

Childhood Immunisation

Information for families of babies and young children



immunise

their best protection

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What is this guide about?

This guide is an introduction to immunisation and explains:

- the immunisation process
- the vaccines given to babies and young children
- the diseases the vaccines protect against
- any reactions the vaccines may cause.

All childhood vaccines on the National Immunisation Schedule are free to all children in New Zealand until their 18th birthday.* All immigrant and visiting children can have free immunisations and free Well Child Tamariki Ora services.

If you have questions or would like more information, you can:

- talk to your family doctor, nurse, lead maternity carer or Plunket nurse
- look up immunisations in your baby's *Well Child Tamariki Ora My Health Book*
- go to www.health.govt.nz/immunisation
- call the Immunisation Advisory Centre (IMAC) on 0800 IMMUNE (0800 466 863) or visit www.immune.org.nz



If you are worried about your baby or child's reaction to an immunisation, talk to your doctor or nurse or call the free Healthline service on 0800 611 116 anytime day or night.

* HPV immunisation is funded for all aged 9-26 years; MMR immunisation is funded for all born from 1 January 1969.

Immunisation for all ages

The timetable of recommended vaccines is called the National Immunisation Schedule. You can see it on page 34. It shows when everyone should receive each routine immunisation, starting at 6 weeks old. For the best protection against serious diseases everyone needs to be immunised on time, every time.

More information about immunisation for older children, teenagers and adults is available from your family doctor or nurse.

Have a look at the timetable. If you're not sure whether your child has been immunised or if you think anyone in your family has missed out on immunisations, talk to your family doctor or nurse. It's best for your baby to be immunised on time, but if they're late, you can usually catch up (except for rotavirus, where babies who are late must start the immunisations before they are 15 weeks old).

Other vaccines may be needed, for example, for children with certain medical conditions or risks and before overseas travel. Information about these vaccines is included on page 24.

**Immunise
on time,
every time.**



What is immunisation?

Immunisation is one of the best ways to protect your child against many serious diseases. It works by using a vaccine to stimulate your baby's immune system.

When a germ like a virus or bacteria enters the body for the first time, the immune system takes time to produce special antibodies to fight that particular germ.

During that time, a person may become unwell.

As the protective cells and antibodies are made, they destroy the germs and the person recovers. The immune system remembers the germ, for years or for life.

If it enters the body again, the immune system can fight off the germ before the person becomes unwell.

Why does your baby need immunisation?

Babies are born with some passive immunity to certain infections because antibodies are passed on to them from their mother before birth. Breast-fed babies get additional antibodies from their mother's milk. However, this immunity does not last long. Babies and children need immunisation to provide ongoing protection from many life-threatening diseases.

Over a million people around the world die every year from diseases that can be prevented by immunisation. Most of these diseases have become rare in New Zealand thanks to immunisation programmes. Some diseases, such as whooping cough and pneumococcal disease are still common.

Many of the diseases that are now rare in New Zealand still exist in other countries and are brought into the country by travellers from time to time, for example, measles. Some diseases will always be present, such as tetanus, which is caused by bacteria that live in the soil.

The World Health Organization and the Ministry of Health recommend that you immunise your children. Immunisation is your choice – please talk to your family doctor or nurse if you have any questions.

When should your child be immunised?

Immunisation starts at 6 weeks old. This allows your baby to start developing protection as soon as possible when the passive immunity from their mother begins to wear off.

Babies and children can catch diseases at any time.

It's important babies and children are immunised on time, every time for the best possible protection against many serious illnesses.

If you think your child – or anyone in your family – may not have had all the immunisations or if you're not sure, talk to a doctor or nurse. They will be able to tell you which immunisations you and your family should have.

Some children will need extra vaccines, such as the influenza immunisation, if they have certain long-term health conditions, such as diabetes. Talk to a doctor or nurse to find out if your child needs extra immunisations. There is more information about the extra immunisations available in New Zealand on page 24.

Babies and children can catch diseases at any time.



What is a vaccine and how does it work?

What is a vaccine?

A vaccine contains a dead or weakened form of a germ that cannot cause the disease, but is enough to make the immune system produce antibodies to fight it. When a person is vaccinated, their immune system makes cells and antibodies in response to the vaccine, which will protect them from the real disease if they come into contact with it in the future.

Types of vaccines

There are generally three types of vaccines:

- live vaccines: bacteria or viruses that have been weakened so that they cannot cause disease (eg, measles, mumps and rubella)
- dead (or inactivated) vaccines: bacteria and viruses that have been inactivated (eg, polio vaccine)
- subunit vaccines: parts of bacteria or viruses (eg, hib and hepatitis B) or bacterial toxins that have been made harmless (eg, diphtheria and tetanus).

Vaccines may also contain:

- substances that help the body respond to the vaccine
- preservatives
- traces of the materials that are used during manufacture.

