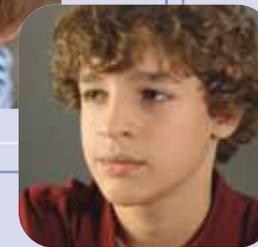


# Childhood and adolescent vaccinations



Coordinamento editoriale:  
Marta Fin (Assessorato politiche per la salute, Regione Emilia-Romagna).

Revisione dei testi e aggiornamento a cura di:  
Maria Grazia Pascucci, Gabriella Frasca e Flavia Baldacchini (Assessorato politiche per la salute, Regione Emilia-Romagna).

Hanno collaborato alla 1ª edizione:  
Luisella Grandori, Pietro Ragni (Assessorato politiche per la salute, Regione Emilia-Romagna) con il contributo di Massimo Farneti, Rosanna Giordani, Giovanna Giovannini, Mara Manghi, Sandra Sandri (pediatri di comunità), Maria Catellani, Roberto Cionini (pediatri di libera scelta) e con la consulenza di Maurizio Bonati (Istituto Mario Negri - Milano).

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Ge.Graf

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# Vaccination schedule

After a general introduction about vaccinations for children and teenagers (why to get vaccinated, what are the benefits, how to learn more about it) we describe in specific leaflets the different vaccinations scheduled for all children and teenagers (polio, diphtheria, tetanus, hepatitis B, pertussis, haemophilus influenzae, pneumococcus, meningococcus, measles, mumps, rubella, HPV). Then we describe those which are recommended for children and teenagers who go through particular situations that may increase the risk of getting a particular disease (flu, chickenpox).

All vaccinations included in the vaccination schedule, which you will find on the last page of the brochure, and all vaccinations strongly recommended for children and teenagers at risk, are free of charge.

Every leaflet contains a description of the infectious disease, an explanation of the vaccines used against it and a report on the possible side effects.

Information concerning contagious diseases is based on the most authoritative national and international scientific literature as well as on statistics and epidemiologic data issued by the Department of Health and the Emilia-Romagna region.

We also describe the side effects certainly or probably caused by vaccinations according to national and international scientific literature data and according to information gathered by the regional and national Vaccine Adverse Event Reporting System, controlled by the Department of Health.

If you have any doubts or need more information about the vaccines, you can either contact your paediatrician or the local health unit (AUSL) specialized in vaccinations.

For more information you can call the Emilia-Romagna regional health service **toll free number 800 033 033** (numero verde gratuito del Servizio sanitario regionale dell'Emilia-Romagna 800 033 033), from Monday to Friday from 8.30 am to 5.30 pm and on Saturday from 8.30 am to 1.30 pm.

VACCINO	AGE (months and years old)						
	2 months	4 months	10-12 months	12-15 months	5-6 years	11 years	14-15 years
Poliomyelitis	1 <sup>st</sup> dose	2 <sup>nd</sup> dose	3 <sup>rd</sup> dose		4 <sup>th</sup> dose		
Diphtheria/Tetano	1 <sup>st</sup> dose	2 <sup>nd</sup> dose	3 <sup>rd</sup> dose		4 <sup>th</sup> dose		5 <sup>th</sup> dose
Hepatitis B	1 <sup>st</sup> dose	2 <sup>nd</sup> dose	3 <sup>rd</sup> dose				
Pertussis	1 <sup>st</sup> dose	2 <sup>nd</sup> dose	3 <sup>rd</sup> dose		4 <sup>th</sup> dose		
Haemophilus influenzae	1 <sup>st</sup> dose	2 <sup>nd</sup> dose	3 <sup>rd</sup> dose				
Pneumococcal infection	1 <sup>st</sup> dose	2 <sup>nd</sup> dose	3 <sup>rd</sup> dose				
Meningococcal serogroup C				one dose			one dose
Measles, mumps, rubella				1 <sup>st</sup> dose	2 <sup>nd</sup> dose		
Chickenpox*							1 <sup>st</sup> dose 2 <sup>nd</sup> dose
HPV <sup>§</sup>						1 <sup>st</sup> dose 2 <sup>nd</sup> dose 3 <sup>rd</sup> dose	

\* Only for those who risk being infected § Only for girls.

