

Article: HPV vaccine – Information for girls



You may have already heard about the vaccines that could protect girls against cervical cancer. Perhaps you have talked to your parents and friends about it and are wondering whether to have a vaccine yourself.

The HPV vaccines protect you against certain viruses belonging to the group of so-called human papillomaviruses (HPV). You are almost certain to be exposed to these viruses in the next few years of your life. They are nearly always harmless. But in a very small number of women, these viruses can cause a chronic infection that may slowly develop into cervical cancer over many years. We have a short leaflet that explains the basics here (URL: <http://www.informedhealthonline.org/index.567.en.html>).

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This article explains in detail what these viruses do and how the vaccines work. We also explain more about cervical cancer, and why it is such a serious disease. We hope this information will help you to decide whether you would like to have the vaccine or not.

What is HPV and why is it likely to infect almost everyone? (URL:

<http://www.informedhealthonline.org/undefined>)

The HPV group of viruses spread very easily through close sexual contact – not only sexual intercourse, but through intimate contact too. Although some people will never be exposed to the virus, even if they have sex, about 80-90% of all sexually active people will be infected at some point in their lives. This will usually already happen in the first few years of sexual activity.

HPV infections are usually harmless and nearly always clear up on their own. The viruses infect the skin and the soft, moist linings inside parts of our bodies like our noses, mouths, throats and genitals. These inside linings are called mucous membranes. Most people do not know when they have an HPV infection, because it does not hurt and does not usually cause any other problems.

What happens when you are infected with HPV? (URL: <http://www.informedhealthonline.org/undefined>)

Most of the time HPV infections cause no harm. The immune system fights and destroys the virus. When we are infected, it usually takes about eight months to clear up completely.

However, sometimes the immune system is not able to destroy the viruses and people develop a chronic HPV infection: the infection stays in the skin or membranes as long as a year or more. Even a chronic infection will not usually cause symptoms. But in some of the women who have a chronic HPV infection in their genital area, the infection causes cells in the cervix to change over time. This will usually not have any serious consequences. Sometimes, though, cancer will start developing.

There is no effective treatment for HPV infections. Prevention is the only option for protection.

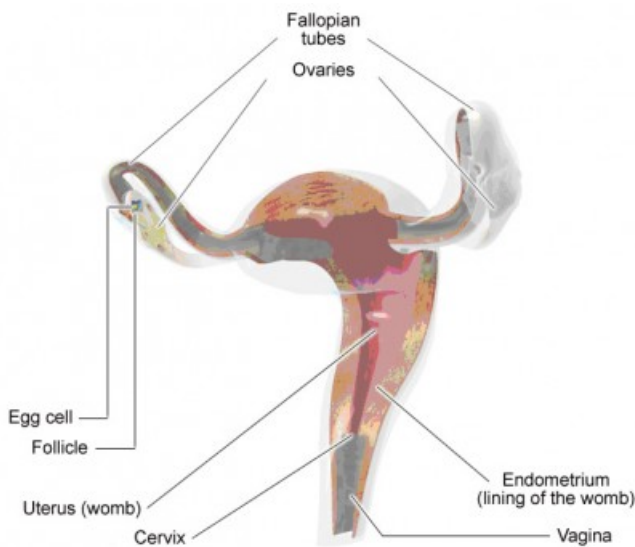
Some types of HPV can cause genital warts (papillomas or condylomas) in and around the vagina. These warts are often not noticeable. Sometimes they can be felt: they are small hard bumps with an uneven surface. But these warts are not cancer or pre-cancerous changes.

What is cervical cancer? (URL: <http://www.informedhealthonline.org/undefined>)

Cervical cancer is cancer of the cervix. This means that malignant (cancerous) cells are growing in the membranes there. It takes a very long time to develop. It affects about 6,200 women every year in Germany, which is about 12 to 14 out of every 100,000 women.

Most of these women are between the ages of 35 and 55. Cervical cancer is a very serious disease.

