

Primary Breast cancer

J A S C A P

JEET ASSOCIATION FOR SUPPORT TO CANCER PATIENTS, MUMBAI, INDIA

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JASCAP is a charitable trust that provides information on various aspects of cancer. This can help the patient and his family to understand the disease and its treatment and thus cope with it better.

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Donation suggested Rs.30.00

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Primary Breast Cancer

This booklet is for you if you have or someone close to you has a breast cancer

If you are a patient, your doctor or nurse may wish to go through the booklet with you and mark sections that are particularly important for you.

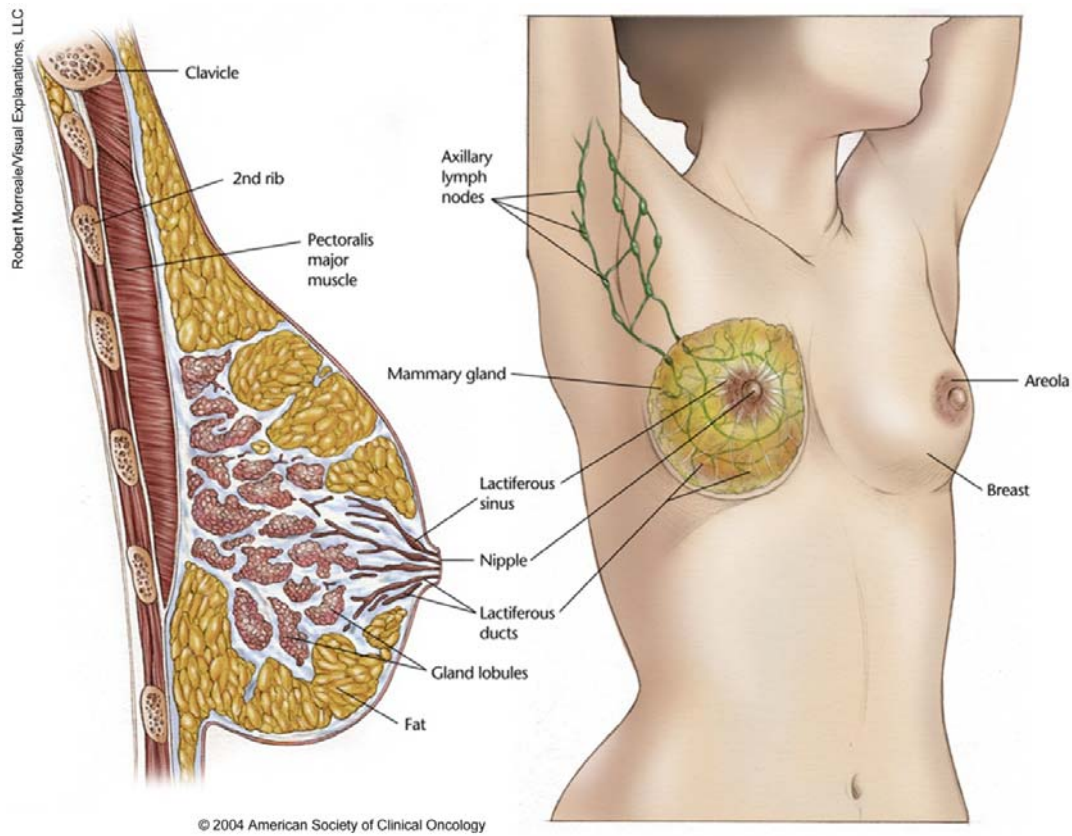


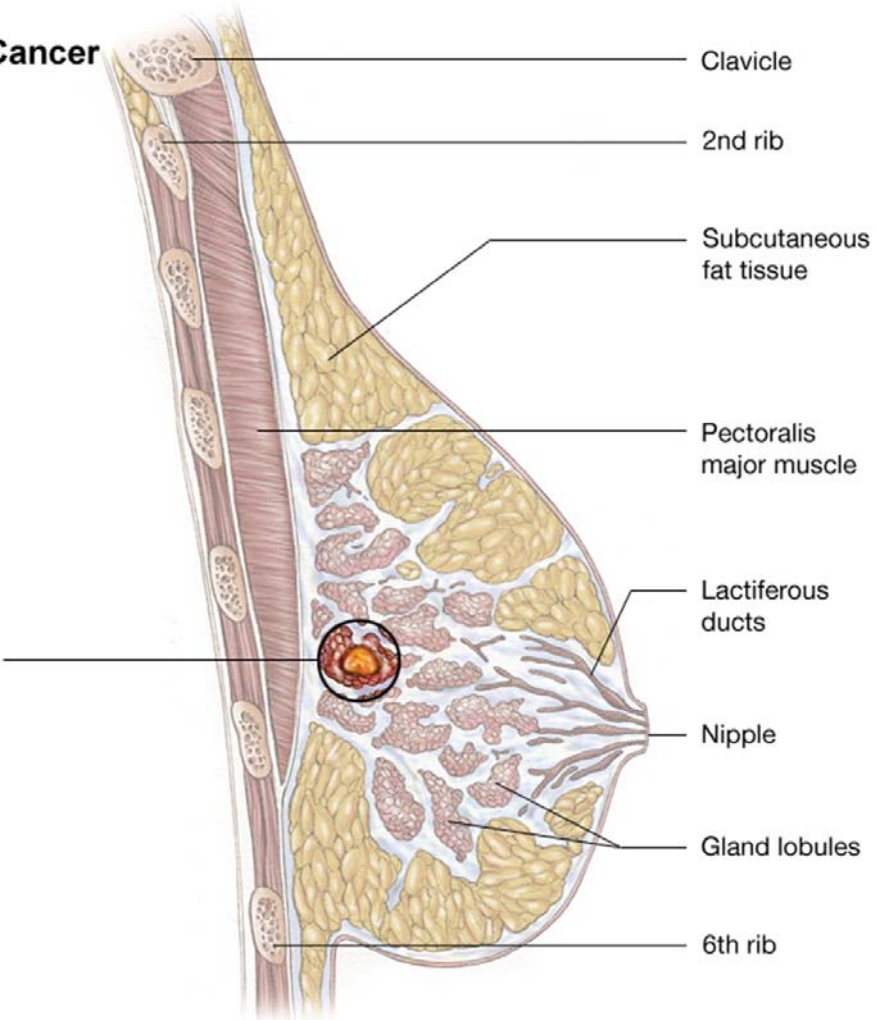
Illustration and section of the breast.

