CERVICAL CANCER AWARENESS

WHAT IS CERVICAL CANCER?

The body is made up of trillions of living cells. Normal body cells grow, divide to make new cells, and die in an orderly way. During the early years of a person's life, normal cells divide faster to allow the person to grow. After the person becomes an adult, most cells divide only to replace worn-out or dying cells or to repair injuries.

Cancer begins when cells in a part of the body start to grow out of control. There are many kinds of cancer, but they all start because of out-of-control growth of abnormal cells.

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells continue to grow and form new, abnormal cells. In most cases the cancer cells form a tumor. Cancer cells can also invade (grow into) other tissues, something that normal cells can't do. Growing out of control and invading other tissues are what makes a cell a cancer cell.

Cells become cancer cells because of damage to DNA. DNA is in every cell and directs all its actions. In a normal cell, when DNA is damaged the cell either repairs the damage or the cell dies. In cancer cells, the damaged DNA is not repaired, but the cell doesn't die like it should. Instead, this cell goes on making new cells that the body does not need. These new cells will all have the same damaged DNA as the first abnormal cell does.

People can inherit damaged DNA, but most often the DNA damage is caused by mistakes that happen while the normal cell is reproducing or by something in our environment. Sometimes the cause of the DNA damage is something obvious, like cigarette smoking. But often no clear cause is found.

Cancer cells often travel to other parts of the body, where they begin to grow and form new tumors that replace normal tissue. This process is called *metastasis*. It happens when the cancer cells get into the bloodstream or lymph vessels of our body.

No matter where a cancer may spread, it is always named (and treated) based on for the place it started. For example, breast cancer that has spread to the liver is still called breast cancer, not liver cancer. Likewise, breast cancer that has spread to the bone is still breast cancer, not bone cancer.

Different types of cancer can behave very differently. They grow at different rates and respond to different treatments. That is why people with cancer need treatment that is aimed at their particular kind of cancer.

Not all tumors are cancerous. Tumors that aren't cancer are called benign. Benign tumors can cause problems – they can grow very large and press on healthy organs and tissues. But they cannot grow into (invade) other tissues. Because they can't invade, they also can't spread to other parts of the body (metastasize). These tumors are almost never life threatening.

CAUSES, RISK FACTORS, AND PREVENTION

What are the risk factors for cervical cancer?

A risk factor is anything that changes your chance of getting a disease such as cancer. Different cancers have different risk factors. For example, exposing skin to strong sunlight is a risk factor for skin cancer. Smoking is a risk factor for many cancers. But having a risk factor, or even several, does not mean that you will get the disease.

Several risk factors increase your chance of developing cervical cancer. Women without any of these risk factors rarely develop cervical cancer. Although these risk factors increase the odds of developing cervical cancer, many women with these risks do not develop this disease. When a woman develops cervical cancer or pre-cancerous changes, it may not be possible to say with certainty that a particular risk factor was the cause.

In thinking about risk factors, it helps to focus on those you can change or avoid (like smoking or human papilloma virus infection), rather than those you cannot (such as your age and family history). However, it is still important to know about risk factors that cannot be changed, because it's even more important for women who have these factors to get regular Pap tests to detect cervical cancer early.

Cervical cancer risk factors include:

Human papilloma virus infection

The most important risk factor for cervical cancer is infection by the human papilloma virus (HPV). HPV is a group of more than 150 related viruses, some of which cause a type of growth called *papillomas*, which are more commonly known as *warts*.

HPV can infect cells on the surface of the skin, and those lining the genitals, anus, mouth and throat, but not the blood or internal organs such as the heart or lungs.

HPV can be spread from one person to another during skin-to-skin contact. One way HPV is spread is through sex, including vaginal, anal, and even oral sex.

Different types of HPVs cause warts on different parts of the body. Some cause common warts on the hands and feet; others tend to cause warts on the lips or tongue.

Certain types of HPV may cause warts on or around the female and male genital organs and in the anal area. These are called *low-risk types* of HPV because they are seldom linked to cancer.

Other types of HPV are called *high-risk types* because they are strongly linked to cancers, including cancer of the cervix, vulva, and vagina in women, penile cancer in men, and cancers of the anus, mouth, and throat in both men and women.

Doctors believe that a woman must be infected with HPV in order to develop cervical cancer. Although this can mean infection with any of the high-risk types, about two-thirds of all cervical cancers are caused by HPV 16 and 18.

