

## Cervical Cancer

### Overview

Each year, about 15,000 women in the United States learn that they have cancer of the cervix. Cervical cancer is one of the most common cancers of women's reproductive organs. Most cases of cervical cancer are caused by infection with human papillomavirus (HPV).

Before cancer of the cervix appears, the cells of the cervix go through precancerous changes known as dysplasia, in which abnormal cells begin to appear in the cervical tissue; it is these precancerous changes that the annual Pap test is meant to test for. For some women, these changes may go away without any treatment. More often, they need to be treated to keep them from changing into cancer.

Because so many women do have Pap tests annually, deaths from cervical cancer have decreased greatly and are now rare in the United States; however, deaths still occur. Chances of successfully treating cancer are highest when detected early.

### Need-to-know Anatomy

The cervix is part of the female reproductive system. It is the narrow lower end of the uterus, the hollow, pear-shaped organ where a fetus grows. It is about 1 inch around and connects the vagina (birth canal) to the uterus. During a woman's menstrual period, blood flows from the uterus through the cervix to the vagina.

The cervix also produces mucus that helps sperm move from the vagina into the uterus. Sperm travels through the cervix to fertilize a woman's egg during conception.

During pregnancy, the cervix is tightly closed to help keep the baby inside the uterus. During childbirth, the cervix opens or dilates to allow the baby to pass through the vagina.

### Causes

A sexually transmitted virus called the human papillomavirus (HPV) causes almost all cases of cervical cancer. HPV usually goes away by itself, and most people with HPV never even know they have it. But sometimes a HPV infection can cause larger problems. HPV can be categorized into two groups: low risk and high risk. Some high-risk types of HPV may stimulate the growth of precancerous cells in the cervix. If these abnormal cells are not found and treated, they may become cancerous.

Two of the high-risk HPV strains are HPV 16 and 18. Two of the low risk HPV strains are 6, 11. These are the four strains the HPV vaccine Gardasil protects against. Strains 16 and 18 account for about 70% of all cervical cancers and a smaller percentage of vaginal and vulvar cancers. Studies are being conducted to develop vaccines to prevent the remaining 30% of cervical cancers. Some low risk HPV strains, such as strain 6 and 11 can cause genital warts, but do not cause cervical cancer. These low-risk strains account for about 90% of genital warts.

## Risk Factors

Women with certain risk factors may be more likely to develop cervical cancer. These factors include:

- **Infection with human papillomavirus (HPV)** – Some types of HPV can cause changes to cells in the cervix. The changes may lead to genital warts, precancerous growths, or cancer.
- **Age** – The risk of cervical cancer increases with age and most often is diagnosed in women over the age of 40. However, younger women are often diagnosed with precancerous lesions that require treatment to prevent cancer.
- **Smoking** – Cigarette smoke contains chemicals that damage the body's cells. Smoking increases the risk of precancerous changes in the cervix, especially in women with HPV.
- **Sex at an early age** – Women who have had sex at an early age have a higher risk of cervical cancer. Researchers are not sure why, but they think HPV may more easily infect a young woman's cervix.
- **Number of sexual partners** – Women who have had fewer sexual partners have a lower risk of cervical cancer. This is because the more sexual partners a woman has, the greater chance she has of getting HPV.
- **Sexually transmitted diseases (STDs)** – Women who have an STD besides HPV have a higher risk of cervical cancer because the chance of acquiring HPV is also greater.
- **Weakened immune system** – Women who are HIV-positive or take drugs that suppress the immune system, such as women who have undergone organ transplant or take steroids for other reasons, have a higher than average risk of developing cervical cancer.
- **Lack of regular Pap tests** – Cervical cancer is more common among women who do not have regular Pap tests. The Pap test helps doctors find precancerous cells. Treating precancerous cervical changes often prevents cancer. In most cases, cervical cancer is treatable or preventable if caught at an early stage.

## Types

There are two main types of cancer of the cervix; each one develops from different tissue types. The most common (about 80 percent to 90 percent) are squamous cell carcinomas. The other 10 percent to 20 percent are adenocarcinomas. Squamous cell carcinoma develops in the lining of the cervix, while adenocarcinoma develops in gland cells that produce cervical mucus. There is some controversy over whether patients with adenocarcinoma of the cervix have a worse prognosis than those with the more common squamous cell carcinoma. Some types of adenocarcinoma are aggressive and are associated with a poor prognosis. The most important

factor of prognosis is the stage of the cancer, which will determine the treatment options and outcomes. Treatment options are the same regardless if a cervical cancer is squamous or adenocarcinoma.

