immunisation.

A parent only needs to recall their child having chickenpox or the characteristic rash. A blood test is **NOT** required. If there is any doubt about whether your child has had chickenpox in the past, give them the vaccine.

There are no safety concerns around giving the vaccine to someone who is already protected.

- » Children born before 1 July 2006 and adults do not get a free chickenpox vaccine dose unless they have a medical condition that meets the eligibility criteria for one of the 'special groups'.
 - » Talk to your doctor or nurse if you think you or your child may qualify.

Who can purchase chickenpox vaccine?

- » Parents who want to protect their child from 9 months of age.
- » Parents who want to protect a child who is not eligible for a free chickenpox vaccine dose.
- » Parents who want to increase their child's likelihood of protection by giving them a second chickenpox vaccine dose.
- » Adults who have no history of chickenpox disease or immunisation, e.g. those born and raised in tropical countries.

The chickenpox vaccine can be purchased through your family doctor. The combination measles, mumps, rubella and chickenpox vaccine is available in other countries but not available in New Zealand.

Who should seek further advice before having the chickenpox vaccine?

- » People known to have a weakened immune system.
- » People receiving high-dose steroid medicine, e.g. prednisone, for more than 14 days. They should wait for at least four weeks after their treatment has finished before receiving the vaccine.
- » People taking antiviral medication, e.g. tablets for cold sores. These should be stopped for 24 hours prior to immunisation and not restarted for 14 days afterwards.
- » Children taking aspirin. Whilst there has been no association between chickenpox immunisation and Reye's Syndrome, avoidance of aspirin around the time of immunisation and for six weeks afterward is advised as a precaution.
- » People who have received a blood product in the year before immunisation.
- » People expecting to receive a blood product in the two months after immunisation. These should not be given for two months after immunisation unless their use outweighs the benefits of the immunisation.
- » Immunisation should be postponed in individuals suffering from a fever over 38°C. However, the presence of a minor infection is not a reason to delay immunisation.
- » Chickenpox vaccine can be administered to a person living with a newborn baby, pregnant woman or person who is immune suppressed.

Who should not have the chickenpox vaccine?

- » Anyone who has a severe weakness of the immune system
- » Anyone who had a severe allergic response (anaphylaxis) to a previous dose of this vaccine or a component of this vaccine.
- » Women who are currently pregnant.
- » People who have received another live injected vaccine within the previous four weeks.

What if a woman has the chickenpox vaccine and then finds out she is pregnant?

Research in the US found no evidence of developmental abnormalities or injury to the unborn child when the varicella vaccine was inadvertently given just before or during pregnancy.

Disease	Possible complications of disease	Possible vaccine responses
<p>A highly contagious viral illness causing fever and a rash that becomes itchy blisters.</p> <p>Years later the virus can become active again and cause herpes zoster, which is also known as shingles.</p>	<ul style="list-style-type: none"> • Permanent skin scarring. • Bacterial skin infection in around 1 child out of 20 child cases. • Nerve inflammation (cerebral ataxia) for around 1 child out of 4000 child cases. • Bone, joint, liver, blood vessel inflammation. • Encephalitis (brain inflammation) for around 4 people out of 10,000. • Pneumonia in adults, especially pregnant women. • Hospitalisation for 2–6 people out of 100,000 cases. • Death for 2–4 people out of 100,000 cases. • Chickenpox during pregnancy can cause severe abnormalities in unborn babies including skin scarring, eye, limb or brain abnormalities, developmental delay, and a poor outcome. • Maternal chickenpox close to delivery can infect the newborn, causing severe disease and death. • Shingles in later life. 	<p>Common responses</p> <ul style="list-style-type: none"> • Headache and/or tiredness. • Mild rash 6–43 days after immunisation. <p>Rare responses</p> <ul style="list-style-type: none"> • High fever. • Transfer of vaccine virus from a vaccine rash to another person. • Severe allergic reaction (anaphylaxis).

Vaccines are prescription medicines. Talk to your doctor or nurse about the benefits or any risks.

References

- Centers for Disease Control and Prevention. Prevention of varicella recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep.* 2007;56(RR-04):1-40.
- Chaves SS, Haber P, Walton K, Wise RP, Izurieta HS, Schmid DS, et al. Safety of varicella vaccine after licensure in the United States: Experience from reports to the Vaccine Adverse Event Reporting System, 1995–2005. *J Infect Dis.* 2008;197(Suppl 2):S170-7.
- Civen R, Chaves SS, Jumaan A, Wu H, Mascola L, Gargiullo P, et al. The incidence and clinical characteristics of herpes zoster among children and adolescents after implementation of varicella vaccination. *Pediatr Infect Dis J.* 2009;28(11):954-9.
- Gershon AA, Gershon MD. Pathogenesis and current approaches to control of varicella-zoster virus infections. *Clin Microbiol Rev.* 2013;26(4):728-43.
- Gershon A, Marin M, Seward J. Varicella vaccines. In: Plotkin S, Orenstein W, Offit P, Edwards K, editors. *Plotkin's Vaccines.* 7th ed. Philadelphia: Elsevier; 2018. p. 1145-80.
- Goulleret N, Mauvisseau E, Essevoz-Roulet M, Quinlivan M, Breuer J. Safety profile of live varicella virus vaccine (Oka/Merck): Five-year results of the European Varicella Zoster Virus Identification Program (EU VZVIP). *Vaccine.* 2010;28(36):5878-82.
- Heining U, Seward JF. Varicella. *Lancet.* 2006;368(9544):1365-76. Tarlow MJ, Walters S. Chickenpox in childhood: A review prepared for the UK Advisory Group on Chickenpox on behalf of the British Society for the Study of Infection. *J Infect.* 1998;36(Suppl 1):39-47.
- Levin MJ, Murray M, Zerbe GO, White CJ, Hayward AR. Immune responses of elderly persons 4 years after receiving a live attenuated varicella vaccine. *J Infect Dis.* 1994;170(3):522-6.
- Macartney K, Heywood A, McIntyre P. Vaccines for post-exposure prophylaxis against varicella (chickenpox) in children and adults. *Cochrane Database Syst Rev.* 2014;(6):Art. No.: CD001833.
- Ministry of Health. Immunisation handbook [Internet]. Wellington: Ministry of Health; 2020 [updated 2020 September 25; cited 2020 September 30]. Available from: <https://www.health.govt.nz/publication/immunisation-handbook-2020>
- Ozaki T, Nishimura N, Muto T, Sugata K, Kawabe S, Goto K, et al. Safety and immunogenicity of gelatin-free varicella vaccine in epidemiological and serological studies in Japan. *Vaccine.* 2005;23(10):1205-8.
- Pace D. Review of varicella zoster virus: From epidemiology to prevention. *Malta Medical Journal.* 2008;20(3):7-11.
- WHO Strategic Advisory Group of Experts on Immunisation (SAGE) Working Group on Varicella and Herpes Zoster Vaccines. Systematic review of available evidence on effectiveness and duration of protection of varicella vaccines [Internet]. Geneva: World Health Organization; 2014 [cited 2020 July 20]. Available from: http://www.who.int/immunization/sage/meetings/2014/april/presentations_background_docs/en/
- Wilson E, Goss MA, Marin M, Shields KE, Jane F. S, Rasmussen SA, et al. Varicella vaccine exposure during pregnancy: Data from 10 years of the pregnancy registry. *J Infect Dis.* 2008;197(Suppl 2):S178-84.