The very small amounts of these substances that are in the vaccines do not cause any harm.

How well do the vaccines work?

Studies have shown that if all recommended doses of vaccines are given, they will protect 80% to 98% of the children who are immunised. For example, the pertussis (whooping cough) vaccine is effective in around 84% of children and the measles vaccine in 90% to 98% of children.

A very small number of children who are immunised do not develop strong immunity and they may still become ill with one of the diseases. If that happens, they usually have a milder illness than people who have not been immunised. More than one dose of some vaccines is needed for full protection. Booster doses may also be required in later years to maintain immunity (eg, against tetanus).

How are vaccines given?

Most vaccines are given by injection into the arm or leg. Rotavirus vaccine is given as drops of liquid into the mouth. When two or more injections are given at the same time, they are given in different arms or legs.

Booster vaccines

Babies need to be immunised on time, every time for the best protection. Some vaccines are given more than once to boost the immune system.

The gap between the doses of vaccines makes sure that each dose has time to work effectively. The recommended time gap is a minimum time. If the gap is longer, you don't have to start the course again. Talk to your doctor or nurse if you think your child has missed some of their immunisations.

Community immunity

Community immunity is an important part of protecting the community against disease. People who are immunised do not usually get sick from an illness they are vaccinated against, and can't pass the disease on to others. This prevents infection from circulating in the community and helps to protect people who are not immunised, those who are too young to be immunised and those who cannot receive a vaccine for some reason.

Approximately 95% of the people in the community must be immunised to achieve community immunity against diseases such as measles. If 95% of children in the community are immune, then those who do not develop strong immunity or cannot be immunised have a smaller chance of becoming infected, because of community immunity.



How long do vaccines last?

Different vaccines provide protection for different lengths of time. Neither immunisation nor natural infection will always result in lifelong immunity to a disease.

A few vaccines, like MMR and hepatitis B, may make you immune for your entire life. Some vaccines need booster doses to maintain their protection. Whooping cough vaccine does not provide lifelong immunity, which means that whooping cough can circulate among the adult population and infect babies too young to be immunised. Booster whooping cough vaccines are offered at 11 years old and to pregnant women. Diphtheria and tetanus boosters are offered at 11, 45 and 65 years old, and after some injuries.

Other vaccines provide immunity that protect young children for a few years when they're at greater risk of either catching a disease, or suffering serious effects from it – these include rotavirus, and some meningococcal vaccines. Influenza vaccine is given annually, to protect against the strains of influenza that are most common in a particular year.

How safe are vaccines?

Strict procedures are followed when vaccines are made to ensure they are safe. Before a vaccine can be approved for use, it is trialled extensively, sometimes with tens of thousands of people. These clinical trials with volunteers can take several years.

Throughout all of these processes, safety is monitored very closely.

Before a vaccine is approved for use in New Zealand, the manufacturer must demonstrate its safety and effectiveness to the satisfaction of Medsafe, a division of the Ministry of Health.

After a vaccine is introduced, its safety continues to be monitored for the duration of its use. The safety of vaccines is monitored internationally using many different methods.

How the safety of vaccines is monitored in New Zealand

In New Zealand, any reaction to a vaccine can be reported to the Centre for Adverse Reactions Monitoring (CARM) at the University of Otago, usually by your family doctor or nurse. If you are worried about your child's health after an immunisation, contact your doctor.

You can also report a suspected reaction to CARM by calling **(03) 479 7247** or reporting it online (www.otago.ac.nz/carm). The information provided to CARM by doctors, nurses and parents will assist in identifying those children who should receive follow-up immunisation in a controlled environment, such as a hospital. Minor reactions such as mild fever, pain, or redness where the injection was given are usually not reported to CARM (see page 26 for information on mild reactions).

Any serious events may also be recorded on the National Immunisation Register (NIR) (see page 28 for more information on the NIR).

In addition to this type of safety monitoring, there are ongoing studies that compare people who are vaccinated with people who are not vaccinated to ensure the vaccines we use are as safe as possible.



Diseases to be immunised against

What diseases will my child be protected against?

The National Immunisation Schedule recommends that children be immunised for protection from 12 preventable diseases before they are 5 years old.

The diseases are:

- diphtheria
- tetanus
- whooping cough (pertussis)
- polio
- hepatitis B
- hib (*Haemophilus influenzae* type b)
- rotavirus
- pneumococcal disease
- measles
- mumps
- rubella
- chickenpox (varicella).



More information about these diseases can be found on pages 15 and 30.

Babies and children have the best chance of developing immunity against these diseases if they receive the immunisations at the ages recommended on the National Immunisation Schedule on page 34.

Do children have to have all the immunisations?

Having some vaccines but not others is possible, but means children are at risk from any disease they're not yet immune to. Most vaccines need more than one dose to ensure protection.