## **Prevention**

Almost all cervical cancers can be prevented by having regular Pap tests. (Pap is short for Papanicolaou, the name of the doctor who invented the test.) The Pap test can detect HPV infection and pre-cancers. Treatment of these problems can stop cervical cancer before it develops or spreads. An HPV test may be performed at the same time as the Pap test. However, it is not recommended as part of regular Pap testing for women under the age of 30. If the Pap test results are questionable, an HPV test will be performed to determine if a strain of the HPV virus that may lead to cervical cancer is present. Also, the new HPV vaccine may be able to prevent cervical cancer.

Another way to prevent cervical cancer is to avoid the following risk factors. Women can:

- Delay having sex until they are older.
- Limit the number of sex partners.
- Avoid sexual intercourse with people who have had many partners.
- Avoid sexual intercourse with people who are infected with HPV, genital warts or other symptoms of a sexually transmitted disease.
- Have safe sex. The evidence is mixed on whether condoms protect against HPV, but they definitely do protect against HIV and other sexually transmitted diseases.
- Quit smoking.

## **HPV Vaccine**

HPV vaccines have the potential for preventing cervical cancer. A vaccine called Gardasil<sup>→</sup> offers protection from the virus that causes most cervical cancers by blocking the infection. The Food and Drug Administration (FDA) approved the drug in June 2006. A new vaccine for HPV called Cervarix<sup>®</sup> is currently under review by the FDA.

Routine vaccination is recommended for girls and women age 11 to 26 if they have not already received the vaccine. Giving the vaccine in the 11 to 12 age range activates the girls' immune systems before they are sexually active - which means before they come in contact with HPV.

Higher antibody (protein) levels also are needed to help produce a response to the vaccine that will help protect girls against the virus. It is most effective if given before girls become sexually active. Three doses of the vaccine are given by injection during a six-month period. You receive the first dose followed two months later by the second dose. Six months after you receive the first dose, you receive the third dose.

The most common side effect associated with the vaccine is soreness at the injection site (upper arm), and mild fever or flu-like symptoms also have been reported.

## **Pap test**

A Pap test, often called a Pap smear, is a screening procedure used to detect abnormal cells in and around the cervix. In this test, the doctor uses a stick or brush to take a few cells from the cervix while holding the vagina open with a speculum. The cells are sent to a laboratory, where they are examined for signs of abnormality. Results usually take a few weeks and may indicate that the cells are normal or abnormal. An abnormal result could mean inflammation of the cervix, trichomonas or yeast infection, or other causes. In post menopausal women, the Pap test could detect abnormal glandular cells that could indicate endometrial cancer.

Women should have a Pap test beginning three years after starting vaginal intercourse and no later than age 21.

- At age 30, women with three or more consecutive exams with normal results may have a Pap smear performed less frequently. This is dependent on risk factors and should be discussed with the doctor.
- Women who have been treated for cervical dysplasia (a precancerous lesion) or cancer may need to have a Pap smear more frequently if recommended by the doctor.
- If you have had a hysterectomy, ask your doctor about screening. If you are healthy, had the hysterectomy for a reason other than precancer or cancer, and have normal Pap tests, then you may be screened less frequently than annually. But even if your cervix was removed during your hysterectomy, regular pelvic exams are still recommended to check for precancerous cells in the vaginal and vulva area, especially for those who have been exposed to HPV.

## **Improving Prevention & Detection**

Research to improve detection and screening methods for cervical cancer is ongoing. Some of these advancements may still be in the investigational stage and not yet approved or available.

Because cervical cancer is highly treatable when detected in an early stage, many studies are looking at developing better ways to detect cervical cancer, such as fluorescent spectroscopy. This method uses fluorescent light to detect changes in precancerous cells in the cervix.

A newer Pap test method known as the Thin Prep test transfers a thin layer of cells onto a slide. Because this sample can be preserved, a test for HPV can be done at the same time. (A regular pap smear tests for the presence of abnormal cells, not the virus.)

