



[cancer.org](https://www.cancer.org) | 1.800.227.2345

Treating Ovarian Cancer

If you've been diagnosed with ovarian cancer, your cancer care team will discuss your treatment options with you. It's important that you think carefully about each of your choices. Weigh the benefits of each treatment option against the possible risks and side effects.

Local treatments

Some treatments are **local**, meaning they treat the tumor without affecting the rest of the body.

Types of local therapy used for ovarian cancer include:

- [Surgery for Ovarian Cancer](#)
- [Radiation Therapy for Ovarian Cancer](#)

Systemic treatments

Drugs used to treat ovarian cancer are considered **systemic therapies** because they can reach cancer cells almost anywhere in the body. They can be given by mouth or put directly into the bloodstream.

Depending on the type of ovarian cancer, different types of drug treatment might be used, including:

- [Chemotherapy for Ovarian Cancer](#)
- [Hormone Therapy for Ovarian Cancer](#)
- [Targeted Drug Therapy for Ovarian Cancer](#)
- [Immunotherapy for Ovarian Cancer](#)

It's important to discuss all of your treatment options, including their goals and possible side effects, with your doctors to help make the decision that best fits your needs. It's also very important to ask questions if there's anything you're not sure about.

If time permits, it is often a good idea to seek a second opinion. A second opinion can give you more information and help you feel more confident about the treatment plan you choose.

- [What Should You Ask Your Doctor About Ovarian Cancer?](#)
- [Seeking a Second Opinion](#)

Thinking about taking part in a clinical trial

Clinical trials are carefully controlled research studies that are done to get a closer look at promising new treatments or procedures. Clinical trials are one way to get state-of-the-art cancer treatment. In some cases they may be the only way to get access to newer treatments. They are also the best way for doctors to learn better methods to treat cancer. Still, they're not right for everyone.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials.

- [Clinical Trials](#)

Considering complementary and alternative methods

You may hear about alternative or complementary methods that your doctor hasn't mentioned to treat your cancer or relieve symptoms.

Help getting through cancer treatment

People with cancer need support and information, no matter what stage of illness they may be in. Knowing all of your options and finding the resources you need will help you make informed decisions about your care.

Whether you are thinking about treatment, getting treatment, or not being treated at all, you can still get supportive care to help with pain or other symptoms. Communicating with your cancer care team is important so you understand your diagnosis, what treatment is recommended, and ways to maintain or improve your quality of life.

Different types of programs and support services may be helpful, and can be an important part of your care. These might include nursing or social work services, financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services – including rides to treatment, lodging, and more – to help you get through treatment. Call our National Cancer Information Center at 1-800-227-2345 and speak with one of our trained specialists.

- [Palliative Care](#)
- [Programs & Services](#)

Choosing to stop treatment or choosing no treatment at all

For some people, when treatments have been tried and are no longer controlling the cancer, it could be time to weigh the benefits and risks of continuing to try new treatments. Whether or not you continue treatment, there are still things you can do to help maintain or improve your quality of life.

Some people, especially if the cancer is advanced, might not want to be treated at all. There are many reasons you might decide not to get cancer treatment, but it's important to talk to your doctors and you make that decision. Remember that even if you choose not to treat the cancer, you can still get supportive care to help with pain or other symptoms.

- [If Cancer Treatments Stop Working](#)

The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of

your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask your cancer care team any questions you may have about your treatment options.

More in Ovarian Cancer

- [About Ovarian Cancer](#)
- [Causes, Risk Factors, and Prevention](#)
- [Early Detection, Diagnosis, and Staging](#)
- [Treatment](#)
- [After Treatment](#)

Surgery for Ovarian Cancer

- [Surgery for epithelial ovarian cancer](#)
- [Surgery for ovarian germ cell tumors and ovarian stromal tumors](#)
- [More information about Surgery](#)

Surgery is the main treatment for most ovarian cancers. How much surgery you have depends on how far your cancer has spread and on your general health. For women of childbearing age who have certain kinds of tumors and whose cancer is in the earliest stage, it may be possible to treat the disease without removing both ovaries and the uterus.

Surgery for epithelial ovarian cancer

For epithelial ovarian cancer, surgery has 2 main goals: [staging](#)¹ and debulking. If your cancer isn't properly staged and debulked, you may need to have more surgery later, so it's important that this surgery is done by a specialist who's trained and experienced in ovarian cancer surgery, like a gynecologic oncologist.