Some parents ask if the combined vaccines can be separated. In New Zealand, most vaccines on the National Immunisation Schedule are combined and not available singly. Combined vaccines mean fewer injections. However, single hib, single polio and single hepatitis B vaccines are available for the few children for whom pertussis vaccine is not recommended.



Are there some children who should not be immunised?

There are very few children who should not be immunised. However, if your child has had a serious reaction to a vaccine, is being treated for cancer or other severe illness, or has had a blood transfusion or other blood products in the last year, you should talk to your doctor, specialist or nurse before the immunisation.

Children with asthma, allergies or who are recovering from an illness such as a common cold can still be immunised.

Is it safe to immunise children against so many diseases at the same time?

Babies and children come into contact with millions of viruses and bacteria every day from the moment they are born, and their immune systems are constantly responding to these. Combined vaccines such as measles, mumps and rubella (MMR) mean fewer visits to the doctor and fewer injections.

Combined vaccines do not overload the immune system. Modern vaccines have fewer antigens (disease particles) than in previous decades, even though they protect against more diseases, because of improved manufacturing processes. When more than one vaccine is given in one visit, those vaccines have been tested to ensure that they are safe and effective to be given at the same time.

If a child has had a disease, do they still need to be immunised?

If you think your child has had one of the diseases, talk to your doctor, who will be able to tell you about tests that are available (for a small fee) to check for existing antibodies against measles, mumps, rubella and hepatitis B. If your child is already immune to one of the diseases in the MMR vaccine, they will still need to be protected against the others. There are no additional risks to vaccinating a person who has already had the disease.

When taking your baby or child to be immunised:

- read the information in this book before you go
- always take your child's *Well Child Tamariki Ora My Health Book* and make sure the doctor or nurse fills in the details, so you have a record of your child's immunisations
- ask the doctor or nurse questions if you have any concerns or worries
- tell the doctor or nurse how your baby reacted to any previous immunisations
- allow 20 minutes for waiting in the clinic after your child has been immunised. Your baby may need a drink or food while you are waiting.

Vaccines and the diseases they protect against

The following section tells you more about the vaccines on the National Immunisation Schedule for young children. The section includes:

1. DTaP-IPV-HepB/Hib vaccine
2. Rotavirus vaccine
3. Pneumococcal vaccine
4. MMR vaccine
5. Chickenpox (varicella) vaccine.

DTaP-IPV-HepB/Hib vaccine

This vaccine protects against six diseases:

- **D**iphtheria
- **T**etanus
- **P**ertussis (also known as whooping cough)
- **P**olio (**IPV** – Inactivated Polio Vaccine)
- **H**epatitis **B** (HepB)
- *Haemophilus influenzae* type **b** (Hib).

Babies need 3 doses of the DTaP-IPV-HepB/Hib vaccine. They should receive it at 6 weeks old, 3 months old and 5 months old.

The vaccine is given by an injection in the arm or leg. Your child will need a further booster of Hib at 15 months old and DTaP-IPV at 4 years old.

Refer to the National Immunisation Schedule on page 34 for information about the booster immunisations your child will need when they are older.

The six diseases

Diphtheria is a serious disease that can quickly lead to breathing problems. It is caused by bacteria that attack the lining of the nose, mouth and throat. It can damage the heart and in severe cases it can lead to death. Diphtheria is now rare in New Zealand thanks to immunisation. However, there is still a risk that diphtheria could enter New Zealand from overseas.

Tetanus is a painful disease that affects the muscles. It can cause breathing problems, muscle stiffness and severe muscle spasms. It is caused by a common bacteria found in soil and enters the body through cuts and grazes. The only way to build immunity is by immunisation.

Whooping cough (pertussis) is a serious infection that can cause coughing and choking that make it hard to breathe. It can last for up to 10 weeks and some people will need hospital care. Whooping cough is a common disease in New Zealand. This disease is most serious in infants.

Polio is a virus found in the nose and throat. It is spread by coughing, sneezing and sharing drink bottles. It infects the bowel and can attack the nervous system. In severe cases it may cause paralysis and even death. Polio has disappeared from New Zealand and most parts of the world as a result of immunisation. However, there is still a risk that polio could enter New Zealand from overseas.

Hepatitis B is a virus that is passed on through body fluids. It can be passed from pregnant women to their babies, particularly during birth. Hepatitis B causes liver infection and serious illness. Infected children are more likely to carry the virus long term and can eventually develop liver cancer or liver failure. Hepatitis B has declined considerably since the vaccine was introduced in New Zealand.

Hib is bacteria found in the nose and throat and spread by coughing and sneezing. It can cause a number of major illnesses, including meningitis, epiglottitis, blood poisoning and pneumonia. All of these illnesses can lead to death if they are not treated quickly. Hib used to be the most common cause of life-threatening bacterial infection in children under 5 years old. Immunisation has made it rare in New Zealand.

How effective is the DTaP-IPV-HepB/Hib vaccine?