Anatomy

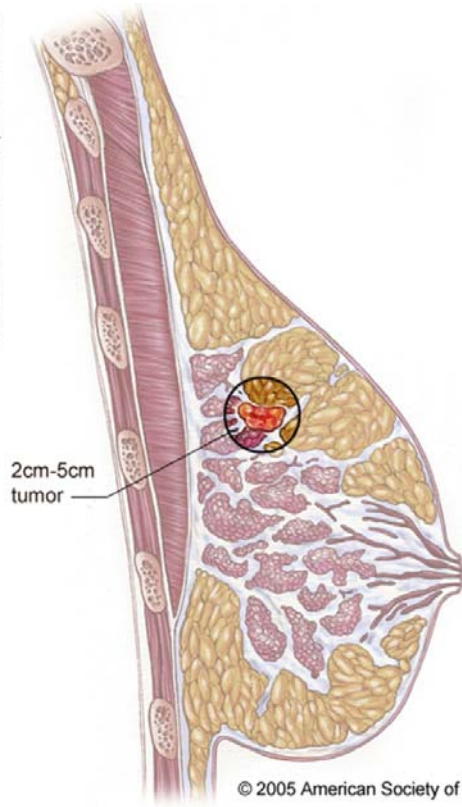
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Stage I Cancer

Tumor is less than or equal to 2 cm



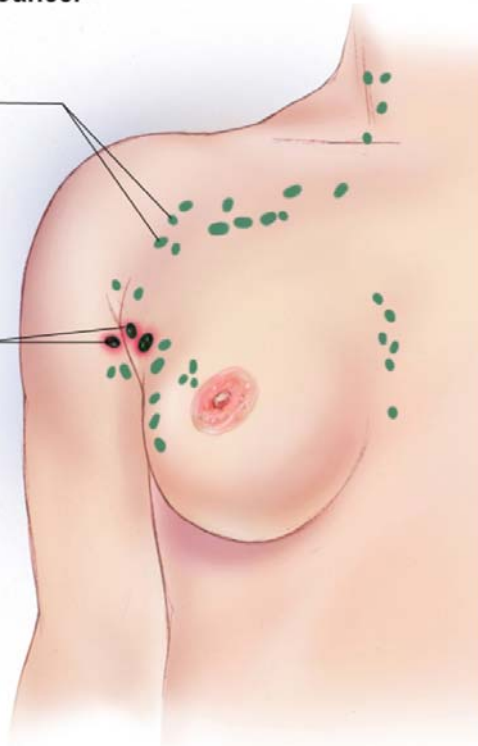
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Stage IIa Cancer

