Ovarian Cancer Causes, Risk Factors, and Prevention

Learn about the risk factors for ovarian cancer and what you might be able to do to help lower your risk.

Risk Factors

A risk factor is anything that affects your chance of getting a disease such as cancer. Learn more about the risk factors for ovarian cancer.

- Ovarian Cancer Risk Factors
- What Causes Ovarian Cancer?

Prevention

There is no known way to prevent most ovarian cancers. But there are things you can do that might lower your risk. Learn more.

- Can Ovarian Cancer Be Prevented?

Ovarian Cancer Risk Factors

- Factors that increase your risk of ovarian cancers
- Factors with unclear effects on ovarian cancer risk

- Factors that can lower risk of ovarian cancer

A risk factor is anything that increases your chance of getting a disease like cancer. Different cancers have different risk factors. Some risk factors, like smoking, can be changed. Others, like a person’s age or family history, can’t be changed.

But having a risk factor, or even many, does not mean that you will get the disease. And some people who get the disease may not have any known risk factors. Researchers have discovered several risk factors that might increase a woman's chance of developing **epithelial** ovarian cancer. These risk factors don’t apply to other less

Having a family history of ovarian cancer, breast cancer, or colorectal cancer

Ovarian cancer can run in families. Yourovarian cancer risk is increased if your mother, sister, or daughter has (or has had) ovarian cancer. The risk also gets higher the more relatives you have with ovarian cancer. Increased risk for ovarian cancer can also come from your father's side.

A family history of some other types of cancer such as colorectal and breast cancer is linked to an increased risk of ovarian cancer. This is because these cancers can be caused by an inherited mutation (change) in certain genes that cause a family cancer syndrome that increases the risk of ovarian cancer.

Having a family cancer syndrome

Up to 25% of ovarian cancers are a part of family cancer syndromes[1] resulting from inherited changes (mutations)in certain genes.

Hereditary breast and ovarian cancer syndrome (HBOC)

This syndrome is caused by inherited mutations in the genes *BRCA1* and *BRCA2*, as well as possibly some other genes that have not yet been found. This syndrome is linked to a high risk of breast cancer[2] as well as ovarian, fallopian tube, and primary peritoneal cancers. The risk of some other cancers, such as pancreatic cancer[3] and prostate cancer[4], are also increased.

Mutations in *BRCA1* and *BRCA2* are also responsible for most inherited ovarian cancers. Mutations in *BRCA1* and *BRCA2* are about 10 times more common in those who are Ashkenazi Jewish than those in the general U.S. population.

The lifetime ovarian cancer risk for women with a *BRCA1* mutation is estimated to be between 35% and 70%. This means that if 100 women had a *BRCA1* mutation, between 35 and 70 of them would get ovarian cancer. For women with *BRCA2* mutations the risk has been estimated to be between 10% and 30% by age 70. These mutations also increase the risks for primary peritoneal carcinoma and fallopian tube carcinoma.

In comparison, the ovarian cancer lifetime risk for the women in the general population is less than 2%.

Hereditary nonpolyposis colon cancer (HNPCC)

Women with this syndrome have a very high risk of colon cancer[5] and also have an increased risk of developing cancer of the uterus (endometrial cancer) and ovarian cancer. Many different genes can cause this syndrome. They include *MLH1*, *MSH2*, *MSH6*, *PMS2,* and *EPCAM.* The lifetime risk of ovarian cancer in women with hereditary nonpolyposis colon cancer is about 10%. Up to 1% of all ovarian epithelial cancers occur in women with this syndrome. Another name for HNPCC is Lynch syndrome.

Peutz-Jeghers syndrome

People with this rare genetic syndrome develop polyps in the stomach and intestine while they are teenagers. They also have a high risk of cancer, particularly cancers of the digestive tract (esophagus, stomach, small intestine, colon). Women with this syndrome have an increased risk of ovarian cancer, including both epithelial ovarian cancer and a type of stromal tumor called **sex cord tumor with annular tubules**

If you have had breast cancer, you might also have an increased risk of developing ovarian cancer. There are several reasons for this. Some of the reproductive risk factors for ovarian cancer may also affect breast cancer risk. The risk of ovarian cancer after breast cancer is highest in those women with a family history of breast cancer. A strong family history of breast cancer may be caused by an inherited mutation in the *BRCA1* or *BRCA2* genes and hereditary breast and ovarian cancer syndrome, which is linked to an increased risk of ovarian cancer.

