

# UTERINE SARCOMA

## What Is Cancer?

Cancer is a group of many related diseases. All forms of cancer involve out-of-control growth and spread of abnormal cells.

Normal body cells grow, divide, and die in an orderly fashion. During the early years of a person's life, normal cells divide more rapidly until the person becomes an adult. After that, normal cells of most tissues divide only to replace worn-out or dying cells and to repair injuries.

Cancer cells, however, continue to grow and divide, and can spread to other parts of the body. These cells accumulate and form *tumors* (lumps) that may compress, invade, and destroy normal tissue. If cells break away from such a tumor, they can travel through the bloodstream, or the lymph system to other areas of the body. There, they may settle and form "colony" tumors. In their new location, the cancer cells continue growing. The spread of a tumor to a new site is called *metastasis*. When cancer spreads, though, it is still named after the part of the body where it started. For example, if prostate cancer spreads to the bones, it is still prostate cancer, and if breast cancer spreads to the lungs it is still called breast cancer.

Leukemia, a form of cancer, does not usually form a tumor. Instead, these cancer cells involve the blood and blood-forming organs (bone marrow, lymphatic system, and spleen), and circulate through other tissues where they can accumulate.

It is important to realize that not all tumors are cancerous. Benign (noncancerous) tumors do not metastasize and, with very rare exceptions, are not life-threatening.

Cancer is classified by the part of the body in which it began, and by its appearance under a microscope. Different types of cancer vary in their rates of growth, patterns of spread, and responses to different types of treatment. That's why people with cancer need treatment that is aimed at their specific form of the disease.

In America, half of all men and one-third of all women will develop cancer during their lifetimes. Today, millions of people are living with cancer or have been cured of the disease. The risk of developing most types of cancer can be reduced by changes in a person's lifestyle, for example, by quitting smoking or eating a better diet. The sooner a cancer is found, and the sooner treatment begins, the better a patient's chances are of a cure.

## What Are Uterine Sarcomas?

Uterine sarcomas are cancers of the connective tissues of the uterus (womb).

Cells that line or cover most organs are called *epithelial cells*, and cancers that develop from these cells are called *carcinomas*. Cancers that start from "connective tissues," such as muscle, fat, bone, and fibrous tissue (the material that forms tendons and ligaments) are called *sarcomas*.

Over 95% of cancers of the uterus develop from cells of the lining layers of that organ. Carcinomas of the lower part of the uterus above the vagina, called the *cervix*, are called *cervical carcinomas*. Carcinomas that develop from the lining cells of the upper part of the uterus, called the *body* or *corpus* of the uterus, are called *endometrial carcinomas*. Cervical and endometrial carcinomas are discussed in separate documents available from the American Cancer Society.

Most uterine sarcomas fall into one of three categories, based on the type of cell they developed from.

- *Endometrial stromal sarcomas* develop in the *stroma* (supporting connective tissue) of the endometrium.
- *Uterine leiomyosarcomas* start in the muscular wall of the uterus.
- *Uterine carcinosarcomas*, also known as *malignant mixed mesodermal tumors* or *malignant mixed Mullerian tumors* (abbreviated as MMMT), start in the endometrium and have features of both sarcomas and carcinomas. They are usually classified with uterine sarcomas but some doctors believe they are more closely related to carcinomas.

Among this group of uterine cancers, carcinosarcomas are the most common, followed by leiomyosarcomas. Endometrial stromal sarcomas are the least common.

Several types of *benign* (noncancerous) tumors, such as *leiomyomas*, *adenofibromas*, and *adenomyomas*, can also develop in the connective tissues of the uterus. These tumors are usually treated by *hysterectomy* (surgical removal of the uterus). In some cases, the tumor can be removed without removing the entire uterus depending on the age and reproductive desires of the patient. The remainder of this document refers to uterine sarcomas and not to benign tumors.

## What Are The Key Statistics About Uterine Sarcomas?

An estimated 38,300 new cases of cancer of the uterine corpus (body of the uterus), usually of the endometrium, will be diagnosed in the United States during 2001. It is estimated that about 6,600 women in the United States will die from cancer of the uterine corpus during 2001.

According to estimates from various studies, uterine sarcomas (including carcinosarcomas, leiomyosarcomas, and endometrial stromal sarcomas) account for between 2% and 4% of cancers of the uterus.

## What Are The Risk Factors For Uterine Sarcomas?

A *risk factor* is anything that increases a person's chance of getting a disease such as cancer. Different cancers have different risk factors. For example, unprotected exposure to strong sunlight is a risk factor for skin cancer. Smoking is a risk factor for cancer of the lung, mouth, throat, kidney, bladder, and several other cancers. Several factors have been found that increase a woman's risk of developing a uterine sarcoma.

**Prior pelvic radiation therapy:** High-energy (ionizing) radiation used to treat some cancers can damage the DNA of cells, sometimes increasing the risk of developing a second type of cancer. Women who have had pelvic radiation have an increased risk for developing uterine sarcomas. These cancers usually are diagnosed 5 to 25 years following radiation exposure. This risk factor accounts for less than one-third of uterine sarcomas.

**Race:** One type of uterine sarcoma, leiomyosarcoma, is more common among African Americans than among whites or Asians. The reason for this increased risk is unknown. No racial differences in risk have been noted among other types of uterine sarcomas.

**Age:** Uterine sarcomas tend to occur in middle aged and elderly women, although they may affect younger women as well.