Infection with HPV is common, and in most people the body can clear the infection by itself. Sometimes, however, the infection does not go away and becomes chronic. Chronic infection, especially when it is caused by certain high-risk HPV types, can eventually cause certain cancers, such as cervical cancer.

Although there is currently no cure for HPV infection, there are ways to treat the warts and abnormal cell growth that HPV causes.

For more information on about this topic, see our documents *Cervical Cancer Prevention and Early Detection* and*HPV and HPV Testing*.

Smoking

When someone smokes, they and those around them are exposed to many cancer-causing chemicals that affect organs other than the lungs. These harmful substances are absorbed through the lungs and carried in the bloodstream throughout the body. Women who smoke are about twice as likely as non-smokers to get cervical cancer. Tobacco by-products have been found in the cervical mucus of women who smoke. Researchers believe that these substances damage the DNA of cervix cells and may contribute to the development of cervical cancer. Smoking also makes the immune system less effective in fighting HPV infections.

Immunosuppression

Human immunodeficiency virus (HIV), the virus that causes AIDS, damages the immune system and puts women at higher risk for HPV infections. This might explain why women with AIDS have a higher risk for cervical cancer. The immune system is important in destroying cancer cells and slowing their growth and spread. In women with HIV, a cervical pre-cancer might develop into an invasive cancer faster than it normally would. Another group of women at risk of cervical cancer are those taking drugs to suppress their immune response, such as those being treated for an autoimmune disease (in which the immune system sees the body's own tissues as foreign and attacks them, as it would a germ) or those who have had an organ transplant.

Chlamydia infection

Chlamydia is a relatively common kind of bacteria that can infect the reproductive system. It is spread by sexual contact. Chlamydia infection can cause pelvic inflammation, leading to infertility. Some studies have seen a higher risk of cervical cancer in women whose blood test results show evidence of past or current chlamydia infection (compared with women who have normal test results). Women who are infected with chlamydia often have no symptoms In fact, they may not know that they are infected at all unless they are tested for chlamydia during a pelvic exam.

A diet low in fruits and vegetables

Women whose diets don’t include enough fruits and vegetables may be at increased risk for cervical cancer.

Being overweight

Overweight women are more likely to develop adenocarcinoma of the cervix.

Long-term use of oral contraceptives (birth control pills)

There is evidence that taking oral contraceptives (OCs) for a long time increases the risk of cancer of the cervix. Research suggests that the risk of cervical cancer goes up the longer a woman takes OCs, but the risk goes back down again after the OCs are stopped. In one study, the risk of cervical cancer was doubled in women who took birth control pills longer than 5 years, but the risk returned to normal 10 years after they were stopped.

The American Cancer Society believes that a woman and her doctor should discuss whether the benefits of using OCs outweigh the potential risks. A woman with multiple sexual partners should use condoms to lower her risk of sexually transmitted illnesses no matter what other form of contraception she uses.

Intrauterine device use

A recent study found that women who had ever used an intrauterine device (IUD) had a lower risk of cervical cancer. The effect on risk was seen even in women who had an IUD for less than a year, and the protective effect remained after the IUDs were removed.

Using an IUD might also lower the risk of endometrial (uterine) cancer. However, IUDs do have some risks. A woman interested in using an IUD should first discuss the possible risks and benefits with her doctor. Also, a woman with multiple sexual partners should use condoms to lower her risk of sexually transmitted illnesses no matter what other form of contraception she uses.

Having multiple full-term pregnancies

Women who have had 3 or more full-term pregnancies have an increased risk of developing cervical cancer. No one really knows why this is true. One theory is that these women had to have had unprotected intercourse to get pregnant, so they may have had more exposure to HPV. Also, studies have pointed to hormonal changes during pregnancy as possibly making women more susceptible to HPV infection or cancer growth. Another thought is that pregnant women might have weaker immune systems, allowing for HPV infection and cancer growth.

Being younger than 17 at your first full-term pregnancy

Women who were younger than 17 years when they had their first full-term pregnancy are almost 2 times more likely to get cervical cancer later in life than women who waited to get pregnant until they were 25 years or older.

Poverty

Poverty is also a risk factor for cervical cancer. Many low-income women do not have ready access to adequate health care services, including Pap tests. This means they may not get screened or treated for cervical pre-cancers.