Staging epithelial ovarian cancer

The first goal of ovarian cancer surgery is to *stage* the cancer to see how far the cancer

has spread from the ovary. Usually this means removing the uterus (this operation is called a *hysterectomy*), along with both ovaries and fallopian tubes (this is called a *bilateral salpingo-oophorectomy* or BSO). In addition, the omentum is also removed (an *omentectomy*). The omentum is a layer of fatty tissue that covers the abdominal contents like an apron, and ovarian cancer sometimes spreads to this area. Some lymph nodes in the pelvis and abdomen might also be biopsied (taken out to see if the cancer has spread from the ovary).

If there is fluid in the pelvis or abdominal cavity, it will be removed for testing. The surgeon may "wash" the abdominal cavity with salt water (saline) and send that fluid to the lab for testing. Biopsies may also be taken from different areas inside the abdomen and pelvis. All the tissue and fluid samples taken during the operation are sent to a lab to look for cancer cells. Staging is very important because ovarian cancers at different stages are treated differently. If the staging isn't done correctly, the doctor may not be

[Guide](#)³ to learn more.

- Debulking surgery might also mean removing a piece of the bladder. If this happens, a catheter (to empty the bladder) will be placed during surgery. This will be left in place until the bladder recovers enough to be able to empty on its own. Then, the catheter can be removed.
- Debulking might also require removing the spleen and/or the gallbladder, as well as part of the stomach, liver, and/or pancreas.

If both ovaries and/or the uterus are removed, you will not be able to become pregnant. It also means that you will go into menopause if you haven't done so already. Most women will stay in the hospital for 3 to 7 days after the operation and can resume their usual activities within 4 to 6 weeks.

Intraoperative imaging

To know where the ovarian cancer is in your body to remove it, the surgeon typically uses the imaging tests done before surgery as well as a bright light and feeling for the tumors during the operation. Still, some tumors that are not easily seen or felt by hand might be missed. To help find these tumors, **intraoperative imaging** might be used.

This approach uses a special imaging system in the operating room during the surgery. A fluorescent drug called **pafolacianine (Cytalux)** will be injected into your blood a few hours before surgery. The drug travels through the body and attaches to a specific protein found on ovarian cancer cells. During surgery, the imaging system gives off near-infrared fluorescent light that will cause the drug to light up so the surgeon can see which areas need to be removed.

The most common side effects from pafolacianine (Cytalux) are belly pain, heartburn, itching, chest pain, nausea, vomiting, and flushing.

Your doctor will probably ask you to avoid taking any supplements that have folic acid inpa 0 ns___7sl

children, only the ovary containing the cancer and the fallopian tube on the same side are removed (leaving behind the other ovary and fallopian tube and the uterus).

Ovarian stromal tumors are often confined to just one ovary, so surgery may just remove that ovary. If the cancer has spread, more tissue may need to be removed. This could mean a hysterectomy and bilateral salpingo-oophorectomy and even debulking surgery.

Sometimes, after child bearing is finished, surgery to remove the other ovary, the other fallopian tube, and the uterus may be recommended, for both germ cell and stromal ovarian tumors.

More information about Surgery

For more general information about surgery as a treatment for cancer, see [Cancer Surgery](#)⁴.

To learn about some of the side effects listed here and how to manage them,

Abeloff MD, Armitage JO, Lichter AS, Niederhuber JE, Kastan MB, McKenna WG, eds. *Clinical Oncology*. 5th ed. Philadelphia, PA: Elsevier; 2014: 1592.

National Comprehensive Cancer Network (NCCN)--Ovarian Cancer Including Fallopian Tube Cancer and Primary Peritoneal Cancer. (2018, February 2). Retrieved February 5, 2018, from https://www.nccn.org/professionals/physician_gls/pdf/ovarian.pdf

Schorge JO, McCann C, Del Carmen MG. Surgical Debulking of Ovarian Cancer: What Difference Does It Make? *Reviews in Obstetrics and Gynecology*. 2010;3(3):111-117.

Last Revised:

Radiation Therapy for Ovarian Cancer

eds. *Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2015.

Morgan M, Boyd J, Drapkin R, Seiden MV. Ch 89 – Cancers Arising in the Ovary. In: Abeloff MD, Armitage JO, Lichter AS, Niederhuber JE, Kastan MB, McKenna WG, eds. *Clinical Oncology*. 5th ed. Philadelphia, PA: Elsevier; 2014: 1592.