**Endometrial cancer risk factors:** Factors that increase a woman's risk of developing endometrial cancer also increase her risk for developing carcinosarcoma, but not any of the other types of uterine sarcoma. These factors tend to be related to levels of the female hormones, estrogen and progesterone. Obesity, certain types of estrogen replacement therapy, treatment with *tamoxifen* (a hormonal drug used for breast cancer treatment and breast cancer risk reduction), infertility, diabetes, starting menstrual periods before age 12, and reaching menopause after age 52 all increase the amount of estrogen a woman's uterus is exposed to, increase the duration of that exposure, or alter the balance between estrogen and progesterone toward a relative excess of estrogen.

It is important to remember, however, that these factors increase a woman's risk for developing some uterine sarcomas, but do not always cause the disease. Many women with one or more of these factors never have a uterine sarcoma, and others with uterine sarcomas do not have any known risk factors.

## **Do We Know What Causes Uterine Sarcomas?**

We do not yet know exactly what causes most uterine sarcomas, but we do know what certain risk factors are. A great deal of research is underway to learn more about the disease.

Scientists have recently learned much about changes in the DNA of certain genes that occur when normal uterine cells develop into sarcomas. Some of the observations are discussed in the section "What's New in Uterine Sarcoma Research and Treatment?"

## **Can Uterine Sarcomas Be Prevented?**

Most cases of uterine sarcoma cannot be prevented. Although pelvic radiation increases the risk of developing a uterine sarcoma, the benefit of pelvic radiation therapy in treating other cancers far outweighs the risk of developing a rare cancer such as uterine sarcoma many years later.

## **Can Uterine Sarcomas Be Found Early?**

In some cases, knowing the signs and symptoms of uterine sarcoma and discussing them promptly with your health care provider permits diagnosis at an early stage. Unfortunately, many uterine sarcomas may reach an advanced stage before recognizable signs and symptoms are present. These signs and symptoms differ among the three main types of uterine sarcoma.

### **Signs and Symptoms of Uterine Sarcomas**

**Unusual bleeding, or spotting:** If you have gone through menopause, it is especially important to report unusual bleeding or spotting to your health care provider. About 85% of patients diagnosed with uterine sarcoma have complained of post-menopausal bleeding or spotting (bleeding between periods). Although this can occur with benign (noncancerous) conditions such as hormonal imbalances and some infections, it is important to have an immediate medical evaluation of unusual bleeding. Abnormal bleeding is more likely to be caused by carcinosarcomas or endometrial stromal sarcomas than by leiomyosarcomas.

**Other discharge:** About 10% of women with uterine sarcomas have a discharge without any visible blood. Although such discharges are usually a sign of some benign condition such as infection, absence of visible blood in a discharge does not mean cancer is absent. Any abnormal discharge should be investigated by your health care provider.

**Pelvic pain and/or mass:** About 10% of women have pain and/or a mass that can be felt at the time their uterine sarcoma is diagnosed.

## Screening tests

At this time, there are no recommended screening tests or examinations that can reliably detect most uterine sarcomas in women who are *asymptomatic* (without symptoms). The Pap test can find some early uterine sarcomas (especially carcinosarcomas and endometrial stromal sarcomas), but many cases (especially leiomyosarcomas) are not detected by this test. In contrast, the Pap test is very effective in finding early carcinomas of the *cervix* (the lower part of the uterus). For this reason, the American Cancer Society recommends a yearly Pap test and pelvic exam starting at age 18 or when a woman first becomes sexually active, whichever is first. If Pap tests are negative three years in a row, the health care provider may choose to do them less often, depending on a woman's risk factors.

## How Are Uterine Sarcomas Diagnosed?

In most cases, the possibility of uterine sarcoma is suggested by certain symptoms such as abnormal spotting, bleeding, discharge, or pelvic pain. These symptoms do not specifically indicate that a woman has a uterine sarcoma. In fact, they are more often due to hormonal imbalances that cause benign overgrowth of the endometrium or an endometrial carcinoma. Doctors will use one or more tests to distinguish among these possibilities. Most carcinosarcomas and endometrial stromal sarcomas are diagnosed during evaluation of these symptoms.

In other cases, a mass in the uterus is felt by the patient or her doctor, or the patient has a feeling of "fullness" in the pelvis. Imaging tests may suggest that the mass is a sarcoma, and surgery is planned with this diagnosis in mind. In other instances, the mass is initially believed to be a *leiomyoma* (the benign counterpart of leiomyosarcomas) but later discovered to be a sarcoma after it has been removed and examined under a microscope. Between one-fifth and one-half of leiomyosarcomas are diagnosed in this way.

## Consultation, history, and physical examination

**Consult with a specialist:** If uterine sarcoma is suspected, most physicians would recommend that the woman be examined by a *gynecologic oncologist* (a doctor who specializes in diagnosing and treating female reproductive system cancers).

**Complete medical history:** The first step in the consultation will be gathering a complete personal and family medical history. This is an interview to ask about symptoms, risk factors, and any other health problems.

**Complete physical examination:** This will include a general physical examination and an examination of the pelvis.

## Sampling and testing endometrial tissue

If a woman has abnormal uterine bleeding, tissue from the lining of the uterus must be removed and examined under the microscope to determine if endometrial *hyperplasia* (benign overgrowth), endometrial carcinoma, uterine sarcoma, or some other disease is present. The tissue can be sampled by *endometrial biopsy* or by *dilation and curettage (D & C)* with or without a *hysteroscopy* (a test in which a gynecologist views the inside of the uterus through a thin, lighted tube). These procedures will find nearly all carcinosarcomas and endometrial stromal sarcomas. Less than half of leiomyosarcomas will be found in this way, because these cancers begin in the wall of the uterus and often have not spread to the lining of the uterine cavity -- the area sampled by an endometrial biopsy or D&C.