Type of administered vaccine	AGE (months and years old)						
	2 months	4 months	10-12 months	12-15 months	5-6 years	11 years	14-15 years
Hexavalent (diphtheria, tetanus, pertussis, polio myelitis, hepatitis B haemophilus)	✓	✓	✓				
Trivalent (measles, mumps, rubella)				✓	✓		
Tetravalent (diphtheria, tetanus pertussis)					✓		
Diphtheria/Tetanus for adults							✓
7-valent / 13-valent pneumococcal	✓	✓	✓				
Meningococcal serogroup C				✓			✓*
HPV						✓	
Chickenpox							✓

\*if not previously administered

# Vaccinations for children and teenagers

## Advantages

All around the world vaccinations have helped reducing or defeating terrible diseases, such as smallpox, polio, tetanus and diphtheria. Vaccinations are based on the fact that, when infected by given micro organisms, the body produces immune defences against them, so that it can self-protect. Vaccines are generally well-tolerated and do not cause any damage. Serious reactions such as anaphylactic shock or neurological problems are extremely rare, and always much less frequent than the complications due to the disease itself.

Vaccines provide much more benefits than risks. Vaccinations do not only protect individuals, but the whole community as well. Through the vaccination of a large number of children it is possible to fight the spread of the microbe, thus leading to a decrease or even to a complete disappearance of the disease. Therefore, vaccinations also protect unvaccinated children and people who cannot take the vaccine because of serious health problems (immune system problems, cancer, etc.).

## Get informed in order to choose wisely

In every local health centre of our region you will find specialized staff, willing to provide information about this topic. They will also consider whether there are reasons to postpone the vaccination, they will ask parents for the permission to vaccinate their children, they will administer the vaccine and check on children after the vaccination has been given. Parents will have the chance to examine the files concerning the administered vaccines and they will also be given explanations about how to face the small problems which can occur after the vaccination (fever, swelling in the area where the shot was given etc...).

Contraindications to vaccinations are rare. To determine if there are conditions which can prevent the child from taking the vaccine, an interview with the doctor is necessary. Potential contraindications are not to be confused with the "side effects", which are problems that might occur after the vaccination.

**Vaccinations usually consist of one or more injections. Children do not need to have an empty stomach to take the vaccine.**

After the vaccination, parents and children are invited to stay in the waiting room for 30 minutes. This is a precautionary measure, because it is very rare for reactions to appear right after the vaccination. Anyway, all the health centres specialized in vaccinations of our region are equipped to handle these emergencies.

## If something goes wrong

Serious problems after the vaccination are very rare but not impossible. If your child, after the vaccination, shows alarming problems, we suggest that you contact your paediatrician. For the extremely rare cases of permanent damage caused by vaccination, the state has established damages. In these cases, please contact the forensic medicine service of your Local Health Unit (AUSL).

## Combination vaccines

Combination vaccines combine multiple vaccines into a single shot. This represents a saving of money, time and especially of stress to both mothers and children. In addition, children will get fewer injections, thereby limiting the amount of side effects.

Usually the following combination vaccines are used:

The **hexavalent** vaccine (poliomyelitis, diphtheria, tetanus, hepatitis B, pertussis, haemophilus) is given in three doses in the first year of age.

The **trivalent** vaccine (measles, mumps, rubella) is given at the age of 13-15 months and 5-6 years.

The **tetavalent** vaccine (diphtheria, tetanus, pertussis, poliomyelitis) is used as a booster dose at age 5-6 years.

Other combination vaccines can be used occasionally.

# Poliomyelitis

## ■ □ □ The disease

Poliomyelitis is an infectious disease caused by three different types of polioviruses. These viruses usually enter the body through the digestive system. Polio is a very dangerous disease which, in the most serious cases, can cause paralysis, primarily of limbs, and sometimes also lead to death. There is no treatment for polio. The only solution is prevention.

In Italy the improvement of hygiene conditions has stopped the spread of many infectious diseases, including poliomyelitis, but only thanks to prevention it is possible to protect children and stop epidemics.

In Italy several epidemics occurred in the past decades, causing thousands of cases of paralysis. For this reason vaccination has become compulsory since 1966. The outcomes are positive: the last 2 cases of polio in Italy date back to 1982, and concerned two not immunised children.

As polio still exists in some countries of the world (especially in Africa and India) and nowadays people move very easily from one continent to the other, it is necessary to keep vaccinating children, in order to avoid the reappearance of the poliovirus in Italy.

## □ ■ □ The vaccine

There are two vaccines against polio, and both are effective. The first is known as **Salk** vaccine, the second is called **Sabin** vaccine.

Since 2002, in Italy, vaccination against polio consists of 4 doses of the Salk vaccine, which contains the killed or inactivated polioviruses. It is usually administered by only one injection, together with other vaccines.

The Sabin vaccine, which contains the live but attenuated viruses, is no longer used.

The vaccine is highly effective: almost all the people having been immunised are protected for decades.

## Side effects

The Salk vaccine is highly safe. Most children do not have problems. Reactions, such as soreness or swelling at the injection site, fever or indisposition, are very rare.

