

## Ovarian Cancer

### Overview

Each year, about 22,000 women in the United States learn that they have ovarian cancer. Ovarian cancer begins in the ovaries, and the symptoms are often common and vague, which makes it difficult to diagnose.

Many types of tumors can start growing in the ovaries. Some are benign (non-cancerous) and do not spread beyond the ovary. Malignant (cancerous) tumors can spread to other parts of the body. There are more than 30 different types of ovarian cancer, which are categorized according to the cell type.

Currently, there is no effective means of detecting ovarian cancer early. As a result, it is usually diagnosed in advanced stages and only 50 percent of women survive longer than five years after diagnosis. If ovarian cancer is diagnosed early, which happens in about 25 percent of cases, the five-year survival is greater than 90 percent. Most patients with ovarian cancer have surgery followed by chemotherapy. Studies have shown that prognosis and survival depends largely on how much tumor is left at the time of initial surgery. Patients who have no remaining tumor or with only tumor nodules less than one centimeter in diameter have the best chance for cure and long-term survival.

If you have been diagnosed with ovarian cancer, you should be seen by a gynecological oncologist, a doctor who is specially trained to take care of women with gynecologic cancers. Most gynecologic oncologists perform surgery, administer chemotherapy and follow their patients closely after treatment has been completed. According to the National Ovarian Cancer Coalition, studies have shown that women who had their surgery performed by gynecological oncologist live longer than those who do not.

### Anatomy

The ovaries are part of the female reproductive system. There are two ovaries located in the pelvis, one on each side of the uterus, the hollow, pear-shaped organ where a fetus grows. The ovaries produce eggs and female hormones (estrogen and progesterone). Every month, during the menstrual cycle, an egg is released from one ovary in a process called ovulation. The egg travels from the ovary through the fallopian tube, the site of conception. If conception occurs, the embryo moves on to the uterus and implants in the endometrium, the uterine lining.

## Causes

The exact cause of ovarian cancer is not known. Like all cancers, ovarian cancer develops when abnormal cells grow out of control. Abnormal cells develop because of damage to DNA, a substance in every cell that directs its activities. DNA is like a “blueprint” for the activities of the cell. Damaged DNA may be inherited (passed from parent to child), or a person’s DNA may be damaged by some environmental exposure. Normally, when DNA becomes damaged, the body is able to repair it. In cancer cells, the damaged DNA is not repaired. The cells begin to grow out of control. When they travel to other parts of the body and replace normal tissues, this is called metastasis (spread of cancer).

## Risk Factors

Women with certain risk factors may be more likely to develop ovarian cancer.

- Family history – Women are at increased risk if a first-degree relative (mother, daughter, sister) or a second-degree relative (grandmother, aunt, cousin) has ovarian cancer. If you have a family history of breast or colon cancer, you may have inherited genes (BRCA1 or BRCA2) that may increase the risk of developing ovarian cancer.
- Age – The risk of ovarian cancer increases with age and most often is diagnosed in women over the age of 50, with the highest risk in women over 60.
- Childbearing – Women who have never had children have a higher risk of developing ovarian cancer than women with children. The more children a woman has, the less likely she is to develop ovarian cancer.
- Personal history – A woman who has had breast or colon cancer has a greater chance of developing ovarian cancer than a woman who has not had breast or colon cancer.

The link between the risk factors listed below and ovarian cancer are controversial and have not been proven.

- Fertility drugs – Taking medicines to increase a woman’s fertility may slightly increase a woman’s chance of developing ovarian cancer. However, no reports have proven this association, and researchers are still studying whether there is a link.
- Talcum powder – Some studies suggest that women who used talcum powder in the genital area for many years may be at increased risk of developing ovarian cancer. At one time, talcum powder contained asbestos, a known cancer-causing agent. For more than 20 years, law has required that all powders be asbestos-free.

- Hormone replacement therapy – Some studies suggest that women who use hormone replacement therapy after menopause may have a slightly increased risk of developing ovarian cancer.
- Obesity – New data suggests that obesity and ovarian cancer may be linked. The association of obesity and cancer of the uterus is already well described, possibly because obesity leads to high levels of circulating hormones, which cause excessive growth of the uterine lining. Less is known of any direct link between obesity and ovarian cancer, but several studies have now demonstrated an increased risk.