**Endometrial biopsy:** An endometrial biopsy is an office procedure in which a sample of endometrial tissue is obtained through a very thin, flexible tube inserted into the uterus through the cervix. The tube removes a small amount of endometrium using suction. The suctioning takes about a minute or less. The discomfort is similar to severe menstrual cramps and can be minimized by taking a nonsteroidal anti-inflammatory drug such as ibuprofen an hour before the procedure.

**Dilation and Curettage (D & C):** If the endometrial biopsy provides an inadequate amount of tissue or is suggestive of but not diagnostic for cancer, a D & C with or without a hysteroscopy must be done. In this outpatient procedure, the cervix is dilated and a special surgical instrument is used to scrape tissue from inside the uterus. The procedure takes about an hour and may require general anesthesia or *conscious sedation* (medication is given into a vein to make the patient drowsy but able to stay awake). A dilation and curettage is usually done in an outpatient surgery area of a clinic or hospital. Most women have little discomfort after this procedure.

**Testing of endometrial tissue:** Tissue samples removed by endometrial biopsy, D & C, or surgery through a hysteroscope are examined under the microscope to determine if cancer is present. If cancer is found by the biopsy, D & C, or sample removed during hysteroscopy it will be characterized as a specific type of carcinoma or sarcoma, and will be graded. The tumor's grade is based on whether its appearance under the microscope resembles that of normal tissue very closely (low grade) or only remotely (high grade). The rate at which the cancer cells appear to be growing is another important factor in grading of a uterine sarcoma. High-grade sarcomas tend to grow and spread more quickly than low-grade sarcomas.

The endometrial biopsy, D & C specimen, or tissue removed during hysteroscopy can also be used to test if the cancer cells contain *estrogen receptors* and *progesterone receptors*. Progesterone and estrogen are hormones that help regulate the growth of normal cells of the uterus. These hormones are produced by the ovaries. As noted in the section "What Are The Risk Factors for Uterine Sarcoma?" having too much estrogen in relation to progesterone increases a woman's risk of developing endometrial carcinoma and some types of uterine sarcoma. For normal cells to respond to these hormones, they must contain special proteins that recognize

estrogen and progesterone. These recognition proteins are called *receptors*, and can be identified by laboratory tests. Some endometrial stromal sarcomas that contain estrogen and progesterone receptors depend on these hormones to grow. Hormonal therapies that prevent estrogen production or block the action of this hormone can slow the growth of some endometrial stromal sarcomas.

### **Transvaginal ultrasound or sonography**

A transvaginal *sonogram* (ultrasound) uses sound waves to create images of the uterus. A probe inserted into the vagina releases sound waves that echo off the tissues of the pelvic organs. The pattern of echoes is analyzed by a computer to create images on a computer screen. These images often help determine whether a tumor is present and whether it involves the *myometrium* (muscular wall of the uterus).

For an *ultrahysterosonogram* or *saline infusion sonogram*, saline (saltwater) is introduced into the uterus through a catheter before the transvaginal sonogram is done. This will allow the doctor to see abnormalities of the uterine lining more clearly.

### **Tests to detect the spread of uterine sarcomas**

If the *pathologist* (a doctor specializing in diagnosis of diseases by laboratory tests) examining the endometrial biopsy, D & C, or hysteroscopy specimen determines that cancer is present, the next step is surgery to remove the uterus. First, though, some tests are necessary to determine whether the cancer has spread to other organs. These tests typically include some routine imaging tests. Other procedures may also be used.

Sometimes, a tumor within the wall of the uterus that is thought to be benign may be removed, and later found to be a leiomyosarcoma after being examined under a microscope. Women in this situation may also undergo routine imaging tests and other procedures to detect if the cancer has spread to other organs.

**Computed tomography (CT) scan:** In this procedure a special x-ray machine rotates around the body, taking pictures from many angles. These pictures are combined by a computer to produce detailed cross-sectional images that are often helpful in determining if and where endometrial cancer has spread beyond the uterus (to the surface of the bowel or to the lymph nodes, for example).

**Magnetic resonance imaging (MRI):** This procedure also produces very detailed cross-sectional images. Unlike the CT scan, MRI uses magnetic fields and radio waves instead of x-rays.

**Chest x-rays:** These images are routinely obtained to see if a uterine sarcoma has metastasized (spread) to the lungs.

**Cystoscopy and proctoscopy:** If a woman has signs or symptoms that suggest the uterine sarcoma has spread to the bladder or rectum, the inside of these organs can be viewed through a lighted tube. These examinations are called cystoscopy and proctoscopy, respectively.

## How Are Uterine Sarcomas Staged?

*Staging* is the process of analyzing information learned about a tumor through the diagnostic process to tell how much the cancer has spread. The stage of a uterine sarcoma is the most important factor in selecting treatment. Ask your health care team to explain the stage of your cancer so that you can make fully informed choices about your treatment.

The cancer care team uses a staging system to describe and summarize how far a patient's cancer has spread. The system used to stage endometrial cancer is called the FIGO (International Federation of Gynecology and Obstetrics) system of staging. This is a surgical staging system. This means that staging is based on examination of tissue removed during an operation. The FIGO system classifies the cancer in stages I through IV, with some of these stages being further divided (for example, stages IIA, IIB and IIC). The FIGO endometrial cancer staging system is also used for uterine sarcomas.

**Stage I:** The cancer is limited to the *corpus* (body) of the uterus.

**Stage II:** The cancer has spread from the body of the uterus to the *cervix* (the lower part of the uterus next to the vagina).