By using the Salk vaccine for the whole vaccination cycle, the risk of paralysis, which could rarely appear when the Sabin vaccine was used, has been completely eliminated. Allergic reactions to vaccine components are very rare, as for all vaccines.

# Diphtheria and Tetanus

## ■ □ □ The diseases

**Diphtheria** is a very serious and contagious disease which usually spreads from person to person by breathing. It is caused by *Corynebacterium diphtheriae*, a bacterium that produces a toxic substance (diphtheric toxin) with consequent serious damage of several organs (such as the heart and kidneys). The material formed in the nose, throat and larynx can cause suffocation. About one case out of ten can lead to death, even if treated.

In Italy, at the beginning of the 20th century, from 20,000 to 30,000 cases of diphtheria occurred every year, with about 1,500 deaths. With the diffusion of the vaccination across the nation, cases of diphtheria in Italy almost disappeared. The last case of diphtheria during childhood occurred in 1991 in an unvaccinated young girl.

Recently in Eastern Europe, the reduction in the number of vaccinations for economic reasons has caused an epidemic (from 1996 to 1998) with thousands of deaths.

In the Nineties in Italy, three cases of diphtheria were recorded, all in unvaccinated people, but none of these in Emilia-Romagna. The death of a Finnish child, who had not been vaccinated yet, in 2001, proves that the microbe is still circulating across Europe.

**Tetanus** is a very serious illness caused by a microbe (*Clostridium Tetani*) which can enter the body through wounds, especially if soil or dust are present, and which produces a toxic substance (tetanic toxin). This toxin causes very severe and painful convulsions and, in about one case out of six, it can lead to death. Tetanus often forces people to a long hospitalization.

Starting from 1968, children in Italy must be vaccinated against tetanus. For this reason, nowadays tetanus affects almost only adults and elderly people. Every year, in Italy, about 60 people contract the disease, the majority of whom are unvaccinated or incompletely vaccinated women over 65. In our region, there are less than 10 cases of tetanus every year.

## **The vaccine**

The vaccines against diphtheria and tetanus are prepared with the diphtheric and tetanic toxins, which are modified in order not to be dangerous but capable of inducing the organism to produce defences against the two diseases.

Both vaccines are administered through injection, combined with other vaccines. The vaccination is highly effective: almost 90% of the people who are administered the vaccine are protected against diphtheria and almost 100% are protected from tetanus. Booster doses are necessary for these vaccines: the first one at 5-6 years of age and the following ones every ten years.

## **Side effects**

The vaccine is well tolerated and it usually does not cause reactions.

It can cause swelling, redness and soreness where the shot was given. Fever, usually mild, also rarely occurs. Adults can very rarely experience dizziness or sensibility disorders (neuritis).

Allergic reactions to components of the vaccine are very rare, as for every vaccine.

# Hepatitis B

## ■□□ The disease

Hepatitis B is a contagious disease that affects the liver and is caused by the hepatitis B virus. In many cases the virus does not cause any problems, since the organism can defend itself from the virus.

In other cases, on the contrary, it is a real disease, with symptoms such as weakness, joint pain, nausea, vomit, fever, yellowish discoloration of the skin and the eyes (jaundice). These symptoms not always appear together, especially in children.

The development of the infection is not always the same either. The majority of people (85-90%) recover completely.

In some cases, especially in adults, the disease can be lethal, while in other cases some serious illnesses can occur, such as cirrhosis or liver cancer.

It is possible to become chronic carrier of the virus without developing the disease.

The Hepatitis B virus is transferred from ill people or from chronic carriers through blood and sexual contact. People who live with an ill person, or with a chronic carrier, risk to be infected.

Children of mothers who are chronic carriers have a high risk of getting infected if not vaccinated as soon as possible.

Nowadays transfusions are very safe and they do not represent a risk of infection. Children and teenagers started being vaccinated in 1991, this campaign led to a decrease of hepatitis B especially in people aged from 15 to 24, who are the most exposed.

As far as this age group is concerned, the cases in Emilia-Romagna decreased from 102 in 1992 to only one case in 2008.

## □■□ The vaccine

The vaccine against hepatitis B in use nowadays contains only one part of the virus. It is very effective, especially for children, who gain protection in almost all the cases (98%).

The vaccine is administered through an injection, sometimes together with other vaccines.

Vaccination is compulsory in Italy since 1991 for all children in their first months of age. It is offered for free to all the people at risk for hepatitis. Children of mothers who are chronic carriers are given the first injection on the day they are born.

### □ □ ■ Side effects

The vaccine is well tolerated. Soreness, redness and swelling can appear on the injection area. Mild fever, headache, nausea, dizziness, muscle and joint pain can rarely occur, but always mildly and for a short time. Teenagers and adults can even more rarely experience sensitivity or movement problems. Allergic reactions to components of the vaccine are very rare.