## Types of Ovarian Cancer

There are several types of ovarian cancer, which are classified according to the type of cell they originate from and whether the tumor is benign or cancerous. The three main types of ovarian tumors are:

- Epithelial – Nearly 90 percent of ovarian cancers are epithelial, which means they occur in cells on the surface of the ovaries, called the epithelium. This kind of ovarian cancer occurs mostly in women over the age of 60, but women of any age can develop it.
- Germ cell – Germ cell tumors are uncommon and account for less than 5 percent of ovarian tumors. Germ cell tumors begin in the cells that form eggs in the ovary and usually affect only one ovary. Germ cell cancers are typically diagnosed in adolescent girls and young women. Germ cell cancers cause pain and discomfort in the early stages.
- Sex-cord stromal cell – This is an uncommon form of ovarian cancer that starts in the stromal cells, which make female hormones and connect the ovarian tissue together. It accounts for only 5 percent of all ovarian cancers. This type of cancer causes pain and discomfort in the early stages.

## Symptoms

Most women with ovarian cancer have some symptoms. However, these symptoms may feel vague, seem minor, or may be explained by other non-cancerous or less serious conditions. For example, a woman may think, “I’m getting older, so it’s probably normal that I’m gaining weight” or “I seem to be going to the bathroom more frequently, but it’s probably just an infection.”

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

- General abdominal discomfort or pain (gas, indigestion, pressure, swelling, bloating, cramps)
- Nausea, diarrhea, constipation, or frequent urination
- Loss of appetite
- Feeling of fullness even after a light meal

- Unexplained weight gain or loss
- Abnormal bleeding from the vagina
- Unusual fatigue (tiredness)

## Prevention

Although most cases of ovarian cancer cannot be prevented, there are certain things a woman can do that may lower her risk of developing ovarian cancer:

- Taking oral contraceptives (birth control pills) for more than five years reduces a woman's risk by about 50 percent.
- Breastfeeding may decrease a woman's risk of ovarian cancer.
- Healthy diet and regular exercise are important ways to reduce your risk of cancer and other diseases.
- Surgical removal of the ovaries and fallopian tubes (prophylactic oophorectomy) decreases a woman's risk. This is generally recommended only for certain very high-risk patients over age 40. It does not entirely eliminate the risk, because cancers can still form in the cells that line the pelvic and abdominal cavity.
- Tubal ligation (having the fallopian tubes tied) may decrease a woman's risk of developing ovarian cancer.

## Testing

Unlike a Pap test for cervical cancer or a mammogram for breast cancer, there is currently no reliable test to screen healthy women for ovarian cancer. (A Pap test only screens for cervical cancer, not ovarian cancer.) Every woman should have a vaginal and rectal pelvic exam performed by a gynecologist, a doctor who specializes in treating diseases of the female reproductive organs, once a year. This exam allows the doctor to examine the ovaries from many sides. If your doctor feels something abnormal, further tests will be performed.

## Genetic Testing

Discuss your family history with your doctor. Tell your doctor about any previous cancers you have had such as breast or colon cancer. If you have one or more first-degree relatives (mother or sister) who have had ovarian cancer, this suggests a possible hereditary cause. If you are at high risk for ovarian cancer, your doctor will recommend additional testing, which may include genetic testing. Blood tests are available for the BRCA1 or BRCA2 genes, which also cause breast cancer, and for genes involved in a familial colon cancer syndrome called Lynch Syndrome. In a woman believed to be at high risk for carrying one of these mutations, a blood test may help determine if she is high risk for the development of ovarian cancer (as well as breast, uterine, or colon cancer, depending on the gene). Many women find this information helpful in making important decisions about certain prevention strategies for them and their children. There are benefits and risks with genetic testing, so women should discuss them with their doctor.

## **Transvaginal Ultrasound (Sonogram)**

In a transvaginal ultrasound, an instrument called an ultrasound scanner sends out sound waves and receives echoes as they bounce off the ovaries. These echoes create electronic pictures of the ovaries on a small television screen. Transvaginal ultrasound is done with a wand-shaped scanner that is covered with a latex or latex-free cover and inserted into the vagina. You will feel some pressure from the transducer as it is inserted. A radiologist interprets the pictures and then reports the findings to the doctor.

