The Immunisation Advisory Centre

Prevention of herpes zoster (shingles) through immunisation

Herpes zoster (shingles)

Herpes zoster is commonly a painful, and sometimes debilitating, medical condition. As many as one in three people will have herpes zoster in their lifetime.

After having chickenpox (varicella), a common childhood disease in New Zealand, the varicella-zoster virus (VZV) remains latent (sleeping) near the cranial or spinal nerves.

For most people, the latent VZV is controlled by their immune system and prevented from reactivating. However, as we get older the ability of our immune system to control the virus begins to decline, and the likelihood that the VZV will reactivate and cause herpes zoster increases. Of those aged 85 years, at least half will have had herpes zoster.

Individuals who have had the varicella (chicken pox) disease or vaccination can go on later to develop herpes zoster. However, available information suggests that those who have acquired immunity from receiving the vaccination rather than the disease have a lower risk of developing herpes zoster.

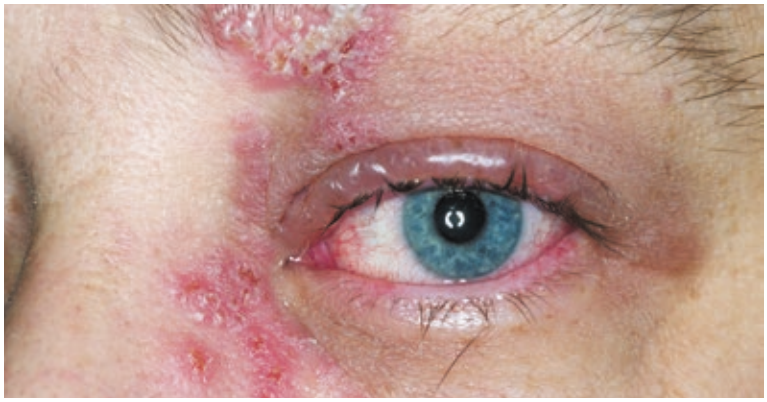
In addition to advancing age, other factors may also contribute to the virus reactivating and the occurrence of herpes zoster. These include immunosuppression, psychological stress, physical trauma, being a woman and genetic susceptibility, e.g. a history of related family members getting herpes zoster.

Symptoms

When the immune system is not able to control the latent VZV, the virus travels along a nerve to the skin and the infection erupts on the skin as a localised painful, blistered rash.

Symptoms of herpes zoster may include:

- Pain or altered sensation, such as burning, itching or tingling, commonly reported for a few days prior to the rash onset and followed by acute throbbing or burning pain.
- Fatigue, fever, headache may also occur.
- Localised rash on one side of the body, only in the area the infected nerve is associated with (dermatome).
- Fluid-filled blisters at rash site.



Herpes zoster can be painful and sometimes debilitating, before and after the rash has appeared. Even relatively mild herpes zoster can make everyday activities much more difficult for a couple of days. For many, the pain and the discomfort of herpes zoster lasts for several days or even weeks.

Complications

One in four people experience herpes zoster-related complications. Blisters can become infected, which if untreated or severe can lead to hospitalisation. There is also some evidence that herpes zoster may be associated with an increased risk of cerebrovascular diseases such as stroke and transient ischaemic attack. Persistent chronic pain from damage to the nerve after the rash has healed, post-herpetic neuralgia, can also occur.

Other possible complications relate to the area of the body the infected nerve is associated with; for example, infection of the cranial nerves that are associated with the head, face, mouth and eyes (herpes zoster ophthalmicus) can be particularly severe and cause:

- Headaches, facial muscle weakness.
- Earache, hearing loss, vertigo and/or tinnitus.
- Loss of vision, glaucoma.

Around 80% of herpes zoster-related hospitalisations are in people aged over 50 years.

Postherpetic neuralgia (PHN)
Postherpetic neuralgia is pain that persists for months to years after the herpes zoster rash has healed. Pain related to PHN can significantly reduce a person's physical and emotional well-being and negatively affect their quality of life.

The risk of PHN increases with older age at the time of herpes zoster, having a recent episode of severe immunosuppression and the presence of some chronic medical conditions, such as autoimmune conditions, chronic respiratory disease and type 2 diabetes. Women are also more likely to develop PHN than men. In the elderly, PHN is associated with increased frailty, an inability to perform daily activities and a loss of independence.

Overall, around 3 people out of 10 with herpes zoster develop PHN.

