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# Breast Cancer

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**Breast cancer** is the most common cancer in women. Most cases occur in women over the age of 50 but breast cancer can occur in younger women. If you notice any lump or change to your normal breast then you should see a doctor promptly. If breast cancer is diagnosed at an early stage, there is a good chance of a cure. 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.

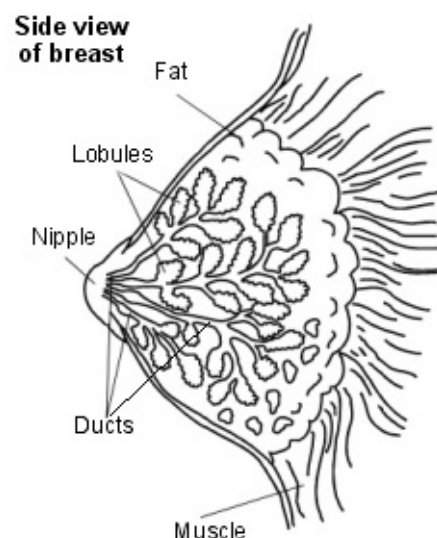
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## The breasts

Breast tissue is attached to muscle on the chest wall. A tail of breast tissue extends up into the armpit. The breasts contain:

- Many lobules which are made up of glandular tissue. They make milk after pregnancy.
- Ducts. These are channels which take milk from the lobules to the nipple.
- Fatty tissue and supporting connective tissue.
- Blood vessels, lymph channels and nerves (like all other areas of the body).

Many women find that their breasts become more lumpy and tender before periods. Breasts also alter their size and shape with increasing age, pregnancy and marked weight changes. What is important is that you get to know your own breasts - how they look and feel - and report any changes promptly to a doctor.



## 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 cancerous (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 spread again.

Some cancers are more serious than others, some are more easily treated than others (particularly if diagnosed at an early stage) and 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 obtain reliable information on treatment options and outlook.

See separate leaflet called [What Causes Cancer?](#) for more details.

## What is breast cancer?

Breast cancer is one of the most common cancers. Around one in nine women develop breast cancer at some stage in their lives. About 48,000 cases occur in the UK each year. Most develop in women over the age of 50 but younger women are sometimes affected. Breast cancer can also develop in men, although this is rare. Breast cancer develops from a cancerous (malignant) cell which develops in the lining of a duct or lobule in one of the breasts.

There are some subtypes of breast cancer which are important to know, as the treatment and outlook (prognosis) vary depending on the exact type of the cancer. The following gives a rough idea of the main subtypes. Your specialist will be able to give you more details as to the exact subtype of breast cancer that you have.

### **Invasive or in situ?**

Most breast cancers are diagnosed when a tumour has grown from within a duct or lobule into the surrounding breast tissue. These are called invasive breast cancers. Invasive breast cancers are also divided into those where cancer cells have invaded into local blood or lymphatic vessels and those that have not.

Some people are diagnosed when the cancerous cells are still totally within a duct or lobule. These are called carcinoma in situ, as no cancer cells have grown out from their original site. Ductal carcinoma in situ (DCIS) is the most common type of non-invasive breast cancer and about 1 in 5 new breast cancer cases will be DCIS. A carcinoma in situ is easier to treat and has a better outlook than an invasive cancer.

### **Grade of the cancerous cells**

A sample of breast cancer tissue can be looked at under the microscope. By looking at certain features of the cells, the cancer can be graded.

- Grade 1 - the cancer cells tend to be slow-growing and less aggressive.
- Grade 2 - is a middle grade.
- Grade 3 - the cancer cells tend to be fast-growing and more aggressive.

### **Presence of receptors**

Some breast cancer cells have receptors, which allow certain types of hormones or proteins to attach to the cancer cell. The types of receptor tested for are:

- Hormones. Tests on a sample of breast cancer cells can show if they contain oestrogen receptors. Oestrogen is the female hormone. Overall, about 7 in 10 breast cancers are oestrogen receptor positive. Treatment can block the oestrogen in these cancers (see below).
- Human epidermal growth factor (HER2) is a protein that can affect the growth of some cancer cells. It is found on the surface of normal breast cells. Some breast cancer cells have a very high number of HER2 receptors. Cancers having high levels of these receptors are called HER2-positive.

### **Stage of the cancer**

This does not describe a type of cancer but describes how much the cancer has grown and whether it has spread. As a general rule, the earlier the stage, the greater the chance of a cure (see later).

## What causes breast cancer?

A cancerous (malignant) 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.