The cervix is the end or opening of the uterus (womb) high up inside the vagina. It is the most common place in women for HPV to cause cancer.



HPV plays a critical role in the development of cervical cancer. A chronic HPV infection there can cause cells to change. These could in turn develop into pre-cancerous changes. But it is important to know that even pre-cancerous changes do not always develop into cancer. In about 30-40% of cases they disappear again on their own. Cervical cancer will only develop in about 12-15% of all women who have these early cancerous stages.

However, to try to prevent cancer developing, many women have surgery to remove these pre-cancerous tissues from the cervix. So avoiding these pre-cancerous changes can have the benefit of preventing surgery.

How can you protect yourself from HPV? (URL: <http://www.informedhealthonline.org/undefined>)

You may already have learned in school that HPV is a so-called sexually transmitted infection. Always using a condom during sexual intercourse provides important protection against sexually transmitted infections. HPV is rarely spread via sperm and is mainly caught as a result of close contact between genitals. So condoms, while essential for your protection, are not enough to stop you from being infected by HPV.

The HPV vaccine can provide immunity to some of the HPV viruses in girls and women who have not already been infected with those viruses. The vaccines cover the two varieties of HPV that are most likely to cause cervical cancer (HPV 16 and HPV 18). But they cannot provide complete protection either because, according to current knowledge, a third of all cervical cancer cases are not caused by HPV 16 and 18.

There are two vaccines in Germany that are used to protect against the cancer-causing HPV 16 and HPV 18 viruses. One of them is called "Cervarix", the other is called "Gardasil" or "Silgard". "Gardasil" or "Silgard" also protects against two other types of HPV that cause genital warts (HPV 6 and HPV 11).

The vaccines have particles in them which very closely resemble the viruses themselves, but they are not active. Even though these "dead" particles cannot cause an infection, your body's defence system (your immune system) will think they are real viruses. So your body will produce antibodies to fight the viruses. This means that if a real HPV 16 or HPV 18 enters your body, your immune system will know how to protect you and clear your body of those viruses without them causing any harm.

How have the vaccines been tested for safety and effectiveness? (URL: <http://www.informedhealthonline.org/undefined>)

The HPV vaccines have been tested in trials involving more than 40,000 young women between the ages of 15 and 26. The women in the two largest trials had the Gardasil vaccine. You can read more about that research here (URL: <http://www.informedhealthonline.org/index.293.en.html>)

. There have been trials involving somewhat older women and young men too. HPV vaccines have also been tested for safety in younger girls.

In the two larger trials the women either had the Gardasil vaccine or a fake medicine (placebo). So-called randomised controlled trials are the form of research that can prove whether a vaccine genuinely works. Here the groups of women who volunteer in the trials agree to be randomly assigned to one of two groups. One of the groups has an HPV vaccine and the other does not. This approach ensures that there were no important differences between the two groups of women – other than whether they were vaccinated or not. You can read more about why this type of research is important here

(URL:
<http://www.gesundheitsinformation.de/evidence-based-medicine.61>

The trials only lasted five years at the most. This is too short to be able to know how many women in the groups developed cervical cancer. You would need at least 20 years to know that for sure. However, the trials did show a difference in the early pre-cancerous stages. If a woman is diagnosed with pre-cancerous stages, she will be encouraged to have an operation. Preventing these conditions will avoid a lot of surgery – and some cancers as well.

How well did the HPV vaccines work? (URL: <http://www.informedhealthonline.org/undefined>)

In the two large trials that tested Gardasil and lasted five years or less, pre-cancerous changes were, as expected, relatively uncommon. That is why there had to be so many thousands of women in the trials to be able to detect any benefit. The rate of pre-cancerous changes caused by HPV 16 and 18 was about 2-3% in women who were not vaccinated with a HPV vaccine. The trials found that women who had been vaccinated were roughly half as likely to develop pre-cancerous changes caused by these two viruses in the next few years (about 1-2%). Research on Cervarix showed that it had a similar effect.