# Pertussis (whooping cough)

## ■□□ The disease

Pertussis is a contagious disease caused by a microbe (*Bordetella pertussis*) which spreads by contact with airborne discharges of the bacterium and causes epidemics every 3-4 years.

Since the vaccination has spread, the number of cases in Italy has highly decreased. In our region they diminished from 5,000 in 1987, to 700 in 1998 and to only 35 cases in 2008.

Pertussis lasts for several weeks. It is initially characterized by sneezing, a runny nose, mild fever and catarrhal cough. Later on, the typical coughing fits appear, and they may be followed by vomiting. This stage lasts for about 4 weeks, then the coughing fits gradually diminish and become less hard.

Usually patients recover from pertussis without consequences, but complications such as laryngitis, pneumonia, seizures, and brain damage are possible.

This disease is particularly serious if contracted during the first year of age: it can cause suffocation crises which force the patient to hospitalization. Moreover, at this age brain damage is more frequent and can be permanent, leading to death in the most serious cases.

Pertussis is always highly disturbing for children, while for adults it is milder but longer-lasting. These weaker forms are often not recognized and can infect younger children.

## □■□ The vaccine

A vaccine that contains only some "parts" of the microbe – and consequently causes very rare side effects – has been used for some years. The vaccine consists of only one shot, which is injected combined with other vaccines.

The vaccination is highly recommended for children from 2 months of age, in order to protect them in their first months of age, when the disease can be more dangerous. The defences transferred from mother to child do not protect the baby from this illness. About 85% of vaccinated children are well-protected from the disease, at least in its more serious forms. After the 3 scheduled doses during the first 12 months of life, protection lasts at least until the fifth year of age.

**In order to protect younger children who have not been vaccinated yet, or are being vaccinated, it is important that older brothers and sisters are vaccinated, especially if they go to school.**

## □ □ ■ Side effects

Soreness, redness and swelling can appear within 24/48 hours in the area where the shot was given, but these reactions are usually mild and short-lasting. During the two days after the shot is given, the child may experience fever (usually mild), irritability or sleepiness. These reactions are very rare and can last for one or two days. Fever higher than 40.5 °C, inconsolable crying which lasts for more than 3 hours, collapse and seizure have become extremely rare thanks to the new vaccines. These reactions do not cause consequences but may suggest avoiding subsequent vaccinations against pertussis.

If the child has experienced fever-related seizures in the past (the so-called febrile convulsions, febrile seizures or "fever fits"), there are no reasons to prevent him/her from taking the vaccine, but the paediatrician will nonetheless make the ultimate decision.

Allergic reactions to vaccine components are very rare, as for all vaccines.

# Haemophilus Influenzae infection

## ■□□ The disease

Haemophilus bacteria (Haemophilus Influenzae type B) can usually be found in the throat or in the nose, where they do not cause any problems, and are spread through air. Almost every child in their first 5 years of age sooner or later contracts the bacteria. This contact usually does not cause any damage. However, in some children it can spread throughout the body and cause serious diseases.

Among these, the most common one is meningitis, which can be life-threatening and cause serious lasting damage, such as convulsions, deafness, blindness, paralysis and mental retardation.

However, these bacteria can also affect the child's throat and they can cause a serious inflammation that can lead to death by asphyxiation. It can also affect lungs or the whole body.

These diseases usually strike children under 5 years of age and even more those under 2 years of age.

Every child can get sick from serious infections caused by haemophilus bacteria. The risk is higher for those children who:

- live in big families, with older brothers and sisters who go to nursery school or school;
- go to nursery school;
- are affected by immune system problems, congenital disorders, tumors, lack of spleen, leukemia or HIV infections.

In Italy the number of serious diseases caused by haemophilus bacteria has decreased a lot after the introduction of the vaccine in the second half of the Nineties. The recorded cases have decreased from 130 in 1996 to 51 in 2008. In the same lapse of time the number of cases in Emilia-Romagna has dropped from 12 to 1.

## □■□ The vaccine

The vaccine is the only way to prevent the most serious infections caused by the haemophilus bacteria. It contains part of the modified microbe, which is no longer dangerous but at the same time still able to provide a good protection against the disease.

The vaccine is recommended for every child from 2 months of age, in order to

protect them when they are most exposed to this infection.

If the child is in a high risk condition (see above), vaccination is even more important.

The vaccination consists of only one injection, usually combined with other vaccines. The vaccine against haemophilus bacteria is highly effective (99%). A booster dose is not needed after the first year of age.

Vaccination is recommended for every child up to 5 years of age and for older people only in case of high risk (see above).