This test can show any growths on or near your ovaries, although doctors can't tell just from looking at the growths whether they are cancer. Unless you are having a transabdominal ultrasound performed first, you will be instructed not to drink any fluids 4 hours before the procedure. This procedure is usually performed in a clinic setting or doctor's office.

## **Surgical biopsy**

The only way to confirm a diagnosis of ovarian cancer is for a pathologist to look at the ovarian tissue. A sample of tissue is usually obtained during surgery. Read more about surgery in the treatment section.

## **Pelvic examination**

If ovarian cancer is diagnosed, the doctor will also need to check to see if the cancer has spread to other parts of the body. One step is a pelvic exam. In this test, the doctor examines the pelvic area to see if the cancer has spread to nearby organs, such as the uterus, vagina, bladder, and rectum. In the pelvic exam, the doctor inserts one or two gloved fingers into the vagina and presses on the lower abdomen with the other hand. Sometimes this exam involves placing a finger in the vagina and rectum at the same time to feel the structures deeper in the pelvis. You should tell the doctor if it hurts when your organs are touched or moved.

## **CA-125 blood test**

The CA-125 blood test measures the level of a protein produced by ovarian cancer cells. The protein, CA-125, is known as a tumor marker because it is usually present at higher levels in women with ovarian cancer. CA-125 is most reliable, and most commonly used, to detect recurrent ovarian cancer in women who have been previously treated. If the CA-125 level is high before treatment, it can also be used to monitor or assess the effectiveness of chemotherapy treatment in women with ovarian cancer. Doctors generally look at the trend in the CA-125 levels over a course of time, rather than at each individual CA-125 level. These levels can help predict treatment outcomes for not only ovarian cancer, but closely related cancers such as fallopian tube cancer and primary peritoneal cancer.

Although CA-125 testing is helpful for monitoring treatment, this test alone can not diagnose ovarian cancer, nor is it effective in screening healthy women for ovarian cancer. A high level of CA-125 does not necessarily mean you have ovarian cancer; other non-cancerous conditions such as inflammatory conditions of the abdomen, recent surgery, and gynecologic conditions like fibroids, endometriosis, ectopic pregnancy or a ruptured cyst can all cause an increase in CA-125. At the same time, a low level of CA-125 does not mean you are cancer-free; not all ovarian cancer cell types produce CA-125, and some produce only low levels.

## Other Imaging Tests

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** – A chest X-ray can 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 provide detailed information about the size, shape, and position of a tumor. It may also provide information on enlarged lymph nodes that may contain cancer that has spread from the ovary.
  - As part of a CT scan, you may be asked to drink oral contrast or have an IV line (a tube that enters a vein in the body) 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 (sound) waves to create computerized pictures of the pelvis and abdomen. The doctor views these pictures to see whether cancer has spread. You may be placed in a tube, which may 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 usually wear earplugs.
- **PET Scan** – This test detects the energy given off by a radioactive chemical in your bloodstream. First, you will have a very small dose of the chemical, called a radiotracer, injected into a vein in your arm. The tracer travels through the body and is absorbed by the organs and tissues being studied. Next, you will be asked to lie down on a flat examination table that is moved into the center of a PET scanner. This machine detects and records the energy given off by the tracer substance and, with the aid of a computer, this energy is converted into three-dimensional pictures. A physician can then look at cross-sectional images of the body organ from any angle in order to detect any functional problems.

## Treatment

Women with ovarian cancer are usually treated with surgery and chemotherapy. Radiation may be used in some cases. Your doctor will describe your treatment choices and the expected results of each, and develop the best treatment plan for you.

Treatment of ovarian cancer depends on a number of factors, including:

- The stage of the cancer
- The size of the tumor after debulking
- Your desire to have children
- Your age and overall health

Surgery is used to diagnose ovarian cancer, to determine how far the disease has progressed, and to remove as much of the cancer as can be removed. How much surgery you have depends on whether the cancer has spread outside the ovary or ovaries, your general health, your desire to have children, and whether the tumor can be completely removed; in some cases, this is impossible because it is attached to or involves other vital organs.

