

REGIONE VENETO

DEPARTMENT FOR HEALTH POLICIES

REGIONAL DIRECTORATE FOR PREVENTIVE MEDICINE

CHILDHOOD VACCINATION

Vaccinations are one of the most important medical conquests; thanks to them many serious and potentially lethal infective diseases are nowadays kept under control and have not been able to reveal their dangerousness.

Vaccination is a simple, effective and safe method to protect children from severe diseases for which there is still no therapy or which can cause serious complications. Disease risks are much higher than rare risks due to vaccination.

Vaccinating children also means to participate in the World Health Organization Action protecting the children's health all over the world and aiming at eradicating diseases such as poliomyelitis and measles.

It goes back a long time that the medical and nursing staff operating in the Veneto Regional Health Services and family paediatricians manifest a strong devotion to guarantee children's health protection through vaccination.

The high number of people adhering to the childhood vaccination campaign in the Veneto region rewards that promotional activity and shows confidence in this fundamental prevention measure.

The aim of this booklet is to provide people with all the necessary information on childhood vaccination and preventable diseases in order to make childhood vaccination a fully conscious choice.

Waiting for a better knowledge on vaccinations is not only a fundamental right but also offers the opportunity to improve both the quality and effectiveness of vaccination services.

We would like to invite you to read this booklet attentively, to consider it firstly as an informational instrument: the vaccination services' staff and family paediatricians will always be at your disposal for further information and to take away your doubts.

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INTRODUCTION

Vaccinations are one of the most important medical conquests. Sometimes, we would like to know a little more about them, especially when we receive the invitation for the first vaccinations of our child.

There are many vaccines: the choice depends on the disease to prevent. Some among them are made by inactive (killed) micro-organisms or by attenuated (not dangerous) or by just a portion of these micro-organisms or also by substances produced by them, called toxins, which are made inactive in the laboratory.

Vaccines stimulate a natural defense system: the immune system. The purpose of this system is to make antibodies and protection cells which can prevent sickness to reveal itself. During our life we need to defend ourselves against thousands of viruses and bacteria which we meet because they are everywhere in our environment.

Vaccines fight dangerous infective diseases for which there is still no cure (poliomyelitis) or for which treatment is not always effective (diphtheria, Tetanus, Meningitis due to Hib, Meningococcus, invasive infections due to pneumococcus, Hepatitis B, Chickenpox) or diseases which can cause serious complications (Rubella, Measles, Pertussis).

To be well informed on vaccinations, it is important that parents always ask the vaccination office and family paediatrician for advice and clarifications.

Before getting vaccinated, the medical staff has to verify whether there are no contraindications. Also they must carefully read the child's health documentation (personal health record and so on).

We suggest to parents to communicate to the vaccination office and the paediatrician their doubts or notices they estimate helpful.

It is necessary to postpone vaccination in case of acute feverish sickness or in case of serious general disorders. In case of a vaccine made with live micro-organisms, a child who recently got an administration of immunoglobulin temporarily needs to avoid vaccination. Slight common diseases (a cold, diarrhea, upper breathing ways infections) are not contraindicated.

To learn more about them

What is inside the vaccines?

How do vaccines work?

Against which diseases are vaccines helpful?

Before getting your child vaccinated

When vaccination has to be postponed

After vaccination, slight local irritative reactions sometimes occur, such as redness, swelling, and pain. These reactions can be treated by the application of a clean, cold and wet cloth. A child can also be feverish. In case of a rectal temperature higher than 38,5°C, it is necessary to administrate an antipyretic drug. Other side effects rarely occur. In these cases, all side effects need to be communicated to the paediatrician or vaccination office in order to get the proper treatment.

**After
Vaccina-
tion**

Vaccination is a preventive medical treatment, which is safe and effective and done all over the world also thanks to Humanitarian Organisations such as UNICEF, Doctors Without Borders and others. Thanks to vaccination some diseases are kept under control while other ones are eradicated. A high childhood vaccination coverage decreases both circulation of infective agents and protects subjects who, for several reasons, have not been vaccinated.

**What is
important
to know
about them**

As already happened in case of smallpox, we foresee that also Poliomyelitis will be eradicated from the world within a few years: when it will happen, it won't be necessary to be vaccinated against it

**And for
future ?**

In Italy in November 2003, a National Plan for the elimination of measles and congenital rubella was approved. The goals of the plan are to eliminate measles from the Country, stopping its local transmission, and to keep incidence of congenital rubella lower than 1 in 100,000 of new-born babies

We hope to substitute every vaccine that is not necessary anymore, with new other vaccines to treat widespread serious diseases which are nowadays without control.