## **Symptoms**

Early cervical cancer usually has no noticeable symptoms, but it can be detected early with yearly check-ups that include getting a Pap test to check for abnormal cells in the cervix. Possible signs of cervical cancer include vaginal bleeding and pelvic pain or discharge. These and other symptoms may be caused by cervical cancer, although other conditions may cause the same symptoms.

You should see your doctor if any of the following problems occur:

- Vaginal bleeding after intercourse, between periods or after menopause

- Unusual vaginal discharge that is watery, bloody or has a foul odor
- Pelvic pain or pain during intercourse

## **Tests**

If you have symptoms or Pap test results that suggest precancerous cells or cancer of the cervix, your doctor will suggest other procedures to make a diagnosis. The first step is usually colposcopy, in which the doctor examines the cells of the cervix more closely. Another common test to more closely examine the cells is a biopsy, in which a sample of cervical cells are taken for examination.

If the biopsy indicates cervical cancer, you will be referred to a gynecologic oncologist, a doctor who specializes in treating cervical cancer. The specialist may suggest other tests to see if the cancer has spread beyond the cervix.

### **Colposcopy**

Colposcopy is a diagnostic test used to evaluate an area of abnormal tissue on the cervix, vagina, or vulva using an instrument called a colposcope. A colposcope looks like a pair of binoculars on a stand. It magnifies tissue so a health care practitioner can see abnormalities that cannot be seen with the naked eye. The health care practitioner will insert a speculum to open the vagina and make the cervix visible, swab the cervix and vagina with a vinegar solution that makes abnormal tissue easier to see, position the colposcope between your legs, and look through it to examine the cervix. No part of the instrument will touch you, and you will not feel any pain. A colposcopy is usually done in the doctor's office or clinic.

You should not douche or use tampons or vaginal medications for 24 hours before the exam. If biopsies are taken during the colposcopy, you may experience light to medium bleeding for two to three days after the procedure. The bleeding should not be heavier than a menstrual flow. To allow the biopsy areas to heal, you should not have sexual intercourse, douche, or use tampons for two to three days.

### **Biopsy**

In a biopsy, your doctor removes a small amount of tissue for examination under a microscope to look for precancerous cells or cancer cells. Most women have the biopsy in the doctor's office and no anesthesia is needed. To do the biopsy, the doctor will insert a speculum to hold the vagina open and take a very small sample. After the sample is taken, it will be sent to a laboratory where a pathologist, a doctor who identifies diseases by studying cells and tissues, checks the tissue using a microscope. You may experience some bleeding and discharge after the exam and discomfort similar to menstrual cramps. Ibuprofen can be taken to relieve these symptoms. After a biopsy, you should not have sex, douche, or use tampons for 24 hours, or longer for biopsies that require local or general anesthesia.

Different types of cervical biopsies include:

- **Punch biopsy** – The tissue sample is removed from the cervix using biopsy forceps, an instrument used to grasp tissue firmly and then remove it. This procedure is usually performed in your gynecologist's office and does not require anesthesia. You will feel a sharp pinch during the procedure. You may experience slight bleeding after the procedure.
- **Endocervical curettage (ECC)** – A tissue sample is scraped from an area just past the opening of the cervix using a curette (small, spoon-shaped instrument) or a thin, soft brush. This can be done in your doctor's office and does not require anesthesia. You will have some cramping and bleeding after the procedure.
- **LEEP (Loop Electro-Surgical Excision Procedure)** – The LEEP is performed using a small heated wire to remove tissue and precancerous cells from the cervix. This procedure can be done in your doctor's office and requires local anesthesia. You may have some cramping during and after the procedure. You may have moderate to heavy vaginal discharge that lasts for about 3 weeks.
- **Cone biopsy (also called LEEP cone or cold knife cone biopsy)** – A cone-shaped sample of tissue is removed from the cervix so that the pathologist can see if abnormal cells are in the tissue beneath the surface of the cervix. This specimen is much bigger than the biopsy done in the office without anesthesia. A sample of tissue can be removed for a cone biopsy using a LEEP cone procedure, which can be done in the doctor's office under local anesthesia, or a knife cone procedure, done in an operating room under local or general anesthesia. You may have some vaginal bleeding for about a week and some spotting for about 3 weeks after the procedure.

### **Pelvic examination**

Pelvic examination: A pelvic examination is part of every gynecologic visit and should be done yearly. A pelvic exam includes a rectal exam. When a cancer diagnosis is made, the doctor examines the pelvic area to see if the cancer has spread to nearby organs, such as the uterus, vagina, bladder, and rectum.