## Risk factors

Although breast cancer can develop for no apparent reason, there are certain risk factors which increase the chance that breast cancer will develop. These include:

- Age. The risk of developing breast cancer roughly doubles for every 10 years of age. Most cases develop in women over the age of 50.
- Where you live. The rate of breast cancer varies between countries. This may reflect genetic or environmental factors.
- Family history. This means if you have close relatives who have or have had breast cancer. In particular, if they were aged under 50 when diagnosed.
- If you have had a previous breast cancer.
- Being childless, or if you had your first child after the age of 30.
- Not having breast-fed your children.
- Early age of starting periods.
- Chest being exposed to radiation.
- Having a menopause over the age of 55.
- Taking continuous combined hormone replacement therapy (HRT) for several years (in women over 50 years), leading to a slightly increased risk.
- Excess alcohol.

## Family history and genetic testing

About 1 in 20 cases of breast cancer are caused by a faulty gene which can be inherited. The genes BRCA1 and BRCA2 are the most common faulty genes. [See separate leaflet called Breast Cancer - Hereditary Factors for more details.](#)

## Breast cancer symptoms

### A breast lump

The usual first symptom is a painless lump in the breast. **Note:** [most breast lumps are not cancerous \(malignant\)](#). Most breast lumps are fluid-filled cysts or fibroadenomas (a clumping of glandular tissue) which are non-cancerous (benign). However, you should always see a doctor if a lump develops, as the breast lump may be cancerous.

### Other symptoms of breast cancer

Other symptoms which may be noticed in the affected breast include:

- Changes in the size or shape of a breast.
- Dimpling or thickening of some of the skin on a part of a breast.
- The nipple turning in (becoming inverted).
- Rarely, a discharge occurring from a nipple (which may be bloodstained).
- A rare type of breast cancer, causing a rash around the nipple, which can look similar to a small patch of eczema.
- Rarely, pain in a breast. **Note:** pain is not a usual early symptom. Many women develop painful breasts (mastalgia) and this is not usually caused by cancer.

The first place that breast cancer usually spreads to is the lymph glands (nodes) in the armpit (axilla). If this occurs, you may develop a swelling or lump in an armpit. If the cancer spreads to other parts of the body then various other symptoms can develop.

# How is breast cancer diagnosed?

## Initial assessment

If you develop a lump or symptoms which may be breast cancer, a doctor will usually examine your breasts and armpits to look for any lumps or other changes. You will normally be referred to a specialist. Sometimes a biopsy of an obvious lump (see below) is arranged, but other tests may be done first such as:

- **Mammogram.** This is a special X-ray of the breast tissue.
- **Ultrasound scan of the breast.**
- **MRI scan of the breast.** This is more commonly performed on younger women, who may have denser breast tissue.

## Biopsy - to confirm the diagnosis

A biopsy is a procedure in which a small sample of tissue is removed from a part of the body. The sample is examined under the microscope, to look for abnormal cells. A specialist may take a biopsy with a needle which is inserted into the lump for some cells to be withdrawn. Sometimes the doctor may be guided as to where to insert the needle with the help of a mammogram or ultrasound scan. Sometimes a small operation is needed to obtain a biopsy sample.

The biopsy sample can confirm or rule out breast cancer. Also the cells from a tumour can be assessed and tested to determine their grade and receptor status (see above).

## Assessing the extent and spread

If you are confirmed to have breast cancer, further tests may be needed to assess if it has spread - for example:

- Blood tests.
- An ultrasound scan of the liver.
- Chest X-ray.
- A bone scan.
- Other types of scan.

Separate leaflets describe each of these tests in more detail. This assessment is called staging of the cancer. The aim of staging is to find out:

- How large the tumour has grown.
- Whether the cancer has spread to local lymph nodes in the armpit.
- Whether the cancer has spread to other areas of the body (metastasised).

See separate leaflet called [Staging and Grading Cancer](#) for more details.

Finding out the stage of the cancer, the grade of the cells and the receptor status of the cancer, helps doctors to advise on the best treatment options. It also gives a reasonable indication of outlook.

# What is the treatment for breast cancer?

Treatment options which may be considered include surgery, chemotherapy, radiotherapy and hormone treatment. Often a combination of two or more of these treatments is used. The treatments used depend on:

- The cancer itself - its size and stage (whether it has spread), the grade of the cancer cells, and whether it is hormone responsive or contains HER2 receptors; AND
- The woman with the cancer - your age, whether or not you have had your menopause, your general health and personal preferences for treatment.

You should have a full discussion with a specialist who knows your case. They 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 of cancer.