Infection of close contacts
The blisters of the herpes zoster rash contain live VZV and, as with chickenpox, contact with the fluid in the blisters can spread the virus. However, unlike chickenpox, the virus is not spread by the person with herpes zoster coughing or sneezing. Although the risk of transmission of VZV from the herpes zoster rash is low, there is a possibility that a person who is not immune to chickenpox and who is a close contact of someone with herpes zoster could develop chickenpox. It is recommended that the herpes zoster rash is covered to protect susceptible contacts.

Treatment

Herpes zoster can be treated with anti-viral medication, such as valaciclovir or aciclovir. Medication is most effective when taken as early as possible from the onset, at least within three days of the symptoms appearing. Antiviral therapy can help to reduce the risk of developing PHN in some people.

Prevention

Almost everyone who grew up in New Zealand is expected to have acquired VZV by adulthood, even if they do not recall having had chickenpox or were not vaccinated against the disease. To reduce the risk of herpes zoster, immunity against VZV can be boosted with a dose of zoster vaccine (Zostavax®).

Zostavax® - a live attenuated zoster vaccine

It contains the same VZV strain as the chickenpox vaccine but is around ten times stronger.

Zostavax® is used to boost VZV immunity and prevent reactivation of the virus in adults, to reduce the risk of herpes zoster, acute herpes zoster-related pain and the development of chronic pain from PHN. Zostavax® is licensed for adults aged 50 years or older.

Vaccine eligibility

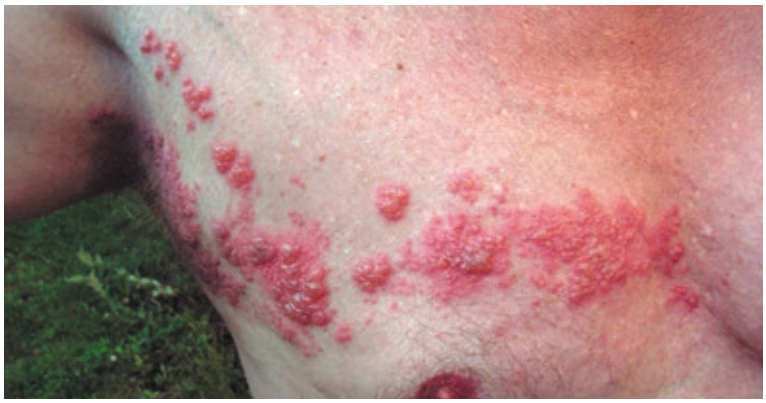
From 1 April 2018, Zostavax® will be funded for adults aged 65 years. Zostavax® will also be funded for adults aged 66–80 years inclusively from 1 April 2018 to 31 March 2020 only, as a catch-up immunisation programme. Funded vaccine is supplied by ProPharma.

Eligible individuals will be able to receive Zostavax® from general practices (but not community pharmacies) for free from 1 April 2018.

Zostavax® is available for non-funded adults aged 50–64 years and 81 years or older from general practices and some pharmacies. It may be appropriate for certain individuals to receive the vaccine at an age younger than 65 years (refer to the Immunisation Handbook 2017). Non-funded vaccine stock is supplied by Healthcare Logistics. In general practice, Zostavax® for non-funded adults must be prescribed by a doctor or nurse practitioner with prescribing rights.

Vaccination efficacy and effectiveness

The ability of Zostavax® to prevent herpes zoster is highest in adults aged 50–59 years at 70% (95% CI 54–81%) (Schmader et al., 2012) and becomes less effective with advancing age, 48% in adults aged 65–69 years (95% CI 44–52%) and 42% in adults aged 80 years or older (95% CI 36–47%) (Tseng et al., 2016). In some older adults, studies suggest that although vaccination may not be sufficient to maintain total



suppression of the virus and prevent herpes zoster, it boosts enough VZV immunity to reduce acute pain associated with the herpes zoster and the risk of PHN (Oxman et al., 2005; Tseng et al., 2015).

A review of 766,330 community-dwelling adults aged 65 years or older in the U.S. over a two-year period found that 4% had received Zostavax®. Comparison of the vaccinated adults with unvaccinated adults showed that Zostavax® reduced the risk of herpes zoster by 48% (95% CI 39–56%) and reduced the risk of PHN in those who had herpes zoster by 59% (95% CI 21–79%) (Langan et al., 2013).