### **Cystoscopy and proctoscopy**

If advanced cancer is diagnosed and your doctor suspects the cancer may have spread beyond the cervix, a cystoscopy or proctoscopy may be done using a lighted tube to view the inside of the bladder (cystoscopy) or the anus, rectum, and lower colon (proctoscopy). The procedure can be performed as an outpatient using minimal sedation or under general anesthesia.

### **Imaging**

To learn more about the extent of disease and suggest a course of treatment, the doctor may order some of the following imaging tests:

- **Chest X-ray** – This is a picture of the chest that shows your heart, lungs, airway, blood vessels, and lymph nodes. A chest X-ray can often show whether cancer has spread to the lungs.
- **Computerized Tomography (CT) Scan** – This diagnostic test uses an X-ray machine and a computer to create detailed pictures of the body, including 3-D images. It is used to detect

disease outside the cervix or abnormal organ structure. CT scans also can be used to guide a needle into a mass if a biopsy is needed. As part of a CT scan, you may be asked to drink oral contrast or have an IV (intravenous) line for injection of a contrast dye. Contrast dye makes your organs more visible on the X-ray film.

- **Magnetic resonance imaging (MRI)** – This diagnostic test uses magnetic fields and radio waves to create computerized pictures of the pelvis and abdomen. You may have to be placed in a tube, which can feel confining to people who have a fear of enclosed spaces. A contrast dye might be used. The MRI is noisy while it is operating, so patients are usually given earplugs. The doctor can view these pictures on film to see whether cancer has spread. This test may be done during pregnancy if necessary.
- **Positron Emission Tomography (PET) Scan:** This diagnostic test uses a radioactive chemical, called a tracer, to create 3-D images of the body. A small dose of the radioactive tracer is injected into a vein in the arm. The tracer travels through the body, and the organs and tissues absorb it. The PET scanner, a tube-like machine, records the energy given off from the tracer in the body to create the 3-D images. In combination with CT scans, a PET scan determines the size and activity of abnormal tissue growth.

## Treatment

Once a diagnosis of cervical cancer is made, your doctor will explain your prognosis and treatment options. Your prognosis is what the doctor thinks will happen with your cancer – your chance of recovery, the expected course of the cancer, or the length of time you will be sick.

Your prognosis will depend on the following:

- The stage of the cancer (The stage tells whether the tumor has spread to nearby tissues and other parts of the body.)
- The type of cervical cancer (squamous cell or adenocarcinomas)
- The size of the tumor
- Lymph node involvement

Treatment options will depend on the following:

- The stage of the cancer
- The size of the tumor
- The patient's desire to have children
- The patient's age and overall health

Treatment of cervical cancer during pregnancy depends on the stage of the cancer and the stage of the pregnancy. If cervical cancer is detected before it has spread or found in the last trimester of pregnancy, treatment may be delayed until after the baby is born.

## Staging

If the biopsy shows that you have cancer, your doctor will do a pelvic exam and may biopsy additional tissue to learn the stage of your disease. Staging may also include other tests, such as a chest X-ray and cystoscopy or proctoscopy. The stage tells whether the tumor has spread to nearby tissues and other parts of the body.

## Stages of Cervical Cancer

- **Stage 0** – The cancer is found only in the top layer of cells lining the cervix and has not invaded deeper tissues of the cervix. Stage 0 is also called carcinoma in situ.
- **Stage I** – The cancer has invaded the cervix beneath the top layer of cells. It is found only in the cervix.
- **Stage II** – The cancer has spread beyond the cervix but not to the pelvic wall (the tissues that line the part of the body between the hips) or to the lower third of the vagina.
- **Stage III** – The cancer has spread to the lower part of the vagina and may have spread to the pelvic wall and nearby lymph nodes. The cancer may also be pressing on the ureter, the tube that carries urine from the kidney to the bladder.
- **Stage IV** – The cancer has spread to the bladder, rectum or other parts of the body.

Recurrent cervical cancer is cancer that comes back after it has been treated. The cancer may appear again in the cervix or in other parts of the body. The cancer's stage never changes even if your cancer recurs.