It is assumed that the vaccine works better in young girls who have not been infected with HPV – but researchers disagree on this point. Further research is needed to be able to be more certain.



Nobody knows for sure what you can expect if you have a vaccine between the ages of 12 and 17. Most of the women in the trials above were older than 17. Between the ages of 12 and 17, your risk of developing pre-cancerous changes within the next five years is a lot lower anyway. We also do not know how long the protective effect of the vaccine lasts. So, for example, if women are vaccinated in their teens, they might still get a chronic HPV infection at the age of 30 if the protective effect of the vaccine has worn off. If that were to happen, their risk would increase again. It will become clearer in the future whether or not a

booster vaccine is needed after a certain amount of time.

Once girls or women have been sexually active for some time, it is very likely that they will already have been infected by HPV. Then it is probably too late for the vaccine to help. The vaccines were not shown to offer real protection in the trial participants who were already infected by HPV. That is why the authorities are recommending that teenagers, but not older women, should have the vaccine.

The so-called quadrivalent vaccine (Gardasil or Silgard) protects against four types of HPV. This was also able to reduce the rate of genital warts, from 4% in the unvaccinated women down to 1% of those who were vaccinated (just under 1 in 100 women). That means that genital warts were prevented in 3% of the women. The two types of vaccines (Gardasil/Silgard and Cervarix) have not been directly compared with each other in trials, so we do not know whether one of them provides better protection against pre-cancerous changes.

What about the side effects? (URL: <http://www.informedhealthonline.org/undefined>)

All vaccinations can cause adverse effects (often called “side effects”). But no serious adverse effects were reported in the large HPV vaccine trials. The regulatory authorities in Europe and the USA have not reported any deaths caused by the HPV vaccine either.

Most of the safety information that exists outside of trials is information about Gardasil, which was the first HPV vaccine to be licensed. According to US authorities, reactions at the place on the arm where the vaccine was injected were common: many girls and women reported that they had some pain afterwards (8 out of 10), and some reported swelling and redness (3 out of 10). This went away quickly. Just over 1 out of 10 women reported a mild fever. Less common temporary problems reported included indigestion, headaches, tiredness or muscle ache.

The US authorities have published data and recommendations about the safety of Gardasil. They say that the results are generally reassuring: given how many millions of girls have now been vaccinated, they believe that the vaccine is reasonably safe. But they do warn that, as with many vaccines in teenagers, there is a risk of fainting soon after the vaccination. Together with the EU authorities, they therefore urge doctors to monitor

everyone injected for at least 15 minutes afterwards. This means that you should not get up quickly after having the shot – and you should not do something like ride a bike shortly afterwards either.

If you are ill with a fever when your vaccination is due, it would be safer to postpone the vaccination till the fever is gone. Fever is a sign that your body might already be dealing with another problem, and that it is not the best time to give your immune system another challenge. If you have a bad adverse reaction to the first shot, you may not be able to have the remaining HPV vaccinations either.

Who can have the vaccines and what is involved? (URL: <http://www.informedhealthonline.org/undefined>)



In Germany, authorities responsible for vaccinations recommend that all young women between the ages of 12 and 17 get vaccinated against HPV. The statutory health insurance funds will pay for the HPV vaccine in all teenage girls of this age. If you are younger than 12 or older than 17, you can still get the vaccine, but you or your parents will have to pay for it yourself. Some statutory health insurance funds cover the costs of the vaccine in women between the ages of 18 and 26 too.

If you choose to have the vaccination, you will be given a total of 3 injections in your upper arm. After the first dose – depending on which vaccine it is – the second dose will be one or two months later. The third dose will then be given 6 months after the original dose. It is important to have all 3 doses: one alone will probably not offer much protection.

Can I decide whether or not to have the vaccine myself? (URL: <http://www.informedhealthonline.org/undefined>)

Your doctor might ask your parents for their permission to vaccinate you. You may not be able to get the vaccine if they refuse to give permission. If your parents want you to be vaccinated, but you do not want to be vaccinated, and you object, your doctor will not vaccinate you against your will.