Childhood and Adolescent Immunization Schedule in Veneto Region

<i>Vaccine</i>	<i>Birth</i>	<i>3° months¹</i>	<i>5° months¹</i>	<i>3° months¹</i>	<i>14° months¹</i>	<i>15° months¹</i>	<i>6 years</i>	<i>12 years</i>	<i>15 years</i>
Diphtheria, Tetanus, Pertussis		DTaP	DTaP	DTaP			DTaP		DTaP
Inactivated Polio		IPV	IPV	IPV			IPV		
Hepatitis B	HB ²	HB	HB	HB					
Haemophilis influenzae Type b		Hib	Hib	Hib					
Measles, Mumps, Rubella					MMR1 ⁴		MMR2 ⁵		
Pneumococcal		PCV ³	PCV ³			PCV ³			
Meningococcal				Men C					Men C
Varicella (chickenpox)					Varicella ^{6a}			Varicella ^{6b}	

Caption: **DTaP:** Acellular diphtheria tetanus pertussis vaccine;
IPV: Inactivated poliomyelitis vaccine;
Hib: Invasive Haemophilis influenzae Type b vaccine
PCV: Heptavalent Pneumococcal Conjugate vaccine;
Men C: Meningococcal C Conjugate vaccine;
HB: Hepatitis B vaccine;
MPR: Measles, Mumps, Rubella vaccine;
dTap: diphtheria tetanus pertussis vaccine for adults.

Calendars, vaccines, and age of administration are carefully established to make vaccination a simple and effective way to protect our children's health. More and more often vaccines are presented in a combined form to reduce the number of injections. Small differences in administration times do not affect the vaccine effectiveness; delays in beginning and completion times cause otherwise a longer period in which the child is not protected enough against those diseases. In case of a premature baby or low-weight babies, the vaccination calendar and administration times do not have to be modified, except in very specific cases (i.e. administering the Hepatitis B vaccine to babies weighing less than 2,000 gr.)

Vaccination against Poliomyelitis

What is Poliomyelitis?

Poliomyelitis is an infective disease produced by three different kinds of **viruses** which penetrate into our body mainly through the digestive tract.

It is a very dangerous disease because, in the most serious cases, it can cause irreversible paralyses, especially of the limbs, and sometimes it can even be mortal. Unfortunately, there is no medical treatment for this disease once it has broken out; vaccination is the only possibility to avoid the disease's serious after-effects.

In Italy, before the introduction of vaccination (by the law of 1966), there were more than 6,000 cases of Polio during 1958 and circa 3,000 on a yearly basis during the 1960s; the last case of Polio was recorded in Italy in 1983.

After the introduction of mass vaccination the disease began to disappear in most parts of the world, but it is still present in some developing nations. As long as polio will not be eliminated from the entire world, the risk that the virus might re-enter in our country still remains. For this reason, it is very important to protect our children against Polio through vaccination.

The vaccine against Poliomyelitis

The vaccine against Poliomyelitis (also called "Salk" or IPV- Inactivated Poliomyelitis Vaccine) contains killed (inactivated) polio viruses and it is administered through an intramuscular or a hypodermic injection.

The complete vaccination cycle includes administering four doses. This strengthened vaccine is more effective than the first licensed one. The vaccine is available in a single formulation or consists of various combinations with other vaccines.

The use of the previously adopted vaccine containing attenuated live viruses, called Sabin, was definitely abandoned and replaced with the strengthened inactivated vaccine, that is more effective and without serious side effects.

When it is necessary to postpone vaccination

A child who is known to have an acute feverish sickness or who presents serious general disorders should temporarily not get the polio vaccine.

When it is necessary to avoid vaccination

A child who has had a severe (life-threatening) allergic reaction to any vaccine components or to a previous dose of this vaccine should not get the Salk vaccine.

Side effects

This is a very safe and well-tolerated vaccine.

The polio vaccine, as any foreign substances to our body, rarely causes specific allergic reactions.

Vaccination against **Diphtheria and Tetanus**

What is Diphtheria?

Diphtheria is a serious infective disease caused by a substance (**toxin**) which is produced by a micro-organism called *Corynebacterium diphtheriae*.

It can be spread especially by saliva droplets. This diphtheric toxin can cause serious lesions in many organs, such as the heart, kidneys, and nervous system; it can also cause the formation of particular membranes in nose, throat and larynx and the paralysis of the palatine veil which can lead to suffocation.

About 5-10 people out of 100 who get diphtheria will die from it even when the disease is properly treated. In the early 1900s about 20,000-30,000 children a year got diphtheria in Italy and approximately 1,600 of them died.

After the introduction of the diphtheria vaccination in Italy in 1939 by law, the disease cases decreased and nowadays they are sporadic. The last fatal case happened in 1991 to a little girl who had not been vaccinated. During recent years thousands of diphtheria cases happened in East European countries, because of the inadequacy of vaccination campaigns.

What is Tetanus?

Tetanus is a serious disease caused by a substance (**toxin**) which is produced by a micro-organism (the *Clostridium tetani*). It can enter the body through breaks in the skin even through a simple scratch.

The tetanic toxin causes strong spasms of the muscles which can lead to death when they occur to respiratory muscles. When the disease reveals itself, despite treatment, a very long hospitalization is required, mostly in an intensive (care) unit. By an 1968 law, all new-born babies have to be vaccinated by a tetanus vaccine combined with the diphtheria one. In Italy about one hundred adults who are not vaccinated will get tetanus.

The vaccine against Diphtheria and Tetanus

The vaccine against Diphtheria and Tetanus is prepared to properly modify the diphtheric and tetanic toxins so that they are not dangerous anymore, but still capable of stimulating the body in producing defenses against the two diseases. The vaccine is administered through an intramuscular injection.