The surgery for ovarian cancer should ideally be performed by a gynecologic oncologist (a physician specifically trained to provide both surgical and medical care for women with gynecologic malignancies). Debulking (surgical cytoreduction), in which the surgeon tries to remove as much of the tumor as possible, is an important procedure for ovarian cancer. If you are a candidate for ovarian cancer surgery, you will have debulking, which includes a total hysterectomy (removal of the uterus and cervix). In addition to the hysterectomy, you may also have a unilateral (one side) salpingo-oophorectomy, where one ovary and one fallopian tube is removed, or a bilateral (two sides) salpingo-oophorectomy, where both ovaries and both fallopian tubes are removed. Most women with ovarian cancer are treated with bilateral salpingo-oophorectomy.

Once a diagnosis of ovarian 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 are likely to be sick.

Your prognosis will depend on:

- The stage of the cancer
- The type of ovarian cancer
- The size of the tumor after debulking

## Staging

The stage of a cancer describes whether the tumor has spread to nearby tissues and other parts of the body. Staging is accomplished during surgery - the same surgery in which a biopsy is performed and the diagnosis of cancer is confirmed. Staging generally requires removing lymph nodes, samples of tissue from the diaphragm and other organs in the abdomen, and fluid from the abdomen.

### Stages of Ovarian Cancer

- **Stage I** – The cancer is limited to the ovary or ovaries. When cancer is diagnosed at this stage, a woman has a 95 percent chance of being cured. However, only 25 percent of ovarian cancer cases are found at Stage I.
  - Stage IA: The tumor is limited to the inside of only one ovary.
  - Stage IB: The tumor is limited to the inside of both ovaries.
  - Stage IC: The tumor is limited to one or both ovaries. In addition, it appears on the surface of the ovary, a fluid-filled capsule has burst, or cancer cells are found in the fluid in the abdomen.
- **Stage II** – The cancer is in one or both ovaries and has spread to other parts of the pelvis.
  - Stage IIA: The tumor has spread to the uterus, fallopian tubes, or both.
  - Stage IIB: The tumor has spread to the bladder, rectum, or colon.

- Stage IIC: The tumor has spread to any of the above. Also, it appears on the surface of the ovary, a fluid-filled capsule has burst, or cancer cells are found in the fluid in the abdomen.
- **Stage III** – The cancer is in one or both ovaries and has spread to nearby lymph nodes or to other abdominal organs. This does not include the liver.
  - Stage IIIA: The tumor has spread to the lining of the abdomen, but cannot be seen (it is microscopic). The cancer has not spread to the lymph nodes.
  - Stage IIIB: The cancer has spread into the abdomen, and is visible (less than 2 cm, about 3/4 of an inch, in size). The cancer has not spread to the lymph nodes.
  - Stage IIIC: The cancer has spread into the abdomen and the deposits measure larger than 2 cm. The cancer has spread to the lymph nodes.
- **Stage IV**: The cancer has spread to the lung, liver, or other distant organs.

Recurrent ovarian cancer: The cancer has come back after it has been treated. The cancer may appear in other parts of the body, but it is still considered ovarian cancer.

## **Surgery**

Surgery is the primary treatment for ovarian cancer. The first step in surgery is to take a sample of the suspicious tissue to find out if it is indeed cancer. This is called a surgical biopsy. Once cancer is confirmed, the surgeon, preferably a gynecological oncologist, determines how far the cancer has spread so a stage can be assigned to the cancer. The oncologist will also determine whether surgery can be continued to remove the cancerous tissues.

If the disease appears to be limited to one or both ovaries, the surgeon will take samples of nearby tissues from the pelvis and abdomen to determine if the cancer has spread. Sometimes this can be done with laparoscopic or robotic surgery.

If there is obvious spread, the surgeon will attempt to remove as much as the cancerous tissue as possible right away, if the patient's condition and the tumor's location allow it. This procedure is referred to as "debulking" or "surgical cytoreduction." The goal of debulking is to remove as much of the tumor as possible. This improves the patient's prognosis. Debulking involves removing the ovaries, the body of the uterus, the cervix, the fallopian tubes and the omentum (fatty tissue around these organs), and any other visible deposits of cancer in the pelvic and abdominal areas. This may include the removal or partial removal of other organs such as the spleen, lymph nodes, liver, or intestines. Reducing the size of the tumor helps chemotherapy and radiation therapy work better, because they have less tumor to treat.