National Comprehensive Cancer Network (NCCN)--Ovarian Cancer Including Fallopian Tube Cancer and Primary Peritoneal Cancer. V2.2018. Accessed February 5, 2018, from https://www.nccn.org/professionals/physician_gls/pdf/ovarian.pdf

Last Revised: April 11, 2018

Chemotherapy for Ovarian Cancer

- [Chemotherapy for epithelial ovarian cancer](#)
- [Chemotherapy for germ cell tumors](#)
- [Chemotherapy for stromal tumors](#)
- [Side effects of chemotherapy](#)
- [More information about chemotherapy](#)

Chemotherapy (chemo) is the use of drugs to treat cancer. Most often, chemo is a systemic treatment, meaning the drugs enter the bloodstream and reach almost all areas of the body. Chemo can be useful to kill very small amounts of cancer cells that may still be around after surgery, for cancers that have metastasized (spread), or to shrink very large tumors to make surgery easier. Most of the time, chemo uses drugs that are injected into a vein (IV) or given by mouth. In some cases, chemotherapy may also be injected through a catheter (thin tube) directly into the abdominal cavity. This is called *intraperitoneal (IP) chemotherapy*.

Chemotherapy for epithelial ovarian cancer

Chemo for ovarian cancer usually involves getting two different types of drugs together. Getting a combination of drugs instead of just one drug alone seems to work better as a

first treatment for ovarian cancer. Usually, the combination includes a type of chemo drug called a *platinum compound* (usually cisplatin or carboplatin), and another type of chemo drug called a *taxane*, such as paclitaxel (Taxol[®]) or docetaxel (Taxotere[®]). These drugs are usually given as an IV (put into a vein) every 3 to 4 weeks.

The typical course of chemo for epithelial ovarian cancer involves 3 to 6 cycles of treatment, depending on the stage and type of ovarian cancer. A cycle is a schedule of regular doses of a drug, followed by a rest period. Different drugs have varying cycles; your doctor will let you know what schedule is planned for your chemo.

Epithelial ovarian cancer often shrinks or even seems to go away with chemo, but the cancer cells may eventually begin to grow again. If the first chemo seemed to work well and the cancer stayed away for at least 6 to 12 months, it can be treated with the same chemotherapy used the first time. In some cases, different drugs may be used.

Some of the other chemo drugs that are helpful in treating ovarian cancer include:

cavity through a catheter (thin tube). The tube can be placed during the staging/debulking surgery, but sometimes it is placed later. If it is done later, it can be placed by a surgeon using laparoscopy, or by an interventional radiologist under x-ray guidance. The catheter is usually connected to a [port](#)¹, a half dollar-sized disk topped with a pliable diaphragm. The port is placed under the skin against a bony structure of the abdominal wall, such as a rib or pelvic bone. A needle can be placed through the skin and into the port to give chemo and other drugs. Over time, problems may occur with the catheter (for example, it might become plugged or infected), but this is rare. .

Giving chemo this way gives the most concentrated dose of the drugs directly to the

Ovarian stromal tumors are not often treated with chemotherapy, but when they are, the combination of carboplatin plus paclitaxel or PEB (cisplatin/Platinol, etoposide, and bleomycin) is used most often.

Side effects of chemotherapy

Chemo drugs can cause side effects. These depend on the type and dose of drugs given, and the length of treatment. Some of the most common possible side effects include:

- Nausea and vomiting
- Loss of appetite
- Loss of hair
- Hand and foot rashes
- Mouth sores

Chemo can also affect the blood-forming cells of the bone marrow, which can lead to:

- Increased chance of infections (from low white blood cell counts, also called *leukopenia*)
- Easy bruising or bleeding (from low blood platelet counts, also called *thrombocytopenia*)
- Fatigue (from low red blood cell counts and other reasons, also called *anemia*)

These side effects usually go away after treatment is finished. While you are in treatment, tell your cancer care team about any side effects you are having. There are often ways to lessen these side effects. For example, drugs can be given to help prevent or reduce nausea and vomiting.

Some chemo drugs may have long-term or even permanent side effects:

- Cisplatin can cause kidney damage. To help prevent this, doctors give lots of IV fluid before and after this drug is given.
- Both cisplatin and the taxanes can cause nerve damage (called *neuropathy*). This can lead to problems with numbness, tingling, or even pain in the hands and feet.
- Cisplatin can also damage the nerves to the ear, which can lead to hearing loss (called *ototoxicity*).
- Chemo can also cause early menopause and infertility (being unable to become pregnant), which may be permanent. This is rarely an issue in the treatment of

Armstrong DK, Bundy B, Wenzel L, et al. Intraperitoneal cisplatin and paclitaxel in ovarian cancer. *N Engl J Med*. 2006; 354:34-43.