The Diphtheria and Tetanus vaccine is also available in a formulation variously combined with other vaccines, such as the vaccine against Poliomyelitis, Pertussis, Haemophilus Influenzae type B and Hepatitis B.

When is it necessary to postpone vaccination

A child who is known to have an acute feverish sickness or who presents serious general disorders should temporally not be vaccinated.

When is it necessary to avoid vaccination

There are no specific conditions under which it is not possible to get this vaccination: only those individuals who have had a severe (life-threatening) allergic reaction to any vaccine components or to a previous dose of this vaccine should not get it. Even a pregnant woman can be vaccinated.

Side effects

This is a very safe and well-tolerated vaccine and it usually does not cause reactions. Within 48 hours after the shot, it is possible to have a local irritative transitory reaction. This reaction may cause tenderness, pain, redness, and swelling.

A child can sometimes get a fever, usually a very slight one. Rarely, some other side effects, such as neuritis (inflammation of nerve ending,) may happen in adult subjects, especially when they get a high number of booster shots. For this reason, it is very important to always keep his/her own vaccination booklet or certificate to avoid unnecessary vaccine administration in case of seeking help at the first aid station.

This vaccine, as any foreign substances to our body, rarely causes specific allergic reactions.

Vaccination against **Hepatitis B**

What is Hepatitis B?

Hepatitis B is a contagious liver disease caused by a **virus** which is spread through contact with infected body fluids (blood and its derivatives, containing blood organic secretions, semen, vaginal mucus) of an ill person or a healthy carrier (called HBsAg positives).

This disease has a very long incubation period (45-160 days, usually about 120) and it can reveal itself in various ways. About 65-70% of the people infected with hepatitis B might not feel sick (asymptomatic forms). Very often, small children might suffer slight illness presenting tiredness, muscle or stomach pains, vomiting and fever with or without jaundice (yellow skin or eyes).

The acute disease may be fatal, though rarely, especially at adult age. The most serious problem given by Hepatitis B is the possibility of becoming a chronic disease. This can happen with a different frequency depending on the age: a baby who is born to a sick mother or one who carries the virus has an 80% chance of being chronically infected at birth, while this possibility is reduced to 10% in older children or adults.

Chronically infected people are exposed to a risk of serious problems such as cirrhosis or liver cancer. Besides, chronically infected subjects are a source of potential infection.

The vaccine against Hepatitis B

The vaccine against hepatitis B that is adopted nowadays contains just a part of the virus and is produced in the laboratory through fine genetic engineering techniques: for this reason, the virus is not able to produce the disease anymore, but it can immunize from itself.

This vaccine is highly effective (more for children than adults) and gives a long-term protection. The complete vaccination cycle includes administering 3 doses; a specific immunization schedule starting at birth is provided to those babies who are born to a sick or a carrier mother. At present, booster shots are not scheduled. Vaccine administration is made through an intramuscular injection. The hepatitis B vaccination is provided to all new-born babies in Italy since 1991. Additionally, free vaccination is available for those individuals who, for

professional reasons (i.e. doctors, nurses) or personal ones (i.e. people living together with sick or carrier individuals), are particularly at risk of infection.

When it is necessary to postpone vaccination

A child who is known to have an acute feverish sickness or who presents serious general disorders should temporally not get the vaccine.

When it is necessary to avoid vaccination

People who have had a severe allergic reaction to any vaccine components (i.e. yeast baker) or to a previous dose of this vaccine should not get vaccinated.

Side effects

This is a very safe and well-tolerated vaccine; it is possible to have a local irritative transitory reaction. This reaction may produce slight tenderness, pain, redness, and swelling.

People may get a fever, though rarely, usually a very slight headache, nausea, vertigo, slight short-term muscle and articular pain. More rarely, peripheral neuritis (inflammation of nerve ending) is to be recorded in adult or adolescent subjects.

This vaccine, as for any foreign substances in our body, will rarely cause specific allergic reactions.

Vaccination against **Pertussis**

What is Pertussis?

Pertussis is an infective disease caused by a **bacterium** (*Bordetella pertussis*) which is spread from person to person through the air and, before the introduction of vaccination, caused an epidemic every 3-4 years.

At first, pertussis behaves like a common cold: tenderness, pain, slight fever, sneezing, and cough, especially during the night. But after 1-2 weeks the typical severe coughing spells begin and, therefore, pertussis is also called "whooping cough" or "bad cough." Each cough attack happens violently and rapidly, over and over, until the air is gone from the lungs and the child is forced to inhale with the loud "whooping" sound. Often the cough can cause vomiting to children, endangering his or her nutrition. This disease phase takes usually 4-6 weeks, after which there are a few convalescence weeks when the cough is less and less violent and rapid.

Usually, the disease course is favourable, even though some complications may occur: croup, pneumonia, convulsions and asphyxia followed by brain damage.

The disease is most severe in infants less than 1 year old, because babies often get complications with suffocating crises and breathing difficulties leading to hospitalization.

Small babies have more often brain complications than others which can cause permanent damage and, in the most serious cases, can be fatal.

Whatever the age of the child may be, pertussis can cause many problems, because the violence of the cough limits playing and moving around, and it hinders eating and sleeping at night.