**Stage III:** The cancer has spread beyond or outside the uterus, but remains confined to the pelvic area.

**Stage IIIA:** The cancer has spread to the *serosa of the uterus* (the layer of tissue on the outer surface of the uterus) or to the *adnexa* (tissues immediately to the right and left sides of the uterus), or microscopic examination found cancer cells in *peritoneal fluid* (fluid from the inner lining of the pelvis and abdomen).

**Stage IIIB:** The cancer has spread beyond the uterus, to the vagina.

**Stage IIIC:** The cancer has spread to lymph nodes near the uterus (pelvic and/or para-aortic lymph nodes).

**Stage IV:** The cancer has spread to the *mucosa* (inner surface) of the urinary bladder or the *rectum* (lower part of the large intestine), and/or has spread to lymph nodes in the groin, and/or has spread to organs that are not next to the uterus, such as the bones or lungs.

**Stage IVA:** The cancer has spread to the *mucosa* (inner surface) of the rectum or urinary bladder.

**Stage IVB:** The cancer has spread to lymph nodes in the groin area and/or has spread to organs that are not next to the uterus, such as the bones or lungs.

## **Survival Rates by Stage**

The *prognosis* (the outlook for chances of survival) for women with a uterine sarcoma depends on many factors. The stage of the cancer is one important factor, but the type of sarcoma (carcinosarcoma, leiomyosarcoma, or endometrial stromal sarcoma), the grade of the sarcoma (low grade versus high grade), and the woman's general state of health also influence her prognosis. The survival statistics noted below are estimates based on studies of many women with uterine sarcomas. Although they reflect the average outlook for large groups of patients, they cannot reliably predict the outlook for any particular individual. Also, the survival statistics are 5-year survival rates, meaning that they are based on follow-up of women diagnosed more than 5 years ago. Advances in treatment may make the outlook more favorable for women diagnosed more recently.

**Stage I:** About 50% of women diagnosed at this stage survive five years or more after diagnosis.

**Stage II:** About 20% of women with stage II disease are expected to survive five years or more.

**Stages III and IV:** About 10% of women with stage III or IV disease are expected to survive five years or more.

## **How Are Uterine Sarcomas Treated?**

### **Considering Treatment Options**

After the diagnostic tests are done, your cancer care team will recommend one or more treatment options. Don't feel rushed about making a decision. If there is anything you do not understand, ask to have it explained again. The choice of treatment depends largely on the type of cancer and stage of the disease when it is diagnosed. Other factors might play a part in choosing the best treatment plan. These might include your age, your overall state of health, whether you plan to have children, and other personal considerations. Be sure you understand all of the risks and side effects of different treatment options before making a decision.

From the start, keep in mind that you must deal with your own individual physical and emotional factors. In the process of deciding what kind of treatment to have, you will find it helpful to discuss options with your family and friends, as well as with your primary care physician and nurse. At every step of the way, during pre-treatment, treatment, and recovery, you should talk with your cancer care team about side effects and ways to eliminate them or make them easier to endure. They want to answer your questions, so ask them!

You may want to get a second opinion. This can provide more information and help you feel confident about the treatment plan you choose. Some insurance companies require a second

opinion before they will pay for certain treatments, but a second opinion is usually not required for routine cancer treatments.

There are four basic types of treatment for women with uterine sarcoma -- surgery, radiation therapy, hormonal therapy, and chemotherapy. A combination of these treatments may be used. The choice of treatment(s) will depend on the type and stage of your cancer, and your overall medical condition.

## **Surgery**

Several different operations are used to treat uterine sarcoma. The medical vocabulary for these operations is based on the Greek or Latin medical names of the organs that are removed. The medical name of an operation that removes an organ or tissue usually ends with "-ectomy." So, removing the uterus is a *hysterectomy* and removing lymph nodes is a *lymphadenectomy* (also called lymph node biopsy or dissection). Removing one ovary is a *unilateral* (one side) *oophorectomy* and removing both is a *bilateral* (two sides) *oophorectomy*. Likewise, removing one or two fallopian tubes is a *unilateral salpingectomy* or *bilateral salpingectomy*. Often an operation removes several organs. For example, removal of both ovaries and fallopian tubes is called a *bilateral salpingo-oophorectomy* (BSO). This partial list of names of operations should help you understand information you may read and discuss with your health care providers. Don't hesitate to ask your cancer care team to explain your condition and recommend treatments in simple, nonmedical terms.

The choice of surgical procedures to treat uterine sarcoma is mainly based on the stage, type, and grade of the cancer. This decision is also influenced by a woman's general state of health and her age. In some cases, a firm surgical plan is based on *preoperative* (before surgery) tests such as imaging studies, and results of the pelvic examination, endometrial biopsy, and/or D & C. In other cases, the surgeon begins the operation with several options which were selected based on the preoperative examination and test results. A decision about which of these options to take depends on what the surgeon finds during the surgery.

**Myomectomy:** This operation is often done to remove leiomyomas. In some cases, a tumor removed by this procedure is later found to be a leiomyosarcoma after examination under a microscope. When this occurs, additional surgery is usually required.

**Simple Hysterectomy:** This is surgical removal of the *uterus* (the body of the uterus and the cervix). The *parametrium* (loose connective tissue around the uterus) and the *uterosacral ligaments* (tissue connecting the uterus and sacrum) are not removed, and the vagina remains intact. The operation is called an abdominal hysterectomy if it involves a surgical incision in the front of the abdomen. When the uterus is removed through the vagina it is called a vaginal hysterectomy. If lymph node sampling is needed, this can be done through the same incision as the abdominal hysterectomy. If a hysterectomy is done vaginally, lymph nodes can be removed using a laparoscope. (Laparoscopy is explained later on in this section on surgery.) General anesthesia or regional anesthesia is used so the patient is asleep or sedated during the procedure. For an abdominal hysterectomy the hospital stay is usually 3 to 5 days. Complete recovery takes about 4 to 6 weeks. A laparoscopic procedure and vaginal hysterectomy usually requires a

hospital stay of 1 to 2 days and a 2 to 3 week recovery. A hysterectomy results in *infertility* (inability to have children). Complications are unusual, but could include excessive bleeding, wound infection, or damage to the urinary or intestinal systems.