Diethylstilbestrol (DES)

DES is a hormonal drug that was given to some women to prevent miscarriage between 1940 and 1971. Women whose mothers took DES (when pregnant with them) develop clear-cell adenocarcinoma of the vagina or cervix more often than would normally be expected. This type of cancer is extremely rare in women who haven't been exposed to DES. There is about 1 case of this type of cancer in every 1,000 women whose mothers took DES during pregnancy. This means that about 99.9% of "DES daughters" do not develop these cancers.

DES-related clear cell adenocarcinoma is more common in the vagina than the cervix. The risk appears to be greatest in women whose mothers took the drug during their first 16 weeks of pregnancy. The average age of women when they are diagnosed with DES-related clear-cell adenocarcinoma is 19 years. Since the use of DES during pregnancy was stopped by the FDA in 1971, even the youngest DES daughters are older than 35 − past the age of highest risk. Still, there is no age cut-off when these women are safe from DES-related cancer. Doctors do not know exactly how long women will remain at risk.

DES daughters may also be at increased risk of developing squamous cell cancers and pre-cancers of the cervix linked to HPV.

You can learn more about DES in our separate document called *DES Exposure: Questions and Answers*. It can be read on our website, or call to have a free copy sent to you.

Having a family history of cervical cancer

Cervical cancer may run in some families. If your mother or sister had cervical cancer, your chances of developing the disease are 2 to 3 times higher than if no one in the family had it. Some researchers suspect that some instances of this familial tendency are caused by an inherited condition that makes some women less able to fight off HPV infection than others. In other instances, women from the same family as a patient already diagnosed could be more likely to have one or more of the other non-genetic risk factors previously described in this section.

EARLY DETECTION, DIAGNOSIS, AND STAGING

Can cervical cancer be found early?

The best way to find cervical cancer early is to have regular screening with a Pap test (which may be combined with a test for human papilloma virus or HPV). As Pap testing became routine in this country during the past half century, finding pre-invasive lesions (pre-cancers) of the cervix became far more common than finding invasive cancer. Being alert to any signs and symptoms of cervical cancer (discussed in the next section) can also help avoid unnecessary delays in diagnosis. Early detection greatly improves the chances of successful treatment and prevents any early cervical cell changes from becoming cancerous.

More information about using the Pap test and the HPV test to find cervical cancer early, including the American Cancer Society's Guidelines for cervical cancer screening can be found in our document *Cervical Cancer Prevention and Early Detection*.

TREATING CERVICAL CANCER

How is cervical cancer treated?

This information represents the views of the doctors and nurses serving on the American Cancer Society's Cancer Information Database Editorial Board. These views are based on their interpretation of studies published in medical journals, as well as their own professional experience.

The treatment information in this document is not official policy of the Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor.

Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.

General treatment information

The options for treating each patient with cervical cancer depend on the stage of disease. The stage of a cervical cancer describes its size, depth of invasion (how far it has grown into the cervix), and how far it has spread.

After establishing the stage of your cervical cancer, your cancer care team will recommend your treatment options. Think about your options without feeling rushed. If there is anything you do not understand, ask for an explanation. Although the choice of treatment depends largely on the stage of the disease at the time of diagnosis, other factors that may influence your options are your age, your general health, your individual circumstances, and your preferences. Cervical cancer can affect your sex life and your ability to have children. These concerns should also be considered as you make treatment decisions. (See *Sexuality for the Woman With Cancer* to learn more about these issues.) Be sure that you understand all the risks and side effects of the various treatments before making a decision.

Depending on the type and stage of your cancer, you may need more than one type of treatment. Doctors on your cancer treatment team may include:

- A gynecologist: a doctor who treats diseases of the female reproductive system
- A gynecologic oncologist: a doctor who specializes in cancers of the female reproductive system
- A radiation oncologist: a doctor who uses radiation to treat cancer
- A medical oncologist: a doctor who uses chemotherapy and other medicines to treat cancer

Many other specialists may be involved in your care as well, including nurse practitioners, nurses, psychologists, social workers, rehabilitation specialists, and other health professionals.

Common types of treatments for cervical cancer include:

- Surgery
- Radiation therapy
- Chemotherapy (chemo)
- Targeted-therapy

For the earliest stages of cervical cancer, either surgery or radiation combined with chemo may be used. For later stages, radiation combined with chemo is usually the main treatment. Chemo (by itself) is often used to treat advanced cervical cancer.