The vaccine against Pertussis

The vaccine against pertussis, also called acellular because it is made with some highly purified parts of the micro-organism, is administrated through an intramuscular injection and combined with other vaccines in the same ampoule. The complete basic vaccination cycle includes the administration of 3 doses; in addition, a booster shot is recommended at the age of 5-6 and 14-15.

This vaccination is advised to babies as of 3 months old, in order to protect them during their first years of life, when the disease is usually more dangerous.

When it is necessary to postpone vaccination

A child who is known to have an acute feverish sickness or who presents serious general disorders should temporally not get the vaccination against pertussis. The doctor in charge will also consider postponing pertussis vaccination in case of neurological problems which are still not exactly stated until the problem will be explained or the diagnosis determined.

When it is necessary to avoid vaccination

When a child has a severe neurological disease which can get worse in time, the doctor in charge will evaluate the case whether to vaccinate or not.

Children who had feverish convulsions can have the vaccine administered, taking the precaution to monitor the appearance of fever.

People who have had severe allergic reactions to any vaccine components or to a previous dose of this vaccine should not get vaccinated.

Side effects

Within 24-48 hours after the shot, it is possible to have a local irritative transitory reaction. This reaction may cause pain, redness, and swelling.

Within the first two days after vaccination a child can sometimes get a fever, usually very slight, inconsolable crying for three or more consecutive hours, irritability or sleepiness. These reactions are generally transitory especially now with the use of the acellular vaccine. With this kind of acellular vaccines adopted nowadays, serious reactions (i.e. episodes similar to collapse, convulsions) are really an exception. These reactions do not have any consequences, but the doctor needs to evaluate them very carefully before proceeding with the vaccination cycle.

This vaccine, as for any foreign substances in our body, rarely causes specific allergic reactions.

Vaccination against **Haemophilus Influenzae type B**

What is Haemophilus Influenzae type B?

This bacterium, not to confuse with viruses of Influenza, which, for the sake of convenience, will be indicated as **hib**, can be found in a child's nose and throat, where it usually will not give problems.

It is spread through the air by coughing, sneezing, and even breathing. Almost all children will come into contact with it during their first 5-6 years of age without any damage; they develop antibodies to be protected for the future. Nevertheless, hib does in some instances not stay in a child's nose and throat and will spread to the bloodstream to reach other organs, where it may cause some serious diseases. Meningitis is the most frequent one amongst them. This disease is always serious and a child can suffer permanent damages such as deafness, motor paralyse and mental retardation.

Less frequently, hib may cause epiglottitis (serious and sudden inflammation of the throat with suffocation symptoms) and sepsis (a widespread blood infection). Those diseases, also called "invasive forms," happen almost only in children less than 5 years old; a higher risk is reported for children who regularly go into communities (i.e. nursery schools or kindergarten).

The vaccine against hib

The vaccine is the only way to prevent hib invasive infections. It contains a part of the micro-organism bound with a protein so that it can even give protection to a baby of a few months old.

This vaccine is highly effective in avoiding the disease and in eliminating germ form carriers, healthy children who, once infected, can spread the bacterium and give the disease to others.

The vaccine is administrated through an intramuscular injection and is also available in combination with other vaccines.

The number of doses of the vaccination cycle depends on the child's age: 3 doses are recommended during the first year of life; after the first year one booster shot per year is enough.

When it is necessary to postpone vaccination

As usual, a child who is known to have an acute feverish sickness or who presents serious general disorders should temporarily postpone vaccination

When it is necessary to avoid vaccination

There are no pathologies to avoid this vaccination: only children who have had a severe allergic reaction to any vaccine components or to a previous dose of this vaccine should not get vaccination.

Side effects

It is possible to have a local irritative transitory reaction. This reaction may cause pain, redness, and swelling.

Not often a child can get a fever, usually less than 38,5°C, irritability or sleepiness.

This vaccine, as for any foreign substances in our body, may on rare occasions cause specific allergic reactions.

National Plan for the Elimination of Measles and Congenital Rubella

Measles is a disease which can be conquered by vaccinating all children, as has already happened in Italy in the case of poliomyelitis, diphtheria, and which can even be eliminated forever such as smallpox.

However, there are periodically measles epidemics in Italy, which will strike those children who are not vaccinated. The last big epidemic happened in 2002 with more than 40,000 cases and 6 deaths.

The last national research on the vaccinal protection level of Italian children (ICONA research of the Higher Health Institute, 2003) showed that nowadays 23% of the children have not been vaccinated yet against measles mumps and rubella. Today, the elimination of measles and congenital rubella is the first priority in Italy in the field of preventable diseases through vaccination. To achieve this goal the regions and autonomous provinces, the Health Ministry and the Higher Health Institute, together with paediatricians and Italian hygienists, planned and activated the "National Plan for the Elimination of Measles and Congenital Rubella" during 2003, of which the main purpose is to avoid a child's death by measles or serious malformations due to a mother infected by rubella during pregnancy.

Vaccination strategy of the plan is scheduled as listed:

- ? To vaccinate 95% of children less than 2 years old every year;
- ? To vaccinate children older than 2 years, adolescents not yet protected against measles and rubella and all those children who were going to primary and secondary schools during the school years 2003-2004 and 2004-2005;
- ? To introduce the second booster shot of Triple Vaccine against Measles, Mumps and Rubella.

