



# **The Norwegian Childhood Immunisation Programme**

## Parent Information in English

The text is based on the brochure:  
Vaksinasjon i barne- og ungdomsalder • Nasjonalt vaksinasjonsprogram  
Published by the Norwegian Institute of Public Health

## Why is it important to vaccinate?

From birth we constantly encounter a great number of different viruses, bacteria and other infectious substances. Most are not harmful, many are beneficial, but some can cause disease.

The body's immune system helps protect us against infections. When we are exposed to infection, the immune system sets in motion a number of reactions in order to neutralise the infectious substances and limit the harmful effects. Being subjected to an infectious disease often provides lifelong protection (immunity) so that a person does not get the same disease several times. This is because the immune system "remembers" the infectious substance.

### Simple and effective protection against dangerous disease

When we vaccinate, the immune system's "memory" is utilised. In vaccination, a weakened bacterium or virus, parts of them or something resembling them is added to the body. Then the immune system is activated without us becoming sick. This is how some dangerous infectious diseases can be prevented in a simple and effective way. For some diseases, the vaccination will lead to lifelong protection, in other cases the effect is reduced after a few years and booster doses are required.

### Infants tolerate vaccines well

A child's immune system is already prepared early in the womb to tackle various infectious substances that it encounters after birth. Vaccines use only a small part of a child's immune capacity and burden the immune system much less than ordinary infections, such as a cold. Infants therefore tolerate vaccination well, including receiving several vaccinations at once.

### Community immunity

When the great majority of the population has been vaccinated against a disease, there will be few people left to whom the infection can spread. This can make it possible to protect the few who have not been vaccinated. With the help of vaccination, it is possible to entirely eradicate some diseases worldwide. So far, this has been accomplished for the viral disease smallpox.

### Child Immunisation Programme

The recommended vaccination programme for children and adolescents in Norway includes vaccines against twelve different diseases:

- rotavirus
- diphtheria
- tetanus
- whooping cough
- poliomyelitis
- infection with *Haemophilus influenzae* type b (Hib)
- hepatitis B
- pneumococcal disease
- measles
- mumps
- rubella and
- human papillomavirus (HPV), which can cause cervical cancer

Some children are also offered vaccination against tuberculosis. All these diseases can be life-threatening or result in serious complications. See a complete summary of the vaccination programme below.

Vaccination usually begins when a child is six weeks old. Since several of the diseases vaccinated against affect youngest children the hardest, delays should be avoided. Booster doses are given when a child is school age. The rotavirus vaccine is given orally (drinkable vaccine). The other vaccines are administered by injection (shot). Mercury is not used as a preservative in any of the vaccines in the Childhood Immunisation Programme.

### Combination vaccines

Combination vaccines have been used since the Norwegian Childhood Immunisation Programme began in 1952. These contain vaccines against several diseases in the same syringe. It means fewer injections for a child. The combination vaccines result in fewer side effects than when the vaccines are given individually.

All vaccination is voluntary.

### Vaccination schedule

| Child's age                          | Vaccination against  | No. of injections |
|--------------------------------------|--|-------------------|
| 6 weeks                              | Rotavirus (given orally)   | –                 |
| 3 months                             | Rotavirus (given orally)   | –                 |
|                                      | Diphtheria, tetanus, whooping cough, poliomyelitis, Hib-infection and hepatitis B (DTP-IPV-Hib-HepB)<br>Pneumococcal disease   | 1<br>1            |
| 5 months                             | Diphtheria, tetanus, whooping cough, poliomyelitis, Hib-infection and hepatitis B (DTP-IPV-Hib-HepB)<br>Pneumococcal disease   | 1<br>1            |
| 12 months                            | Diphtheria, tetanus, whooping cough, poliomyelitis<br>Hib-infection and hepatitis B (DTP-IPV-Hib-HepB)<br>Pneumococcal disease | 1<br>1            |
| 15 months                            | Measles, mumps, rubella (MMR)  | 1                 |
| 2nd grade<br>approximately 7 years   | Diphtheria, tetanus, whooping cough and poliomyelitis (DTP-IPV )   | 1                 |
| 6th grade<br>approximately 11        | Measles, mumps, rubella (MMR)  | 1                 |
| 7th grade, girls<br>approximately 12 | Human papillomavirus (HPV )<br>(Vaccine against cervical cancer), total of 2 doses   | 1 per dose        |
| 10th grade<br>approximately 15       | Diphtheria, tetanus, whooping cough and poliomyelitis (DTP-IPV )   | 1                 |
|                                      | Tuberculosis (BCG) *   | 1                 |

\*For children in defined risk groups (normally given in infancy).