## Precancerous Lesions

Treatment for a precancerous lesion of the cervix depends on whether the lesion is low or high grade, whether the woman wants to have children in the future, and the woman's age and general health. A woman with a low-grade lesion may not need further treatment, especially if the abnormal area was completely removed during biopsy. When a precancerous lesion requires treatment, the doctor may use cryosurgery (freezing) or laser surgery to destroy the abnormal area without harming nearby healthy tissue. More often, the doctor will remove the abnormal tissue by LEEP or conization. In some precancerous cases, a woman may have a hysterectomy (removal of the uterus, including the cervix), particularly if abnormal cells are found inside the opening of the cervix.

Precancerous lesions are usually curable if caught early. However, a woman should continue with regular Pap tests and pelvic exams, especially if she has HPV.

## Surgery for small cancers and precancerous lesions

The following surgical procedures may be used for precancerous lesions or for cancerous tissue that has not spread beyond the cervix.

- **Cryosurgery (cryotherapy)** – This surgical procedure uses an instrument to freeze and destroy precancerous tissue. This is not used on invasive cancer. The advantage to this procedure is that it can be performed in the doctor's office and women typically do not experience any bleeding after the exam. One disadvantage to this therapy is that no tissue is removed, which means there is nothing to be evaluated under a microscope. This type of procedure also has the potential for missing a cancer or causing a change in the cervical mucus.
- **LEEP (Loop electrosurgical excision procedure)** – This procedure uses electrical current passed through a thin wire hook. The hook removes the tissue. This is primarily used on precancerous lesions under local anesthesia. The advantage of this procedure is that more of

the tissue can be removed for evaluation and the chances of cure are greater. There is some bleeding after the procedure.

- **Cone** – a gynecologist uses the same procedure as a cone biopsy to remove all of the cancerous tissue. This procedure can be used in a woman who has a very small cervical cancer and who wishes to preserve the ability to have children. It is performed in the operating room and more of the tissue can be removed for evaluation. There is some bleeding after the procedure.
- **Hysterectomy** – This operation removes the uterus and the cervix. If a woman has a hysterectomy, she will no longer be able to have children. This kind of hysterectomy is used only on women with very small cervical cancers, less than 3 millimeters in depth.
- **Bilateral salpingo-oophorectomy** – In this procedure, the fallopian tubes and ovaries are removed at the same time as the hysterectomy. If a woman is close to the age of menopause, her doctor may discuss removing her ovaries and fallopian tubes to reduce the chance that the cancer will recur in one of those organs.

Side effects from surgery vary depending on the procedure. Some women have excessive bleeding, infection, or damage to the urinary and intestinal systems. Most of the risks are very small and temporary.

### **Surgery for larger cancers**

The following surgical procedures may be used for larger cervical cancer lesions (usually up to 4 to 5 centimeters in width), but only if the cancer is all within the cervical tissue. If the cancer has spread beyond the cervix, doctors will usually recommend chemotherapy in combination with radiation therapy.

- **Trachelectomy** – This procedure removes the cervix and surrounding tissue but not the uterus. It is used in special circumstances for women who have a larger cancer but wish to preserve the ability to have children. A woman who undergoes a trachelectomy will have to have stitches placed in the cervix (a procedure called cerclage) in order to carry a future pregnancy. Trachelectomies are only done at specialized hospitals. The procedure may include removal of lymph nodes.
- **Radical hysterectomy** – The surgeon removes the cervix, uterus, part of the vagina, and the tissues surrounding the cervix called the parametria. At the same time, the surgeon also removes nearby lymph nodes. Hospital stay is usually from 1 to 2 days for postsurgery care. Some women may stay in the hospital up to 4 days. More and more radical hysterectomies are being done laparoscopically or robotically-assisted by gynecologic oncologist(s).

When robotics are used, it is called robotic-assisted surgery. By using robotics, surgeons are able to perform surgeries in a precise and controlled manner using clear 3-D views of the abdominal cavity. First, the surgeon inserts the surgical instruments and 3-D cameras into the body through incisions that are 1 to 2 centimeters long. The surgeon sits at a special console that enlarges the 3-D views of the surgery site. While sitting at the console, the surgeon moves the instruments precisely to direct the robotic arms and perform the surgery in “real

time.” Robotic-assisted surgery cannot be programmed, and it requires that every surgical movement be performed with direct input from the surgeon.

You should discuss your surgical options with your doctor.