Cannistra SA, Gershenson DM, Recht A. Ch 76 - Ovarian cancer, fallopian tube carcinoma, and peritoneal carcinoma. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2015.

Colombo N, Parma G, Zanagnolo V, Insinga A. Management of ovarian stromal cell tumors. *J Clin Oncol*. 2007 Jul 10;25(20):2944-2951.

Cristea M, Han E, Salmon L, Morgan RJ. Practical considerations in ovarian cancer chemotherapy. *Therapeutic Advances in Medical Oncology*. 2010;2(3):175-187.

Gourly C, Walker JL, Mackay HJ. Update on Intraperitoneal Chemotherapy for the Treatment of Epithelial Ovarian Cancer. *Am Soc Clin Oncol Educ Book*. 2016;35: 143-51.

Last Revised: April 11, 2018

Hormone Therapy for Ovarian Cancer

- [Luteinizing-hormone-releasing hormone \(LHRH\) agonists](#)
- [Tamoxifen](#)
- [Aromatase inhibitors](#)
- [More information about hormone therapy](#)

Hormone therapy is the use of hormones or hormone-blocking drugs to fight cancer. This type of systemic therapy is rarely used to treat epithelial ovarian cancer, but is more often used to treat ovarian stromal tumors.

Luteinizing-hormone-releasing hormone (LHRH) agonists

LHRH agonists (sometimes called *GnRH agonists*) switch off estrogen production by the ovaries. These drugs are used to lower estrogen levels in women who are premenopausal. Examples of LHRH agonists include goserelin (Zoladex[®]) and leuprolide (Lupron[®]). These drugs are injected every 1 to 3 months. Side effects can include any of the symptoms of menopause, such as hot flashes and vaginal dryness. If they are taken for a long time (years), these drugs can weaken bones (sometimes leading to osteoporosis).

Tamoxifen

Tamoxifen is a drug that is often used to treat breast cancer. It can also be used to treat ovarian stromal tumors and is rarely used to treat advanced epithelial ovarian cancer. Tamoxifen acts as an anti-estrogen in many tissues in the body, but as a weak estrogen in others. The goal of tamoxifen therapy is to keep any estrogens circulating in the woman's body from stimulating cancer cell growth. The anti-estrogen activity of this drug can lead to side effects like hot flashes and vaginal dryness. Because tamoxifen acts like a weak estrogen in some areas of the body, it does not cause bone loss but

can increase the risk of serious blood clots in the legs.

Aromatase inhibitors

Aromatase inhibitors are drugs that block an enzyme (called *aromatase*) that turns other hormones into estrogen in post-menopausal women. They don't stop the ovaries from making estrogen, so they are only helpful in lowering estrogen levels in women after menopause. These drugs are mainly used to treat breast cancer, but can also be used to treat some ovarian stromal tumors that have come back after treatment as well as low grade serous carcinomas. They include letrozole (Femara[®]), anastrozole (Arimidex[®]), and exemestane (Aromasin[®]). These drugs are taken as pills once a day.

Common side effects of aromatase inhibitors include hot flashes, joint and muscle pain, and bone thinning. The bone thinning can lead to osteoporosis and bones that break easily.

More information about hormone therapy

To learn more about how hormone therapy is used to treat cancer, see [Hormone Therapy](#)¹.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)².

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/treatment-types/hormone-therapy.html
2. www.cancer.org/cancer/managing-cancer/side-effects.html

References

Cannistra SA, Gershenson DM, Recht A. Ch 76 - Ovarian cancer, fallopian tube carcinoma, and peritoneal carcinoma. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2015.

Gershenson DM, Bodurka DC, Coleman RL et al. Hormonal Maintenance Therapy for Women with Low Grade Serous Cancer of the Ovary or Peritoneum. *J Clin Oncol*. 2017; 35(10): 1103-1111.

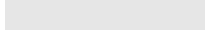
Morgan M, Boyd J, Drapkin R, Seiden MV. Ch 89 – Cancers Arising in the Ovary. In: Abeloff MD, Armitage JO, Lichter AS, Niederhuber JE, Kastan MB, McKenna WG, eds. *Clinical Oncology*. 5th ed. Philadelphia, PA: Elsevier; 2014: 1592.