Research has shown that the DTaP-IPV-HepB/Hib immunisation is very effective in protecting babies against the six diseases listed above.

80–95% of children who are fully immunised on time are protected against the diseases. It's important that your child has booster shots at 4 and 11 years old to make sure they remain protected.

A small number of children who are immunised may still become ill. If they do, they usually get a milder illness than people who have not been immunised.

Possible reactions to the DTaP-IPV-HepB/Hib vaccine

Most children will not feel any effects from the immunisation but some may experience some mild reactions within 6 hours of the injection. The most common reactions include:

- mild fever
- unsettled (tiredness and crying) up to 48 hours after having the injection
- swelling or soreness where the injection was given.

See page 26 for advice on what to do if your baby has a reaction.

If you are worried about your baby's reaction to the immunisation, talk to your doctor or nurse or call the free Healthline service on 0800 611 116 anytime day or night.

Rotavirus vaccine

Rotavirus vaccine is given as a course of 2 doses at 6 weeks old and 3 months old, orally (as drops in the mouth). **The course must be started before your baby is 15 weeks old.**

The vaccine protects against rotavirus, a highly infectious type of gastroenteritis or tummy bug.

Rotavirus can cause:

- vomiting (being sick)
- diarrhoea
- fever (high temperature)
- abdominal (tummy) pain.

Rotavirus can lead to severe dehydration and in some cases death.

While death is extremely unlikely in New Zealand, many children are hospitalised with this disease.



How effective is the rotavirus vaccine?

Studies show that immunisation is the best way to stop babies catching rotavirus. Without immunisation, almost all children will catch rotavirus before they are 5 years old. Immunisation prevents most rotavirus infections, and almost all severe rotavirus infections. The first dose must be given before babies are 15 weeks old.

The rotavirus immunisation does not protect against other causes of vomiting and diarrhoea.

Possible reactions to the rotavirus vaccine

Most babies will not feel any effects from the immunisation. The most common reactions include mild irritability, mild diarrhoea or vomiting in the week after vaccination, similar to babies who have not received the vaccine.

There may be a small risk of intussusception (a kind of bowel blockage) associated with the rotavirus vaccine. This occurs naturally in some babies each year, and the cause is not known in most cases. Signs include severe crying and tummy pain. Babies might draw their legs up to their chest as if they have colic, and may also vomit or have blood in their poo. If this happens, you should take your baby to a doctor or hospital emergency department straight away. Tell the hospital when your baby got the vaccine. The possible increased risk of intussusception (estimated at 1 to 5 per 100,000) is very small compared to the risks of rotavirus infection (634 per 100,000 children aged under 3 years old were hospitalised annually in New Zealand).

If you are worried about your baby's reaction to an immunisation, talk to your doctor or nurse or call the free Healthline service on 0800 611 116 anytime day or night.

Pneumococcal vaccine

Pneumococcal (*pronounced new-mo-cock-al*) is one of the most common causes of meningitis, severe ear infections and pneumonia.

Babies need 4 doses of the pneumococcal immunisation for protection. They should be immunised at 6 weeks, 3 months, 5 months and 15 months of age.

The vaccine is given by injection in the arm or leg.

What is pneumococcal infection?

Pneumococcal is a serious infection common in children younger than 5 years old. It is caused by a bacteria found in the throat. It is spread through the air by coughing and sneezing. (Pneumococcal infection is also common in elderly people and people with certain medical conditions).

How effective is the pneumococcal vaccine?

The rate of pneumococcal disease in children under the age of 2 years has halved since immunisation was introduced. Studies show that 97% of children are protected after 4 doses of the vaccine.

Possible reactions to the pneumococcal vaccine

Most children will not feel any effects from the immunisation but some babies may experience a mild reaction within 6 hours of the injection.

The most common reactions include:

- mild fever
- unsettled (tiredness and crying) up to 48 hours after having the injection
- swelling or soreness where the injection was given.

See page 26 for advice on what to do if your baby has a reaction.

If you are worried about your baby's reaction to an immunisation, talk to your doctor or nurse or call the free Healthline service on 0800 611 116 anytime day or night.

MMR vaccine

This immunisation protects your child against three diseases:

Measles, **M**umps and **R**ubella. (Rubella is also known as German measles).

Children need the MMR immunisation when they are 15 months old.

They will need a second immunisation when they are 4 years old.

They need 2 MMR injections for protection.

The vaccine is given by injection in the arm or leg.

The three diseases

Measles is a very infectious virus. Before immunisation was introduced, nearly all children caught measles. Measles causes a rash, high fever, runny nose, cough and sore watery eyes. Severe cases can result in pneumonia, encephalitis (swelling in the brain), diarrhoea and rarely, death.

Mumps is caused by a virus and is spread through the air. Mumps causes fever, headache and swelling of the glands around the face. Mumps can also cause meningitis and encephalitis. Infertility among young men who get mumps is rare.