While debulking is generally performed at the time of the surgical biopsy, this can not always be done. Sometimes the patient's overall health is too poor to allow the surgery can continue. In other patients, the tumor may be attached to critical organs. For these patients, any remaining tumor will then be treated with chemotherapy. Your doctor will determine if another attempt to remove the remaining tumor is an option after chemotherapy.

Surgery for ovarian cancer is an open procedure and is performed in the operating room. It requires general anesthesia, so you will be asleep during the surgery. Most women will remain in the hospital for 3 to 7 days after the operation and can resume their usual activities within 4 to 6 weeks. Surgery usually causes some pain and tenderness in the area of the operation. Discomfort or pain after surgery is controlled with medicine. For several days after surgery, the patient may have difficulty emptying her bladder and having bowel movements.

Women who have had a hysterectomy will not be able to get pregnant. Women who have had the ovaries and fallopian tubes removed, but not the uterus, may be able to get pregnant with donor eggs, or may wish to freeze their own ovarian tissue to use later for in vitro fertilization.

Removing the ovaries means removing the body's natural source of estrogen and progesterone, female hormones that the ovaries produce until menopause. The lack of estrogen may cause osteoporosis 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. You may wish to take hormones, for example, or learn special exercises to maintain bone mass.

### **Other Surgery**

Women who undergo treatment as participants in a clinical trial may need to have a second surgical procedure after chemotherapy or radiation therapy, to make sure all cancer is removed or to take samples of lymph nodes or other tissues.

If the cancer comes back (recurrent ovarian cancer), your doctor may recommend that you have a second attempt at debulking. Your doctor will discuss the merits of this procedure, which is usually based on the distribution and volume of recurrent disease, how well you responded to prior therapy, and how long it took for the cancer to recur. The goal of this secondary surgery is complete removal of cancer recurrence and is usually done only if that goal is thought to be achievable.

Advanced ovarian cancer can grow and completely block the bowels (intestines). If this happens, you may need to have part of your colon removed. In this procedure, a part of your bowel is brought up to the abdominal wall, making an opening to the outside of your body. You will have a temporary colostomy (pouch) that will collect your stool. Later, another surgery can be done to re-connect the bowel.

### **Chemotherapy**

Most women with ovarian cancer have chemotherapy. Chemotherapy uses medicines to stop the growth of cancer cells either by killing the cells or by stopping them from dividing.

Chemotherapy that is given by mouth or injected into a vein or muscle is called systemic chemotherapy. The medicines enter the bloodstream and reach cancer cells throughout the body.

When chemotherapy is placed directly into an organ or a body cavity, such as the abdomen, the medicines mainly affect cancer cells in that area. When chemotherapy is delivered directly into

the peritoneal space (the abdominal cavity, between the abdominal muscles and the abdominal organs), it is called intraperitoneal therapy or IP therapy. IP therapy can be used to treat ovarian cancer if there is only a small amount of tumor remaining after debulking. The chemotherapy is infused into the peritoneal space, where it will come in direct contact with the cancer.

The standard chemotherapy treatment for ovarian cancer is paclitaxel plus a platinum based drug such as carboplatin or cisplatin. Platinum is a metal that is an important component of the anticancer drugs carboplatin and cisplatin. Most chemotherapy treatments are given on an outpatient basis and are delivered systemically in a 3 to 4 week cycle. However, the length of treatment and dose varies depending on the stage of the disease.

If you are a good candidate for surgery and there is little tumor left after surgery and bowel surgery is not needed, IP therapy should be strongly considered. IP therapy can be given in an outpatient or inpatient setting through an implanted port or external catheter and takes about two hours for the treatment. The chemotherapy is absorbed by the body over the next few days. During this time, a woman may feel bloated and have some abdominal pressure.

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. Certain medicines used in the treatment of ovarian cancer may cause some hearing loss or kidney damage. To help protect the kidneys, patients may receive extra fluid through an IV while taking these medicines.