National Comprehensive Cancer Network (NCCN)--Ovarian Cancer Including Fallopian Tube Cancer and Primary Peritoneal Cancer. V2.2018. Accessed February 5, 2018, from https://www.nccn.org/professionals/physician_gls/pdf/ovarian.pdf

Last Revised:

Targeted Drug Therapy for Ovarian Cancer

Bevacizumab can also be given with olaparib (see below) as [maintenance treatment](#) in



cisplatin or carboplatin.

- Olaparib can be used with bevacizumab (see above) as [maintenance treatment](#) in women whose cancers have shrunk quite a bit with chemotherapy containing carboplatin or cisplatin.

In women without a *BRCA* mutation:

- If the tumor has a high genomic instability score (a test measuring the amount of abnormal genes in cancer cells), olaparib can be used with bevacizumab as maintenance treatment in women whose cancers have shrunk quite a bit with chemotherapy containing carboplatin or cisplatin.

In women with or without a *BRCA* mutation:

- Olaparib can be used as maintenance treatment for advanced ovarian cancer that has come back after treatment, and then has shrunk in response to chemotherapy containing cisplatin or carboplatin.

Niraparib (Zejula) may be used in some situations to treat ovarian cancer.

In women with or without a *BRCA* gene mutation:

- Niraparib might be used as maintenance treatment for advanced ovarian cancer, where the cancer has shrunk with first-line chemotherapy containing cisplatin or carboplatin.

In women with a *BRCA* gene mutation:

- Niraparib might be used as maintenance treatment for advanced ovarian cancer that has come back after treatment, where the cancer has then shrunk with chemotherapy containing cisplatin or carboplatin.

Rucaparib (Rubraca) can be used in women with or without a *BRCA* mutation, as maintenance treatment for advanced ovarian cancer that has come back after treatment, and then has shrunk in response to chemotherapy containing cisplatin or carboplatin.

These drugs have been shown to help shrink or slow the growth of some advanced

ovarian cancers for a time. So far, though, it's not clear if they can help women live longer.

Side effects of PARP inhibitors

Side effects of these drugs can include nausea, vomiting, diarrhea, fatigue, loss of appetite, taste changes, low red blood cell counts (anemia), belly pain, and muscle and joint pain.

away if you develop any eye problems.

This drug can cause **serious lung disease** in some people, which might even be life threatening. It's very important to let your doctor or nurse know right away if you're having symptoms such as coughing, trouble breathing, or chest pain.

This drug can also cause **nerve damage** (peripheral neuropathy), which can lead to numbness, tingling, or weakness in the hands or feet.

Drugs that target cells with *NTRK* gene changes

A very small number of ovarian cancers have changes in one of the *NTRK* genes. Cells with these gene changes can lead to abnormal cell growth and cancer. **Larotrectinib (Vitrakvi)** and **entrectinib (Rozlytrek)** are targeted drugs that stop the proteins made by the abnormal *NTRK* genes. These drugs can be used in people with advanced ovarian cancer whose tumor has an *NTRK* gene change and is still growing despite other treatments.

These drugs are taken as pills, once or twice a day.

Side effects of drugs that target *NTRK* gene changes

Common side effects can include dizziness, fatigue, nausea, vomiting, constipation, weight gain, and diarrhea.

Less common but serious side effects can include abnormal liver tests, heart problems, and confusion.

More information about targeted therapy

To learn more about how targeted drugs are used to treat cancer, see [Targeted Cancer Therapy](#)⁴.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)⁵.

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/treatment-types/biosimilar-drugs/list.html
2. www.cancer.org/cancer/types/myelodysplastic-syndrome.html
3. www.cancer.org/cancer/types/acute-myeloid-leukemia.html
4. www.cancer.org/cancer/managing-cancer/treatment-types/targeted-therapy.html
5. www.cancer.org/cancer/managing-cancer/side-effects.html

References

Aghajanian C, Blank SV, Goff BA, et al. OCEANS: a randomized, double-blind, placebo-controlled phase III trial of chemotherapy with or without bevacizumab in patients with platinum-sensitive recurrent epithelial ovarian, primary peritoneal, or fallopian tube cancer. *J Clin Oncol*. 2012;30(17):2039-2045.

Coleman RL, Liu J, Matsuo K, Thaker PH, Weston SN, and Sood Ak. Chapter 86: Carcinoma of the Ovaries and Fallopian Tubes. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds.

Okamura R, Boichard A, Kato S, Sicklick JK, Bazhenova L, Kurzrock R. Analysis of *NTRK* Alterations in Pan-Cancer Adult and Pediatric Malignancies: Implications for *NTRK*-Targeted Therapeutics. *JCO Precis Oncol*. 2018; 10.1200/PO.18.00183.