It is often a good idea to get a second opinion, especially from doctors experienced in treating cervical cancer. A second opinion can give you more information and help you feel more confident about choosing a treatment plan. Some insurance companies require a second opinion before they will agree to pay for certain treatments. Almost all will pay for a second opinion. Still, you might want to check your coverage first, so you'll know if you will have to pay for it.

It is important to discuss all of your treatment options, including their goals and possible side effects, with your doctors to help make the decisions that best fit your needs. It's also very important to ask questions if there's anything you're not sure about. You can find some good questions to ask in the section, "What should you ask your doctor about cervical cancer?"

Your recovery is the goal of your cancer care team. If a cure is not possible, the goal may be to remove or destroy as much of the cancer as possible to help you live longer and feel better. Sometimes treatment is aimed at relieving symptoms. This is called *palliative treatment*.

TALKING WITH YOUR DOCTOR

What should you ask your doctor about cervical cancer?

It is important for you to have frank, open discussions with your cancer care team. They want to answer all of your questions, no matter how trivial you might think they are. Here are some questions to consider:

- What type of cervical cancer do I have?
- Has my cancer spread beyond the cervix?
- Can the stage of my cancer be determined and what does that mean?

- What are my treatment choices?
- What treatment do you recommend and why?
- What risks or side effects are there to the treatment you suggest?
- Will I be able to have children after my treatment?
- What are my treatment options if I want to have children in the future?
- What should I do to be ready for treatment?
- What are the chances my cancer will recur (come back) with the treatment programs we have discussed?
- Should I follow a special diet?
- Based on what you've learned about my cancer, what is my prognosis (chance of survival)?
- Where can I get a wig if I chemotherapy drugs make me lose my hair?
- What do I tell my children, husband, parents, and other family members?
- How many patients with cervical cancer do you treat each year?

In addition to these sample questions, be sure to write down some of your own. For instance, you might want specific information about recovery time so that you can plan your work schedule. Or you may want to ask about second opinions or about clinical trial options.

AFTER TREATMENT

What happens after treatment for cervical cancer?

For some women with cervical cancer, treatment may remove or destroy the cancer. Completing treatment can be both stressful and exciting. You might be relieved to finish treatment, but find it hard not to worry about cancer coming back. (When cancer comes back after treatment, it is called *recurrence*.) This concern is very common in people who have had cancer.

It may take a while before your fears lessen. But it may help to know that many cancer survivors have learned to live with this uncertainty and are living full lives. Our document, *Living With Uncertainty: The Fear of Cancer Recurrence*, gives more detailed information on this. You can read it online, or call us to have a free copy sent to you.

For other women, the cancer may never go away completely. These women may get regular treatments with chemotherapy, radiation therapy, or other therapies to try to help keep the cancer in check. Learning to live with cancer that does not go away can be difficult and very stressful. It has its own type of uncertainty. Our document, *When Cancer Doesn't Go Away,* talks more about this.

Follow-up care

After your treatment ends, your doctors will still want to watch you closely. Ask what kind of follow-up schedule you can expect. It is very important to go to all of your follow-up appointments. During these visits, your doctors will ask questions about any problems you may have and examine you. You will get regular pelvic exams. Most doctors recommend that women treated for cervical cancer keep getting regular Pap tests no matter how they were treated (cone biopsy, hysterectomy, trachelectomy, or radiation). Although normally cells for a Pap test are from the cervix, if you no longer have a cervix (because you had a trachelectomy or hysterectomy), the cells will be sampled

from the upper part of the vagina (known as the *vaginal cuff*). Lab tests and x-rays or other imaging tests may also be done look for signs of cancer and long term effects of treatment.

Almost any cancer treatment can have side effects. Some may last for a few weeks to months, but others can last the rest of your life. The visits with your doctor are the time for you to talk to your cancer care team about any changes or problems you notice and any questions or concerns you have. These exams also give your doctor a way to watch you for signs of the cancer coming back or a new cancer. Women who had cervical cancer have an increased risk of getting vaginal cancer, and are also at risk of getting another HPV related cancer or, more rarely, a cancer that may have been caused by treatment.

It is important to keep your health insurance. Tests and doctor visits cost a lot, and even though no one wants to think of their cancer coming back, this could happen.