### Side effects

Side effects are rare and short-lasting. Mild reactions, lasting for a short period of time and more common in older children, may include redness, swelling and soreness at the injection site. For younger children, side effects can include fever, usually less than 38.5 °C (about 100.49 °F), irritability, sleepiness, sometimes nausea and diarrhea. These problems are slight and rare and they may last 1-2 days. Allergic reactions are very rare, as for all vaccines.

# Measles, Rubella, Mumps

## ■ □ □ The diseases

Measles, rubella and mumps are considered to be harmless childhood diseases. In fact, sometimes they can have very serious consequences.

Suffice it to say that there have been two measles epidemics in the last decade in Italy. In 2002 and 2003, in Italy, an epidemic of measles led to more than one thousand hospitalizations, 23 encephalitis cases and four deceases. In Emilia-Romagna, 200 cases per year have been registered between 2002 and 2003.

The second epidemic, which in 2008 spread all over Europe, caused in Emilia-Romagna 180 measles cases, including 61 hospitalizations and 9 cases of pneumonia. Mainly young people between the age of 15 and 24 were concerned.

Since the Nineties, the Emilia-Romagna region has organized a large scale vaccination campaign, stopping the spread of the measles epidemic and drastically reducing the cases of rubella and mumps.

**Measles** is usually associated with high fever, hard cough, respiratory secretions, conjunctivitis and rose spots on the skin (exanthema).

The disease's main complications are otitis, bronchopneumonia or encephalitis. Encephalitis can cause permanent damage such as convulsions, deafness or mental retardation. Death by measles is unusual, but not impossible.

Measles can very rarely (1-2 cases out of 100,000) cause SSP (Subacute sclerosing panencephalitis), which can cause irreversible brain damage.

In countries where vaccination has existed for a long time, SSP has virtually disappeared.

**Rubella** (commonly known as **German measles**) passes unnoticed in the majority of cases. Sometimes it is associated with mild fever, glands (lymph nodes) swelling, especially in the neck or in the nape and pink spots on the skin. To be sure you had German measles, you need to take a blood test, since other viruses can appear with the same symptoms.

In 2008 there has also been an epidemic of rubella. In 2008 the number of rubella cases in Emilia-Romagna has gone up from less than 30 per year to 500.

German measles does not generally cause problems, apart from the case of unvaccinated pregnant women or women who have not had the disease yet. In these cases, the virus can reach the foetus and cause abortion or heart, eyes, hearing apparatus or brain malformations.

During the 2008 epidemic, 116 women at fertile age and 3 pregnant women contracted rubella in Emilia-Romagna.

Epidemic **parotitis** (commonly called **mumps**) is usually associated with painful swell-

ling of a salivary gland located under the ear (parotid gland). The swelling can affect one or both glands or even other salivary glands. The disease often occurs with headache, stomach-ache and fever.

Complications, such as meningo-encephalitis (usually benign), hearing apparatus damage or pancreas inflammation, are rare.

This disease can cause inflammations of one or both testicles in about 30% of cases when it affects men after their puberty. More rarely, in about 5% of women, it can affect the ovaries.

In Emilia-Romagna the number of cases of mumps has dropped from about 8,000 per year in 1996 to less than 200 in 2008.

### **The vaccine**

The vaccine against measles, rubella and mumps (trivalent) contains, in the same shot, the three live attenuated viruses (weakened viruses which do not cause the disease but can equally stimulate the defences against the infection).

As far as measles is concerned, the protection obtained is about 95% after the first dose and 99% after the second. A long-term protection from rubella can be obtained right after the first dose in more than 90% of cases. As for mumps, the protection depends on the kind of vaccine and may not be optimally effective. Nonetheless, in countries where the vaccination is widespread, the number of cases of this disease has drastically decreased.

The vaccine is administered through an injection in the arm. The trivalent vaccine protects children from all three diseases with one injection and it is useful for the community, since it reduces the circulation of the three viruses, protecting unvaccinated people as well.

The vaccine is recommended for all children between 12 and 15 months of age. The second dose is administered at 5-6 years. Children who already had one of the three diseases can be vaccinated without any problems.

### **Side effects**

The vaccine is usually well-tolerated. Redness and swelling in the injection site are rare, mild and temporary. 5-12 days after the vaccination the patient can experience mild fever while only in 5-15% of cases it is higher than 39°C. Fever convulsions are very rare, while they are more common when associated with a disease, especially measles. Temporary joint pain can occur after 1-3 weeks. These are very rare in children and more common in women. Even more rare (1 case out of 30,000) is a temporary decrease in the number of platelets (thrombocytopenia) during the two months after the vaccination. This complication is ten times more common if measles or rubella infect people. After vaccination, it is possible to experience the symptoms of the three diseases in a very mild form.