Pujade-Lauraine E, Hilpert F, Weber B, et al. Bevacizumab combined with chemotherapy for platinum-resistant recurrent ovarian cancer: The AURELIA open-label randomized phase III trial. *J Clin Oncol*. 2014 May 1;32(13):1302-8. Epub 2014 Mar 17.

Ray-Coquard I, Pautier P, Pignata S, et al. Olaparib plus Bevacizumab as First-Line Maintenance in Ovarian Cancer. *N Engl J Med*. 2019;381(25):2416-2428. doi:10.1056/NEJMoa1911361.

Tewari KS, Penson RT, and Monk BJ. Chapter 77: Ovarian Cancer. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles & Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

Yao Y, Dai W. Genomic Instability and Cancer. *J Carcinog Mutagen*. 2014;5:1000165. doi:10.4172/2157-2518.1000165.

Last Revised: November 17, 2022

Immunotherapy for Ovarian Cancer

- [Immune checkpoint inhibitors](#)
- [More information about immunotherapy](#)

Immunotherapy is the use of medicines to stimulate a person's own immune system to recognize and destroy cancer cells more effectively.

Immune checkpoint inhibitors

An important part of the immune system is its ability to keep itself from attacking normal cells in the body. To do this, it uses “checkpoints” – proteins on immune cells that need to be turned on (or off) to start an immune response. Cancer cells sometimes use these checkpoints to avoid being attacked by the immune system. But drugs that target these checkpoints can be used to treat some people with ovarian cancer.

- **Pembrolizumab (Keytruda)** targets PD-1, a protein on certain immune cells (called **T cells**) that normally helps keep these cells from attacking other cells in the body. By blocking PD-1, these drugs boost the immune response against cancer cells. This can shrink some tumors or slow their growth.

Pembrolizumab can be used in people with certain types of advanced ovarian cancer that have high levels of MSI or changes in the MMR genes whose cancer starts growing after chemotherapy or other drug treatments.

This immunotherapy drug is given as an intravenous (IV) infusion every 3 weeks.

Possible side effects of immunotherapy

Side effects of these drugs can include fatigue, cough, nausea, itching, skin rash, loss of appetite, constipation, joint pain, and diarrhea.

Other, more serious side effects occur less often.

Infusion reactions: Some people might have an infusion reaction while getting these drugs. This is like an allergic reaction, and can include fever, chills, flushing of the face, rash, itchy skin, feeling dizzy, wheezing, and trouble breathing. It's important to tell your doctor or nurse right away if you have any of these symptoms while getting these drugs.

Autoimmune reactions: These drugs work by basically removing one of the safeguards on the body's immune system. Sometimes the immune system starts attacking other parts of the body, which can cause serious or even life-threatening problems in the lungs, intestines, liver, hormone-making glands, kidneys, or other organs.

It's very important to report any new side effects to your health care team as soon as possible. If serious side effects do occur, treatment may need to be stopped and you may get high doses of corticosteroids to suppress your immune system.

More information about immunotherapy

To learn more about how drugs that work on the immune system are used to treat cancer, see [Cancer Immunotherapy](#)¹.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)².

- [Stage III cancers](#)
- [Stage IV cancers](#)
- [Recurrent or persistent ovarian cancer](#)
- [Palliative treatments](#)

The first step in treating most ovarian cancers is surgery to remove and [stage](#)¹ the cancer. Debulking is also done as needed. (See [Surgery for Ovarian Cancer](#).) Because fallopian tube and primary peritoneal cancers have the same staging system as ovarian cancers they are included in this section.

Stage I cancers

The initial treatment for stage I ovarian cancer is [surgery to remove the tumor](#). Most often the uterus, both fallopian tubes, and both ovaries are removed (a hysterectomy with bilateral salpingo-oophorectomy). The treatment after surgery depends on the sub-stage of the cancer.

Stages IA and IB (T1a or T1b, N0, M0): The treatment after surgery depends on the way the cancer cells look in the lab (called the *tumor grade*).

For grade 1 (also called low grade) tumors, most women don't need any treatment

Cancer is called *recurrent* when it come backs after treatment. Recurrence can be local (in or near the same place it started) or distant (spread to organs like the lungs or bone). Persistent tumors are those that never went away completely after treatment. Advanced epithelial ovarian cancer often comes back months or years after the initial treatment.