Rubella is usually a mild, viral illness. It causes a rash, fever and swollen glands in children. It is extremely dangerous for pregnant women because it can cause deafness, blindness and brain damage in an unborn baby.

How effective is the MMR vaccine?

Studies show that the MMR immunisation will protect more than 95% of people from measles, mumps and rubella if they have had both doses of the immunisation (at 15 months old and 4 years old).

A small number of people who are immunised may still become ill.

If that happens, they usually get a milder illness than people who have not been immunised.

Possible reactions to the MMR vaccine

Most children will not feel any effects from the immunisation but some (fewer than 1 in 10) may experience a mild response between 5 and 12 days after immunisation. The most common reactions include:

- mild fever
- rash
- unsettled (tiredness and crying)
- swollen glands.

See page 26 for advice on what to do if your baby has a reaction.

If you are worried about your baby's reaction to an immunisation, talk to your doctor or nurse or call the free Healthline service on 0800 611 116 anytime day or night.



Chickenpox vaccine

Chickenpox (varicella) is a common virus that causes an itchy skin rash and blisters. It is usually mild, but can lead to skin infections and more serious complications such as blood infections, pneumonia, inflammation of the brain, and eye and kidney problems. Without vaccination nearly all children will get chickenpox between the ages of 2 and 10 years old. Teenagers and adults are more likely to develop complications than children. Chickenpox is serious for pregnant women because it can cause damage to unborn babies.

One dose of chickenpox vaccine is given free at age 15 months. Children turning 11 years of age who have not previously been infected with or vaccinated against chickenpox are also eligible for a free dose.

How effective is the chickenpox vaccine?

One dose of the vaccine will protect around four out of five people from any kind of chickenpox and almost everyone from severe chickenpox.

Some people who have been vaccinated will still get chickenpox, but they will have a milder illness.

Possible reactions to the chickenpox vaccine

Most children will not feel any effects from the immunisation, but some may experience mild reactions such as fever and injection site tenderness, similar to other childhood vaccines. About one in twenty children develop a mild rash between 5 and 26 days after immunisation. In rare cases, this can be contagious - keep any blisters covered and stay away from anyone at risk of severe disease, such as people with weakened immune systems, babies or pregnant women.

See page 26 for advice on what to do if your baby has a reaction.

If you are worried about your baby's reaction to an immunisation, talk to your doctor or nurse or call the free Healthline service on 0800 611 116 anytime day or night.

Other immunisations

Immunisations for targeted groups

The following immunisations are not funded as part of the National Immunisation Schedule, unless your child has particular serious health conditions that affect their immunity. **Talk to your family doctor or nurse about whether your child is eligible for these funded vaccines.**

If your child is not eligible, you can still purchase these vaccines.

Immunisations that may be given at birth

Hepatitis B vaccine and hepatitis B antibodies are given at birth to babies of mothers who carry the hepatitis B virus. This is to ensure that babies do not become infected at birth.

Babies at higher risk of tuberculosis (TB) may be offered immunisation at birth if they are at particular risk of TB, for example, children living in a house with someone with TB or with a family member who has lived in affected countries. The TB immunisation does not stop children being infected with TB but it does help stop serious infection. Protection lasts for up to 15 years.

Influenza vaccine

The immunisation protects against influenza, a common virus that infects the nose, throat and lungs. Some people become so ill from influenza that they need hospital care and a small number of people die. The immunisation is free to babies and children who have breathing illnesses such as severe asthma.

Between 50% and 70% of people who are immunised will be protected against influenza.

Annual immunisation is needed to stay protected because protection can lessen over time and the types of influenza may change each year. There is a slight risk of small children developing a fever after immunisation.

Meningococcal vaccine

Meningococcal disease is a bacterial infection that causes two very serious illnesses: meningitis (an infection of the membranes that cover the brain) and/or septicaemia (blood poisoning). Meningococcal disease can affect anyone, but it's more common in children younger than 5 years old, teenagers and young adults. There are several strains of the disease – the most common in New Zealand are B and C. There are no vaccines currently available in New Zealand that protect against meningococcal B.

Vaccination against meningococcal disease is around 80% effective over the short term, depending on the vaccine. Protection from meningococcal vaccines tends to last around 3 to 5 years, although booster doses may be given at a later time. Because the vaccines don't provide long-term protection, or protect against all strains, it's important to be aware of the signs and symptoms of meningococcal disease, and seek medical advice **immediately** if you're concerned. Information on the signs and symptoms can be found on the illustrated card called *Meningococcal disease causes meningitis* (code HE2417), available at www.healthed.govt.nz

Commonly reported reactions to the vaccine for infants include fever, irritability, crying more often than expected, redness, tenderness and swelling at the injection site.

Reactions to immunisations

Your child may have a mild reaction after immunisation

Mild reactions after immunisation are quite common, as part of the immune system's natural response to the vaccine.