Side effects from surgery vary depending on the procedure. Some women have excessive bleeding, infection or damage to the urinary and intestinal systems. Most of the risks are very small and temporary. Complete recovery usually takes 4 to 8 weeks. Activity after surgery can be gradually increased, but you should avoid heavy lifting for the first 2 weeks. After a few weeks, you may begin to do light chores and some driving, and return to work if your job is not too physically demanding. By the sixth week you should be able to take tub baths and resume sexual activities.

### **Laparoscopic surgery**

In some cases, these procedures can be done without open surgery, with the help of a small telescope called a laparoscope. The laparoscope is inserted through small incisions in the abdomen so the surgeon can see the area around the uterus. At the same time, surgical instruments can be inserted through another incision. Laparoscopy allows the surgeon to inspect the abdominal cavity for spread of cervical cancer, and scar tissue without making a large incision. Laparoscopy may allow a woman to avoid more invasive open surgery that uses larger incisions. Compared to open surgery, it leaves smaller scars, is often less risky, and usually requires a shorter recovery period.

### **Radiation therapy**

Radiation therapy is used for cancers that have spread beyond the cervix (II, III, or IV) or very large lesions (larger than 5 centimeters)

Radiation therapy uses high energy X-rays or other types of radiation to kill cancer cells or shrink the tumor. Radiation therapy is used instead of surgery in most cases. However, it is sometimes necessary after surgery if it is discovered that the cancer has spread outside the cervix, or to reduce the risk that a cancer will come back after surgery. There are two types of radiation therapy: external radiation therapy and internal radiation therapy.

### **External radiation therapy**

External radiation therapy uses a machine outside the body to send radiation toward the cervical cancer. Internal radiation therapy uses a small amount of radioactive material that is delivered directly to the tumor using implants. The type of radiation used depends on the stage of the cervical cancer. A radiation oncologist, a doctor who specializes in radiation therapy, will give you your radiation treatments. The length of your radiation treatment will be determined by your radiation oncologist.

When external radiation is prescribed, patients will be given an appointment for pretreatment simulation. Simulation involves taking X-rays of your pelvis and marking the skin on your hips and lower back with a colored marking pen to show the radiation therapist where to aim the radiation. The simulation is painless; however, you will have to lie face down on a special table

for at least an hour. You will need to keep the colored lines marked on your skin, so you should not take tub baths during the course of radiation treatment, and sponge baths are better than showers.

On the days of your actual treatment with external radiation, you will lie on a treatment table and the radiation therapist will position you so the radiation will reach the right part of your body. Once you are positioned, you cannot move until the treatment is finished. External radiation typically requires 25 outpatient visits lasting about 30 minutes each. Your position on the table will be the same for each treatment. Your doctor will tell you when you can wash off your colored markings, after the course of treatment is over.

During treatment, sexual intercourse is not recommended. Even after treatment is completed, the side effects of radiation therapy may make sexual intercourse uncomfortable or painful for a period of time. Other side effects of radiation therapy include:

- \* Fatigue
- \* Dryness, itching, tightening, and burning in the vagina
- \* Red, dry, tender, itchy skin
- \* Moist, weepy skin (later in treatment)
- \* Hair loss in the treated area
- \* Loss of appetite
- \* Diarrhea
- \* Frequent and uncomfortable urination
- \* Reduced white blood cell count
- \* Premature menopause

In most cases, chemotherapy will be given with the radiation in order to help the radiation work better - a radiation sensitizer.

### **Internal radiation therapy**

For internal radiation therapy, implants are inserted through the vagina into the cervix, where they are placed next to the tumor while the patient is under anesthesia. The implants stay in place for a few days. During that time, you will stay in the hospital, with limited visits, to protect others from the radiation. Internal radiation therapy may also be done on an outpatient basis, using something called high dose rate radiation. Outpatient radiation treatment is done under sedation, in several three-hour visits. Whether your radiation is received inpatient or outpatient, once the implants are removed, no radioactivity is left in your body.

### **Chemotherapy**

Chemotherapy uses drugs to stop the growth of cancer cells either by killing the cells or by stopping them from dividing. Chemotherapy can be given by mouth or injected into a vein or muscle. In most cases, it is given to a patient through a vein during an outpatient visit. The drugs enter the bloodstream and can reach cancer cells throughout the body. This is called systemic chemotherapy. When chemotherapy is placed directly into an organ or a body cavity, such as the abdomen, the drugs mainly affect cancer cells in that area. This is called regional chemotherapy.