Target strategies are provided to eradicate rubella through actions especially addressed toward fertile aged or pregnant women and toward people who have a high professional risk.

According to WHA provisions for Europe, the goal is to eradicate measles and congenital rubella in Italy by 2007.

By an agreement between the State and Regions (State-Regions Conference, resolution of the 13th of November, Official Gazette n. 297 of December 23rd, 2003) the Italian Regions ratified their engagement toward this very important goal, by adopting all the necessary actions to make it successful such as: realization of vaccinal computerized registers, improvement of technical vocational training of involved health operators, improvement of measles, rubella

and side effects of vaccination surveillance, and starting up educational campaigns for the population.

“Triple” Vaccination against Measles, Mumps and Rubella

This vaccine is a combination of three attenuated live viral strains in the same ampoule, meaning that the viruses are modified to not be able to produce the disease anymore, but they can stimulate production of effective antibodies.

The use of this triple vaccinal formulation is recommended for several reasons:

- A child is all at once vaccinated against the three diseases by one injection;
- The whole population (adults and older children) is indirectly protected because there is less circulation of viruses due to vaccination.

The vaccine is administered by a subcutaneous injection in the upper part of the arm.

The combined vaccine is recommended for all babies of one year old (as of 365 days of life). This vaccine can be administered together with other vaccinations (hexavalent; chickenpox).

Triple vaccination can also be administered to subjects who already had one of these diseases (maybe without realizing it, as often happens in case of rubella and mumps) or who already had a vaccination against one of them.

The precautions, contraindications and side effects of triple vaccination are the same as described in single vaccination.

A second booster shot a few years after the first one can be useful to immunize children who did not respond to the first vaccination (about 5%).

Vaccination against **Measles**

What is measles?

Measles is an infective, highly contagious disease caused by a **virus** which spreads through the upper respiratory tract.

It causes high fever, coughing, a running nose, conjunctivitis and a typical rash over the entire body (exanthema).

A child is always tied down by measles which is correctly considered as the most serious among the "common" childhood infective diseases because its acute symptomatology and its possible complications. These complications can be: laryngitis, bronchial pneumonia, plateletpenia (a decrease of the number of platelets), convulsions and, above all, encephalitis. The last one happens once to every 1,000-3,000 children who get measles; it is an extremely serious brain inflammation which can be fatal (15% of cases) or can cause permanent damage (40% of cases) such as convulsions, deafness, and mental retardation.

It rarely happens that 5-15 years after getting measles, an irreversible neurological damage occurs: this is caused by a persistent infection related to the measles virus (subacute sclerosis panencephalitis, SSPE).

Vaccine against measles

The vaccine against measles is made with the attenuated live measles virus so that the virus is disabled in giving the disease, but capable of stimulating the production of protective antibodies.

Vaccination against measles can be done individually or together with the rubella and mumps vaccination (triple vaccination). It is also available in combination with other vaccines.

In every instance, the vaccine gets administered by a subcutaneous injection in the upper part of the arm.

Occasionally, a single formulation of this vaccine is not easily found.

Measles vaccination is recommended for all babies of one year old (since the 365th day of their life), together with other vaccinations.

It is, at any rate, very useful to get this vaccination at every age after the first year, when the subject has never had measles.

The vaccine is very effective because it produces protective antibodies in 95% of the vaccinated children and this percentage increases after a second booster shot. There is protection 7-10 days after being vaccinated. Thanks to its quick effects, measles vaccination can prevent sickness even after infection when it is administered within 2-3 days after having contact with the ill subject.

When it is necessary to postpone vaccination

It is necessary to postpone when:

- A child is known to have an acute feverish sickness or presents serious general disorders the medical staff should temporarily postpone vaccination;
- Immunoglobulin(s), blood or plasma were recently administered to the subject; these products can hinder a good immune response to vaccination;
- A live virus based vaccination was recently administered to the subject.

When it is necessary to avoid vaccination

The measles vaccine, either single or combined, must not be administered in these cases:

- Serious defect of the immune system due to diseases or treatments;
- Severe allergic reactions to any vaccine components (i.e. neomycin or gelatine) or to a previous dose of this vaccine.

Side effects

The measles vaccine, either single or combined with the rubella and mumps vaccine, is well-tolerated. It is possible to have a local irritative reaction (redness, swelling) where the shot was given.

Within 7-14 days after the vaccination a child can sometimes get a fever, usually very slight and for a short time (1-2 days), in 5-15% of the cases the temperature can reach 39°C.

Sometimes one can have the symptoms of a common cold or of a disease similar to attenuated measles with a reddish rash, coughing, and pink eyes. These symptoms are brief, have a quick and spontaneous recovery, are not contagious and without complications. More serious side effects like plateletpenia (i.e. the decrease of the number of platelets) are very rare and with a favourable course. When the side effects, however, happen in the natural disease they can give serious complications and cause permanent damage.

This vaccine, as any foreign substances to our body, rarely causes specific allergic reactions.

Vaccination against **Rubella**

What is rubella?

