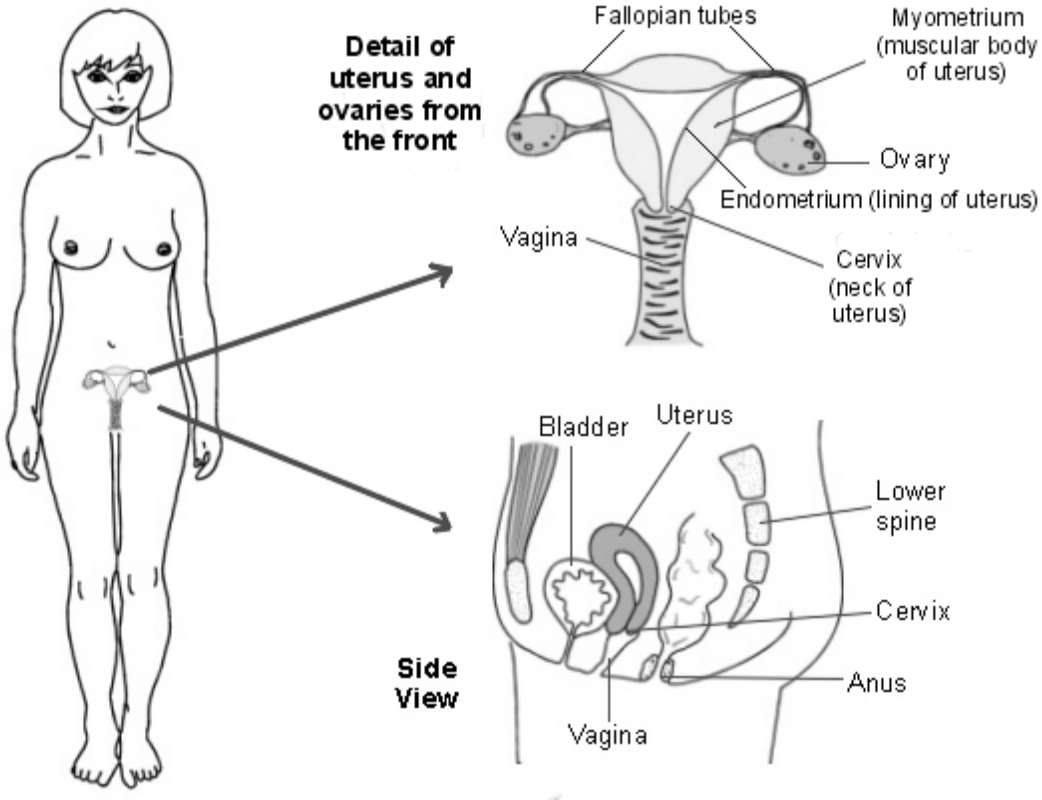
Ovarian Cancer

Most cases of ovarian cancer (cancer of the ovary) develop in women over the age of 50. The cause is not clear. Some ovarian cancers can be cured. In general, the more advanced the cancer (the more it has grown and spread), the less chance that treatment will be curative. However, treatment can often slow the progress of the cancer. Some women with a strong family history of ovarian cancer may benefit from regular screening.

What are the ovaries?

Women have two ovaries, one on either side of the uterus (womb) in the lower abdomen. Ovaries are small and round, each about the size of a walnut. The ovaries make eggs. In fertile women, each month an egg (ovum) is released from one of the ovaries. The egg passes down the Fallopian tube into the uterus where it may be fertilised by a sperm.



The ovaries also make hormones including the main female hormones - oestrogen and progesterone. These hormones pass into the bloodstream and have various effects on other parts of the body, including regulating the menstrual cycle and periods.

What is cancer?

Cancer is a disease of the cells in the body. The body is made up from millions of tiny cells. There are many different types of cell in the body,and there are many different types of cancer which arise from different types of cell. What all types of cancer have in common is that the cancer cells are abnormal and multiply 'out of control'.