Lymph nodes

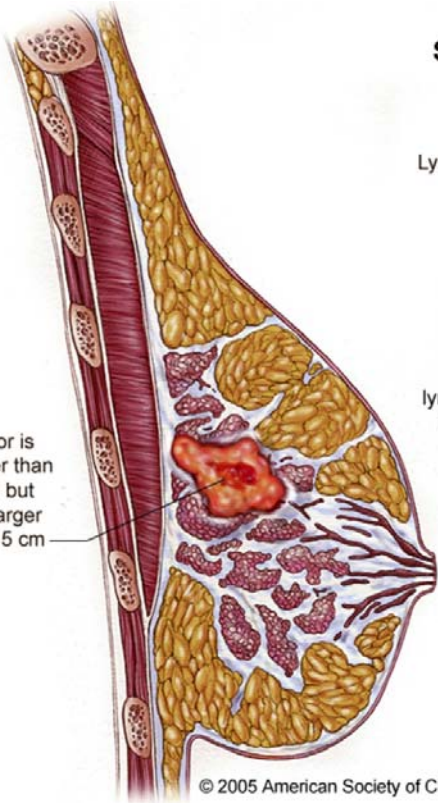
Multiple lymph nodes metastasis



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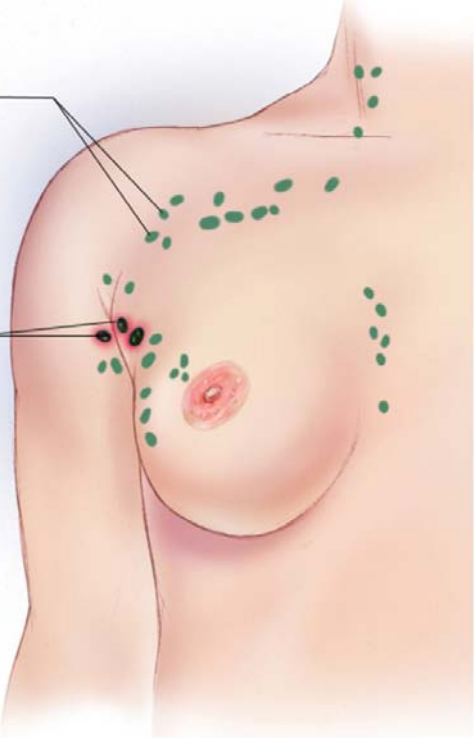
Tumor is larger than 2 cm but not larger than 5 cm



Stage IIb Cancer

Lymph nodes

Multiple lymph nodes metastasis



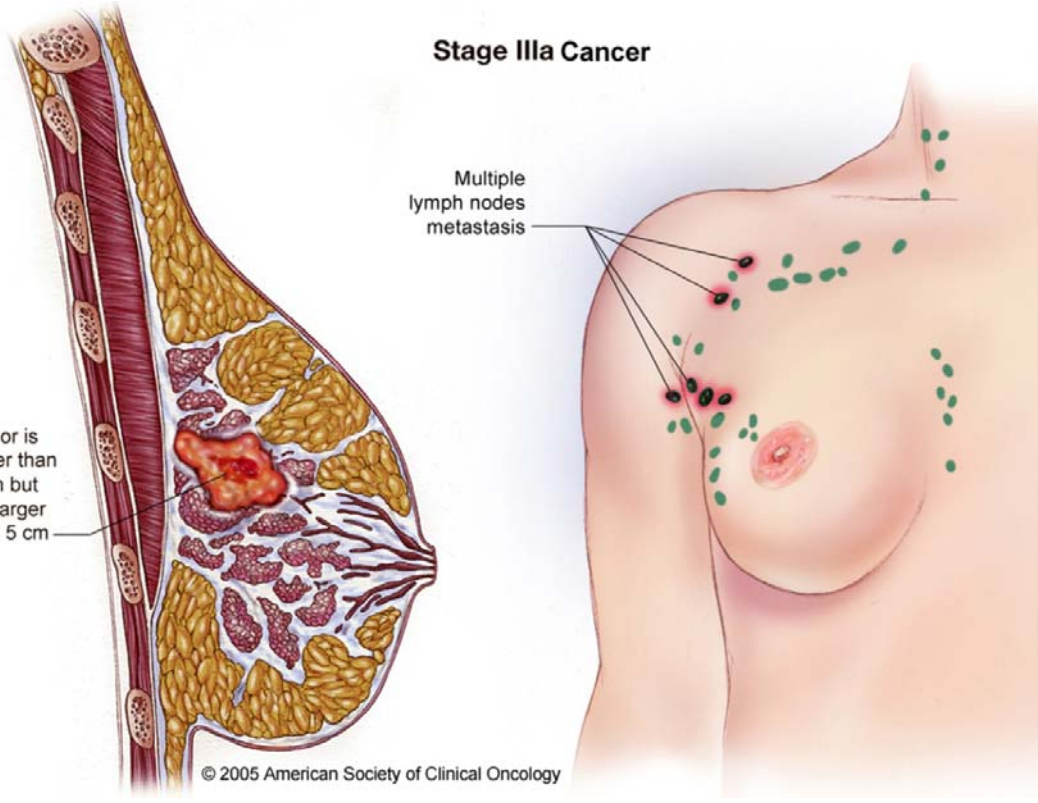
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Tumor is larger than 2 cm but not larger than 5 cm