Booster doses against diphtheria, tetanus, whooping cough and polio are recommended for adults every 10 years.

## BEFORE AND AFTER VACCINATION

### Before vaccination

Before the vaccination, the public health nurse will ask whether the child is healthy and if there were any reactions after previous vaccines. Remember to inform the nurse if the child has an allergy or other health problems, or if the child has recently received medicine or a vaccine outside the programme.

Vaccinating a child who has a cold or is otherwise slightly under the weather is not dangerous. However, it is normal to postpone the vaccination in the event of an acute illness and with a fever greater than 38 °C.

Children who have had unusual reactions after previous vaccinations and children with serious or prolonged illnesses should be assessed by a doctor before vaccination. In some cases, it may be necessary to deviate from the programme.

### After vaccination

Most children have little or no reaction after vaccination. A fever greater than 39 °C and/or reduced general condition may be a sign of a serious disease and is not necessarily a reaction to the vaccine. Therefore, always contact a doctor if you are concerned about the child.

### Reactions to vaccines (side effects)

- Redness, swelling and pain at the injection site occur from time to time after all vaccines that are injected and can last for a few days.
- Mild fever, restlessness, crying, sleepiness, feeling unwell or a lack of appetite occurs in up to one in ten children after vaccination. A fever greater than 39 °C is uncommon.
- In small children, a rapidly rising fever can lead to fever cramps. Fever cramps are not dangerous but you should contact a doctor to rule out other acute disease.
- Pallor, feeling unwell or fainting after vaccination is more common in older children than in infants and is almost always due to the child reacting to the injection and/or the pain or to the situation.
- An allergic reaction to vaccines can occur in rare cases. The most dangerous allergic reactions come quickly after vaccination. Therefore, the child should wait at the public health clinic for at least twenty minutes after vaccination.

>>

**SYSVAK national immunisation registry**

SYSVAK is a national electronic immunisation registry governed by the Norwegian Personal Health Data Filing System Act and the SYSVAK Registry Regulations. The purpose of SYSVAK is to maintain an overview of vaccination status for the individual and to keep up with vaccination coverage on a nationwide basis. For the public health service, the registry is also a tool for ensuring that all children are offered a satisfactory range of vaccinations. All vaccines that are given must be recorded in SYSVAK. There is no opportunity to refuse recording of vaccines given through the Child Immunisation Programme. Vaccinations given earlier that have not been recorded will be registered retrospectively.

Names, Norwegian personal identification numbers, vaccines given and vaccination dates are registered in SYSVAK. The information is stored in accordance with applicable rules for personal privacy in the health service.

***Mine vaksiner* online service**

Through the *Mine vaksiner* (My Vaccines) public service found at [www.helsenorge.no](http://www.helsenorge.no), parents of children under 16 can get an overview of which vaccines a child has received. After reaching age 16, the individual must log on themselves. An electronic ID is needed to log on. It is also possible to print out a vaccination certificate in Norwegian and English.

## VACCINE AGAINST ROTAVIRUS

### Rotavirus disease

Rotavirus is the cause of approximately half of the cases of diarrhoea and vomiting in infants and toddlers. The virus transmits very easily. The usual route of infection is when a child puts their hand in their mouth after touching an object that is contaminated with rotavirus. Children excrete the virus in their stools before, during and after symptoms appear. Having a rotavirus infection only gives partial protection against re-infection, so many people will have several episodes of rotavirus disease during childhood. Good hand hygiene reduces the spread of the virus but will not stop it completely.