A malignant tumour is a lump or growth of tissue made up from cancer cells which continue to multiply. Malignant tumours invade into nearby tissues and organs, which can cause damage.

Malignant tumours may also spread to other parts of the body. This happens if some cells break off from the first (primary) tumour and are carried in the bloodstream or lymph channels to other parts of the body. These small groups of cells may then multiply to form 'secondary' tumours (metastases) in one or more parts of the body. These secondary tumours may then grow, invade and damage nearby tissues and can spread again.

Some cancers are more serious than others, some are more easily treated than others (particularly if diagnosed at an early stage), some have a better outlook (prognosis) than others. So, cancer is not just one condition. In each case it is important to know exactly what type of cancer has developed, how large it has become and whether it has spread. This will enable you to get reliable information on treatment options and outlook.

See separate leaflet called *'Cancer - What are Cancer and Tumours'* for further details about cancer in general.

What is ovarian cancer and how common is it?

Ovarian cancer is the fifth most common cancer in the UK. It is more common than cervical cancer (cancer of the cervix). About 7,000 women are diagnosed with it every year in the UK. The majority of cases are in women aged over 50 years, although it can occur in younger women. There are various types of ovarian cancer. They are classified by the type of cell from which the cancer originates:

- **Epithelial ovarian cancer** is the most common type (about 9 in 10 cases). This type of cancer develops from one of the cells that surrounds the outside of each ovary. This outer layer of cells is called the germinal epithelium of the ovary. Epithelial ovarian cancer mainly affects women who have had their menopause - usually women aged over 50. It is rare in younger women. There are various subtypes depending on the exact look of the cells causing the cancer (which can be seen under the microscope).
- **Germ cell ovarian cancer** develops from germ cells (the cells that make the eggs). About 1 in 10 cases of ovarian cancer are germ cell cancers. They typically develop in younger women. Again, there are various subtypes depending on the exact look of the cells causing the cancer. Most cases of germ cell ovarian cancer are curable, even if diagnosed at a late stage, as it usually responds well to treatment.
- **Stromal ovarian cancer** develops from connective tissue cells (the cells that fill the ovary and produce hormones). This type of cancer is rare.

The treatments and prognosis (outlook) are different for each type of ovarian cancer.

The rest of this article is only about epithelial ovarian cancer.

What causes (epithelial) ovarian cancer?

A cancerous tumour starts from one abnormal cell. The exact reason why a cell becomes cancerous is unclear. It is thought that something damages or alters certain genes in the cell. This makes the cell abnormal and multiply out of control. (See separate leaflet called *'Cancer - What Causes Cancer'* for more details.)

In most cases, the reason why an ovarian cancer develops is not known. However, there are factors which are known to alter the risk of ovarian cancer developing. These include:

- Age. Most cases occur in women over the age of 50 years.
- Ovulation factors. Factors that reduce the number of times a woman will ovulate slightly lower the risk. For example, taking the combined oral contraceptive pill (COCP), having children and breast-feeding. In contrast, not having children and having a late menopause slightly increases the risk.

- Being overweight or obese increases the risk.
- Taking hormone replacement therapy (HRT) may slightly increase the risk.
- Sterilisation or hysterectomy (removal of the uterus) appears to reduce the risk slightly.
- Taking the COCP provides some protection from ovarian cancer. This protection seems to continue for many years after stopping the pill.
- Genetic factors - see below.

Family history and genetic testing
Most cases of ovarian cancer are *not* due to genetic or hereditary factors. Around one in twenty cases is due to faulty genes which increase the risk of cancer of the breast and ovary. Some women are referred for genetic testing if a faulty gene is suspected on the basis of a strong family history of cancer. The most common genes are BRCA1 and BRCA2. For example, if you have two or more close relatives who have had ovarian or breast cancer at a young age (or certain other cancers), you may benefit from genetic testing. If this applies to you then it is advised that you see your GP to talk it through to establish if you should be referred for genetic testing.