Allergic reactions to components of the vaccine are very rare, as for all vaccines.

# Pneumococcus

## ■□□ The disease

More than 90 types of pneumococcus bacteria (*Streptococcus pneumoniae*) are known nowadays, some of which cause diseases such as meningitis, pneumonia or infections which spread throughout the body (sepsis). Pneumococcus microbes can be found in the nose or throat without causing any discomforts or they can cause mild illnesses, such as otitis, sinusitis and bronchitis.

For children under 5 years of age, and especially under 2 years of age, and for the elderly the risk of getting this disease is higher. In Italy the cases of meningitis caused by a pneumococcus virus in children under 5 are about 40-50 every year, whereas in the Emilia-Romagna region from 2 to 8 cases are recorded. Occurrence does not appear to be high in Italy and in Europe, whereas it is higher in the United States.

In younger children infections caused by pneumococcus bacteria are often lethal; every year about one child dies because of this disease in our region. The most serious forms of pneumococcus infections are more common in people of any age suffering from particular conditions, such as diseases which weaken the immune system, malfunction of the spleen, chronic medical conditions of lungs, liver and heart, diabetes, and in people using cochlear implants for serious hearing impairment. Going to nursery school or to kindergarten can increase the risks of getting serious infections, but risks are still very low.

## □■□ The vaccine

There are two types of vaccine against pneumococcal infections, both administered through an injection:

- One recently produced active vaccine against 7 types of pneumococcus virus which stimulates a good protection from the very first months of age. Its effectiveness in preventing the most serious infections is very high (nearly 100%); protection from otitis is instead very low. The overall protection lasts very long.
- The second vaccine contains 23 types of pneumococcus virus. It has been used for years, children and adults are well protected, but it is not effective under 2 years of age, because it cannot stimulate the immune system in younger babies. This vaccine should be followed by a booster dose after 3-5 years.

For children under 5 and elderly people with a weak immune system or using a

cochlear implant, it is better to take both vaccines, one after the other, in order to strengthen the protection. Children over 5 are given only the vaccine containing 23 types of pneumococcus viruses.

**In the Emilia Romagna region, vaccination against pneumococcus is recommended and given for free to all children under high risk because of the conditions described above, to children going to nursery school and, since 2006, to all newborn babies and people using a cochlear implant.**

Since the middle of 2010 a new vaccine that guarantees protection against 13 kinds of pneumococcus is available. It replaces the previous vaccine effective against 7 types of pneumococcus, which represents a great advantage for all children.

#### Side effects

Both vaccines are well tolerated, but sometimes redness, swelling and soreness may appear in the injection site and the child may be more irritable or sleepy than usual. Fever, usually mild, headache or weakness are very rare, as well as seizures associated with fever. Allergic reactions to the vaccine components are very rare, as for all the other vaccines.

# Meningococcus

## ■ □ □ The disease

The meningococcus (scientifically called **Neisseria meningitidis**) is one of the microbes that may provoke meningitis or spread infections (sepsis), like the pneumococcus, the haemophilus and other viruses.

The meningococcus can be found in many people's throats or noses without provoking any disease, but sometimes, for unknown reasons, it reaches the meninx (the thin membrane which covers the brain) and it spreads all over the body. Serious infections caused by meningococcus strike children until 5 years of age, then the adolescents, the young people and the adults. Like everywhere else in Italy, in Emilia-Romagna serious infections are not so common. Treatments are very effective and an adequate therapy can protect those who had close contact with an infected person. The illness caused by the meningococcus may also have serious consequences and lead to death (10-15% of cases).

Nowadays, we know 13 types of meningococcus, but the most widespread are the A, B and C groups; more precisely, the B and C groups in Italy and in Europe, and the A group in Africa.

In Europe the most common meningococcus is the B group, but in the last few years there have been some epidemics caused by the C group. For this reason, many nations have added in their vaccination calendar the new vaccine against group C meningococcus.

In Italy and in our region there were no epidemics, but in the last few years the number of infections by meningococcus C has grown, even if few are the cases recorded.

Every year in Italy, there are from 50 to 100 cases of illness among children aged under 5, and 1 to 8 in Emilia-Romagna. The prevailing strain has always been the group B meningococcus, but in 2004 and 2005 it was recorded that the number of group C meningococcal infections had increased. After the introduction, in 2006, of the vaccine in Emilia-Romagna, no more cases of group C meningococcal disease have occurred in children.

People whose immune system has been weakened by other illnesses are exposed to the risk of becoming seriously ill because of meningococcus.

## □ ■ □ The vaccine

There are two kinds of vaccine against the meningococcus and they are both administered through an injection:

- the conjugated vaccine against group C meningococcus can be administered to

children from 2 months of age. It can highly defend from the illness (about 90% of children and adolescents) and it should assure a long-term protection.