**Radical hysterectomy:** Like a simple hysterectomy, this operation removes the entire uterus. However, the tissues next to the uterus (parametrium and uterosacral ligaments) and the upper part (about 1 inch) of the vagina next to the cervix are also removed. This operation is used when endometrial carcinoma has spread to the cervix or parametrium but is rarely performed for sarcomas. As in a simple abdominal hysterectomy, general or regional anesthesia and an abdominal surgical incision are usually used, although a radical hysterectomy can also be performed through the vagina. Most patients undergoing a radical hysterectomy also have a lymph node sampling procedure, which can be done through the abdominal incision or by laparoscopic lymph node sampling. Since more tissue is removed by a radical hysterectomy than a simple hysterectomy, the hospital stay is longer - about 5 to 7 days. The surgery results in *infertility* (inability to have children). Complications are unusual, but could include excessive bleeding, wound infection, and damage to the urinary or intestinal systems.

### **Sexual Impact of Radical Hysterectomy**

Following radical hysterectomy, no menstrual bleeding will take place because the uterus has been removed. The operation does not change a woman's ability to feel sexual pleasure. A woman does not need a uterus or cervix to reach orgasm.

Even though there are no changes in a woman's physical functioning, she may feel less feminine after hysterectomy. Some women view themselves as "an empty shell." When cancer has caused pain or bleeding with intercourse, the hysterectomy should improve a woman's sex life by stopping those symptoms.

**Bilateral salpingo-oophorectomy (BSO):** This operation removes both fallopian tubes and both ovaries. In treating endometrial carcinomas and uterine sarcomas, this operation is done at the same time the uterus is removed (either by simple hysterectomy or radical hysterectomy). Removal of both ovaries means that you will go into menopause if you have not done so already. Many symptoms associated with menopause (such as hot flashes, night sweats, vaginal dryness) can be relieved by *estrogen replacement therapy* (ERT). This therapy also lowers a woman's risk of osteoporosis (softening of the bones) and heart disease. However, use of ERT is controversial in women with some types of uterine cancer, because of the potential of increasing the risk of recurrent disease or increasing the risk of other hormonally related cancers, such as breast cancer. Therefore, decisions about ERT in uterine sarcoma survivors must balance the risks (recurrent or other hormonally related cancers) and benefits (relief of symptoms and protection against some other diseases, such as osteoporosis and heart disease). Most experts in this field would either avoid prescribing ERT for uterine sarcoma survivors, or prescribe it only when the stage and grade of the cancer indicate a very low risk of recurrence. There are other treatments for symptoms and prevention of heart disease and osteoporosis which are nonhormonal. Ask your doctor about these options.

**Pelvic lymph node dissection:** This operation removes some lymph nodes from the pelvis to determine whether they contain cancer cells that spread from the uterine sarcoma. This operation is done through the same surgical incision in the abdomen as the simple abdominal hysterectomy or radical abdominal hysterectomy.

**Laparoscopic lymph node sampling:** Laparoscopy is a relatively new technique for viewing the inside of the abdomen and pelvis through a tube which is inserted into a very small surgical incision. Small surgical instruments can be introduced through the tube, allowing the surgeon to remove lymph nodes without a large incision in the abdomen. It may be possible to remove the uterus through the vagina instead of an abdominal incision. This approach can shorten the time needed for recovery from surgery. Studies are in progress to determine whether this surgery is as effective as the traditional operations for treating some types of uterine sarcoma. Meanwhile, many oncologists feel that laparoscopic lymph node sampling is effective and are offering this procedure as an option to their patients.

## **Radiation therapy**

Radiation therapy uses high-energy radiation (such as x-rays) to kill cancer cells. These treatments may be given externally in a procedure that is much like having a diagnostic x-ray. This is called *external beam* radiation therapy. Radiation therapy may be given by placing radioactive materials near the tumor. This is called *brachytherapy*.

**External Beam Radiation Therapy:** Preoperative external and internal radiation therapy may be used if the cervix is grossly involved by tumor. If the cancer has extended more than halfway through the *myometrium* (muscular wall of the uterus) or is a Grade 3 cancer (indicating a potential for lymph node involvement) or if microscopic examination of lymph nodes found cancer cells, the entire pelvis is usually treated with external beam radiation therapy after surgery. Depending on the location of affected lymph nodes, the radiation field may be extended to also include an area of the abdomen called the *para-aortic field*.

This is the more familiar type of therapy in which the radiation is delivered from an outside source. External beam radiation therapy requires treatment 5 days a week for four or five weeks. The skin covering the area that is exposed to radiation is carefully marked with permanent ink or injected dye, similar to a tattoo. A special mold of the pelvis and lower back is custom-made to ensure that the woman is placed in the exact same position for each treatment. The actual external beam radiation treatment takes less than a half hour.

**Brachytherapy:** How much of the pelvis needs to be exposed to radiation therapy depends on the extent of the disease. In cases where only the upper third of the vagina (the vaginal cuff) needs to be treated, a radioactive application is inserted through the vagina. This internal application of radiation therapy is called *brachytherapy*.