In addition, if you are eligible for enhanced breast screening due to a family history of breast cancer, you should be aware of the early symptoms of ovarian cancer (see below). See a doctor promptly if you develop any of these symptoms.

What are the symptoms of (epithelial) ovarian cancer?

In many cases, no symptoms develop for quite some time after the cancer first develops. Symptoms may only be noticed when the cancerous tumour has become quite large. As the tumour grows, the most common early symptoms include one or more of the following:

- Constant pain or a feeling of pressure in the lower abdomen (pelvic area).
- Bloating in the abdomen that does not go away (not bloating that comes and goes). There may also be an actual increase in size of your abdomen.
- Difficulty eating, and feeling full quickly.

Other symptoms that may develop include:

- Loss of appetite.
- Weight loss.
- Pain in the lower abdomen when having sex.
- Passing urine frequently (as the bladder is irritated by the nearby tumour).
- Change in bowel habit such as constipation or diarrhoea.
- A more marked swelling of the abdomen. This is caused by ascites, which is a collection of fluid in the abdomen. It is caused by the growth and spread of the cancer to the inside of the abdomen which causes fluid to accumulate.

All of the above symptoms can be caused by various other conditions. Also, when symptoms first start they are often vague for some time, such as mild discomfort in the lower abdomen. These symptoms may be thought to be due to other conditions. The possibility of ovarian cancer may not be considered for some time until the symptoms get worse.

In particular, one condition that is often mistaken for ovarian cancer is irritable bowel syndrome (IBS). But, it is uncommon for IBS to first develop in women over the age of 50. (IBS typically first develops at a younger age - but may persist into later life). So, if you have not had IBS type symptoms in the past but then develop them aged over 50, then ovarian cancer should be considered and ruled out (usually by tests) before making a diagnosis of IBS.

If the cancer spreads to other parts of the body, various other symptoms can develop.

How is (epithelial) ovarian cancer diagnosed and assessed?

Initial tests
Initial tests to diagnose ovarian cancer may include:

- An examination by a doctor. He or she may feel an enlarged ovary or another suspicious abnormality.
- An ultrasound scan. This is a painless test which uses sound waves to create images of structures inside your body. The probe of the scanner may be placed on your abdomen to scan the ovaries. A small probe is also commonly placed inside the vagina to scan the ovaries from this angle in order to obtain more detailed pictures.
- A blood test. A sample of blood can detect a protein called CA-125. The level of CA-125 is high in more than 8 in 10 women with advanced ovarian cancer and in about half of women with early ovarian cancer. Other non-cancerous conditions can also cause a high level. This means that this test does not conclusively diagnose or rule out ovarian cancer but it can be a helpful test. This test is also often used to monitor the effects of treatment for ovarian cancer.

Further tests
You may be advised to have further tests depending on the symptoms that you have and the results of the initial tests. These tests can help to confirm the diagnosis and to stage the disease. The aim of staging is to find out:

- How much the cancer has grown and whether it has grown to other nearby structures, such as the uterus, bladder or rectum.
- Whether the cancer has spread to local lymph glands (nodes).
- Whether the cancer has spread to other areas of the body (metastasised).

The stages of ovarian cancer are as follows:
Stage 1 - just involving the ovaries.
Stage 2 - the cancer has spread outside the ovaries but not outside the pelvis.
Stage 3 - the cancer has spread outside the pelvis but not involved other areas of the body.
Stage 4 - the cancer has spread to other parts of the body such as the liver and lungs.