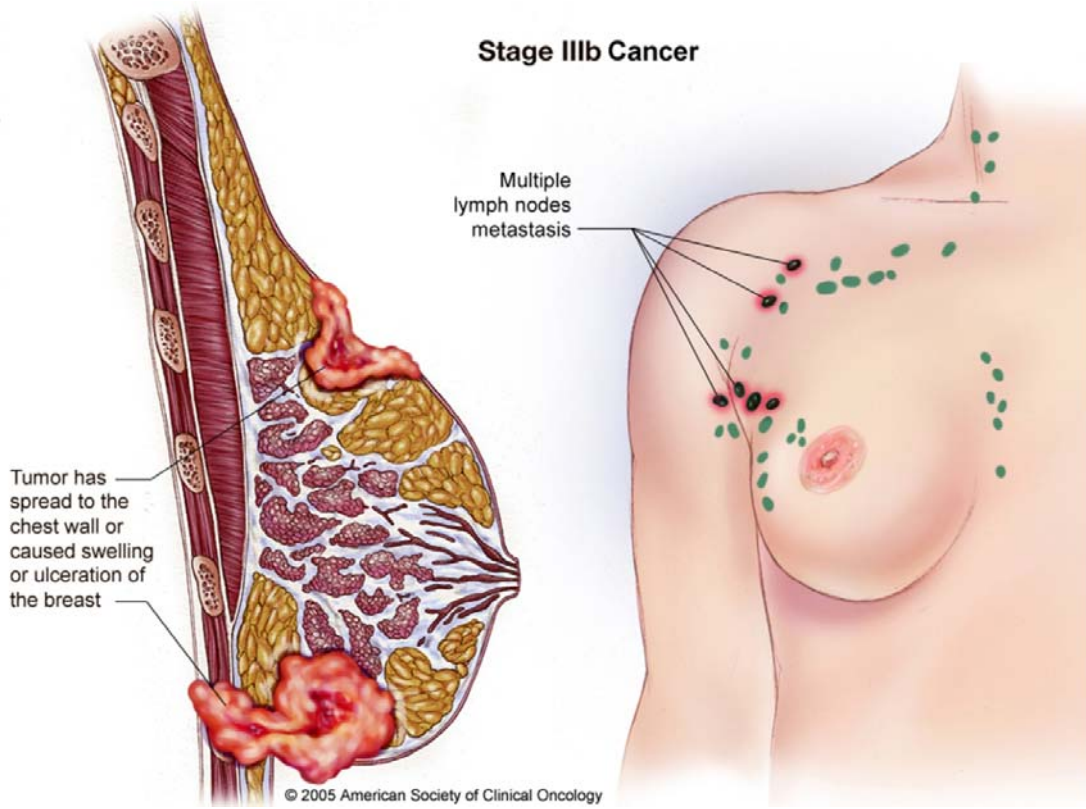
Stage IIIa Cancer

Multiple lymph nodes metastasis

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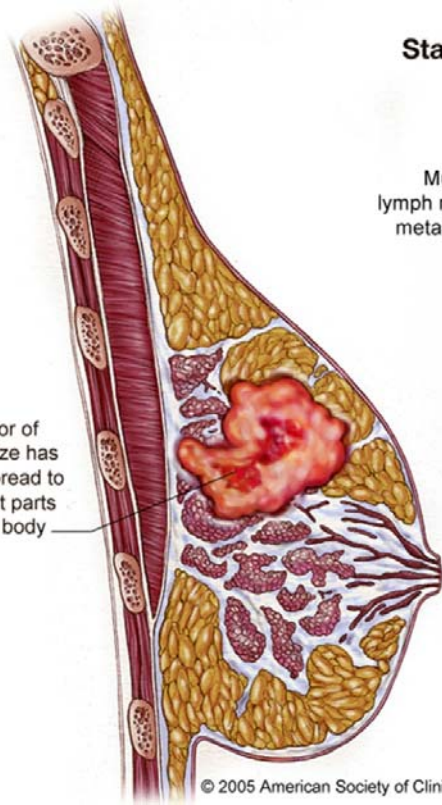


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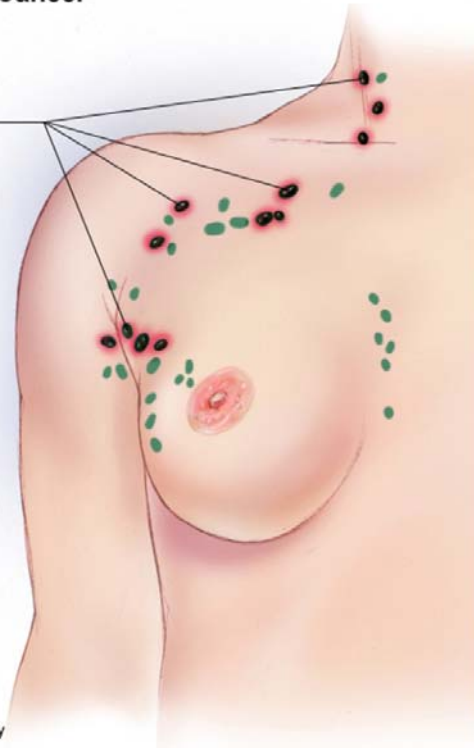
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A tumor of any size has not spread to distant parts of the body