### **Radiation Therapy**

Radiation therapy uses high energy X-rays or other types of radiation to kill cancer cells or shrink the tumor. Although radiation therapy is rarely used in the treatment of ovarian cancer, it sometimes is used to kill any remaining cancer cells in the pelvic area after other treatment. A woman may have it if she has already undergone treatment, but the cancer has come back. In most such cases, the main goal of radiation therapy is to control symptoms, not to treat the cancer.

### **Treatment of Recurrent or Persistent Ovarian Cancer**

Cancer that doesn't respond to chemotherapy or is detected after the completion of primary therapy is referred to as "persistent" or "recurrent," respectively. Persistent or recurrent cancer is usually detected through a CA-125 blood test and CT imaging. Sometimes a biopsy is required to confirm the diagnosis. Treatment is the same for both persistent and recurrent ovarian cancer.

If ovarian cancer recurs or persists, treatment depends on how long it's been since the last treatment and the patient's age and overall health. A second surgical debulking may be performed to remove as much of the tumor as possible, as well as treatment with the same

chemotherapy they received initially. When cancer recurs after six to 12 months, patients are considered "platinum sensitive" and are re-treated with one of the platinum-based drugs, along with other chemotherapy agents used to treat ovarian cancer.

For women who have a recurrence less than six months after stopping chemotherapy, they are considered “platinum-resistant” and may be given additional chemotherapy treatment with paclitaxel only or other treatment drugs that are different from their initial treatment drugs.

Sometimes with recurrent ovarian cancer, treatment has to focus on keeping the disease from growing or spreading rather than ridding the body of cancer entirely.

### **Complementary therapies**

Some women use complementary therapies in addition to standard medical treatment to help relieve stress and minimize side effects, such as fatigue, pain and nausea. Complementary therapy is a variety of health care practices that include acupuncture, aromatherapy, herbal medicine, massage, medicine, yoga, tai chi and qigong. Some complementary therapies may interfere with conventional medical treatment - for example, herbal medicines can interact with drugs, and some forms of massage can be dangerous for people with cancer. For that reason, before beginning any complementary therapy, it is important to discuss these approaches with your doctor.

### **Improving Prevention, Detection and Treatment**

Clinical trials are research studies that involve people. The main purpose of a clinical trial is to find a better way to prevent, diagnose or treat a disease. Research to improve detection, screening and treatment methods for ovarian cancer is ongoing. Some of these advancements may still be in the investigational stage and not yet approved or available.

- Researchers are studying tumor markers, substances found in the blood of women with ovarian cancer, to develop blood tests that may one day be used to detect the cancer. A reliable blood test for tumor markers would allow diagnosis of early-stage ovarian cancer.
- Consolidation therapy is treatment given after the initial therapy to help prevent recurrences. For example, one study showed a slight benefit to taking paclitaxel for a year after chemotherapy would normally end. A number of clinical trials are exploring other therapies that could be used in this way.
- High-dose chemotherapy with stem cell transplant (also known as bone marrow transplant) has been used for women with recurrent ovarian cancer. This treatment has very serious side effects, and has not been proven to help patients live longer. It is only done as part of a clinical trial that is studying improvements to this treatment.
- Angiogenesis is the formation of new blood vessels. Because tumors need blood to grow, doctors and scientists are seeking ways to inhibit angiogenesis and short-circuit cancer development. Cancer cells initiate angiogenesis by sending signals to nearby tissue and activating proteins that foster blood vessel growth. As researchers gain an understanding of this process, they hope to discover new methods to block those signals and stop blood vessels from growing. Researchers also are investigating whether a tumor’s established blood vessel network can be used to fight the cancer.
- Researchers are also looking at gene therapy, a technique that might someday be used to repair damaged genes and decrease a woman’s chances of developing ovarian cancer that runs in her family.

For more information about clinical trials focusing on ovarian cancer, visit the National Cancer Institute's clinical trials database at <http://cancertrials.nci.nih.gov>

## **Survival**

These treatment statistics for ovarian cancer are based on the American Cancer Society's 2008 Cancer Facts and Figures.