Rubella is an infective disease caused by a **virus** which spreads through the airways. When rubella is contracted at a young age, it reveals itself as a slight disease with a favourable course.

Symptoms are slight fever, swelling of the lymph nodes (above all those on neck and nape) and a brief rash. Sometimes, children can have small subcutaneous hemorrhages; adolescents and adults, especially in case of female subjects, can have articular pains.

Serious complications are rare. **Rubella is a serious disease if contracted for the first time during pregnancy.** In this case, it is actually possible that the virus reaches the foetus through the placenta and that can cause serious damage such as abortion, congenital malformations of heart, brain, eyes and hearing.

Vaccine against rubella

The vaccine against rubella is made with the attenuated live measles virus so that the virus is disabled in giving the disease, but capable of stimulating the production of protective antibodies.

Vaccination against rubella can be done individually or together with the measles and mumps vaccination (triple vaccination). It is also available in combination with other vaccines. In every case the vaccine gets administered by a subcutaneous injection in the upper part of the arm.

Sometimes, a single formulation of this vaccine cannot be found easily.

Rubella vaccination, combined with the measles and mumps vaccine, is recommended for all babies of one year old (since their 365th day of life), at the same time with other vaccinations.

Nowadays, male babies are also vaccinated, both for individual protection and, above all, to decrease the circulation of rubella among the population and to lessen the danger of infection in pregnant women. T

he vaccine is very effective because it gives protection to more than 95% of the vaccinated subjects.

When it is necessary to postpone vaccination

It is necessary to postpone when:

- A child is known to have an acute feverish sickness or presents serious general disorders the medical staff should temporarily postpone vaccination;
- Immunoglobulin(s), blood or plasma were recently administered to the subject; these products can hinder a good immune response to vaccination;
- A live virus based vaccination was recently administered to the subject.

When it is necessary to avoid vaccination

The rubella vaccine, either single or combined, must not be administered in these cases:

- Serious defect of the immune system due to diseases or treatments;
- Severe allergic reactions to any vaccine components (i.e. neomycin or gelatine) or to a previous dose of this vaccine.

Side effects

The rubella vaccine is well-tolerated. Within 5-12 days, some vaccinated children (5-15%) may have a slight fever, a slight rash and a swelling of the lymph nodes of the neck.

Within 1-3 weeks after vaccination, children rarely, but more often adolescents and adult females, can have articular pains during a brief period of time. More infrequently may adult subjects have chronic arthritis.

This vaccine, as any foreign substances to our body, rarely causes specific allergic reactions. La rubéola es una enfermedad infecciosa causada por un virus que se transmite a través de las vías respiratorias.

Vaccination against **Mumps**

What is mumps?

Parotids, commonly called mumps, is an infective disease caused by a **virus** spread by the airways. It reveals itself through a swelling in front of the ear caused by the inflammation of a salivary gland called parotid either on one or both sides of the face. Other salivary glands can swell too and often, the subjects have all at once a headache, a more or less high fever, and abdominal pain.

The seriousness of this illness depends on the consequences which may follow: meningoencephalitis, damage to the hearing organs, pancreatitis and, after puberty, orchitis and ovaritis (an inflammation of testicles and ovaries) which can lead to sterility.

Vaccine against mumps

The vaccine against mumps is made with the attenuated live mumps virus so that the virus is disabled in giving the disease, but is capable of stimulating the production of protective antibodies. Vaccination against mumps can be done individually or together with the measles and rubella vaccination (triple vaccination). It is also available in combination with other vaccines.

In every case the vaccine gets administered by a subcutaneous injection in the upper part of the arm.

The single formulation of this vaccine is sometimes not easily to be found. Mumps vaccination, combined with the measles and rubella vaccine, is recommended for all babies of one year old (since their 365th day of life), all together with other vaccinations.

The vaccine can be administered at any age and the vaccination of an immune subject (because he/she already got a vaccination or because he-/she had the disease) is well-tolerated.

When it is necessary to postpone vaccination

It is necessary to postpone when:

- A child is known to have an acute feverish sickness or presents serious general disorders the medical staff should temporarily postpone vaccination;

- Immunoglobulin(s), blood or plasma were recently administered to the subject; these products can hinder a good immune response to vaccination;
- A live virus based vaccination was recently administered to the subject.

When it is necessary to avoid vaccination

The mumps vaccine, either single or combined, must not be administered in these cases:

- Serious defect of the immune system due to diseases or treatments;
- Severe allergic reactions to any vaccine components (i.e. neomycin or gelatine) or to a previous dose of this vaccine.

Side effects

Side effects due to this vaccination are very rare: within a few days a child may show a slight swelling of the parotid gland and may have a brief fever; exceptionally, a meningeal inflammation with a positive course can happen.

This vaccine, as for any foreign substances to our body, rarely causes specific allergic reactions.

Vaccination against **Pneumococcal Infections** **(Streptococcus pneumoniae)**

What is pneumococcus?

It is a widespread **bacterium** to be found in a healthy child's or adult's nose and throat, where it usually does not reveal itself. Pneumococcus is spread by breathing at close range.