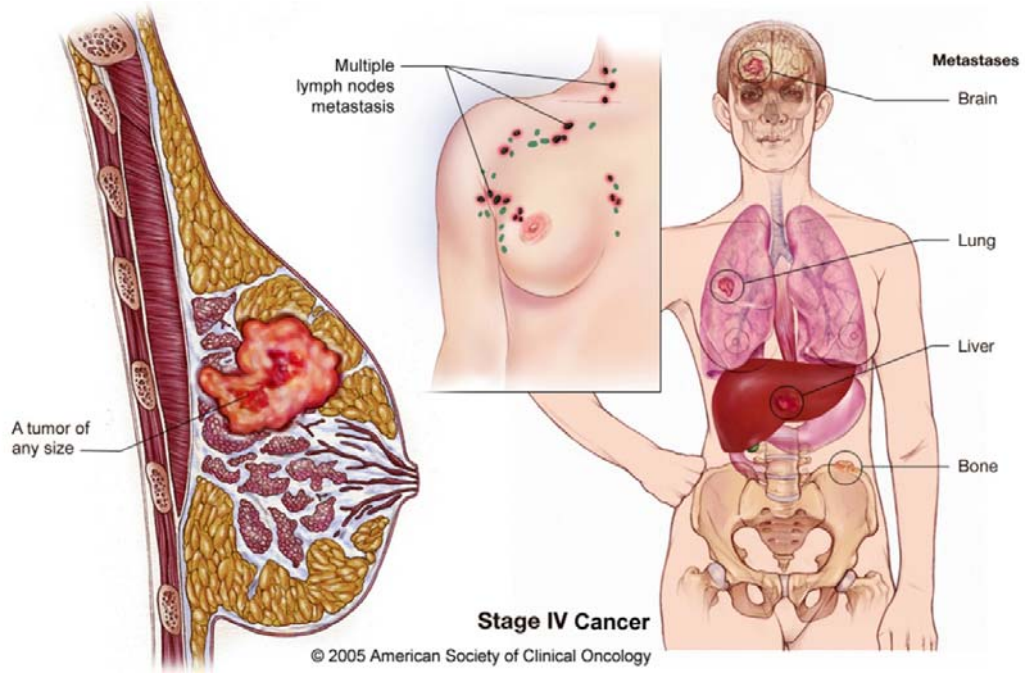


Stage IIIc Cancer

Multiple lymph nodes metastasis



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About Breast cancer

Quick facts

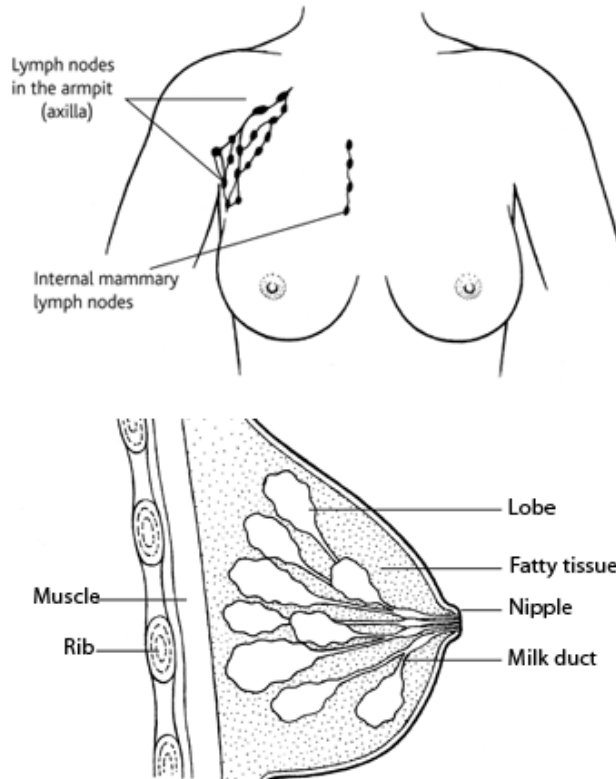
- Breast cancer is the most common cancer in women in the UK.
- A breast lump is the first symptom in 9 out of 10 breast cancers.
- Breast cancer can affect men. We have a separate guide for men with breast cancer .
- Treatment for breast cancer may include a combination of surgery, radiotherapy, chemotherapy, drugs to block hormones or their effects on cancer cells (hormonal therapies), and a drug called Herceptin® (trastuzumab).
- The type of treatment you have will depend on many factors, including the size of the tumour and whether you have had your menopause.

This information is about primary breast cancer (stages 1-3). We also have information on breast cancer that has spread to other parts of the body or come back after treatment (secondary breast cancer).

About breast cancer

About the breasts

The breasts are made up of fat, connective tissue and glandular tissue. They have lobes, where breast milk is made, and ducts, which connect the lobes to the nipple.



Lymph nodes close to the breast, and the structure of the breast

A woman's breasts are rarely the same size as each other, and may feel different at different times of the menstrual cycle, sometimes becoming lumpy just before a period.

Under the skin, an area of breast tissue extends into the armpit (axilla). The armpits also contain a collection of lymph nodes (lymph glands), which are part of the lymphatic system.

There are also lymph nodes just beside the breastbone and behind the collarbones.

Types of breast cancer and related conditions

- Ductal carcinoma in situ (DCIS)
- Lobular carcinoma in situ (LCIS)
- Invasive breast cancer
- Related conditions
- Rarer types of breast cancer

There are different types of breast cancer. They are usually named after the types of cells from which it is thought the cancer has developed. Most breast cancers start in the cells lining the ducts (the channels in the breast that carry milk to the nipple) and spread into the surrounding breast tissue. This is known as invasive ductal breast cancer. There are other, less common types of breast cancer. Knowing the exact type of cancer helps the doctors to decide on the most appropriate treatment.

Learn more about these types and related conditions, including how they are diagnosed and treated, by clicking on the links below.