Tests that are used may include one or more of the following:

- Computed tomography (CT) scan of the lower abdomen. This can provide detail of the structure of the internal organs. (See separate leaflet called *'CT Scan'* for details.)
- A chest x-ray to check if the cancer has spread to your lungs.
- Blood tests to assess your general health and to check if the cancer has affected the function of your liver or kidneys. If you are aged under 40 you may have other tests to check for the rarer types of ovarian cancer.
- Scans of the bowel or urinary tract. For example, colonoscopy or CT scan. (See separate leaflet called *'Colonoscopy'* for more details.) These tests are more likely to be needed if you have symptoms such as constipation or urinary frequency which *may* indicate the cancer has spread to these areas.
- Aspiration of fluid. If your abdomen has swollen with fluid leading to ascites then a sample can be taken. This is done by numbing a small area of skin on the abdomen, using local anaesthetic. A fine needle is then inserted through the abdominal wall and some fluid is removed. This fluid can then be looked at under the microscope to look for cancer cells.
- Even if you do not have fluid in the abdomen, cells may still be obtained by passing a needle through the skin into the abdomen under X-ray control (percutaneous image-guided biopsy).
- Laparoscopy. This is a procedure to look inside your abdomen by using a laparoscope. A laparoscope is like a thin telescope with a light source. It is used to light up and magnify the structures inside the abdomen. A laparoscope is passed into

the abdomen through a small incision (cut) in the skin. The ovaries and other internal organs can be seen. Also, biopsies (small samples) can be taken to be looked at under the microscope to detect and confirm cancer cells.

Even with the above tests, the exact stage (extent of spread) may not be known until after an operation to treat the cancer.

Grading of the cancer cells
If a biopsy of the cancer is taken, or cancer cells are found in aspirated fluid, the cells can be assessed. By looking at certain features of the cells under the microscope the cancer can be graded.

- Grade 1 (a low grade) - the cells look reasonably similar to normal ovarian cells. The cancer cells are said to be well-differentiated. The cancer cells tend to grow and multiply quite slowly and are not so aggressive.
- Grade 2 - is a middle grade.
- Grade 3 - the cells look very abnormal and are said to be poorly differentiated. The cancer cells tend to grow and multiply quite quickly and are more aggressive.

Finding out the stage and grade of the cancer helps doctors to advise on the best treatment options. It also gives a reasonable indication of prognosis (outlook). See separate leaflet called *'Cancer - Staging and Grading Cancer'* for details.

What are the treatment options for (epithelial) ovarian cancer?

Treatment options may include surgery, chemotherapy and sometimes radiotherapy. The treatment advised in each case depends on various factors such as the stage and grade of the cancer and your general health. A specialist will be able to give the pros and cons, likely success rate, possible side-effects and other details about the various possible treatment options for your type and stage of cancer.

You should also discuss with your specialist the aims of treatment. For example:

- In some cases, treatment aims to cure the cancer. (Doctors tend to use the word remission rather than the word cured. Remission means there is no sign of cancer following treatment. If you are in remission, you may be cured. However, in some cases a cancer returns months or years later. This is why doctors are sometimes reluctant to use the word cured.)
- In some cases, treatment aims to control the cancer. If a cure is not realistic, with treatment it is often possible to limit the growth or spread of the cancer so that it progresses less rapidly. This may keep you free of symptoms for some time.
- In some cases, treatment aims to ease symptoms. For example, if a cancer is advanced then you may require treatments such as painkillers or other treatments to help keep you free of pain or other symptoms. Some treatments may be used to reduce the size of a cancer, which may ease symptoms such as pain.

Surgery
An operation is advised in most cases. If the cancer is at a very early stage (just confined to the ovary and not spread), then an operation to remove the affected ovary and associated Fallopian tube may be all the treatment required. However, in many cases the cancer has grown into other nearby structures or has spread. Therefore, a more extensive operation is often needed. For example, the operation may involve removing the affected ovary, plus the uterus, the other ovary and also other affected areas in the lower abdomen.

During the operation the surgeon may take small biopsy samples from structures in the abdomen and from structures lining the abdomen, such as the diaphragm or lymph glands (nodes). The samples are looked at under the microscope to see if any cancer cells have spread to these structures. This helps to give an accurate staging and helps to decide on further treatment.