Serious reactions are rare.

Here are some ways to make your baby or child more comfortable.

Love and care

Give your child lots of cuddles and lots of fluids. If you're breastfeeding, give lots of feeds.

Reducing temperature

If your child gets hot, it can help to undress them down to a single layer (eg, a singlet and pants). Make sure the room is not too hot or too cold. Encourage them to drink more (water and breast feeds).

Medication for discomfort or pain

Give paracetamol or ibuprofen only as advised by your doctor or nurse.

Giving babies and children paracetamol before and repeatedly after any immunisation just in case they feel unwell is not recommended. There is some evidence that paracetamol may reduce the immune response to some childhood vaccinations.



Soothing pain

An ice pack wrapped well in a dry cloth, or better still, a cool cloth, can be held over the injection site if it is sore. Avoid rubbing the injection site because this may make the reaction worse.

Sleepy or slow to feed

Please watch your baby carefully and encourage them to drink.

Serious reactions

Febrile convulsion

Very rarely, a child will have a febrile convulsion or a fit following immunisation.

If your child is having a convulsion:

- don't put anything in your child's mouth
- don't put your child into a bath or shower to cool down
- for advice, call your doctor, nurse or Healthline on **0800 611 116**
- in an emergency, call **111**.

There is no easy way to prevent a febrile convulsion. Keep your child cool and comfortable if they have a fever. Febrile convulsions are not associated with any ongoing problems, and children usually recover quickly.

Rare allergic reactions following immunisation

You and your child will be asked to wait at the clinic or surgery for 20 minutes after a vaccine is given. This is to make sure that medical treatment is available if an allergic reaction called anaphylaxis occurs. Anaphylaxis happens around once in every million vaccinations. A skin rash, dizziness and noisy breathing start soon after the vaccine is given. Drugs to treat this allergic reaction work very quickly. Allergic reactions can also be caused by food, other medicines and bee stings.

If you are worried about your baby's reaction to an immunisation, talk to your doctor or nurse or call the free Healthline service on 0800 611 116 anytime day or night.

National immunisation register, records and immunisation certificate

The National Immunisation Register

Your doctor or nurse will record your child's immunisation details on your child's medical record and the National Immunisation Register (NIR). The NIR is a computerised information system that holds the immunisation details of all children in New Zealand born after 2005. Your lead maternity carer, family doctor or nurse will discuss the NIR with you, including what information is collected and stored and who can access the information.

The NIR helps you and your health care providers keep an accurate record of your child's immunisations to make sure they receive the correct immunisations throughout their life. Information about your child's immunisations is available if you visit different health care providers in another part of the country (eg, if you shift to another area or to another doctor).

The NIR will also tell your doctor or nurse when your child's next immunisations are due or if the immunisations are overdue.

You can choose not to have your child's information stored on the NIR, but you will need to complete and sign a form that your lead maternity carer, family doctor or nurse can provide.

Your child can still get immunisations if their information is not stored on the NIR.

For more information, talk to your lead maternity carer, doctor, nurse or Well Child Tamariki Ora provider. Information on the NIR can also be found in the pamphlet *Immunise your child on time* (code HE1327), available at www.healthed.govt.nz



Immunisation records and the Immunisation Certificate

Your doctor or nurse will keep a record of the immunisations your child has been given. The information is also held on the National Immunisation Register (NIR).

The immunisation is recorded on the Immunisation Certificate in your child's *Well Child Tamariki Ora My Health Book*. You will be asked for the Immunisation Certificate when your child starts at an early childcare service, kōhanga reo or primary school. The certificate shows which childhood immunisations your child has had. Your doctor or nurse signs the certificate when they give your child the 15-month-old immunisations and again after the 4-year-old immunisations.

You will be asked to produce a signed certificate even if you have decided not to have your child immunised.

Your doctor or nurse can sign the certificate at any time. Children can still attend an early childcare service or school if they have not been immunised.



How is the Immunisation Certificate used?

The early childcare service or school will record the information from your child's Immunisation Certificate on their immunisation register. You can check this at any time. If your child starts at an early childcare service before 15 months old, you should show the service the certificate once your child has had their 15-months-old immunisations.

The Medical Officer of Health will check the early childcare and school registers if there is a threat or outbreak of a disease in your area. Children who have not been immunised will be offered immunisation. They may also be asked to stay at home until the disease threat has gone to help stop it spreading.