Rotavirus disease often causes more severe symptoms than other gastrointestinal infections. Most children will recover without complications but some will need treatment for dehydration. If treatment begins too late, the disease can be fatal, but this happens rarely in Norway.

Before the introduction of the rotavirus vaccine in the Childhood Immunisation Programme, rotavirus disease was the cause of almost two-thirds of all admissions of young children to hospital with vomiting and diarrhoea. Every year, 700–1100 children with rotavirus disease were admitted to hospital for treatment and the majority were under 2-years-old.

### ROTAVIRUS VACCINE

The vaccine contains live, weakened rotavirus. The vaccine virus does not cause rotavirus disease among healthy children. The rotavirus vaccine is very effective and gives almost 100 % protection against severe rotavirus infection.

The rotavirus vaccine is given orally and tastes sweet.

The vaccine used in the Childhood Immunisation Programme consists of 2 doses. The first dose is given at 6 weeks at the earliest, but no later than 12 weeks. The second dose is given when the child is 3 months of age, but no later than 16 weeks.

Protection after vaccination lasts for 3–4 years. This is enough to protect the youngest and most vulnerable children.

Inform the public health clinic if the child has recently taken medicine, has an allergy or any other health problems.

Delay vaccination if the child has an acute infectious disease with fever over 38 °C or an acute gastrointestinal infection with diarrhea or vomiting.

#### *Common side effects:*

The most common unwanted effects from Rotarix (the vaccine in the Childhood Immunisation Programme) are:

Irritability and loose stools among 1 in 10 vaccinated children.

Stomach pains, excess wind and skin reactions occur in up to 1 in 100 vaccinated children.

Intussusception is a rare condition among infants where a part of the intestine is pulled into itself. Every year in Norway, about 35–40 children under 1-year-old are admitted to hospital with intussusception. Studies have shown that this number could increase slightly after introducing the rotavirus vaccine (up to 1 extra case per 20,000 vaccinated), particularly when the vaccine is given above a certain age. Therefore the first dose should be given by the time the child is 12 weeks old and the second dose when the child is 16 weeks old. The first vaccine dose is given at 6 weeks at the earliest, but no later than 12 weeks at the latest.

## VACCINE AGAINST DIPHTHERIA, TETANUS, WHOOPING COUGH, POLIOMYELITIS, HIB INFECTION AND HEPATITIS B

### Diphtheria

is a nose and throat infection caused by diphtheria bacteria. The bacteria create toxins that can attack the heart, kidney and nervous tissue. The disease can be fatal. During and just after the Second World War, there were diphtheria epidemics in Norway. After vaccination was introduced in 1952, only a few cases of the disease have occurred after infection abroad. Diphtheria continues to occur in parts of Europe and other parts of the world.

### Tetanus

is caused by a bacterium that can be found in soil. Infection can occur when the bacterium comes into contact with wounds. The disease is not transmitted from person to person. The bacterium creates toxins that attack the nervous system and cause muscle stiffness and painful cramps. The disease is highly fatal. It is rarer in the Nordic countries than in warmer regions.

### Whooping Cough (Pertussis)

is a prolonged (6–12 weeks) airway infection with severe fits of coughing. Whooping cough can lead to brain damage due to lack of oxygen during coughing fits, and in rare cases to death. It can be dangerous for small children, particularly infants. In older children and adults, the disease can be prolonged and bothersome, but rarely life-threatening. The disease is very contagious – nearly 100 % of the population got the disease before we started to vaccinate.

### Poliomyelitis

is a viral disease that usually results in cold-like symptoms, body aches or diarrhoea. It can cause inflammation of the brain membrane (meningitis) and can lead to permanent paralysis. Fatalities do occur. Before the vaccine arrived in 1957, there were annual polio epidemics in Norway in which several hundred children and adolescents were permanently paralysed. Up to 10 % died. After vaccination was introduced, the disease is under control in Norway and a number of other countries. Europe was declared free of polio in 2002, but the disease still occurs in several countries in Africa and Asia. Unvaccinated people can become infected while travelling and can infect other unvaccinated people on their return.