- The 5-year survival rate is 92 percent for women whose ovarian cancer is found in only one ovary. Only 19 percent are found at this stage.
- The one-year survival rate for all women with ovarian cancer is about 75 percent.
- The 5-year survival rate for women who have just been told they have ovarian cancer is about 45 percent.
- The 5-year survival rate for women whose disease has spread only to nearby places is 71 percent.
- The 5-year survival rate for women whose cancer has spread to distant sites in their bodies is about 30 percent.

Survival of ovarian cancer varies by age. Women younger than 65 are about twice as likely (56 percent) to survive 5 years after diagnosis as women 65 and older (29 percent)

## **Managing**

During the first two years after treatment, you should have follow-up visits every two to four 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 a CA-125 blood test, chest X-ray and CT scan if needed. After two years, follow up visits should continue every six months. If the cancer does not return within three to five years, visits can be scheduled less often.

## **Fertility**

If you are able to have children, your doctor will discuss fertility options with you. Since the first line of treatment for ovarian cancer is a hysterectomy with bilateral salpingo-oophorectomy, in which the uterus, fallopian tubes, and ovaries are removed, most women will not be able to have children after having ovarian cancer.

## **Sexuality**

Issues that affect quality of life, such as sexual health, have become increasingly important, especially since cancer care has improved and survival rates have increased. Often patients are not sure what to expect from health care providers when talking about sexual health during cancer treatment.

Cancer treatment, such as surgery, chemotherapy, hormone therapy, or radiation therapy, may decrease your level of sexual desire by slowing down the production of sex hormones or affecting lubrication of the vagina. 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. Medicines for pain, nausea, anxiety, or depression, may

also decrease desire. If you have experienced changes in your appearance because of treatment, you may feel self-conscious or unattractive. All of these factors affect your sexuality.

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 because of surgery or radiation may use water-soluble lubricants or moisturizing suppositories available at any drugstore without a prescription. Some women may experience shrinkage of the vagina because 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 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.

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) where you are not sure of your partner's faithfulness, you should practice safe sex, using latex condoms and dental dams 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, such as baby oil or petroleum jelly, since these products weaken condoms. Nonoxynol-9 does not help prevent HIV and is not recommended.

### **Treatment and Relationships**

Cancer and cancer treatment may cause changes in your appearance that may distress you. Side effects, such as hair loss, weight changes, scars, or changes in skin color may leave you feeling unattractive and self-conscious. You may feel helpless and frustrated by changes beyond your control. The way you feel about your body and yourself may affect how you interact with others.

Classes to improve your appearance during treatment 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 may cause a strain on any relationship. Anxiety interferes 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 is healthy to talk about them.

Your doctor, nurse, social worker, or chaplain is available to listen to your concerns and give you advice. Many people do not talk to health care professionals about their sexual relationships because they feel embarrassed, ashamed, or afraid, but it is important to discuss your concerns

with one of your health care providers. Choose a doctor, nurse, social worker, chaplain, or therapist whom you trust. 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 mother, a daughter, a wife, a lover, a sister, a boss, and a worker 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 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, however, 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 from the caretaker and sick person roles into your usual, more balanced roles.

### **Spiritual Well-being**

A diagnosis of cancer may raise questions and spiritual concerns. You may wonder, “Why did this happen to me?” or “Am I being punished?”

It is normal for people with cancer to have feelings of shame or guilt because of a cancer diagnosis, even though many factors cause cancer. Try to use your faith to inspire you and help you understand yourself. You may find it helpful to discuss your concerns with your physician, priest, rabbi, minister, or other spiritual person whom you trust.

### **End of Life Issues**

When a patient’s health care team determines that the cancer can no longer be controlled, medical testing and cancer treatment often stop. Some women with advanced disease may choose not to have treatment because of the time, cost, and side effects. However, the patient’s care continues, with a focus on making the patient comfortable. This is called palliative care.

Patients receive medicines and treatment to control pain and other symptoms, such as constipation, nausea, and shortness of breath. Some patients remain at home, while others enter a hospital or other facility. Either way, services are available to help you and your family with the medical, psychological, and spiritual issues surrounding dying. A hospice program 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. You and your family should discuss questions and concerns with the health care team as they arise.