Ductal carcinoma in situ (DCIS): (separate factsheet available)

DCIS is a condition in which breast cancer cells have developed within some of the breast ducts (the channels in the breast that carry milk to the nipple). The abnormal cells are completely contained within the ducts and have not spread into the surrounding breast tissue. Because the cancer cells have not spread outside of the ducts, DCIS is sometimes referred to as pre-cancerous, pre-invasive, non-invasive, or intraductal cancer.

Lobular carcinoma in situ (LCIS) : (separate factsheet available)

LCIS means that there are changes to the cells lining the lobules (where milk is produced) of the breast. It is not cancer, but it means there is a small increase in the risk of developing breast cancer later. Most women with LCIS will never develop breast cancer or need treatment, but doctors usually will recommend regular breast examinations so that any changes can be recognised early if they do occur.

Invasive breast cancer :

If cancer cells have spread beyond the lining of the ducts or lobules into the surrounding breast tissue, it is called invasive breast cancer.

- **Invasive ductal breast cancer** occurs when the cells that line the duct have become cancerous and have spread into the surrounding breast tissue. It is the most common type of breast cancer; between 70-80% (7 to 8 out of every 10) of all breast cancers are this type.
- **Invasive lobular breast cancer** develops from the cells that line the lobes of the breast. They have a different appearance to ductal cancers and have a particular pattern of spread in the surrounding breast tissue. Approximately 10% (1 in 10) of breast cancers are this type.
- **Inflammatory breast cancer** is a rare type of breast cancer in which the cancer cells block the tiny channels (lymph vessels) in the skin and tissues of the breast. This causes the breast to become swollen, red and inflamed. The breast may also feel warm and tender to the touch. Chemotherapy is usually the first treatment, often followed by a combination of radiotherapy, hormonal therapy and surgery. About 1 to 2% (1 to 2 in every 100) of all breast cancers are inflammatory breast cancer.

Note: A separate factsheet is available for inflammatory breast cancer.

Related conditions

Paget's disease of the breast : (separate factsheet available)

Paget's disease of the breast is a change in the skin of the nipple that usually first appears as a scaly, red rash. Some women may notice an itching or burning sensation, and there may be oozing or bleeding from the nipple or the darker area surrounding it (areola). About 9 in 10 women with Paget's disease of the breast will have an underlying breast cancer. Treatment will depend on whether or not cancer is present, the type of tumour and how much of the breast is affected.

Making sense of medical terms

The types of breast cancer are named according to the place the cancer started, and whether it has spread into the breast tissue:

- 'Ductal' means the cancer cells developed in the ducts, the tubes that carry milk to the nipple.
- 'Lobular' means the cancer cells began in the lobes or lobules, where milk is produced.
- 'In situ' means the cancer cells are completely contained within the ducts or lobes.
- 'Invasive' means the cancer has spread from the ducts or lobes into the surrounding breast tissue.
- A 'carcinoma' is a type of cancer (except when mentioned in the context of LCIS, above).

Rarer types of breast cancer

There are a number of rarer types of breast cancer such as:

- medullary breast cancer
- mucinous breast cancer
- tubular breast cancer

Your doctor or nurse, can give you more information about these rarer types of breast cancer.

Breast cancer causes and risk factors

Overview

About 44,000 people in the UK each year are diagnosed with breast cancer. The causes of breast cancer are not yet completely understood, but it is known that some factors (known as risk factors) may increase a woman's risk of developing the disease. The risk of developing breast cancer is very small in young women and increases as women get older. Eight out of ten (80%) breast cancers occur in women over the age of 50. Other risk factors include being overweight, having a significant family history of breast cancer, using hormone replacement therapy after the age of 50 or taking the contraceptive pill.

This booklet is for women with breast cancer. We also have information about breast cancer in men.

Risk factors

A personal history of breast cancer or certain breast diseases

- Women who have had breast cancer before are at a greater risk of developing a new breast cancer.
- Certain types of benign breast disease – lobular carcinoma in situ (LCIS) or atypical hyperplasia – are associated with an increased risk of breast cancer.

Hormonal factors

As the female hormone oestrogen can affect the development of breast cancer, exposure to oestrogen (without any breaks) over a long period can increase the risk. The following risk factors are related to oestrogen exposure.

- Women who are taking combined hormone replacement therapy (HRT), or have recently taken it, have a slightly increased risk of breast cancer. Younger women who take HRT because they have had an early menopause or have had their ovaries removed do not have an increased risk of breast cancer until after the age of 50.
- Women who are taking the contraceptive pill, or have recently taken it, have a very slightly increased risk of developing breast cancer.
- Women who don't have children are slightly more likely to develop breast cancer than women who have children.

- Women who have never breastfed are slightly more likely to develop breast cancer than women who have breastfed for more than a year.
- Women who start their periods at a young age (early puberty) or have a late menopause have a slightly higher risk of breast cancer.

Lifestyle

- Drinking more than two units of alcohol a day over many years can increase the risk. A unit of alcohol is half a pint of normal strength lager or beer, a small glass (125ml) of wine, or a single measure (25ml) of spirit.
- Being overweight, once you have had your menopause, can increase the risk of breast cancer.