### Hib infection

The bacterium *Haemophilus influenzae* type b (Hib) was the most frequent cause of inflammation of the brain membrane (meningitis) in children under 5 in Norway before the vaccine became available. Hib can also cause other serious infections such as pneumonia, arthritis and epiglottitis. After vaccination was introduced in 1952, Hib infections are nearly non-existent in Norway

### Hepatitis B

is an inflammation of the liver caused by the hepatitis B virus. The virus is found in blood and body fluids. It cannot penetrate intact skin. Infection occurs through mucous membranes or broken skin, such as the injection site of a bloody syringe, a blood transfusion or sexual contact. Babies born to mothers infected with the disease are at risk of infection.

Among infected infants, over 90 per cent will have a chronic infection and become carriers of hepatitis B virus if they do not receive preventive care. The risk of becoming a chronic carrier decreases throughout childhood and is less than 5 per cent for those infected in adulthood. Throughout life, people with Down's syndrome have a high risk of becoming chronic carriers because of impairments in their immune systems.

A chronic carrier state can lead to cirrhosis or liver cancer. Chronic carriers are also the main source of infection for hepatitis B so it is important to limit the number of new carriers as much as possible.

Children born to mothers who are carriers will follow a separate vaccination programme that starts within 24 hours after birth. Mothers who know that they are carriers should inform their midwife or public health nurse.

### **SIX-COMPONENT VACCINE AGAINST DIPHTHERIA, TETANUS, WHOOPING COUGH, POLIOMYELITIS, HIB INFECTION AND HEPATITIS B**

The vaccines against diphtheria and tetanus are based on toxins produced by the bacteria but without the toxic effect. The whooping cough vaccine contains purified parts of the whooping cough bacterium. The polio vaccine contains killed polio virus of the three types that can cause disease in humans. The Hib vaccine contains parts of the bacteria's sugar capsule (polysaccharide) bonded to proteins. None of the vaccine components are live. The hepatitis B vaccine contains fragments of the hepatitis B virus.

After three doses of vaccine, children develop lasting protection against Hib infection and hepatitis B.

#### Common side-effects:

Restlessness, irritability, crying, malaise, drowsiness, loss of appetite or feeling unwell for 1-2 days after vaccination occur in less than 1 in 10 children. It is not always clear if these symptoms are due to the vaccine or other causes.

Redness, swelling and pain around the injection site also occur in less than 1 in 10 children and may last for several days. Major, painful reactions are rare.

A brief fever may affect more than 1 in 10 children during the first few days after vaccination. Fewer than 1 in 100 children have a fever over 39.5°C. In such cases, seek medical attention because the fever may have another cause that needs treatment.

### **FOUR-COMPONENT VACCINE AGAINST DIPHTHERIA, TETANUS, WHOOPING COUGH AND POLIOMYELITIS**

A combination vaccine against diphtheria, tetanus, whooping cough and poliomyelitis is offered as a booster dose at an early school age, normally in grade 2. The protection diminishes over time and a new booster dose is offered in grade 10.



## VACCINE AGAINST PNEUMOCOCCAL DISEASE

### PNEUMOCOCCAL DISEASE

There are more than 90 different types of the pneumococcal bacterium. Several of these can cause disease in humans, usually pneumonia, sinusitis and inflammation of the middle ear. Occasionally the infection can become more serious, such as blood poisoning (sepsis) or inflammation of the brain membrane (meningitis). Pneumococcal bacteria can cause disease in both children and adults, but there are different types that dominate in different age groups. Most cases of serious pneumococcal disease occur in very young children, in persons over 65 and in persons with special risk factors.

Before the introduction of the vaccine, 60–80 children under the age of two were affected annually by serious pneumococcal disease. Most children had been healthy previously and had not been particularly predisposed to disease.

### PNEUMOCOCCAL VACCINE

The vaccine contains parts of the bacteria's sugar capsule (polysaccharide) bonded to proteins. The vaccine protects against 13 pneumococcal types. Before the introduction of the vaccine, these 13 types were the cause of a substantial portion of the pneumococcal infections in children under the age of two. The vaccine has also reduced the number of cases of inflammation of the middle ear caused by these pneumococcal types. The vaccine does not protect against disease due to pneumococcal types other than the 13 included in the vaccine. Nor does it protect against disease caused by other bacteria or viruses.