Smoking

Smoking doesn't increase the risk of ovarian cancer overall, but it is linked to an increased risk for the mucinous type.

Factors with unclear effects on ovarian cancer risk

Androgens

Androgens, such as testosterone, are male hormones. There appears to be a link between certain androgens and specific types of ovarian cancer, but further studies of the role of androgens in ovarian cancer are needed.

Talcum powder

It has been suggested that talcum powder might cause cancer in the ovaries if the powder particles (applied to the genital area or on sanitary napkins, diaphragms, or condoms) were to travel through the vagina, uterus, and fallopian tubes to the ovary.

Many studies in women have looked at the possible link between talcum powder and cancer of the ovary. Findings have been mixed, with some studies reporting a slightly increased risk and some reporting no increase. Many case-control studies have found a small increase in risk. But these types of studies can be biased because they often rely on a person's memory of talc use many years earlier. One prospective cohort study, which would not have the same type of potential bias, has not found an increased risk. A second found a modest increase in risk of one type of ovarian cancer.

For any individual woman, if there is an increased risk, the overall increase is likely to very be small. Still, talc is widely used in many products, so it is important to determine if the increased risk is real. Research in this area continues.

Diet

8. www.cancer.org/cancer/types/pancreatic-cancer/causes-risks-prevention/what-causes.html
9. www.cancer.org/cancer/types/ovarian-cancer/about/what-is-ovarian-cancer.html

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What Causes Ovarian Cancer?

- Gene changes related to ovarian cancer

We don’t yet know exactly what causes most ovarian cancers. As discussed in Ovarian Cancer Risk Factors, we do know some factors that make a woman more likely to develop epithelial ovarian cancer. Much less is known about risk factors for germ cell and stromal tumors of the ovaries.

The most recent and important finding about the cause of ovarian cancer is that it starts in cells at the tail ends of the fallopian tubes and not necessarily in the ovary itself. This new information may open more research studies looking at preventing and screening for this type of cancer.

There are many theories about the causes of ovarian cancer. Some of them came from looking at the things that change the risk of ovarian cancer. For example, pregnancy and taking birth control pills both lower the risk of ovarian cancer. Since both of these things reduce the number of times the ovary releases an egg (ovulation), some researchers think that there may be some relationship between ovulation and the risk of developing ovarian cancer.

Also, we know that tubal ligation and hysterectomy lower the risk of ovarian cancer. One theory to explain this is that some cancer-causing substances may enter the body through the vagina and pass through the uterus and fallopian tubes to reach the ovaries. This would explain how removing the uterus or blocking the fallopian tubes

disease. So far, what is known about risk factors has not translated into practical ways to prevent most cases of ovarian cancer.

There are several ways you can reduce your risk of developing the most common type of ovarian cancer, epithelial ovarian cancer. Much less is known about ways to lower the risk of developing germ cell and stromal tumors of the ovaries, so this information does not apply to those types. It is important to realize that some of these strategies lower your risk only slightly, while others lower it much more. Some strategies are easily followed, and others require surgery. If you are concerned about your risk of ovarian cancer, talk to your health care professionals. They can help you consider these ideas as they apply to your own situation.

Avoiding certain risk factors

Some risk factors for ovarian cancer, like getting older or having a family history, cannot be changed. But women might be able to lower their risk slightly by avoiding other risk factors, for example, by staying at a healthy weight, or not taking hormone replacement therapy after menopause. See Risk Factors for Ovarian Cancer to learn more.

Oral contraceptives

Using oral contraceptives (birth control pills) decreases the risk of developing ovarian cancer for average risk women and BRCA mutation carriers , especially among women who use them for several years. Women who used oral contraceptives for 5 or more years have about a 50% lower risk of developing ovarian cancer compared with women who never used oral contraceptives. Still, birth control pills do have some serious risks and side effects such as slightly increasing breast cancer risk. Women considering taking these drugs for any reason should first discuss the possible risks and benefits with their doctor.

Gynecologic surgery

Both tubal ligation and hysterectomy may reduce the chance of developing certain types of ovarian cancer, but experts agree that these operations should only be done for valid medical reasons -- not for their effect on ovarian cancer risk.

If you are going to have a hysterectomy for a valid medical reason and you have a strong family history of ovarian or breast cancer, you may want to consider having both ovaries and fallopian tubes removed (called a *bilateral salpingo-oophorectomy*) as part of that procedure.