- tetravalent polysaccharidic vaccine against the A, C, Y, W-135 groups can be used only with children older than 2, and its effects tend to disappear after 3-4 years. It should be administered when travelling to one of those countries where one type of the meningococcus, other than group C, can be found. There is still no vaccine against group B meningococcus.

### Side effects

The vaccine is usually well tolerated. However, sometimes the patient may develop irritation, swelling and pain in the place of the injection or even a mild fever and general indisposition. Allergic reactions to the vaccine components are rare, as well as for the other vaccines.

**In Emilia-Romagna vaccination against group C meningococcus is strongly recommended and offered for free to children at risk because of congenital defects of the immune system or for the lack or malfunction of the spleen and to all the children aged between 12 and 15 months of age. The vaccination is also available for adolescents aged 14-15.**

# HPV

## ■□□ The disease

The Human Papillomavirus (HPV) is a largely widespread virus: approximately 120 HPV types have been detected and 40 of them can infect the female genital area (especially the cervix and the vagina).

These infections are generally not persistent and self-limited, meaning that they heal spontaneously in about 90% of cases; in most cases they occur without any symptoms: in fact, often women do not realize they have been infected.

Some types of HPV (among these, types 16 and 18) can cause, though rarely, cervical cell abnormalities that may lead to cancer.

Persistent HPV infections are now recognized as the major cause of cervical cancer (more than 70% of cases). The HPV types involved are types 16 and 18. Many years may pass (even 20) from the acquisition of the infection to the development of cancer.

Factors that contribute to the development of cervical cancer are: prolonged use of oral contraceptives, smoke, HIV infection, several sexual partners and children. Cervical cancer is the first cancer to be recognized by the World Health Organization (WHO) as certainly caused by viral infection.

Genital HPV infections are sexually transmitted even without penetration or ejaculation, causing the most common sexually transmitted infection, largely widespread among young women aged around 25.

## □■□ The vaccine

Both vaccines available on the market contain Human Papilloma Virus types 16 and 18.

The vaccine is safe. Therefore it cannot infect or reproduce the virus nor cause the disease.

Clinical trials indicate that if the vaccine is administered when the woman is not sexually active, its effectiveness against precancerous lesions due to HPV types 16 and 18 is higher (90-100%).

The effectiveness of the vaccine reduces greatly for sexually active women.

This is the reason why the World Health Organization (WHO) recommends teenage girls to take the vaccine: its effectiveness at their age is higher.

The Emilia Romagna Regional Health Service (Servizio Sanitario Regionale) offers free vaccination for girls in their 12th year of age. The AUSL local units send letters to every 12-year-old girl to invite them to take the vaccine.

The vaccine consists of 3 doses and should be administered, through intramuscular injection, over a 6-month period.

Since about 30% of cervical cancer cases are not due to HPV types 16 and 18, girls should regularly undergo **pap tests**, even if they are vaccinated. This simple screening is used to identify abnormal cells in the cervix and to prevent the development of these abnormalities into cancers, by using medical treatment. The Emilia Romagna Regional Health Service guarantees to all women between the age of 25 and 64 a free pap test every 3 years, together with in-depth examinations and therapies, if needed.

### Side effects

Clinical trials have shown that the vaccines are safe, and the results of the surveillance on the vaccinated population confirm this too.

However any vaccine, like any other medicine, can provoke side effects: it is important that you report them to your family doctor or to the person who administered the vaccine to you.

Both vaccines contain neither mercury nor thiomersal.

Redness, pain, swelling and itching on the injection site are the most common problems related to HPV vaccines. Fever, headache, muscular and joint pain, gastrointestinal symptoms, cutaneous eruptions and hives are minor symptoms that last for a short period of time.

Allergic reactions to components of the vaccine are very rare.

# Chickenpox

## ■□□ The disease

Chickenpox is a very contagious disease caused by the Varicella-Zoster virus. It is associated with small spots on the skin, which fast turn into vesicles and scabs. It can also be characterized by fever and indisposition, more often in adults. After recovering, the virus remains in the organism, and people with a weak immune system (elderly, immunodeficient people) can suffer from Herpes Zoster, commonly called "shingles", which appears with vesicles and scabs just like chickenpox, but along the run of a nerve (mostly a chest or a head-nerve).

The virus spreads through the small drops produced by talking or breathing or through the vesicles' liquid, through direct contact or air-diffusion, from about two days before the appearance of the vesicles until the moment they become scabs.

Every year, in Italy, about 100,000 cases of chickenpox occur, 10,000 of which in our region. The disease mainly infects children up to 10 years of age, on whom it does not cause serious problems. Among the rare neurological complications, the most common is the inflammation of the cerebellum (lower back portion of the brain), which causes balance disorders but usually disappears without any damage left.