Appendix: Diseases and reactions to vaccines

The following table shows the disease versus vaccine risks*

Disease risks	Possible side effects of vaccines
<p>Rotavirus is a leading cause of gastroenteritis (tummy upset) in young children. Almost all children who are not vaccinated catch it before they are 3 years old.</p> <p>One in 5 seek medical advice.</p> <p>634 in every 100,000 infants are hospitalised annually.</p>	<p>Fever, diarrhoea and vomiting after rotavirus vaccines occur in similar frequency to babies who have not had the vaccine.</p> <p>There is an increased risk of intussusception (a potentially serious bowel condition requiring treatment). There are an expected 6 additional cases of intussusception among every 100,000 infants (this would equate to around 4 to 5 cases of intussusceptions in New Zealand each year).</p>
<p>Diphtheria produces a toxin (powerful poison) that damages the heart, nerves, kidneys and other organs. Around 2–10 in every 100 people infected with diphtheria die.</p>	<p>About 1 in 10 people experience injection site pain, redness and/or swelling. Mild fever, restlessness and/or crying are also common.</p> <p>Risk of high fever associated with febrile seizure less than 4 per 100,000 doses.</p>
<p>Tetanus bacteria release a toxin that causes severe painful muscle spasms. There are around 5–10 cases a year among people who have not been immunised in New Zealand, who all need hospital intensive care treatment. Nearly 1 in 10 of those affected with tetanus will die.</p>	<p>These are self-limiting (go away on their own).</p> <p>There is an increased risk of injection site swelling following booster vaccination at 4 years old. This is not normally associated with increased pain.</p>

Disease risks

Pertussis (commonly called whooping cough) causes a severe ‘barking’ cough that can last up to 3 months. Complications include ear infections, pneumonia, internal bleeding from coughing spasms, convulsions, brain damage and death. Infants and young children are at highest risk of complications.

Polio often causes no symptoms, however, it can lead to fever, sore throat, headache and stiff neck. Infection can quickly progress to paralysis of the limbs and chest, making walking and breathing very difficult. Paralysis is permanent. About 1 in 20 hospitalised patients die and 1 in 2 who survive are permanently paralysed. Post-polio syndrome occurs 30–40 years later, causing muscle pain and worsening of existing muscle weakness.

Hepatitis B is a virus that can cause liver disease. Younger children who catch it are more likely to end up carrying the disease long term. Carriers have a 5 in 100 risk of developing chronic active hepatitis or cirrhosis and a 5–10 in 100 risk of developing liver cancer. Hepatitis B is believed to be second only to tobacco as a cause of human cancer.

***Haemophilus Influenzae* type b** can cause meningitis (inflammation of the tissues surrounding the brain), epiglottitis (throat obstruction), pneumonia, swollen joints and skin infections. About 1 in 20 patients with bacterial meningitis die, and 1 in 4 survivors have permanent brain or nerve damage. About 1 in 100 patients with epiglottitis dies.

Possible side effects of vaccines

About 1 in 10 people experience injection site pain, redness and/or swelling. Mild fever, restlessness and/or crying are also common.

Risk of high fever associated with febrile seizure less than 4 per 100,000 doses. These are self-limiting (go away on their own).

There is an increased risk of injection site swelling following booster vaccination at 4 years old. This is not normally associated with increased pain.

Disease risks	Possible side effects of vaccines
<p>Pneumococcal disease can cause fever, pneumonia, swollen neck or salivary glands, septicaemia (infection of the blood), meningitis and some ear infections. About 1 in 10 patients with meningitis die and many survivors will be left with brain damage or hearing impairment. Before vaccination, around 150 New Zealand preschool children were hospitalised each year with meningitis or septicaemia. Pneumococcal disease was also the cause of approximately one-quarter of all pneumonia cases in children.</p>	<p>10–20 per 100 have a mild injection site reaction, 3 per 100 have a more severe reaction that restricts movement of the arm or leg for a day or so.</p> <p>Fever over 39°C in less than 5 per 100 vaccines.</p>
<p>Measles causes pneumonia in 1 in 15 children with measles, and 1 in 1000 develops encephalitis (swelling in the brain). For every 10 children who develop encephalitis, one will die and up to 4 will have permanent brain damage. About 1 in 100,000 develop subacute sclerosing panencephalitis, which is always fatal.</p>	<p>About 1 in 100 develops redness at the injection site. About 2–3 in 100 experience mild fever and 1–2 in 100 develop a fever over 39.5°C. About 1–2 in 100 develop a rash, which is non-infectious. About 4 in 100 are noticeably irritable. One in 1 million recipients may develop encephalitis from the measles component of the vaccine.</p>
<p>Mumps causes 1 in 200 infected children to develop encephalitis (swelling in the brain). Profound deafness occurs in 1 in 15,000 cases. If infected after puberty, 1 in 5 males gets testicle inflammation and 1 in 20 females gets ovary inflammation. In rare cases, this leads to infertility. Women who get mumps in the first trimester of pregnancy have an increased risk of miscarriage.</p>	<p>Thrombocytopenia (bruising or bleeding) occurs after a first dose of MMR at a rate of 1 in 30,500. This is self-limiting (goes away on its own).</p>
<p>Rubella (commonly called German measles) rarely causes serious side effects in children or adults. However, 8–9 out of 10 babies infected during the first 10 weeks after conception will have a major congenital abnormality (such as deafness, blindness, brain damage or heart defects).</p>	