The early childhood vaccine against pneumococcal bacteria is given at the same time as the combination vaccine against diphtheria, tetanus, whooping cough, polio, Hib infection and hepatitis B.

#### Common side-effects:

Redness, swelling, tenderness or pain at the injection site occur in more than 10 % of the people vaccinated and can last for several days.

Restlessness, irritability, crying, not feeling well, sleepiness, reduced appetite or feeling sick for 1–2 days after the vaccination occur in some people. It is difficult to know whether such symptoms are due to the vaccine or something else.

A brief fever occurs.

## VACCINE AGAINST MEASLES, MUMPS AND RUBELLA (MMR VACCINE)

### Measles

is our most serious childhood disease. The disease is very contagious. Among those who grew up before a vaccine became available, more than 99 % got measles. The disease begins with cold-like symptoms and a high fever, followed by a rash. Measles is often followed by complications such as pneumonia, bronchitis and inflammation of the middle ear. Serious consequences such as inflammation of the brain (encephalitis), permanent brain damage and death occur. Worldwide, about 120,000 people die of measles each year, most of whom are children. Measles outbreaks with deaths also occur among unvaccinated people in our part of the world.

### Mumps

is a viral infection that causes fever and swelling in the salivary gland in front of the ear. The most common complication is mumps meningitis, which usually passes without permanent damage. A more serious complication is permanent deafness. If boys contract mumps after puberty, the virus can attack the testicles and lead to reduced fertility, but probably not sterility.

### Rubella

is a mild disease that causes fever and rash in both children and adults. If a pregnant woman gets rubella, the disease can lead to serious injury to the unborn baby. The risk for deformities is over 80 % for disease within the first trimester of the pregnancy.

The most common means of infection for pregnant women is contact with children who have the disease. In some outbreaks, unvaccinated men have been the source of infection. Therefore, it is important that all children are vaccinated.

### MMR VACCINE

The vaccine against measles, mumps and rubella is known by the name MMR vaccine. The abbreviation comes from the names of the diseases: Measles, Mumps and Rubella. The vaccine is a combination vaccine that contains live, weakened measles, mumps and rubella viruses. After the first MMR dose, which is normally given at the age of 15 months, over 90 % of those vaccinated are protected for many years, possibly for life. A new dose is given at the age of 12 to ensure the protection of the last 10 % and to ensure long-term protection. It is not harmful to vaccinate a person who has already had one or more of the diseases.

Since the MMR vaccine is a live weakened vaccine, it is important that the public health nurse is informed before vaccination if the child has an immunodeficiency disorder or takes medicines.

#### Side effects:

Brief pain, redness and swelling at the injection site occur. One to two weeks after vaccination, some children will get slight symptoms of the diseases vaccinated against, but this occurs in fewer than 1 in 20. The most common symptoms are fever and rash. Infection with a vaccine virus is not contagious. The complications that occur after the diseases rarely or never occur after vaccination.

*In 1997, a hypothesis alleged that MMR vaccine could be a cause of autism. A number of major studies have since been performed which all indicate strongly that MMR vaccine does not cause autism or any other form of brain damage.*

## VACCINE AGAINST CERVICAL CANCER (HPV VACCINE)

### HPV INFECTION AND CERVICAL CANCER

Cervical cancer is a life-threatening disease. In Norway, approximately 300 women annually develop this disease, 70 of whom will die as a result. Additionally, approximately 3000 women undergo surgery for serious early stages of cervical cancer. Pregnant women who have previously undergone such surgery may be at increased risk of aborting or of giving birth prematurely.

Cancer of the neck of the womb (cervix) is caused by a virus called human papilloma virus (HPV). There are many types of HPV virus. Each type has its own number. At least 12 HPV types can cause cervical cancer. The most common ones are HPV 16 and HPV 18. In Norway, these two virus types cause approximately 70 percent of all cases of cervical cancer.