Chemotherapy
Chemotherapy is a treatment of cancer by using anti-cancer drugs which kill cancer cells or stop them from multiplying. See separate leaflet called *'Chemotherapy'* for details. In most cases, cells taken during surgery or at biopsy will be looked at under microscope to check the risk of the cancer returning. If the risk is high, you will be offered chemotherapy. Occasionally, chemotherapy is given before surgery to reduce the size of the cancer. This may make surgery easier and more likely to be successful.

A second operation is sometimes advised after a course of chemotherapy. This aims to inspect inside the abdomen, assess how well chemotherapy has worked and to remove any cancer which could not have been removed in the first operation but which will have shrunk following chemotherapy.

Radiotherapy
Radiotherapy is a treatment that uses high-energy beams of radiation which are focused on cancerous tissue. This kills cancer cells or stops cancer cells from multiplying. (See separate leaflet called *'Radiotherapy'* for details.) Radiotherapy is not often used for ovarian cancer. It is sometimes used following surgery, to kill cancer cells which may have been left behind after the operation. Radiotherapy may also be used to shrink secondary tumours that have developed in other parts of the body and are causing pain or other symptoms.

What is the prognosis (outlook)?

There is a good chance of a cure if ovarian cancer is diagnosed and treated when the disease is at an early stage (confined to the ovary and has not spread). Unfortunately, most ovarian cancers are not diagnosed at an early stage. This is because symptoms often do not occur until after the cancer has grown quite large or has spread. In this situation, a cure is less likely but still possible. In general, the later the stage and the higher the grade of the cancer, the poorer the outlook. Even if a cure is not possible, treatment can often slow down the progression of the cancer.

The treatment of cancer is a developing area of medicine. New treatments continue to be developed and the information about outlook given above is very general. The specialist who knows your case can give more accurate information about your particular outlook and how well your stage and grade of cancer is likely to respond to treatment.

Is there a screening test for ovarian cancer?

Currently there is no ovarian cancer screening test that is offered to all women in the UK . However, research is underway to see if a screening test will detect ovarian cancer early (when treatment is most likely to be curative). Screening tests being studied are the CA-125 blood test and regular ultrasound scan of the ovary.

Two large studies are currently underway which will provide more answers about ovarian cancer screening. Preliminary results of one of these studies - UK Collaborative Trial of Ovarian Cancer Screening (UKCTOCS) - are encouraging. In this study, many ovarian cancers were detected in women with no symptoms and nearly half of the cancers were detected at an early stage. However, many women who had an abnormal screening test had unnecessary surgery, as they were found to not have ovarian cancer. So, the pros and cons of possible ovarian screening tests are yet to be clarified. Full results will not be available until 2015. After this time a decision can be made as to whether a screening test is appropriate and might lead to a fall in deaths from ovarian cancer.

Some people are currently offered screening if they have a strong family history of ovarian cancer. If you have two or more first-degree relatives (sister, mother, aunt) who have had ovarian cancer or have members in the family who have had breast cancer at a young age then you should talk with your doctor to see if you would benefit from screening.

Further help and information

Ovacome (ovarian cancer support)
Elizabeth Garrett Anderson Hospital, Huntley Street, London, WC1E 6DH
Tel: 020 7380 9589 Web: www.ovacome.org.uk
A nationwide support group for all those concerned with ovarian cancer.

Target Ovarian Cancer
Tel: 020 7923 5470 Web: www.targetovarian.org.uk
Dedicated to achieving a long and good life for every woman diagnosed with ovarian cancer in the UK and working to improve diagnosis and treatment of this disease.

Ovarian Cancer Action
Tel: 020 8238 7605 Web: www.ovarian.org.uk
Raises awareness of ovarian cancer in the UK.

OPERA
This is a personalised online risk assessment tool to predict likelihood of having genetic risk for breast and/or ovarian cancer.

Macmillan Cancer Support
Tel: 0808 800 1234 Web: www.macmillan.org.uk
Provides information and support to anyone affected by cancer.

Cancer Research UK
Web: www.cancerhelp.org.uk provides facts about cancer, including treatment choices.

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