Disease risks	Possible side effects of vaccines
<p>Meningococcal disease can cause septicaemia (infection of the blood stream) and/or meningitis (swelling of the tissues surrounding the brain). About 1 in 10 patients with meningitis die. Of those who survive about 1 in 4 have long-term learning difficulties and 1 in 5 to 1 in 25 have permanent deafness or require limb amputation. One in 30 have severe skin scarring. One in 30 have severe brain damage.</p>	<p>Around half of vaccines have a mild injection site reaction, often with some redness and/ or swelling.</p> <p>Fever is in 1–5 per 100 infant vaccines. Irritability in around half of vaccines with occasional crying, more than usual. These events are more common with booster doses.</p> <p>Headache has also been reported in adolescents.</p>
<p>Influenza may lead to hospitalisation in all age groups particularly the elderly or those with an ongoing medical condition. It can lead to pneumonia, and in some cases, may be life threatening. Between 10% and 20% of the population are infected with influenza each year.</p>	<p>About 1 in 10 has a local reaction. Mild fever is common, particularly in children. High fever can also occur. Guillain-Barré syndrome occurs in less than 1 in 1 million, the same rate as the general population.</p>
<p>Varicella (Chickenpox) is very common and usually mild. However, infected blisters are a common complication, and about 1 in 5000 patients develops encephalitis (swelling in the brain). About 2 in 50,000 patients die or suffer permanent disability. The effects from the disease are often worse in adults. Infection during pregnancy can result in congenital malformations in the baby. Onset of infection in the mother from 5 days before to 2 days after delivery can result in severe infection in the newborn baby in up to 1 in 3 cases. Reactivation of the virus in later life causes herpes zoster (shingles).</p>	<p>Localised rash in 1–3 out of 100 and generalised body rash in 3–5 out of 100 between 5–26 days after vaccination. Usually fewer than 5 spots.</p> <p>Transmission of the vaccine virus has been documented but is extremely rare.</p> <p>People who get the vaccine can still develop shingles but this is far less likely than after natural infection.</p>

**Adapted with permission from the Immunisation Advisory Centre.*

The National Immunisation Schedule

Age	Disease to protect against	Vaccine
Pregnancy	Tetanus + diphtheria + whooping cough (pertussis)	Boostrix® (28 to 38 weeks)
	Influenza	Any time during pregnancy.
6 Weeks	Rotavirus (first dose must be given before 15 weeks)	Rotarix® (oral)
	Diphtheria + tetanus + whooping cough (pertussis) + polio + hepatitis B + <i>Haemophilus influenzae</i> type b (Hib)	Infanrix® hexa
	Pneumococcal disease	Synflorix®
3 Months	Rotavirus (second dose must be given before 25 weeks)	Rotarix® (oral)
	Diphtheria + tetanus + whooping cough + polio + hepatitis B + <i>Haemophilus influenzae</i> type b (Hib)	Infanrix® hexa
	Pneumococcal disease	Synflorix®
5 Months	Diphtheria + tetanus + whooping cough + polio + hepatitis B + <i>Haemophilus influenzae</i> type b (Hib)	Infanrix® hexa
	Pneumococcal disease	Synflorix®
15 Months	<i>Haemophilus influenzae</i> type b (Hib)	Hiberix®
	Measles + mumps + rubella	Priorix®
	Pneumococcal disease	Synflorix®
	Chickenpox (varicella)	Varilrix®
4 Years	Diphtheria + tetanus + whooping cough + polio	Infanrix® IPV
	Measles + mumps + rubella	Priorix®
11+12 Years	Tetanus + diphtheria + whooping cough	Boostrix®
	Human papillomavirus (HPV)	Gardasil®9 (2 doses, 6 months apart)
45 Years	Tetanus + diphtheria	ADT® Booster*
65 Years	Tetanus + diphtheria	ADT® Booster*
	Influenza	Given annually.
	Shingles	Zostavax®

*The ADT booster vaccine is free at 45 and 65 years, but you may need to pay for the visit. (Contact your doctor or nurse for details.)





For more information

- **If you are worried about your child's reaction to an immunisation:** talk to your doctor or nurse or call the free Healthline service on **0800 611 116** anytime day or night.
- **For general information about immunisation:** talk to your doctor or nurse or call the Immunisation Advisory Centre (IMAC) on **0800 IMMUNE (466 863)** during office hours. You can also visit www.health.govt.nz/immunisation or IMAC www.immune.org.nz

To report a serious reaction to an immunisation: talk to your doctor or nurse or call the Centre for Adverse Reactions Monitoring (CARM) **03 479 7247**.

- **For information about your baby's immunisation:** refer to the immunisation pages in your baby's *Well Child Tamariki Ora My Health Book*.

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