Four to six weeks after the hysterectomy, the surgeon or radiation oncologist inserts a special applicator into the woman's vagina in the radiation suite of the hospital or care center, and pellets of radioactive material are inserted into the applicator. Several treatments may be necessary. With vaginal brachytherapy, the radiation has little effect on nearby structures, such as the

bladder or rectum. In some situations, both brachytherapy and external beam radiation therapy are given.

If cancer cells are present in the fluid samples from the pelvis or abdomen taken during surgery, then a radioactive solution, such as radioactive phosphate (P32), may be introduced through a catheter into the abdominal and pelvic cavities after the surgery. Treatment with this radioactive solution should not be combined with external beam radiation therapy.

**Side effects of radiation therapy:** Fatigue, which may not occur until several weeks after therapy begins, is a common side effect.

As the radiation passes through the skin to its intended target, it may damage the skin cells causing irritation that ranges from temporary and mild redness to permanent discoloration. The skin may release fluid, which can lead to infection, so care must be taken to clean and protect the area exposed to radiation.

Diarrhea is a common side effect, but it can usually be controlled with nonprescription medications. Bladder irritation called *radiation cystitis*, may also occur, resulting in discomfort and an urge to urinate frequently. Pelvic radiation therapy may cause vaginal *stenosis* (narrowing of the vagina by scar tissue), which might make intercourse painful.

Premature menopause may also occur as a side effect of radiation therapy. However, most women who have radiation therapy for uterine sarcoma also have both ovaries removed. If a woman is not already menopausal, this surgery would cause premature menopause, even if no radiation is given. And, most women diagnosed with uterine sarcoma are in their 50s and 60s, and have already stopped menstruating before their uterine sarcoma was diagnosed. For most patients, premature menopause is not a concern.

If you are having any side effects from radiation, discuss them with your cancer care team. There are things you can do to obtain relief from these symptoms or prevent their occurrence, such as using vaginal dilators to manage vaginal stenosis.

### ***Can a Woman Have Intercourse while Receiving Pelvic Radiation?***

As long as a woman is not bleeding heavily from a tumor in her bladder, rectum, uterus, cervix, or vagina, she can usually have intercourse during pelvic radiation therapy. The outer genitals and vagina are just as sensitive as usual. (Unless intercourse or touching is painful, a woman should still be able to reach orgasm.)

Women should follow their doctor's guidelines on intercourse during radiation therapy. Radiation therapy from a machine outside the body does not leave the body radioactive.

Some women are treated with an "implant." An implant is a radiation source placed inside the bladder, uterus, or vagina for a few days. Even women treated with this type of radiation do not remain radioactive after the implant is removed.

## **Chemotherapy**

Chemotherapy uses anticancer drugs that are most commonly given through a vein or by mouth. These drugs enter the bloodstream and reach all areas of the body, making this treatment potentially useful for cancer that has spread beyond the uterus. If this treatment is chosen, you may receive a combination of drugs. Drugs used in treating uterine sarcomas may include doxorubicin, ifosfamide, and cisplatin. The choice of chemotherapy drugs to use is influenced by the type of uterine sarcoma a woman has.

These drugs kill cancer cells but can also damage some normal cells, which in turn can cause side effects. Therefore, careful attention is given to avoiding or minimizing side effects. Side effects of chemotherapy depend on the specific drugs, the amount taken, and the length of time you are treated. They might include nausea and vomiting, loss of appetite, mouth and vaginal sores, and hair loss.

Because chemotherapy can damage the blood-producing cells of the bone marrow, patients may have low blood cell counts. This can result in an increased chance of infection (due to a shortage of white blood cells), bleeding or bruising after minor cuts or injuries (due to a shortage of blood platelets), and fatigue or shortness of breath (due to low red blood cell counts).

Most of these side effects of chemotherapy stop when the treatment is over. If you are taking chemotherapy and have side effects, remember that there are remedies that can prevent or reduce the severity of many of them. For example, antiemetic medications can prevent or reduce nausea and vomiting. Be sure to talk with your cancer care team about any side effects you are experiencing.

## **Hormone therapy**

Hormone therapy uses medications such as progesterone, usually taken in pill form, to slow the growth of cancer cells. This approach is sometimes used in treating patients with endometrial stromal sarcomas but is rarely used for other types of uterine sarcomas.

## **Clinical Trials**

Studies of promising new or experimental treatments in patients are known as clinical trials. During a course of treatment for cancer, the doctor may suggest that a patient take part in a clinical trial of a new treatment. A clinical trial is only done when there is some reason to believe that the treatment being studied may be of value to the patient. Treatments used in clinical trials are often found to have real benefits.

There are three phases of clinical trials in which a treatment is studied before the treatment is eligible for approval by the FDA (Food and Drug Administration).

The purpose of a Phase I study is to find the best way to give a new treatment and how much of it can be given safely. Physicians watch patients carefully for any harmful side effects. The

research treatment has been well tested in laboratory and animal studies, but the side effects in patients are not completely predictable.

Phase II trials determine the effectiveness of a research treatment after safety has been evaluated in a Phase I trial. Patients are closely observed for an anticancer effect by careful measurement of cancer sites present at the beginning of the trial. In addition to monitoring patients for response, any side effects are carefully recorded and assessed.

Phase III trials require entry of large numbers of patients. Some trials enroll thousands of patients. One of the groups may receive standard (the most accepted) treatment, so the new treatments can be directly compared. The group that received the standard treatment is called the "control group." For example, one group of patients (the control group) may receive the standard chemotherapy for a certain type of cancer, while another patient group may receive a different type of chemotherapy, that may or may not contain an investigational drug, to see if this improves survival. All patients in Phase III trials are monitored closely for side effects, and treatment is discontinued if the side effects are too severe.