HPV infection is easily transmitted via sexual contact and does not usually cause symptoms. Most people acquire an HPV infection at some point during their life. Infection is most common among young people. HPV infection resolves spontaneously in most cases over a few months. If an infection with a cancer-causing (carcinogenic) form of HPV becomes chronic, it can develop into the preliminary stages of cervical cancer (cell changes). These precancerous changes may develop into cervical cancer. This may take 10–30 years.

#### HPV VACCINE

The HPV vaccine consists of proteins and resembles parts of the surface of HPV 16 and 18. The vaccine contains no living virus, and cannot cause HPV infection. When the vaccine is given to girls who are not infected with HPV, the vaccine provides greater than 90 per cent protection against development of serious early stages of cervical cancer.

The first women who received the vaccine, almost ten years ago, still have good protection. The vaccine is thought to have a lasting, perhaps lifelong, effect. Follow-up of those vaccinated over time will show whether a booster dose is required later in life to extend the protection.

The HPV vaccine is offered to girls in the 7th school year. Complete vaccination requires administration of two doses with an interval of at least 6 months. The vaccine is injected into the upper arm with a syringe.

The HPV vaccine has a preventive effect, and should be taken before exposure to infection. This is why the Norwegian Childhood Vaccination Programme offers HPV vaccination to girls well before the Norwegian average age of first sexual activity

#### Side-effects:

The most common side effects of the HPV vaccine are swelling and tenderness in the arm into which the vaccine is given. This resolves after a few days. Short-lasting fever, headache, nausea, vomiting, diarrhoea and abdominal pain have also been reported.

Fainting following vaccination is not uncommon and is almost always caused by reactions to the needle/pain or the situation.

## VACCINE AGAINST TUBERCULOSIS

### Tuberculosis

Tuberculosis is caused by infection with tuberculosis bacteria. Only untreated pulmonary tuberculosis is contagious. The usual means of infection is droplet infection from a person who coughs up bacteria. About 10 % of those infected become ill, and many years can pass before the disease develops. The disease most often attacks the lungs, but it can also result in infection in other organ systems such as brain membranes, lymph nodes, intestines, bones, joints and kidneys.

Norway is among the countries in the world that have the lowest incidence of tuberculosis, with 350-400 new cases each year. Up until 1997, there was a decline in the number of cases. In recent years, there has been a sharp increase because of increased immigration from countries with a high incidence of the disease. Nearly 90 % of those who become ill were born in countries with a high incidence of tuberculosis, and most were infected before they came to Norway. Even though the risk of being infected with tuberculosis in Norway is low, it can be higher in settings with a connection to countries where the disease is common. BCG vaccine is therefore offered to children who have such a connection.

### TUBERCULOSIS VACCINE

The vaccine contains live, weakened tuberculosis bacteria, Bacille Calmette Guérin, and is called BCG. The vaccine is injected in the upper left arm. Normally a small "pimple" or a small weeping sore will appear at the injection site after a couple of weeks. The sore is harmless and will heal after a short time. Some people also get swollen lymph nodes that feel like pellets in the armpit. Up to 80 % of those vaccinated get protection against tuberculosis. The protection develops 1–3 months after the vaccination and is long-lasting.

It is recommended that the vaccine is given to infants at the age of six weeks. By vaccinating infants, protection is given particularly against the most serious forms of tuberculosis in the first years of life. In the event of infection risk in the surrounding environment, older children are also offered BCG vaccine. For these children, it may be necessary to perform a test in advance to check if they have already been exposed to infection and would therefore not benefit from the vaccine.

If a child has impaired health or uses medicines, the public health nurse must be informed before vaccination. People with HIV infection and other immune deficiency conditions should normally not have BCG vaccine.

#### *Side effects:*

Local reactions that are greater or more prolonged than expected are rare. Swelling in a lymph node near the injection site can occur, which can be unpleasant but is not dangerous. In extremely rare cases, it may be necessary to provide medication treatment.



Published by the Norwegian Institute of Public Health

P.O.Box 4404 Nydalen

Tel: +47 21 07 70 00

Available translations: Arabic, English, French, Polish, Russian, Somali, Spanish, Urdu

Download from [www.fhi.no](http://www.fhi.no)