



Ovarian Cancer Research Fund

THE SCIENCE OF *Hope*

About Ovarian Cancer

Ovarian cancer is a disease affecting the ovaries, the reproductive organs responsible for producing eggs and female hormones. Ovarian cancer is often difficult to detect, because the symptoms of ovarian cancer—such as bloating and appetite changes—are similar to those of other non-cancerous conditions. Plus, there is no effective screening test for the early detection of ovarian cancer. The pap smear tests for cervical cancer, not ovarian cancer.

When ovarian cancer is detected and treated early, the five-year survival rate is greater than 92 percent. But only 20 percent of ovarian cancer cases are caught before the cancer has spread. Most patients

are diagnosed at advanced stages, when the disease is harder to treat. The good news is that today 50 percent of women are surviving more than five years after diagnosis—a marked improvement from 30 or more years ago, when the survival rate was 10 to 20 percent.

In spite of improvements in treatment, ovarian cancer is the leading cause of death from gynecologic cancers in the United States, and is the fifth leading cause of cancer death among American women. The National Cancer Institute estimates 22,000 U.S. women will be diagnosed with ovarian cancer each year, and about 13,500 women will die from the disease.

► Symptoms

Symptoms of ovarian cancer can be vague and not always gynecologic, such as:

- **A swollen or bloated abdomen or increased girth (some women notice that their pants are getting tight around the waist)**
- **Persistent pressure or pain in the abdomen or pelvis**
- **Difficulty eating or feeling full quickly**
- **Urinary concerns, such as urgency or frequency**
- **Change in bowel habits with constipation and/or diarrhea**

Any woman may have these symptoms for reasons not related to ovarian cancer. But if these symptoms are new and unusual, and persist for more than two weeks, a woman should see her doctor and ask about ovarian cancer. Prompt attention may lead to detection of the disease at its earliest stage and with its best prognosis.

It remains unclear whether screening all women for ovarian cancer symptoms is feasible or effective. An OCRF-funded study is investigating women's willingness to be systematically assessed for potential symptoms of ovarian cancer as part of a primary care visit. The research will also determine if these health care practitioners assess symptoms accurately and then offer referrals for more comprehensive diagnostic testing.

Factors that may *increase* the risk of ovarian cancer:

- **Personal or family history of cancer (especially ovarian or breast cancer)**
- **Testing positive for either the BRCA1 or BRCA2 gene mutation, which increase the risk of ovarian and breast cancer**
- **Age over 55**
- **No pregnancies**
- **Menopausal hormone replacement therapy**
- **Endometriosis**

Factors that may *decrease* the risk of ovarian cancer:

- **Oral contraceptive use (birth control pills)**
- **Pregnancy**
- **Breast feeding**
- **Hysterectomy/tubal ligation**
- **Removal of the ovaries and/or fallopian tubes, which may be performed as a preventative measure in women with the BRCA1 and BRCA2 mutations**

EACH YEAR, 200,000 women are diagnosed worldwide with ovarian cancer and 125,000 women die from this disease. In the U.S., ovarian cancer accounts for more deaths than all other gynecologic cancers combined, and ranks 5th as the cause of cancer death in women. One in 78 American women will develop ovarian cancer in her lifetime.

► Hereditary Risk

Inherited mutations in the BRCA1 and BRCA2 genes account for approximately 10 percent of ovarian cancers. These mutations are most commonly found in families with a strong history of ovarian and/or breast cancer, and in Ashkenazi Jews. A woman can get these abnormal genes from one or both of her parents, and the mutation is present in every cell of the body, increasing her risk for both ovarian and breast cancer. Women who have a BRCA1 or BRCA2 mutation have a 15 percent to 40 percent lifetime risk of getting ovarian cancer, compared to women in the general population who have a 1.4 percent lifetime risk.

OCRF researchers are working to find better ways to detect who is at risk for ovarian cancer. A group of OCRF-sponsored researchers have identified genetic polymorphisms, or gene changes, that may significantly affect a woman's risk of ovarian cancer—similar to the BRCA alterations, but much more common. Such genetic information may better identify those at increased risk and facilitate screening and prevention. In addition, OCRF researchers are working on a new class of drugs, called PARP inhibitors, which seem to be effective in treating BRCA-positive women with ovarian cancer. Whether PARP inhibitors can treat women without BRCA-positive cancer is also under investigation.

► Diagnosis

If a gynecologist has a suspicion that a woman has ovarian cancer, tests will be ordered including a pelvic exam, radiological tests and blood tests. A definitive diagnosis only occurs after surgery. The most common preliminary tests are:

- **Physical examination**
- **Recto-vaginal pelvic examination**
- **Transvaginal ultrasound and/or CT scan**
- **A blood test for CA-125, a protein in the blood produced by ovarian cancer cells, and which is elevated in many women with ovarian cancer.**

If the results from these tests suggest ovarian cancer might be present, the patient should seek a referral to a gynecologic oncologist before surgery. Research has shown that women treated by gynecologic oncologists live longer than those treated by other physicians.

► Treatment

The goal of treatment for ovarian cancer is to surgically remove as much of the cancer as possible and then to provide chemotherapy to kill any remaining cancer cells in the body. During surgery, the doctor—preferably a gynecologic oncologist—will excise as much of the cancer that can be seen visibly, in a process known as debulking or cytoreductive surgery. The doctor will also assess the cancer stage (how far it has spread) and give tissue samples to a pathologist, who determines the cancer grade (the aggressiveness of the cancer).

After the operation, the use of chemotherapy will depend on the stage of the disease and how much of the tumor was removed. A doctor might also offer the possibility of enrolling in a clinical trial to test new drugs or therapeutic regimens, if the patient meets the criteria. After surgery and chemotherapy, women need regular check-ups that include a pelvic exam, the CA-125 test, and other blood and imaging tests to determine if cancer has returned.

While women with ovarian cancer are living longer and better, new treatments are still needed. OCRF researchers are leaders in discovering new ways to fight ovarian cancer. A team of OCRF-funded researchers recently discovered that ovarian cancer patients with high levels of Dicer and Drosha, two proteins that are vital to a cell's gene-silencing machinery, had a median survival four times longer than those with lower amounts of proteins. Researchers hope that this information will be a useful prognostic factor, and may eventually allow doctors to better tailor effective treatment plans for patients. Other OCRF researchers are focusing on immunotherapy: how to super-charge a woman's immune response to better fight ovarian cancer. One OCRF researcher found that mice with progressive tumors that resemble advanced ovarian cancer were cured by a single injection of specially engineered immune cells. Such engineered immune cells may lead to the development of a new form of cell therapy that could have potent antitumor effects in women with advanced ovarian cancer.



HOW OVARIAN CANCER RESEARCH FUND IS HELPING YOU

Ovarian Cancer Research Fund supports research by scientists at academic medical centers and universities throughout the United States:

- **To understand what causes ovarian cancer**
 - **To find better tests that can diagnose ovarian cancer earlier, and more precisely**
 - **To develop improved treatments and ultimately a cure for ovarian cancer.**
- OCRF also funds a help line, **1-877-OV-HOPE-1**, for anyone affected by ovarian cancer. If you need more information, please go to our website at www.ocrf.org or call us at **1-800-873-9569**.