What else can I do to protect myself against cervical cancer? (URL: <http://www.informedhealthonline.org/undefined>)

<http://www.informedhealthonline.org/undefined>)

When you start going to the gynaecologist as you become sexually active and older, you will be offered regular Pap tests. In this test, cells are gently scraped from around the cervix and examined to look for early pre-cancerous stages. In Germany, the statutory health insurances will pay for every woman above the age of 20 to have a Pap test once a year to screen for cervical cancer. Having had the HPV vaccination does not mean these tests are irrelevant. The HPV vaccination might reduce your risk of cervical cancer, but it does not get rid of the risk entirely.

Using condoms to protect yourself against sexually transmitted infections is an important part of protecting yourself against cervical cancer as well.

And there is one other important thing you can do now to reduce your general risk of cancer: do not start smoking. Smoking does not only increase your risk of lung cancer – it also increases your risk of cervical cancer. If you start smoking as a teenager, it is likely to become a life-long habit that will be very hard for you to break.

Author: German Institute for Quality and Efficiency in Health Care (IQWiG)

Glossary

infection

In medicine, we speak of an infection when a person has caught a germ (an infectious agent). This germ can be a bacterium, a virus, a fungus or a worm. The germ multiplies and then either spreads throughout the body or only attacks one particular organ. As long as there are no signs of a disease, this is called an asymptomatic infection. When the body shows a reaction to the germ in the form of symptoms, this is called a symptomatic infection (an infectious disease). The period between the moment the germs enter the body and the moment the first symptoms of the disease appear, is called the incubation period. It may last a few hours or days, or even many years. An infection does not necessarily have to lead to the onset of a disease.

vaccination

Vaccination involves stimulating the body's production of antibodies to a particular virus or bacteria, so that the person has increased resistance if they are exposed to the real infection. A vaccine aims to launch the body's defence system, without actually causing the disease. Depending on the vaccine, it could take some time after vaccination to develop immunity. With most vaccines, more than one vaccination is needed. Sometimes the immunity from a vaccine lessens over time. That means there are some types of vaccination that need be repeated after a few years to stay active. There are several types of vaccines. Some vaccines are "inactivated" or "killed", which means that even though they are made from a virus, for example, no "live" part of the virus remains. That means the vaccine itself cannot cause infection. Other vaccines are "live attenuated vaccines". This means that the virus has been made so much less infective than the real virus, that it should not be able to cause symptoms.

immune system

The immune system is the body's defense system and its task is to protect the body against germs or degenerated cells (like cancer cells). The immune system is very complex and has not been understood in every detail yet. There are two components: the cellular immune defense (for example "scavenger cells" and "killer cells") and the complement system ("antibodies", for example).

virus

Viruses are germs that enter living cells (plant, animal or human cells) to multiply. Viruses cause illnesses and diseases such as smallpox, influenza, colds, hepatitis, herpes and AIDS.

Sources

IQWiG health information is based on research in the international literature. We identify the most scientifically reliable knowledge currently available, particularly so-called "systematic reviews". These summarise and analyse the results of scientific research on the benefits and harms of treatments and other health care interventions. This helps medical professionals and people who are affected by the medical condition to weigh up the pros and cons. You can read more about systematic reviews and why these can provide the most trustworthy evidence about the state of knowledge here (URL: <http://www.gesundheitsinformation.de/evidence-based-medicine.61.en.html>) . The authors of the major systematic reviews on which our information is based are always approached to help us ensure the medical and scientific accuracy of our products.

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The German Institute for Quality and Efficiency in Health Care (IQWiG)

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Evidence basis of our health information

Our information is based primarily on systematic reviews of the effects of health care. Systematic reviews are necessary to gain an objective picture of health care. In order to do this, a clear question is formulated. Researchers then find all the relevant studies that could answer this question. They then evaluate those studies.

You can find a list of the evidence and other scientific literature on which this information is based at **www.informedhealthonline.org**

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