Even if you don't have an increased risk of ovarian cancer, some doctors recommend that the ovaries be removed with the uterus if a woman has already gone through menopause or is close to menopause. If you are older than 40 and you are going to have a hysterectomy, you should discuss the potential risks and benefits of having your ovaries removed with your doctor.

Another option for average risk women who do not wish to have their ovaries removed because they don't want to lose ovarian function (and go through menopause early) is to have just the fallopian tubes removed (a bilateral salpingectomy) along with the uterus (a hysterectomy). They may choose to have their ovaries removed later. This has not been studied as well as removing both the ovaries and fallopian tubes at the same time, but there is enough information that it may be considered an option to reduce ovarian cancer risk in average risk women.

Prevention strategies for women with a family history of ovarian cancer or BRCA mutation

If your family history suggests that you (or a close relative) might have a syndrome linked with a high risk of ovarian cancer, you might want to consider genetic counseling and testing. During genetic counseling (by a genetic counselor or other health care professional with training in genetic risk evaluation), your personal medical and family history is reviewed. This can help predict whether you are likely to have one of the gene mutations associated with an increased ovarian cancer risk.

The counselor will also discuss the benefits and potential drawbacks of genetic testing with you. Genetic testing can help determine if you or members of your family carry certain gene mutations that cause a high risk of ovarian cancer. Still, the results are not always clear, and a genetic counselor can help you sort out what the results mean to you.

For some women with a strong family history of ovarian cancer, knowing they do not have a mutation that increases their ovarian cancer risk can be a great relief for them and their children. Knowing that you do have such a mutation can be stressful, but many women find this information very helpful in making important decisions about certain prevention strategies for them and their children. See Genetics and Cancer[1] to learn more.

Using oral contraceptives is one way that high risk women (women with BRCA1 and BRCA2 mutations) can reduce their risk of developing ovarian cancer. But birth control pills can increase breast cancer risk in women with or without these mutations. This increased risk appears highest while women are actively taking birth control pills but can

continue even after stopping them. Research is continuing to find out more about the risks and benefits of oral contraceptives for women at high ovarian and breast cancer risk.

Tubal ligation may also effectively reduce the risk of ovarian cancer in women who have *BRCA1* or *BRCA2* mutations. Usually this type of surgery is not done alone and is typically done for reasons other than ovarian cancer prevention.

Sometimes a woman may want to consider having both ovaries and fallopian tubes removed (called a bilateral salpingo-oophorectomy) to reduce her risk of ovarian cancer before cancer is even suspected. If the ovaries are removed to prevent ovarian cancer, the surgery is called *risk-reducing* or *prophylactic*. Generally, salpingo-oophorectomy may be recommended for high-risk women after they have finished having children. This operation lowers ovarian cancer risk a great deal but does not entirely eliminate it. That's because some women who have a high risk of ovarian cancer already have a cancer at the time of surgery. These cancers can be so small that they are only found when the ovaries and fallopian tubes are looked at in the lab after they are removed. Also, women with *BRCA1* or *BRCA2* gene mutations have an increased risk of primary peritoneal carcinoma. Although the risk is low, this cancer can still develop after the ovaries and fallopian tubes are removed.

The risk of fallopian tube cancer is also increased in women with mutations in *BRCA1* or *BRCA2.* Sometimes early fallopian tube cancers are found unexpectedly when the fallopian tubes are removed as a part of a risk-reducing surgery. In fact, some cancers that were thought to be ovarian or primary peritoneal cancers may have actually started in the fallopian tubes. That is why experts recommend that women at high risk of ovarian cancer who are having their ovaries removed should have their fallopian tubes completely removed as well (salpingo-oophorectomy).

Research has shown that premenopausal women who have *BRCA* gene mutations and have had their ovaries removed reduce their risk of breast cancer[2] as well as their risk of ovarian cancer. The risk of ovarian cancer is reduced by 85% to 95%, and the risk of breast cancer cut by 50% or more.

Some women who have a high risk of ovarian cancer due to *BRCA* gene mutations feel that having their ovaries and fallopian tubes removed is not right for them. Often doctors recommend that those women have screening tests to try to find ovarian cancer early.

Hyperlinks

1. www.cancer.org/cancer/risk-prevention/genetics.html
2. www.cancer.org/cancer/types/breast-cancer.html

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Written by

The American Cancer Society medical and editorial content team (https://www.cancer.org/cancer/acs-medical-content-and-news-staff.html)

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.

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