How chemotherapy is given depends on the stage of the cervical cancer. Almost all cervical cancer patients in good medical condition and receiving radiation for stage IIA or higher will be offered chemotherapy in addition to radiation therapy. The kind of chemotherapy you receive and the course (length) of your chemotherapy treatment will be determined by your doctor. In most cases, it includes a drug called Cisplatin, which contains platinum and can cause kidney problems and hearing loss.

Chemotherapy affects normal cells as well as cancer cells. You may experience side effects from chemotherapy treatment such as nausea and vomiting, loss of appetite, diarrhea, fatigue, low blood count, bleeding or bruising after minor cuts or injuries, numbness and tingling in the hands or feet, headaches, hair loss, and darkening of the skin and fingernails.

### **Recurrent Cervical Cancer**

If cervical cancer recurs, the treatment depends on where the cancer is located and how it was treated before. If radiation has not already been given, it may be the treatment of choice for the recurrence. If radiation has already been given and the cervical cancer has spread to the lower colon, rectum, and bladder, a surgeon may be able to remove these organs, but this surgery is not always possible. If the cancer has spread to multiple areas, chemotherapy is usually the treatment of choice.

## **Managing**

### **Follow-up visits**

For the first three years after treatment, you should have follow up visits every three to six months to ensure that changes in your health are monitored and problems are treated early. Your follow up visits will include physical exams, pelvic exams, and may include urine tests, blood tests, and X-rays. A Pap test may also be done to look for cancer cells in the vagina. If the cancer does not return within three to five years, visits can be scheduled less often.

### **Menopause**

Some cervical cancer treatments cause immediate menopause. If your uterus and ovaries have been removed or you have had radiation therapy, the estrogen levels in your body will decrease sharply, which is a characteristic of menopause. The lack of estrogen can cause osteoporosis (brittle, thin bones) and menopausal symptoms such as hot flashes and insomnia. Several medicines and other treatments are available for preventing or treating osteoporosis and menopausal symptoms, so talk with your doctor about your options.

### **Fertility**

Before you begin a treatment plan for cervical cancer, your doctor will discuss your fertility options. Depending on your age and the type of treatment you have, you may not be able to have children. Women who have undergone a hysterectomy or radiation for cervical cancer are infertile, meaning they will not be able to become pregnant. Your doctor may discuss “ovarian transposition” which is sometimes successful at protecting ovaries from radiation therapy. It involves surgically moving the ovaries away from the radiation area to minimize exposure. However, there is no guarantee that ovarian function can be preserved with this procedure.

## Sexuality

As cancer care has improved and survival rates have increased, issues that affect quality of life, such as sexual health, have become increasingly important. Often patients are not sure what to expect from healthcare providers in regard to talking about sexual health during and after cancer treatment.

Cancer treatment, such as surgery, chemotherapy, or radiation therapy, can decrease your level of sexual desire by slowing down the production of sex hormones. Side effects of treatment, such as nausea or fatigue, may also decrease your desire. Negative emotions like depression, anger, fear, or guilt may keep you or your partner from wanting to have sex. Medications for pain, nausea, anxiety, or depression can also decrease desire. If you have experienced changes in your appearance as a result of treatment, you may feel self-conscious. All of these factors affect sexual desire.

Surgery or radiation treatment to the abdomen or pelvis may cause physical changes in blood circulation or nerve supply to the sex organs. Women who experience vaginal dryness as a result of surgery or radiation may use water-soluble lubricants or moisturizing suppositories available at any drugstore without a prescription. Some women may experience some shrinkage of the vagina as a result of radiation or surgery. A combination of learning to relax the vaginal muscles and gentle, gradual stretching of the vagina with dilators can overcome this problem. Finding positions that give the woman control over movement and minimize deep penetration can also help. Your doctor can give you additional advice about sexual activity after radiation treatment or surgery. For more detailed information about positioning and sexual techniques, refer to *Sexuality for Women and Their Partners* by the American Cancer Society. If you are having chemotherapy, it is important to know what your platelet count is before engaging in sexual activity. If your platelet count is lower than 50,000 and you engage in sexual activity, you may be at risk for bleeding.

