Ovarian Cancer - Latest Research [1]

This section has been reviewed and approved by the Cancer.Net Editorial Board [2], 04/2015

ON THIS PAGE: You will read about the scientific research being done now to learn more about this type of cancer and how to treat it. To see other pages, use the menu on the side of your screen.

Doctors are working to learn more about ovarian cancer, ways to prevent it, how to best treat it, and how to provide the best care to people diagnosed with this disease. The following areas of research may include new options for patients through clinical trials [3]. Always talk with your doctor about the diagnostic and treatment options best for you.

Screening. There are no currently effective screening methods for the general population. A screening method that estimates a woman's risk of ovarian cancer by using her age and the results of a yearly CA-125 blood test holds promise for detecting early-stage ovarian cancer. An international study is looking into the role of serial CA-125 screening for ovarian cancer. As explained in Diagnosis [4], CA-125 is a substance called a tumor marker that is found in higher levels in women with ovarian cancer.

In 2012, the U.S Preventative Services Task Force released a statement saying that for the general population of women with no symptoms, screening for ovarian cancer is not helpful and may lead to harm. However, women at high risk for ovarian cancer due to family history or with a *BRCA* mutation(s) (see Risk Factors [5]) are recommended to have screening with CA-125 blood tests and transvaginal ultrasound. This approach has not been proven to improve survival or detect cancers at an earlier and more curable stage.

Targeted therapy. Targeted therapy is a treatment that targets the cancer's specific genes, proteins, or the tissue environment that contributes to cancer growth and survival.

Some targeted therapy is directed towards specific genes that might be found with abnormalities in certain types of epithelial ovarian cancer. For this purpose, ovarian cancer is divided into two groups: type I and type II. Type II cancers are the more typical high grade serous cancers, for which standard chemotherapy has been most effective. These tumors typically are diagnosed at later stages and have mutations in *TP53* and *BRCA* genes in the tumor. Other mutations are rarely seen.

The *BRCA* mutation, even if only found in the tumor and not in the blood, may increase the effectiveness of a certain classes of drugs such as PARP inhibitors (see below). Type I tumors include the more rare types of ovarian cancer including low grade serous, endometrioid, clear cell, and mucinous cancers. These tumors have a variety of mutations including *KRAS, BRAF, PI3KCA* and *PTEN,* which have implications for targeted treatment. Clinical trials in these groups are ongoing.

- **Anti-Angiogenesis Inhibitors.** Drugs called anti-angiogenesis inhibitors block the action of a protein called vascular endothelial growth factor (VEGF). These drugs have been shown to increase the cancer's response to treatment and delay the time it takes for the cancer to return. VEGF promotes angiogenesis, which is the formation of new blood vessels. Because a tumor needs nutrients delivered by blood vessels to grow and spread, the goal of anti-angiogensis therapies is to "starve" the tumor. Bevacizumab (Avastin), an antibody which binds VEGF and prevents it from being active, has been shown to be effective in ovarian cancer. FDA approval was recently given in the United States for its use in combination with selected chemotherapy for patients with platinum resistant recurrence (see Treatment Options [6]).

- **PARP Inhibitors.** Another class of drugs, called PARP inhibitors, are being evaluated for ovarian cancer. These drugs act on DNA repair in cancer cells, making it difficult for them to replicate. The *BRCA* genes (*BRCA1* and *BRCA2*) are also normally involved in DNA repair, and a mutation in these genes interfere with this pathway function. PARP inhibitors make it particularly difficult for cells that otherwise have a *BRCA* mutation to grow and divide.

  The PARP inhibitor olaparib (Lynparza) has received FDA approval in the United States for recurrent disease in patients who have the inherited *BRCA* mutation and who have received three or more lines of chemotherapy. In the supporting study of 137 patients with a *BRCA* mutation, 34% of patients experienced shrinkage in tumor for an average of 7.9 months. A very small number of patients developed secondary hematologic (blood) cancers after use of these drugs. Studies are currently underway with other PARP inhibitors, which do not all require the inherited *BRCA* mutation. These are being tested to see if they can keep the cancer from coming back after chemotherapy. The potential benefits and risks of PARP therapy should be discussed with your doctor.

Many other new targeted treatments are also now in clinical trials. Increasingly, doctors are

learning about each patient's individual tumor's biology through direct molecular testing. This information may be useful in matching patients with a clinical trial for a specific targeted therapy. Learn more about the basics of targeted therapy [7].

Immunotherapy. Immunotherapy is usually designed to boost the body's natural defenses to fight the cancer. It uses materials made either by the body or in a laboratory to bolster, target, or restore immune system function. Researchers are currently examining whether drugs called checkpoint inhibitors may boost the immune system's ability to destroy cancer cells. Examples of these drugs target CTLA4 or PD-1 and have recently been shown to cause shrinkage in other cancer types such as melanoma, as well as having some activity in patients with ovarian cancer.

Cancer vaccines are another type of immunotherapy currently being tested for ovarian cancer. In addition, some approaches called "adoptive cell therapy" take killer T cells found as part of the immune system in an individual patient and grow them in the laboratory, train them to attack certain targets such as MUC 16 (CA125) that is found on any ovarian cancer cells, and them give them back intravenously to the patient. This approach has been tried in patients with hematologic cancers using other targets with some early success, and clinical trials are now opening for ovarian cancer. Learn more about the basics of immunotherapy [8].

Hormone therapy. Research is underway about the role of estrogen, androgens, and other hormones in ovarian cancer treatment. For treatment of recurrent or later-stage ovarian cancer, the use of tamoxifen (Nolvadex, Soltamax), aromatase inhibitors, and enzalutamide (Xtandi), a blocker of the androgen receptor, is being considered.

Gene therapy. One new area of research is discovering how damaged genes in ovarian cancer cells can be corrected or replaced. Researchers are studying the use of specially designed viruses that carry normal genes into the core of cancer cells and then replace the defective genes with the functional ones.

Supportive care. Clinical trials are underway to find better ways of reducing symptoms and side effects of current ovarian cancer treatments, in order to improve a woman's comfort and quality of life.

Looking for More About the Latest Research?

If you would like additional information about the latest areas of research regarding ovarian cancer, explore these related items that take you outside of this guide:

- To find clinical trials specific to your diagnosis, talk with your doctor or search online clinical trial databases now [9].
- Review research announced at recent scientific meetings or in ASCO's peer reviewed journals [10].
- Visit ASCO's *CancerProgress.Net* [11] website to learn more about the historical pace of research for ovarian cancer. Please note this link takes you to a separate ASCO website.
- Visit the website of the Conquer Cancer Foundation [12] to find out how to help support

research for every cancer type. Please note this link takes you to a separate ASCO website.

The next section in this guide is Coping with Side Effects [13] *and it offers some guidance in how to cope with the physical, emotional, and social changes that cancer and its treatment can bring. Or, use the menu on the side of your screen to choose another section to continue reading this guide.*

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