There are many kinds of this germ (serotypes) which are identified by a number. Some amongst them are more frequently responsible for a blood "invasion" (invasive illness) and they can cause serious diseases and even death. Pneumococcus is one of the main causes of sepsis (known as a widespread blood infection which can be a serious danger because of its high concentration of bacteria with their toxic products) and meningitis (an infection of membranes around the brain): this is a very serious disease which can give permanent damage such as convulsions, deafness, motor paralyses and mental retardation.

In Italy, 1-3 cases of meningitis happen every year per 100,000 children less than 5 years old. This bacterium can also cause other diseases such as pneumonia, otitis, and sinusitis. Pneumococcus is sometimes resistant to more commonly used antibiotics.

Children of 0-5 years old and adults over 64 years of age are more exposed to the risk of an invasive disease.

Vaccines against pneumococcus

Pneumococcal vaccines are the only way to prevent diseases such as meningitis and blood infections (septicaemias) caused by pneumococcus.

Some kinds of otitis can also be prevented through vaccination: otitis can have several causes and the vaccine is only effective for a small part amongst them. Vaccination is strongly recommended and is free for children (and also for adolescents and adults) who are particularly at risk of getting serious diseases caused by pneumococcus, because they have health problems such as sickle-cell anemia and thalassemia, functional or anatomical asplenia (i.e. an inadequate function or non-existence of the spleen), chronic bronchopneumopathies, conditions associated with immunodepression, chronic cardiovascular troubles, diabetes mellitus, renal failure, chronic liver diseases (cirrhosis), and loss of cerebrospinal

fluid. Vaccination is also free for all new-born babies in our Region since 01.01.2006. There are two kinds of vaccines against pneumococcus, both made with just a part of the micro-organism, called multivalent because they give protection against several (sero)types of pneumococcus.

The **pneumococcal conjugate vaccine** is administered by an intramuscular injection. The number of doses depends on the age in which the vaccination cycle begins.

The **pneumococcal polysaccharide vaccine (23-valent)** is administered by either an intramuscular or subcutaneous injection. Just a single dose is necessary.

Protection begins 2-3 weeks after the vaccination. A booster shot can be recommended after 5 years in case of subjects who are at special risk.

Children already vaccinated with the pneumococcal conjugate vaccine because they are at high risk also need to be vaccinated by the 23-valent vaccine after they are 2 years old (this vaccination has to be done at least 8 weeks after the conjugate one). The conjugated vaccine is adopted in case of children who are younger than 24 months. When children are older than 5 years, the 23-component polysaccharide vaccine is used. Between the ages of 2 and 5, it is recommended to administer the (one-dose) conjugate vaccine.

When it is necessary to postpone vaccination

This vaccination, like the others, has to be temporarily postponed when a child has an acute feverish sickness or when he/she presents serious general disorders.

When it is necessary to avoid vaccination

There are no pathologies that require avoidance of this vaccination: only children who have had a severe allergic reaction to any vaccine components or to a previous dose of this vaccine should not be vaccinated.

Side effects

It is possible to have a local irritative transitory reaction. This reaction may produce pain, redness, and swelling. Other side effects can be fever, usually lower than 38,5°C, slight irritability or sleepiness, and loss of appetite. This vaccine, as for any foreign substances to our body, rarely causes specific allergic reactions.

Vaccination against

Meningococcal Infections (*Neisseria meningitidis*)

What is meningococcus?

Meningococcus is a widespread **bacterium** to be found in a healthy child's or adult's nose and throat, where it usually does not reveal itself.

There are many kinds of this germ (serotypes) which are identified by an alphabetical letter.

It spreads from person to person through the air by breathing droplets. In some cases, meningococcus can reach the blood and, in this way, it reaches other organs, causing invasive diseases such as meningitis or sepsis (a widespread blood infection). These are always very serious diseases which can cause permanent neurological and behavioural damage and even death.

Less frequently, this bacterium can also cause other diseases such as pneumonia and conjunctivitis.

Children of 0-5 years old are more exposed to the risks of the disease, happening more often to children younger than 2 years old. Also adolescents and young adults are exposed to these diseases, but less commonly.

In Italy, meningococcal invasive diseases happen less often than in other countries, especially the Anglo-Saxon ones.

Vaccines against meningococcus

Pneumococcal vaccines are the only way to prevent death and permanent damages due to the meningococcal infection caused by serotypes A, C, Y, W-135, whereas there is no vaccine for serotypes B, which is the only one together with serotype C that is in circulation in Italy.

Vaccination is strongly recommended for children (and also adolescents and adults) affected with a suffering form of functional or anatomical asplenia, i.e. an inadequate function or non-existence of the spleen.

In our Region, vaccination is also free for all new-born babies since 01.01.2006. There are two kinds of vaccines against pneumococcus, the conjugate and polysaccharide vaccine, both made with just a portion of the micro-organism, and rightly modified.

The **conjugate vaccine** is very effective against the meningococcal (sero)type (serotype C, one of the most common ones in Italy) and it can be administered to children younger than 2 years old.

The **polysaccharide vaccine** can only be administered to children older than 2 years and it is effective against four (4) meningococcal serotypes (A, C, Y, W-135).

The pneumococcal conjugate vaccine is administered by an intramuscular injection and it offers a long-term protection.