During chemotherapy you are also at greater risk for getting an infection. For this reason, practice good personal hygiene and bathe daily. Wash your hands and genitals before and after sexual activity. If you are not in a monogamous sexual relationship (having only one partner) or you are not sure of your partner's faithfulness, you should practice safer sex, using latex condoms to avoid contact with your partner's body fluids. If you use a lubricant with latex condoms, choose a water-based lubricant, and not a lubricant that contains oil (i.e., baby oil or petroleum jelly), since such products can weaken the condom. Nonoxynol-9 is no longer recommended as an HIV preventive.

If you are the spouse or partner of the patient, you need not worry about getting cancer from sexual intercourse. Cancer is not passed from one person to another. Sexual activity does not cause cancer, nor does sexual activity increase the risk that cancer will return. The causes of cancer are complex, such as exposure to certain toxic chemicals, tobacco use, or genetic factors. It is medically impossible to pass cancer from one person to another. However, some chemotherapy drugs can be present during treatment in semen or vaginal fluid. If your partner is receiving chemotherapy, use condoms for the first 72 hours after chemotherapy is finished to avoid any exposure to the drugs.

## **Treatment and relationships**

Cancer and cancer treatment can cause changes in your appearance. Side effects, such as hair loss, weight changes, scars, or changes in skin color may distress you. You may feel helpless and frustrated by changes beyond your control. The way you feel about your body and yourself can affect how you interact with others. Classes are available to help you look good and feel better. Contact your local chapter of the American Cancer Society to find out about classes near you.

Anxiety about cancer and cancer treatment can cause a strain on any relationship. Anxiety can interfere with your ability to enjoy any activity, but it is a treatable condition. Worry and fear about the future may make it hard to share intimacy and affection. This commonly occurs when your need for closeness and intimacy are greater than ever. It is normal to experience these emotions during treatment, and it's healthy to talk about them.

Your doctor, nurse, social worker, or chaplain are available to listen to your concerns and give you advice. Many people don't talk to healthcare professionals about their sexual relationships because they feel embarrassed, ashamed, or afraid. Discuss your concerns with one of your healthcare providers. Choose a doctor, nurse, social worker, chaplain, or therapist whom you trust and who cares about you. He or she can give you information and advice to help you maintain your sexual and emotional health during and after treatment.

## **Treatment and family expectations**

You carry out different roles every day. You may be a friend, a parent, a daughter, a spouse, a lover, a sister, a worker, and a breadwinner all at once. Each of these roles makes demands upon your time and energy. Fatigue and stress caused by your treatment may prevent you from taking care of duties that you once took for granted. If you are not able to meet these demands, you may feel guilty and become frustrated. You may not be able to do as much for your family as before, but you still have a lot to offer through your love, your caring, and your friendship.

Because of your illness, your family and loved ones may try to protect you. Even though they mean well, you may feel like they are taking away your independence or your rights as an adult. After treatment, when you start feeling better, your loved ones may have become used to you in the role of a patient. You may need to sit down together and discuss how to switch back from the caretaker and sick person roles into your usual, more balanced roles.

For more information about your cancer treatment and its impact on your sexuality, please talk with your doctor, nurse, social worker, chaplain, or family therapist.

## **Spiritual well-being**

A diagnosis of cancer may raise questions and spiritual concerns. Questions such as "Why did this happen to me?" and "Is God punishing me for past wrongs?" may come up over and over. It is not unusual for people to have feelings of shame or guilt as a result of having a cancer diagnosis. Scientists believe that a variety of factors cause cancer, such as toxic chemicals in the environment, the use of tobacco, or heredity. The medical community does not yet have all the answers.

Your faith should inspire you and help you understand yourself. You may find it helpful to discuss your concerns with a priest, rabbi, minister, or other spiritual person whom you trust.

### **End of life issues**

In certain instances, when the cancer can no longer be controlled with available therapies or when patients can no longer tolerate treatments, doctors turn their focus to making the patient comfortable. This is called palliative care. The patient receives medications and treatments to control pain and other symptoms, such as constipation, nausea, and shortness of breath. Some patients remain at home during this time, while others enter a hospital or other facility. Either way, services are available to help patients and their families with the medical, psychological, and spiritual issues surrounding dying. A hospice often provides such services.

The time at the end of life is different for each person. Each individual has unique needs for information and support. The patient's and family's questions and concerns about the end of life should be discussed with the healthcare team as they arise.

Cervical Cancer

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