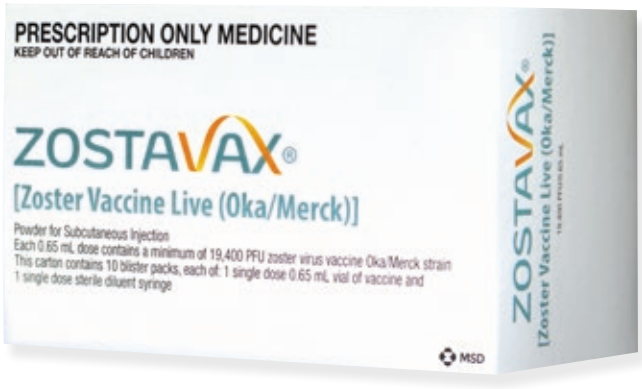
Two other studies assessed vaccine effectiveness and duration of protection in community-dwelling adults aged 60 years or older in the U.S. In just over 300,000 adults, Zostavax® reduced

the risk of herpes zoster involving any part of the body by 55% (95% CI 52–58%), reduced the risk of herpes zoster ophthalmicus by 63% (95% CI 39–77%) and reduced the risk of herpes zoster-related hospitalisation by 65% (95% CI 49–76%) over a two-year period (Tseng et al., 2011).

In just over 700,000 adults, vaccine effectiveness against herpes zoster decreased from 69% (95% CI 66–71%) during the first year after vaccination to 4% (95% CI -24–26%) over eight years. The most significant changes were seen one year after vaccination, decreased to 50% (95% CI 46–53%) and six years after vaccination, decreased to 17 % (95% CI 1–29%) (Tseng et al., 2016).

Older adults have a higher risk of developing herpes zoster and related complications compared with younger adults. The ability of Zostavax® to prevent herpes zoster decreases over a few years after vaccination, so giving Zostavax® too young cannot guarantee protection for older ages.

It has not yet been determined whether booster vaccinations are required, nor what time period between doses would be most beneficial. There do not appear to be any safety concerns with administering a second dose of HZV (Vesikari et al., 2013).



Vaccine contraindications and precautions

Contraindications

Zostavax® should not be given to individuals who:

- Have a history of anaphylaxis to a previous dose of varicella or zoster vaccine or any component of the zoster vaccine, including neomycin or gelatin.
- Are immunocompromised, such as:
  - On immunosuppressive therapy, including high dose corticosteroids.*
  - In a primary or acquired immunodeficiency state due to a condition, such as leukaemia, lymphoma, symptomatic HIV infection with a CD4+ lymphocyte count <200 cells/mm3, or cellular immune deficiency.
- Have active untreated tuberculosis (TB).
- Are pregnant.

**NOTE: Zostavax® is not contraindicated for those receiving inhaled, topical or low dose systemic corticosteroids or corticosteroids as a replacement therapy.*

Do not give Zostavax® to children.

Precautions

Seek specialist advice before administering Zostavax® to individuals who:

- Are on low-level immunosuppressive therapy, such as low dose weekly methotrexate or azathioprine.
  - Refer to the Immunisation Handbook 2017 for recommendations for use of zoster vaccine for individuals on immunosuppressive therapy.
- Have asymptomatic HIV infection with a CD4+ lymphocyte count ≥200 cells/mm3.#
- Anticipate being significantly immunocompromised in the future, such as pre-solid organ transplantation, pre-cancer treatment or with autoimmune disease.#

#NOTE: Individuals with HIV infection or who anticipate being significantly immunocompromised in the future require serology to check varicella immunity prior to receiving Zostavax®. Those with serological evidence of immunity to varicella can receive Zostavax®.

Those who are considered non-immune to varicella generally should not receive Zostavax®. Instead, on specialist advice, two funded doses of varicella vaccine may be administered six weeks apart.

Vaccine safety

Zostavax® is generally well-tolerated. Expected, common vaccine responses include:

- Mild to moderate pain, redness and swelling around injection
- Headache
- Extremity pain
- Itching or rash at injection site

As with any medicine, very rarely a severe allergic response (anaphylaxis) can occur following vaccination. For this reason individuals are advised to wait at their practice or pharmacy for 20 minutes after receiving Zostavax®.

Zostavax® does not cause herpes zoster. However, extremely rarely a vaccine recipient may develop a vaccine-related rash. Although the risk of transmission of vaccine-VZV from the rash is low, there is a possibility that a person who is not immune to chickenpox and who is a close contact of someone with vaccine-related rash could develop chickenpox. If a rash occurs, covering the rash will minimise the risk of transmission.