Genetics

A very small number – between 5–10% (1 in 20 – 1 in 10) – of breast cancers are thought to be related to faulty genes that run in families. The two main genes linked to breast cancer are BRCA1 and BRCA2. If you have a strong family history of breast or ovarian cancer, it is possible that you have inherited a faulty cancer gene. But keep in mind that breast cancer is the most common cancer in women in the UK, so even if you have one or even two elderly family members with breast cancer, it is unlikely that you carry one of these gene changes (mutations).

If you are worried about your breast cancer risk, we have more detailed information on breast cancer risk factors and cancer genetics.

Early detection and screening

The earlier a breast cancer is diagnosed and treated, the better the chance of successful treatment. By checking your breasts regularly for lumps and other changes, you can improve your chances of finding breast cancer at an early, curable stage. Women in the UK at higher risk of developing breast cancer because of their age or family history are eligible for regular breast screening as part of a national screening programme.

Breast self-awareness

It's important to become familiar with how your breasts normally feel at different times of the month. You'll then be able to pick up any changes in your breasts that aren't normal for you. If you are concerned about anything unusual in your breasts, you can make an appointment with your GP.

UK National Breast Screening Programme: *(this is for information only)*.

In the UK, all women between the ages of 50 and 70 (64 in Northern Ireland) are offered mammograms (breast x-rays) every three years, as part of a national breast screening programme. Women over the age of 70 can ask to continue with three-yearly mammograms.

Women may be eligible for regular screening at a younger age if they are at higher risk of developing breast cancer because of their family history. If you have a close relative with breast cancer, you can discuss with your GP whether you should have regular screening before the age of 50.

What is screening?

Screening is testing to detect cancer early, before symptoms are noticed, or to find changes that could develop into cancer later if left untreated.

Symptoms and diagnosis

What are the symptoms of breast cancer?

Breast lumps

In most women, breast cancer is first noticed as a painless lump in the breast. You should visit your doctor straight away if you notice a lump or are aware of any new change in your breast. Although most breast lumps are benign (not cancerous), they still need to be checked carefully to rule out the possibility of cancer. Also, if it is a cancer, the earlier the treatment is given, the more likely it is to be successful.

Other breast changes

Other, less common signs of breast cancer may include:

- a change in the size or shape of a breast
- dimpling of the skin of the breast
- a thickening in the breast tissue
- a nipple becoming inverted (turned in)
- a lump or thickening behind the nipple
- a rash (like eczema) affecting the nipple
- a bloodstained discharge from the nipple (this is very rare)
- a swelling or lump in the armpit.

Pain in the breast is usually not a symptom of breast cancer. In fact, many healthy women find that their breasts feel lumpy and tender before a period. And some types of non-cancerous breast lumps can be painful.

Non-cancerous breast lumps

Most breast lumps are not cancer (benign). Common causes of benign breast lumps are:

- Cysts – sacs of fluid that build up in the breast tissue. Breast cysts are quite common. Nearly 1 in 10 women will have a breast cyst at some time during her life.
- Fibroadenomas – solid tumours made up of fibrous and glandular tissue. They are more common in women in their 20s and 30s.

Benign breast lumps are easily treated.

How breast cancer is diagnosed

Seeing your GP

If you notice a lump or other breast changes, you will probably begin by seeing your GP, who will examine your breasts. If your GP is not sure what the problem is, or thinks that cancer may be present, you will be referred to a specialist for advice or treatment. If your GP suspects that you might have a cancer you should be seen at the hospital within two weeks.

At the hospital

At the hospital, the specialist will ask you about your general health and any previous medical problems, before examining you. He or she will examine your breasts and feel for any enlarged lymph nodes under your arms and at the base of your neck. The specialist will arrange for any tests you may need, usually a mammogram or ultrasound scan, followed by a biopsy (tissue sample) to check for cancer cells.

Tests for breast cancer

The following tests may be used to diagnose breast cancer. You may have one, two or a combination of the tests. You also may have a chest x-ray to check your general health. It can help to have a friend or relative with you when you go for any tests or to get your results.

- Mammogram
- Ultrasound
- Biopsy such as a needle (core) biopsy, fine needle aspiration or excision biopsy
- Blood tests

Mammogram

A mammogram is a low-dose x-ray of the breast tissue. Mammograms can detect changes in the breast tissue before they develop into a lump large enough to be felt.

You will need to take off the clothes from the top part of your body, including your bra. The radiographer will then position you so that the breast is against the x-ray machine and gently but firmly compressed with a flat, clear, plastic plate. Two mammograms (from different angles) are taken of each breast.

Mammograms are usually only used for women over the age of 35. In younger women the breast tissue is more dense, which makes it difficult to detect any changes on the mammogram. Many women find having a mammogram uncomfortable or even painful, but this is normally just for a short time.

Ultrasound

An ultrasound uses sound waves to build up a picture of the breast tissue. Ultrasound can often tell whether a lump is solid (made of cells) or a fluid-filled cyst. It can also often tell whether a solid lump is likely to be benign or malignant.