Sometimes, more [surgery](#) is recommended. Most women with recurrent or persistent ovarian cancer are treated with some form of [chemo](#). Which chemo drugs are used depends on what was used the first time and how well it worked (how long the cancer stayed away). The longer it takes for the cancer to come back after treatment, the better the chance that additional chemo will work. If it has been at least 6 months since any chemo, carboplatin and paclitaxel are often used (even if these drugs were given before). Giving carboplatin with another drug is also an option.

If the cancer comes back in less than 6 months (or if it never went away at all), different chemo drugs usually will be tried. There are many different chemo drugs that can be used to treat ovarian cancer, so some women may receive several different chemo regimens over several years.

Treatment with [targeted drugs](#) might also be helpful. For example, bevacizumab (Avastin) may be given with chemo. A PARP inhibitor drug such as olaparib (Lynparza), rucaparib (Rubraca), or niraparib (Zejula) may also be an option at some point. The antibody-drug conjugate mirvetuximab soravtansine (Elahere) might also be an option in some cases.

In addition, some women benefit from [hormonal treatment](#) with drugs like anastrozole, letrozole, or tamoxifen.

Someone who didn't initially receive chemo can be treated with the same drugs that are used for newly diagnosed cancer usually carboplatin and paclitaxel.

A [clinical trial](#)³ for new treatments might provide important advantages for women with recurrent or persistent ovarian cancer. Ask your cancer care team for information about suitable clinical trials for your type of cancer.

Palliative treatments

Palliative treatments are used to relieve the symptoms of ovarian cancer.

Women with ovarian cancer can have a buildup of fluid in the abdomen. This is called *ascites*. It can be very uncomfortable but can be treated with a procedure called

paracentesis. After the skin is numbed, a needle is used to withdraw the fluid, often several quarts, into a bottle. Often, ultrasound is used to guide the needle. Often the fluid builds up again, and this procedure needs to be repeated. Sometimes a catheter (a thin flexible tube) is placed into the abdomen and left there so that fluid can be removed as often as is needed without using a needle. Another option is to inject chemo directly into the abdomen to slow the buildup of fluid. Treatment with bevacizumab (Avastin) may also help slow fluid buildup. These treatments can relieve symptoms for some women and, rarely, might help some women live longer. Often, however, their effects are temporary, and the cancer returns or persists.

Ovarian cancer can also block the intestinal tract. This is called *obstruction*, and can cause abdominal pain, nausea, and vomiting. Dealing with an intestinal blockage can be difficult. There are several procedures that might be done, depending on the type of obstruction and your overall health:

- Doctors may place a tube through the skin and into the stomach to allow the stomach juices to drain, so that the digestive tract isn't completely blocked.
- Sometimes a stent (a stiff tube) can be put into the large intestine to relieve a blockage. Since this option has a high risk of complications, you should discuss the risks and benefits with your doctor first.
- For some women, surgery can be done to relieve intestinal obstruction. This is usually only done if you are well enough to get additional treatments (like chemo) after surgery. Often, however, the cancer has grown so much in the abdomen that surgery to unblock the intestine doesn't work.

Hyperlinks

1. www.cancer.org/cancer/types/ovarian-cancer/detection-diagnosis-staging/staging.html
2. www.cancer.org/cancer/types/ovarian-cancer/detection-diagnosis-staging/staging.html
3. www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html

Last Revised: November 17, 2022

Treatment for Epithelial Tumors of Low Malignant Potential

Borderline epithelial tumors are also known as *atypical proliferating tumors* and used to be called *low malignant potential tumors*. These tumors look the same as invasive epithelial ovarian cancers when seen on an ultrasound or CT scan. Doctors can't be sure whether a tumor is invasive or borderline until a biopsy sample has been taken (usually during surgery) and checked in a lab.

Surgery for borderline tumors is similar to the surgery for invasive ovarian cancer, with the goals of removing the tumor along with full [staging](#)¹ and [debulking](#).

- For women who have finished having children, the uterus, both fallopian tubes, and both ovaries are removed. Surgical staging is done to see if the tumor has spread outside the ovary or pelvis. Sometimes, this means removing the omentum and some lymph nodes, and doing washings of the abdomen and pelvis.
- For women who want to be able to become pregnant in the future, only the ovary with the tumor and the fallopian tube on that side is removed. Rarely, just the part of the ovary containing the tumor is removed. These women still should have surgical staging to see if the tumor has spread. If the tumor is only in one ovary, the woman is usually observed without further treatment and monitored with ultrasound exams.