Zostavax® can be administered to adults in close contact with infants, pregnant women or individuals who are immunosuppressed. The extremely small risk of a vaccine-related rash and low possibility of vaccine-VZV transmission should be weighed against the risk of herpes zoster and possibility of wild-type VZV transmission.

Vaccine presentation and storage

Zostavax® is supplied as a lyophilised vaccine vial and prefilled diluent syringe in boxes of 10. The vaccine and diluent must be stored between +2°C and +8°C in the original packaging and protected from light. Refer to the *National standards for vaccine storage and transportation for immunisation providers 2017* for detailed vaccine cold chain management information.

Vaccine preparation and administration

Only reconstitute the lyophilised Zostavax® vaccine using the diluent supplied in the prefilled syringe. Vaccinators will need to supply one drawing-up needle and one administration needle. Administer the vaccine immediately after reconstitution to minimise loss of potency and discard the reconstituted vaccine if not used within 30 minutes.

- Attach a drawing-up needle to the diluent syringe and inject all of the diluent into the vaccine vial.
- Gently agitate the vial to mix contents thoroughly.
- Take care not to pull the plunger out of the syringe and gently withdraw the reconstituted vaccine from the vial.
- Remove the needle and discard into the sharps container. Attach an administration needle to the syringe.
- Inject the total volume of reconstituted vaccine (0.65 mL) subcutaneously in the deltoid area.

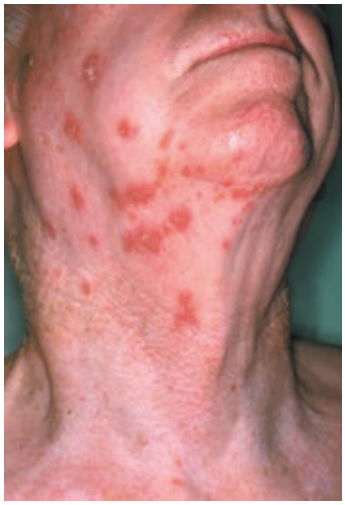
Zostavax® can be administered:

- At the same visit as other vaccines, including influenza, pneumococcal, tetanus/diphtheria and other Schedule vaccines*. Different injection sites should be used.
- Whether or not the person recalls a history of having chickenpox disease or vaccination.

Serology to check varicella immunity is not required, except for individuals who:

- Have asymptomatic HIV infection with a CD4+ lymphocyte count ≥200 cells/mm3, or
- Anticipate being significantly immunocompromised in the future.
- Refer to the Precautions section of this document and the Immunisation Handbook 2017 for more information about serological testing and Zostavax® recommendations for individuals in these two groups.

** Studies where influenza and Zostavax® vaccines or pneumococcal polysaccharide (Pneumovax® 23) and Zostavax® vaccines were administered at the same visit have shown that the immune response to each of the vaccines, and likelihood of local or systemic vaccine responses, were similar regardless of whether the vaccines were administered on the same or different days.*



Individuals with a history of herpes zoster or a previous dose of Zostavax®

Adults who have previously had herpes zoster can receive Zostavax®. An episode of herpes zoster is expected to boost natural immunity against a further episode, so vaccinating soon after having herpes zoster is unlikely to provide any benefit. However, it is not possible to predict how long the natural immunity boost will last in an individual. It is generally recommended to wait at least one year after an episode of herpes zoster before having Zostavax®.

Receipt of Zostavax® is also expected to boost immunity, particularly during the first year after vaccination. Although not currently recommended, in the absence of specific data regarding whether booster vaccinations are required or what time period between doses would be most beneficial, and the absence of any safety concerns, a minimum interval of one year between the first and second doses of Zostavax® would be considered reasonable for individuals who choose to receive a funded dose, if eligible.

Individuals on antiviral therapy

Treatment with antiviral medication, such as acyclovir and valaciclovir, should be stopped for at least 24 hours prior to Zostavax® vaccination and for 14 days post-vaccination so the vaccine virus is able to replicate and induce an immune response.

Individuals receiving blood products

No minimum interval is required between receipt of a blood transfusion or immunoglobulin product and Zostavax®. Timing of Zostavax® administration is different to varicella and measles, mumps and rubella vaccines in this regard. Circulating antibodies do not affect the immune response to Zostavax®.

For more information, and a complete list of references, visit **immune.org.nz**

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