The number of doses depends on the age in which the vaccination cycle begins.

The pneumococcal polysaccharide vaccine is only administered to children older than 2 years by a subcutaneous injection in a single dose. It gives a short-time protection.

When it is necessary to postpone vaccination

This vaccination, as the other ones, has to be temporarily postponed when a child has an acute feverish sickness or when it presents serious general disorders.

When it is necessary to avoid vaccination

There are no pathologies that need avoidance of this vaccination: only children who have had a severe allergic reaction to any vaccine components or to a previous dose of this vaccine should not get vaccinated.

Side effects

It is possible to have a local irritative transitory reaction. This reaction may produce pain, redness, and swelling. Other side effects can include fever, usually lower than 38,5°C, slight irritability or sleepiness, and loss of appetite. This vaccine, as any foreign substances to our body, rarely causes specific allergic reactions.

Vaccination against **Chickenpox**

What is chickenpox?

Chickenpox is an infective, very contagious disease caused by a **virus** which spreads through direct contact with blisters on the skin or through the respiratory tract.

It reveals itself by a not very high fever, an unwell feeling and a typical exanthema characterized by small pink papules which appear in following waves during 3-4 days over the chest, face, the limbs, but also inside the mouth, anus, vagina and ears. These papules cause a very strong itching and will become blisters, pustules and finally granular scabs which will fall off. Sometimes there is also a strong cough together with these symptoms.

Chickenpox complications are not very usual in children. If contracted during the beginning of a pregnancy, varicella [chickenpox] can cause fetal malformations (ocular lesions, malformations of limbs, mental retardation); when it is contracted, however, during the last days of the pregnancy it can cause a very serious form of varicella both in the mother and her child and can even lead to death.

Subjects with a damaged immune system and adolescents and adults a little less, can contract varicella in a more serious form than children and can suffer pulmonary and neurological complications.

A late manifestation of this infection (herpes zooster) happens in 15 cases out of every 100 sick individuals, because of the virus's persistence inside the nervous ganglia. This risk increases with age.

Vaccine against chickenpox

The vaccine against chickenpox is made with an attenuated live virus.

It can be administrated to babies older than 12 months.

In our Region, vaccination against chickenpox is recommended and, since 01.01.2006, free for all new-born babies, and adolescents who have not contracted chickenpox before. It is strongly recommended for adults at particular risk.

The vaccine gets administered in a single dose when children are younger than 13 years and in two doses when people are older.

The vaccination is done through a subcutaneous injection

When it is necessary to postpone vaccination

It is necessary to postpone when:

- A child has an acute feverish sickness or presents serious general disorders the medical staff should temporarily postpone vaccination;
- The subject was recently administered with immunoglobulins, blood or plasma, products which can impede a good immune answer to vaccination;
- The subject was recently administered with a live virus based vaccination.

When it is necessary to avoid vaccination

The chickenpox vaccine, either single or combined, must not be administered in these cases:

- Serious defect of the immune system due to diseases or treatments;
- Severe allergic reactions to any vaccine components (i.e. neomycin or gelatine) or to a previous dose of this vaccine.

Side effects

The chickenpox vaccine is usually well-tolerated. Slight local irritative reactions (redness and swelling) may occur. Within 6-12 days after vaccination a child can sometimes get a fever, generally very slight and for a short time; in 5-15% of the cases the temperature can reach 39°C. 5% of the vaccinated children may have a slight rash. In this case, although rarely, the child may be contagious.

This vaccine, as for any foreign substances to our body, rarely causes specific allergic reactions

If any serious side effects related to vaccination appear, please contact the vaccination office or your family doctor.



Some helpful suggestions...

if after vaccination:

your child is restless

After vaccination children can be restless because they feel pain where they were injected or they are feverish. In this case you can administer a drug, paracetamol, which helps in reducing pain and temperature.

Your child has his/her leg (or arm) warm, swollen or reddened

At the injection site, the leg (or arm) can redden or swell up. To relieve the nuisance, the application of a clean, cold cloth on the painful and inflamed area is usually enough. In case you think the pain is very high, because your child even reacts to a soft touch, you can administer paracetamol.

-

Your child gets a temperature

When your child seems warm and reddened after vaccination, take his/her temperature. It is better to take the rectal temperature, because the axillary temperature is usually lower and less reliable.

When your child gets feverish

- Give him/her plenty to drink;
- Dress him/her in light-weight clothes and don't cover him/her too much
- Give him/her a bath with tepid water (no cold water)
- Give him/her paracetamol (no acetylsalicylic acid) when the fever is higher than 38,2°-38,5° (38,7°-39° rectal temperature).

DOSES OF PARACETAMOL
To administer every 4-6 hours

Weight (kg)	Suppository (mg)	Drops	Syrup (ml)
5-10 11-22 More than 23	1 of 125 mg 1 of 250 mg 1 of 500 mg	3 drops for kg of weight	½ ml per kg of weight

Some helpful addresses to gain more knowledge on internet (web)sites:

www.ministerosalute.it

www.simi.iss.it

www.levaccinazioni.it

www.pediatria.it



CHILDHOOD VACCINATIONS

4° edition

Information document for parents

-2006-

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