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

- Treatment aims to cure the cancer in many cases. In particular, the earlier the stage of the cancer, the better the chance of a cure. Because of routine mammography, many women are diagnosed with breast cancer in the early stages and have a good chance of a cure. Doctors tend to use the word remission rather than the word cured. Remission means there is no evidence 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.
- Treatment may aim 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 it progresses less rapidly. This may keep you free of symptoms for some time.
- Treatment may aim to ease symptoms in some cases. Even if a cure is not possible, treatments may be used to reduce the size of a tumour, which may ease symptoms such as pain. If a cancer is advanced then you may require treatments such as nutritional supplements, painkillers, or other techniques to help keep you free of pain or other symptoms.

## Surgery

The types of operation which may be considered are:

- Breast-conserving surgery. This is often an option if the tumour is not too big. A lumpectomy (or wide local excision) is one type of operation where just the tumour and some surrounding breast tissue are removed. It is usual to have radiotherapy following this operation. This aims to kill any cancer cells which may have been left in the breast tissue.
- Removal of the affected breast (mastectomy). This may be necessary if there is a large tumour or a tumour in the middle of the breast. It is often possible to have breast reconstructive surgery to create a new breast following a mastectomy. This can often be done at the same time as the mastectomy, although it can also be done months or years later. There now are many different types of reconstruction operations available.
- A sentinel lymph node biopsy may be performed. This is a way of assessing if the main lymph nodes draining the breast contain cancer. If they are clear then the remaining lymph nodes in the armpit will not need to be removed. If it is not possible to do this, one or more of the lymph nodes in the armpit may be removed. This helps to stage the disease accurately and to guide the specialist as to what treatment to advise following surgery.

## Radiotherapy

Radiotherapy is a treatment which uses high-energy beams of radiation which are focused on cancerous (malignant) tissue. This kills cancer cells, or stops cancer cells from multiplying. [See separate leaflet called Radiotherapy for more details.](#)

For breast cancer, radiotherapy is mainly used in addition to surgery. For example, if you have breast-conserving surgery it is usual to have radiotherapy to the affected breast after the operation. This aims to prevent breast cancer returning in the same breast. When radiotherapy is used in addition to surgery it is called adjuvant radiotherapy.

## Hormone treatments

Some types of breast cancer are affected by the female hormones oestrogen and progesterone. These hormones stimulate the cancer cells to divide and multiply. Most oestrogen and progesterone are made by the ovaries. Treatments which reduce the level of these hormones, or prevent them from working, are commonly used in people with breast cancer.

Hormone treatment works best in women with hormone-responsive breast cancer; however, it sometimes works in cancers classed as non-hormone-responsive.

Hormone treatments include:

- Oestrogen blockers. Tamoxifen has been available for many years and is still widely used. It works by blocking the oestrogen from working on cells. It is usually taken for five years. Other oestrogen blocker medicines are now available.
- Aromatase inhibitors. These are medicines which work by blocking the production of oestrogen in body tissues. They are used in women who have gone through the menopause. These medicines include anastrozole, letrozole and exemestane.
- Gonadotrophin-releasing hormone (GnRH) analogues. These medicines work by greatly reducing the amount of oestrogen that you make in the ovaries. There are several GnRH analogue preparations. The commonly used one is goserelin. They are usually given by injection and may be used for women who have not yet reached the menopause.
- An alternative which may be considered for women before the menopause is to remove the ovaries (or to destroy them with radiotherapy). This stops oestrogen from being made.

## Chemotherapy

Chemotherapy is a treatment of cancer by using anti-cancer medicines which kill cancer cells, or stop them from multiplying. [See separate leaflet called Chemotherapy with Cytotoxic Medicines for more details.](#)

When chemotherapy is used in addition to surgery it is known as adjuvant chemotherapy. For example, following surgery you may be given a course of chemotherapy. This aims to kill any cancer cells which may have spread from the main tumour site.

Chemotherapy is sometimes given to shrink a tumour before surgery so that surgery may have a better chance of success and also a smaller operation may be performed. This is known as neoadjuvant chemotherapy. The type of chemotherapy given may depend on the type of cancer.

New gene tests are being developed to help doctors decide which women will benefit the most from chemotherapy.

Chemotherapy may also be used for some women to treat breast cancer which has spread to other areas of the body.

## Trastuzumab (Herceptin®)

Trastuzumab (also known as Herceptin®) is a treatment that may be given to women who have a large number of HER2 receptors in their cancer. It is a type of medicine called a monoclonal antibody. It works by attaching to HER2 receptors on the surface of breast cancer cells, thereby stopping the cancer cells from dividing and growing.