Researchers conduct studies of new treatments to answer the following questions:

- Is the treatment likely to be helpful?
- Does this new type of treatment work?
- Does it work better than other treatments already available?
- What side effects does the treatment cause?
- Do the benefits outweigh the risks, including side effects?
- In which patients is the treatment most likely to be helpful?

However, there are some risks. No one involved in the study knows in advance whether the treatment will work or exactly what side effects will occur. That is what the study is designed to discover. While most side effects will disappear in time, some can be permanent or even life-threatening. Keep in mind, though, that even standard treatments have side effects. Depending on many factors, you may decide that a clinical trial will be beneficial in your case.

Enrollment in any clinical trial is completely up to you. Your doctors and nurses will explain the study to you in detail and will give you a form to read and sign indicating your desire to take part. This process is known as giving your *informed consent*. Even after signing the form and after the clinical trial begins, you are free to leave the study at any time, for any reason. Taking part in the study does not prevent you from getting other medical care you may need.

To find out more about clinical trials, ask your cancer care team. Among the questions you should ask are:

- What is the purpose of the study?
- What kinds of tests and treatments does the study involve?
- What does this treatment do?
- What is likely to happen in my case with, or without, this new research treatment?
- What are my other choices and their advantages and disadvantages?

- How could the study affect my daily life?
- What side effects can I expect from the study? Can the side effects be controlled?
- Will I have to be hospitalized? If so, how often and for how long?
- Will the study cost me anything? Will any of the treatment be free?
- If I am harmed as a result of the research, what treatment would I be entitled to?
- What type of long-term follow-up care is part of the study?
- Has the treatment been used to treat other types of cancers?

You can get a list of current clinical trials studying a specific type of cancer by calling the National Cancer Institute's Cancer Information Service toll free at 1-800-4-CANCER or visiting the NCI clinical trials web site for patients ([cancertrials.nci.nih.gov](http://cancertrials.nci.nih.gov)) or health care professionals ([cancernet.nci.nih.gov/prot/protsrch.shtml](http://cancernet.nci.nih.gov/prot/protsrch.shtml)).

## Treatment By Stage

Overall, the options are surgery, sometimes followed by *adjuvant therapy* (in addition to the primary treatment -- usually surgery) with radiation or chemotherapy. The role of adjuvant treatment is still debated by the experts. Most studies have found that adjuvant radiation therapy can reduce the risk of cancer coming back locally in the pelvis. But, most studies have not found adjuvant chemotherapy or radiation therapy to improve survival rates.

**Stages I, II, and III:** The usual surgical treatment is hysterectomy (removal of the body of the uterus and cervix) and salpingo-oophorectomy (removal of the fallopian tubes and ovaries). Pelvic lymph node dissection or laparoscopic lymph node sampling is recommended for some patients. During surgery, organs near the uterus and the peritoneum (the thin membrane that lines the pelvic and abdominal cavities) will be carefully examined to determine if the cancer has spread beyond the uterus.

Low-grade leiomyosarcomas that have not spread beyond the uterus are sometimes removed together with a margin of normal tissue, without removing the uterus, fallopian tubes, or ovaries. This approach preserves the patient's fertility and is a good option for some women who may wish to have children after their cancer is treated. Close follow-up is important and additional surgery will be performed if recurrent cancer is detected.

Even after surgery appears to have removed all of the cancer, local recurrence (cancer coming back in the area of the pelvis) is quite common, because many women have tiny fragments of cancerous tissue remaining in the pelvis. These fragments of cancer, which are too small to be seen by the surgeon, eventually grow into larger tumors. For this reason, adjuvant radiation therapy (radiation given after apparently complete surgical removal) may be recommended. This treatment can reduce the risk of local recurrence and prevent certain symptoms caused by local recurrence. But, adjuvant radiation therapy does not significantly improve the patient's outlook for survival.

Although adjuvant radiation therapy may reduce the risk of local recurrence, many cancers come back in distant organs. This suggests that the cancer cells may have spread through the bloodstream before the cancer was removed. The goal of adjuvant chemotherapy is to destroy

these cells before they grow into tumors large enough to cause problems or large enough to be recognized by imaging tests. Preliminary studies of adjuvant chemotherapy have not shown any improvement in survival rates, but these studies are still in progress.

**Stage IV:** There is currently no standard treatment for these cancers. Surgery or pelvic irradiation (or both) is sometimes done, as in less advanced stages. Women with stage IV uterine sarcomas might consider participation in clinical trials (scientific studies of promising treatments) testing new chemotherapy or other treatments. Preliminary studies have found that chemotherapy drugs can shrink some uterine sarcomas but cannot cure these cancers.

**Recurrent uterine sarcoma:** Treatment options are the same as with stage IV. Unfortunately, this type of cancer has a strong tendency to recur. If a recurrent pelvic tumor is large and causing discomfort, radiation may be used to reduce the size of the tumor and relieve the symptoms. One study indicated that high-dose progesterone therapy may benefit some women with endometrial stromal sarcomas.

## **What Should You Ask Your Physician About Uterine Sarcomas?**

It is important for you to have honest, open discussions with your cancer care team.

Some questions to consider:

- What type and grade of uterine sarcoma do I have?
- Has the cancer spread beyond the uterus?
- What is the stage of my cancer and what does that mean in my case?
- What treatments are appropriate for me? What do you recommend? Why?
- What should I do to be ready for treatment?
- What risks or side effects should I expect?
- What are the chances of recurrence of my cancer with the treatment options we have discussed?
- Should I follow a special diet?
- Will I be able to have children after my treatment?
- What is my expected prognosis, based on what you know about my cancer?
- When will I be able to return to daily activities?
- Does this cancer prevent me from considering estrogen replacement therapy?