For tumors that haven't spread outside the ovary, [Chemotherapy](#) (chemo) and [radiation therapy](#) are not generally the first treatments used. Observation is often recommended for borderline tumors because they grow very slowly and even when they spread they are rarely fatal.

If the tumor has spread outside the ovary when it is first diagnosed, the surgeon will remove as much of it as possible (debulking). Treatment after surgery depends on whether the spread is *invasive* or not. When borderline tumors spread, they can form tumor implants (deposits) on the peritoneum (lining of the abdomen) and on the surface of organs in the abdomen and pelvis. Most often, these implants are non-invasive, meaning they haven't grown into the abdominal lining or organs.

- For women with non-invasive spread from a borderline tumor, chemo has not been shown to be helpful after debulking surgery. These women are usually watched closely without further treatment.



Treatment for Germ Cell Tumors of the Ovary

- [Treating benign germ cell tumors](#)
- [Treating malignant germ cell tumors](#)
- [Treating recurrent or persistent germ cell tumors](#)

Treating benign germ cell tumors

Women with benign (non-cancerous) germ cell tumors such as mature teratomas (dermoid cysts) are cured by removing the part of the ovary that has the tumor (ovarian cystectomy) or by removing the entire ovary.

Treating malignant germ cell tumors

As with epithelial ovarian cancers, it is a good idea to consult with a gynecologic oncologist for treating malignant germ cell tumors, especially because these are so uncommon. About 2-3% of all ovarian cancers are germ cell tumors.

For most types and stages of germ cell cancers

Most types and stages of germ cell cancers of the ovary are treated the same way, with [surgery](#) and [chemotherapy](#) (chemo).

Surgery: In general, all women with malignant germ cell tumors will have the same staging surgery that is done for epithelial ovarian cancer. For women who still want to be able to have children, the cancerous ovary and the fallopian tube on the same side are removed, but the uterus, the ovary, and the fallopian tube on the opposite side are left behind. This isn't an option when the cancer is in both ovaries. If preserving fertility is not a concern, complete staging including removing both ovaries, both fallopian tubes, and the uterus is generally recommended.

Sometimes, the doctor might consider removing only a part of one ovary to allow a woman to keep her ovarian function. Even when both ovaries need to be removed, a woman may wish to keep her uterus to allow future pregnancy through the use of in-vitro fertilization.

If cancer has spread beyond the ovaries, debulking surgery may be done as a part of

Treatment for recurrent or persistent germ cell tumors might include surgery, chemo or, rarely, radiation therapy. For chemo, a combination of drugs is used most often. PEB (cisplatin, etoposide, and bleomycin) may be used if this combination of drugs was not used before. For women who have already been treated with PEB, [other drug combinations](#) are used.

For recurrent or persistent germ cell cancer, a clinical trial for new treatments may provide important advantages. Ask your cancer care team for information about _____

Treatment for Stromal Tumors of the

Ovary, by Stage

- [Stage I](#)
- [Stages II, III, and IV](#)
- [Recurrent stromal tumors](#)

Stage I

All stage I stromal tumors are treated with [surgery](#) to remove the ovary with the tumor. Most women with stage I tumors are watched closely after the operation and don't require further treatment. However, some stage I tumors are more likely to come back after surgery, for example:

- Very large tumors
- Tumors where the cyst broke open (ruptured)
- Poorly-differentiated tumors (also called high grade the cancer cells don't look like normal tissue when examined in the lab).

These cancers are said to be at *high risk* for recurrence. Women with high-risk stage I stromal cancers have 2 options after surgery: observation (being watched closely) or [chemotherapy](#) (chemo).

Stages II, III, and IV

These cancers are treated with surgery to remove the ovary with the tumor. [Surgery](#) is also used to stage and debulk the cancer, as needed. This may be followed by [chemo](#) or [hormone therapy](#). Often, the chemo used is the same type used to treat germ cell tumors (PEB: cisplatin, etoposide, and bleomycin). The combination of carboplatin and paclitaxel (Taxol) may also be used. [Hormone treatment](#) is most often used to treat advanced stromal tumors in women who cannot tolerate chemo, but who want to try treatment. This may mean treatment with a drug such as leuprolide (Lupron) and goserelin (Zoladex), the drug tamoxifen, or an aromatase inhibitor. Rarely, [radiation therapy](#) may be an option.

Recurrent stromal tumors

Cancer that comes back after treatment is said to be *recurrent*. This can happen many years later for stromal tumors. Even so, the prognosis (outlook) might still be good