Chickenpox can be very serious if it infects newborns (if the mother gets infected from 5 days before, to 2 days after the birth) and people who have serious immune system problems. Chickenpox more often causes complications on teen-agers and adults, too. Herpes Zoster can appear years or decades after chickenpox has appeared and it is often more serious (but not for children).

## □■□ The vaccine

The vaccine against chickenpox contains the weakened virus, which cannot cause the disease but can stimulate the production of defences. It is administered with an injection after the 12th month of age. Two doses of vaccine are recommended; after the second dose, a 99% protection is reached. Taking the vaccination within 3-5 days from the contact with a person who has chickenpox can protect from being infected or guarantee that the disease will develop in a weaker form.

The Emilia-Romagna Health System vaccinates only those children whose condition is at risk. This happens because in Italy the vaccine is not provided to everyone: to vaccinate every child would certainly slow down the spread of the virus but

it would also increase the risk of contagion at adult age.

**In the Emilia-Romagna region the vaccine against chickenpox is recommended only for people who have health problems and for people who live with them or assist them, such as:**

- people who are waiting for a transplant
- people with acute lymphoblastic leukaemia
- children with HIV infection
- people with chronic renal failure
- people who have not had chickenpox and live with people who have serious immune system disorders
- fertile women who have not had chickenpox
- people who work in the health sector dealing with newborns or patients who have serious immune system problems.

Since January 1st 2009 the chickenpox vaccine is offered to those adolescents who have not contracted the disease yet, and is given together with the booster dose of diphtheria and tetanus.

In all the above cases vaccination is given by the Emilia-Romagna health system free of charge.

### Side effects

The vaccine against chickenpox is usually well-tolerated and does not cause serious problems. Fever can rarely occur and vesicles or a weak form of Herpes Zoster after a long time (months, years) are even rarer.

Allergic reactions to components of the vaccine are very rare, as for all vaccines.

# Influenza (Flu)

## The disease

Influenza (flu) is a seasonal disease which spreads in winter. It is a very contagious infection caused by two different types of viruses (A and B), which may change every year. The defences developed by the body against the previous year's virus become less effective against the new infection. Therefore, unlike other infectious diseases like measles or chickenpox, it is possible to get influenza every year. Rarely, when the influenza (flu) virus changes a lot compared to the previous years, more serious epidemics occur around the world.

Flu is passed on from person to person, and in particular through the tiny drops spread by talking and breathing, or through hands or objects, which have been recently infected by nose or throat secretions, especially in children. Closed crowded places, where air is not much cleared, such as buses, shops, cinemas and classrooms, are places where the disease is more easily spread.

The first symptoms of influenza are: fever, chills, headache, muscle and joint pains, weakness, sore throat, coldness and cough; sometimes also vomit and diarrhoea. Fever lasts about 2-3 days, it may rarely last longer. Usually cold, sore throat and cough worsen in the following days and cough may last also 2 weeks. Sometimes flu is associated with fever and few other symptoms. After recovering, people often remain weak or indisposed even for many days. People completely recover from flu. The seriousness of the disease depends on the type of virus spread and on its differences from the types spread in the past years. Children who have been infected by few types of flu viruses, because of their age, get sick more often than adults.

The disease can be dangerous for children and adults in bad health conditions (chronic respiratory diseases, heart, liver or kidney illnesses, weak immune system) and for the elderly.

## The vaccine

As the flu virus mutates, every year a new vaccine is produced and given through an injection. The number of doses needed varies:

- one dose is enough for children over 9 years old and for younger children who have not been vaccinated yet
- two doses, the second one four weeks after the first, are necessary if the child is under 9 and is vaccinated for the first time.

Immunisation starts after approximately 15 days from vaccination. Vaccination against influenza effectively protects from possible complications and it is the safest way to prevent the disease. In children, immunisation gets stronger as years go by and they grow up. According to some studies on healthy people, about 50% of children under 5, 70% -80% of teen-agers and up to 90% of adults are protected against flu. Vaccination is recommended every year.

### Side effects

The vaccine is generally well tolerated and it does not cause any discomforts (especially in children). Mild side effects rarely occur. Soreness, redness and swelling can appear within 48 hours in the area where the injection was given. Fever, indisposition, muscle and joint pains, headache after 6-12 hours rarely appear, but they are more likely to appear in people who are taking the vaccine for the first time, and these side effects may last 1 to 2 days. Allergic reactions to components of the vaccine are rare, as for other vaccines. Vaccination against flu is given for free and is strongly recommended for those children whose state of health makes them weaker. Vaccination can be given under payment to all other children as well.