## In summary

The treatment plan that may be advised can vary greatly from case to case as optimal treatment can depend on many different factors.

## What is the outlook (prognosis)?

The outlook has greatly improved in recent years. Deaths from breast cancer are now at the lowest ever in 40 years. This is mainly due to the improvements in the treatment of breast cancer. The outlook is best in those who are diagnosed when the cancer is still small and has not spread. More breast cancers are also now being diagnosed and treated at an early stage. In general, the more advanced the cancer (the more it has spread) then the less chance that treatment will be curative.

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

## Screening for breast cancer

Women in the UK aged between 50 and 70 are invited to have a routine mammography every three years. This is gradually being extended to women aged 47-73.

Mammography is a special X-ray test and aims to detect breast cancer at an early stage when treatment is most likely to be curative. [See separate leaflet called Breast Screening for more details.](#)

Genetic testing and mammography screening (and preventative treatments in some cases) may also be offered to younger women with a strong family history of breast cancer. See your doctor if you feel this applies to you.

## Prevention

A lot of breast cancers are detected at an early stage, by breast screening. However, a small number are not. Some women may have developed breast cancer before they have their first mammogram and some may develop breast cancer between mammograms. All women of every age should be breast aware. That is, get to know how your breasts and nipples normally look and feel. Try to recognise any changes that occur before and after your periods. See your GP if you notice any changes, lumps, or other abnormalities in your breasts or nipples. Don't wait until your next scheduled screening appointment.

There is some evidence that regular exercise may reduce your risk of breast cancer by as much as a third. If you have been through the menopause, it is particularly important you are not overweight or obese. This is because being overweight causes more oestrogen to be produced, which can increase the risk of breast cancer.

Studies have shown that women who breast-feed their children are less likely to develop breast cancer than those who do not. The most likely reason for this is that women do not produce an egg (ovulate) as regularly while they are breast-feeding and oestrogen levels remain stable.

There are also two preventative types of treatment - surgery to remove the breasts (mastectomy) or medication. Surgery can be used to treat breast cancer as well as reduce the chances of developing it. By removing as much breast tissue as possible, a mastectomy can reduce your risk of breast cancer by up to 90%. Like all operations there can be several complications and this is not an easy step to take. If genetic testing has shown you are one of the small number of women from a high-risk family, you will need an in-depth discussion with your doctors, before deciding to have this operation.

Tamoxifen is available on the NHS for women who have an increased risk of developing breast cancer. Tamoxifen can be used in women who have been through the menopause as well as for women who are still having periods. A different medicine called raloxifene can also be used in women who have been through the menopause. Women who have already had both breasts removed won't be offered these medications because their risk of developing breast cancer is very small.

A course of treatment with tamoxifen or raloxifene will usually involve taking a tablet every day for five years. Currently, these two medications are not licensed for the purpose of reducing the risk of breast cancer. However, they can still be used if you understand the benefits and risks and your doctor believes the treatment will be helpful.

## Further help & information

### **Breakthrough Breast Cancer**

Weston House, 246 High Holborn, London, WC1V 7EX

Tel: (Information Line) 08080 100 200

Web: [www.breakthrough.org.uk](http://www.breakthrough.org.uk)

### **Breast Cancer Care**

5-13 Great Suffolk Street, London, SE1 0NS

Tel: (Helpline) 0808 800 6000, (General) 0345 092 0800

Web: [www.breastcancercare.org.uk](http://www.breastcancercare.org.uk)

### Cancer Research UK

Angel Building, 407 St John Street, London, EC1V 4AD

Tel: (Nurse team) 0808 800 4040, (Switchboard) 020 7242 0200

Web: [www.cancerresearchuk.org](http://www.cancerresearchuk.org)

### Macmillan Cancer Support

89 Albert Embankment, London, SE1 7UQ

Tel: (Support Line) 0808 808 00 00

Web: [www.macmillan.org.uk](http://www.macmillan.org.uk)

## Further reading & references

- [Early and locally advanced breast cancer](#), NICE Clinical Guideline (February 2009)
- [Advanced breast cancer \(update\): Diagnosis and treatment](#); NICE Clinical Guideline (July 2014)
- [Familial breast cancer: Classification and care of people at risk of familial breast cancer and management of breast cancer and related risks in people with a family history of breast cancer](#); NICE Clinical Guideline (June 2013)
- [BRCAin breast cancer: ESMO Clinical Practice Guidelines](#); European Society for Medical Oncology (2011)
- [Breast cancer - managing FH](#); NICE CKS, December 2013 (UK access only)
- [Breast screening](#); NICE CKS, December 2011 (UK access only)

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