In addition to these sample questions, be sure to write down some of your own. For instance, you may need specific information about anticipated recovery times so you can plan your work schedule. You may also want to ask about second opinions or about clinical trials for which you may qualify.

## **What Will Happen After Treatment For Uterine Sarcomas?**

Your body is as unique as your personality and your fingerprints. Scientists can determine certain facts about tumors and drugs, and doctors can use a variety of treatments to eliminate the cancer. But no one can say precisely how you will respond to cancer or its treatment.

You may have special strengths such as a healthy immune system, a history of excellent nutrition, a strong family support system, or a deep faith. All of these strengths can make a difference in how you respond to cancer. In fact, behavioral scientists have recently found that women who took advantage of a social support system, such as a cancer support group, survived with a better quality of life.

### **Follow-up Care**

An important part of your treatment plan is a specific schedule of follow-up visits after surgery, chemotherapy, or radiation therapy to be sure what, if any, additional treatment is necessary.

In addition to general physical exams and pelvic exams, follow-up may involve x-rays, CT scans, ultrasound studies, or other imaging studies. There also may be biopsies to check tissue samples under a microscope, blood tests, and other tests.

### **Lifestyle Factors**

You can help in your own recovery from cancer by making healthy lifestyle choices.

If you use tobacco, stop now. Quitting will improve your overall health and the full return of your sense of smell may help you enjoy a healthy diet during recovery.

Limit your consumption of alcoholic beverages, if you drink at all.

Good nutrition can help you get better after treatment. Eat a nutritious diet. Researchers are also finding increasing evidence which demonstrates the importance of nutrition in the prevention of cancer. Eat more fruits, vegetables, whole grains, and high-fiber foods. Eat less fats, especially animal fat. If you have had pelvic radiation, you may not be able to tolerate a high-fiber diet because of diarrhea, bloating, and cramping. Discuss your diet with your health care team.

Become physically active as soon as you feel you can, with your doctor's ok.

If you are receiving treatment for cancer, be aware of the battle that is going on in your body. Radiation therapy and chemotherapy add to the fatigue caused by the disease itself. Give your body the rest it needs so that you will feel better as time goes on.

A cancer diagnosis and its treatment are major life challenges that impact you and everyone who cares for you. Before you get to the point where you feel overwhelmed, consider attending a local support group meeting. If you need individual assistance in other ways, contact your hospital's social service department or the American Cancer Society for help in contacting counselors or other services.

## **What's New In Uterine Sarcoma Research And Treatment?**

**Molecular pathology of uterine sarcoma:** Recent research has improved our understanding of how changes in certain molecules can cause normal cells to become cancerous. It has been known for several years that mutations (damage or defects) to DNA can alter important genes that regulate cell growth. If these genes are damaged, excess growth may result in cancer formation. Analysis of DNA from uterine sarcomas has revealed several changes in the genes that control cell growth. Scientists expect that these discoveries will eventually lead to new strategies for detection, prevention, and treatment.

**Clinical trials:** Studies are currently in progress to find out if certain chemotherapy drugs (such as gemcitabine and paclitaxel) are useful in treating uterine sarcomas. Other studies are testing new ways to give standard drugs. For example, packaging doxorubicin inside tiny fat droplets called *liposomes* may make the drug more effective, while also reducing certain side effects. Studies on adjuvant radiation and chemotherapy continue to evaluate their roles in treatment of uterine sarcomas.

## **Additional Resources**

### **National Organizations and Web Sites**

In addition to the American Cancer Society, other sources of patient information and support include\*:

Gynecologic Cancer Foundation  
Telephone 1-800-444-4441  
Internet Address: [www.sgo.org/gcf](http://www.sgo.org/gcf)

National Cancer Institute  
Telephone 1-800-4-CANCER  
Internet Address: [www.nci.nih.gov/](http://www.nci.nih.gov/)

National Coalition for Cancer Survivorship  
Telephone 1-888-650-9127; 1- 877-622-7937 (for material orders)  
Internet Address: [www.cansearch.org](http://www.cansearch.org)

*\*Inclusion on this list does not imply endorsement by the American Cancer Society*

## **Additional American Cancer Society Information**

After Diagnosis: A Guide for Patients and Families (Booklet; Code #9440)

Cancer Facts for Women (Pamphlet; Code #2007) (Spanish version: Code #2623)

Caring for the Patient with Cancer at Home (Booklet; Code #4656)

Questions and Answers About Pain Control (Booklet; Code #4518).

Sexuality & Cancer -- For the Woman Who Has Cancer, and Her Partner (Booklet; Code #4657)

Understanding Chemotherapy (Booklet; Code #9458)

Understanding Radiation Therapy (Booklet; Code #9459)

## **Other Publications\***

*A Cancer Survivor's Almanac: Charting Your Journey.* Edited by Barbara Hoffman, JD. National Coalition for Cancer Survivorship. Chronimed Publishing, 1996.

Capossela, Cappy, Warnock, Sheila. *Share the Care: How to Organize a Group for Someone Who Is Seriously Ill.* New York: Simon and Schuster, 1995.

Dollinger, Malin, Rosenbaum, Ernest H., Cable, Greg. *Everyone's Guide to Cancer Therapy.* Somerville House Books, 1994.

Morra, Marion and Potts, Eve. *Choices.* Avon Books, 1994.

Runowicz, CD, Haupt, D. *To Be Alive: A Woman's Guide to a Full Life After Cancer.* Henry Holt & Co. 1996.

Schover, Leslie R, PhD. *Sexuality and Fertility After Cancer.* John Wiley & Sons, Inc., 1997.

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