Should your cancer come back, our document, *When Your Cancer Comes Back: Cancer Recurrence* can give you information on how to manage and cope with this phase of your treatment. You can get this document by calling 1-800-227-2345, or you can read it online.

Seeing a new doctor

At some point after your cancer diagnosis and treatment, you may find yourself seeing a new doctor who does not know anything about your medical history. It is important for you to be able to give your new doctor the details of your diagnosis and treatment. Gathering these details soon after treatment may be easier than trying to get them at some point in the future. Make sure you have this information handy:

- A copy of your pathology report(s) from any biopsies or surgeries
- If you had surgery, a copy of your operative report(s)
- If you were in the hospital, a copy of the discharge summary that doctors prepare when patients are sent home
- If you had radiation therapy, a copy of the treatment summary
- If you had chemotherapy, a list of the drugs, drug doses, and when you took them
- Copies of your x-rays and other imaging studies (these can often be put on a DVD)

The doctor may want copies of this information for his records, but always keep copies for yourself.

WHAT`S NEW IN CERVICAL CANCER RESEARCH?

What`s new in cervical cancer research and treatment?

New ways to prevent and treat cancer of the cervix are being researched. Some of the promising new developments include the following:

Sentinel lymph node biopsy

During surgery for cervical cancer, lymph nodes in the pelvis may be removed to check for cancer spread. Instead of removing many lymph nodes, a technique called *sentinel lymph node biopsy* can be used to target just the few lymph nodes most likely to contain cancer. In this technique a blue dye containing a radioactive tracer is injected into the cancer and allowed to drain into lymph nodes. Then, during surgery, the lymph nodes that contain radiation and the blue dye can be identified and removed. These are the lymph nodes most likely to contain cancer if it had spread. If these lymph

nodes don't contain cancer, the other lymph nodes don't need to be removed. Removing fewer lymph nodes may lower the risk of later problems.

A clinical trial is looking at a different way of doing a sentinel node biopsy procedure. It maps the lymph nodes using with robotic (laparoscopic) assisted near infrared imaging after injecting indocyanine green (ICG) dye into the cervix.

HPV vaccines

Vaccines have been developed to prevent infection with some of the HPV types associated with cervical cancer. Currently available vaccines are intended to produce immunity to HPV types 16 and 18, so that women who are exposed to these viruses will not develop infections. Vaccines are also being developed to prevent infection with some of the other HPV types that also cause cancer. Studies are being done to see how well these vaccines will reduce the risk of cervical cancer.

Some experimental vaccines are also being studied for women with established HPV infections, to help their immune systems destroy the virus and cure the infection before a cancer develops. Still other vaccines are meant to help women who already have advanced cervical cancer that has recurred or metastasized. These vaccines attempt to produce an immune reaction to the parts of the virus (E6 and E7 proteins) that make the cervical cancer cells grow abnormally. It is hoped that this immunity will kill the cancer cells or stop them from growing.

Targeted therapy

As researchers have learned more about the gene changes in cells that cause cancer, they have been able to develop newer drugs that specifically target these changes. These targeted drugs work differently from standard chemotherapy drugs. They often have different (and less severe) side effects. These drugs may be used alone or with more traditional chemotherapy.

Pazopanib is a type of targeted therapy drug that blocks the effect of certain growth factors on cancer cells. In studies of patients with advanced cervical cancer, it helped them live longer.

Hyperthermia

Some research indicates that adding hyperthermia to radiation may help keep the cancer from coming back and help patients live longer. Hyperthermia is a treatment that raises the temperature in the area where the tumor is, most often by using radiofrequency antennae placed around the patient.

Drug treatment of pre-cancers

Standard treatment of cervical pre-cancer (such as cervical intraepithelial neoplasia; CIN) includes cryotherapy, laser treatment, and conization. Recent studies to see if medicines can be used instead have had some promising results.

In one study, patients with CIN2 or CIN3 took a drug called diindolylmethane (DIM) for 12 weeks. Follow-up testing showed improvement -- in some women, the CIN went away completely.

In another study, CIN was treated by applying an anti-viral drug called cidofovir to the cervix. In more than half of the treated women, the CIN resolved completely. More studies are needed before this can become a standard treatment.

Another anti-viral drug, imiquimod, has also shown promising results in treating cervical pre-cancers.

Source

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