You will be asked to take off your clothes from the upper part of your body and lie down on a couch. An ultrasound specialist will then put gel onto your breast and gently rub a small microphone-like device over the affected area. This shows a picture of the internal tissue of the breast on a screen. Ultrasound is painless and only takes a few minutes.

A special type of ultrasound, colour **Doppler ultrasound**, can show the blood supply to the lump. The blood supply shows up as patches of red or blue colour on the scan, and the pattern of the blood flow can help tell the difference between a cancer and a benign lump.

Biopsy

There are several ways of taking a breast biopsy. Doctors may use a needle, sometimes with

What is a biopsy?

A biopsy means taking a small sample of tissue from the body for examination under a microscope. The results of the biopsy can tell doctors whether or not the tissue is cancerous. The tests done on the tissue from the biopsy also give doctors important information about a cancer and how it should be treated.

ultrasound or x-ray to guide the needle to the right area, or perform a small operation to collect the tissue sample.

Needle (core) biopsy

A doctor uses a needle to take a small piece of tissue from the lump or abnormal area. Needle biopsies are often done using ultrasound to guide the doctor to the lump. Local anaesthetic is injected into the area first to numb it. You may feel a little soreness or a sensation of pressure, but this should last only for a short time. Several biopsies are usually taken at the same time. The samples are then sent to a laboratory to be looked at by a specialist (pathologist) under a microscope. Depending on the number of biopsies taken, the breast tissue may be quite bruised and sore afterwards. This may take a few weeks to completely disappear.

Fine needle aspiration

A fine needle aspiration (FNA) is a quick, simple procedure done in the outpatient clinic. Using a fine needle and syringe, the doctor takes a sample of cells from the lump and sends it to the laboratory to see if any cancer cells are present. The breast is sensitive, so the test may be quite uncomfortable and the breast may be bruised and sore for a week or so afterwards. A local anaesthetic may be used to numb the area, particularly if an FNA is being taken from a lymph node in the armpit or in the neck.

Sometimes (especially if the lump is small) a needle aspiration may be carried out in the x-ray department so that the doctor can use x-ray or ultrasound guidance to make sure that the needle takes cells from the abnormal area of the breast.

Excision biopsy

Sometimes the whole lump is removed (excision biopsy) under a general or local anaesthetic and sent to a laboratory for examination under a microscope. This may mean an overnight stay in hospital, but it is done as day surgery in some hospitals.

If a lump is too small to be felt but has shown up on a mammogram or ultrasound, the radiologist may need to mark the area for the surgeon before the excision biopsy. This is done by inserting a very small wire (a guide wire) under local anaesthetic, using x-ray or ultrasound guidance. The procedure is known as **wire localisation**.

Blood tests

Samples of your blood will be taken to check your general health, the number of cells in your blood (blood count) and to see how well your kidneys and liver are working. Your blood may

also be tested to see whether it contains particular chemicals (tumour markers), which are sometimes produced by breast cancer cells.

Waiting for your test results

It will probably take several days for the results of your tests to be ready and a follow-up appointment will be arranged for you before you go home. Obviously, this waiting period is an anxious time, and it may help you to talk things over with a close friend, a relative, the hospital specialist nurse or a support organisation. .

Staging and grading of breast cancer

The stage of a cancer describes its size and whether it has spread beyond where it started in the body. Doctors use the results of tests and findings from surgery to decide the stage of a woman's breast cancer.

Knowing the extent of the cancer and how quickly it is likely to grow (the grade) helps the doctors to decide on the most appropriate treatment and also gives a rough idea of the outlook.

Staging

Ductal carcinoma in situ (DCIS) is sometimes described as stage 0. DCIS is almost always completely curable with treatment.

The following stages of breast cancer are known as **invasive breast cancer**:

Stage 1 The tumour measures less than 2cm/1in. The lymph nodes in the armpit are not affected and there are no signs that the cancer has spread elsewhere in the body.

Stage 2 The tumour measures between 2 and 5cm/1–2in, or the lymph nodes in the armpit are affected, or both. However, there are no signs that the cancer has spread further.

Stage 3 The tumour is larger than 5cm/2in and may be attached to surrounding structures such as the muscle or skin. The lymph nodes are usually affected, but there are no signs that the cancer has spread beyond the breast or the lymph glands in the armpit.

Stage 4 The tumour is of any size, but the lymph nodes are usually affected and the cancer has spread to other parts of the body. This is secondary or metastatic breast cancer. Breast cancer that has come back after initial treatment is known as **recurrent** breast cancer.

This section deals with stages 1–3 breast cancer. Stage 4 is covered in our secondary breast cancer section.

TNM staging system

Another staging system known as the **TNM system** is commonly used. This can give more precise information about the extent of the cancer.

- **T** describes the size of the **tumour** (cancer)
- **N** describes whether the cancer has spread to the **lymph nodes** (sometimes called glands)
- **M** describes whether the cancer has spread to another part of the body, such as the bone, liver or the lungs. This is known as metastatic or secondary cancer.

Grading

Grading refers to the appearance of the cancer cells under the microscope. The grade gives an idea of how quickly the cancer may develop. There are three grades: grade 1 (low-grade), grade 2 (moderate or intermediate grade) and grade 3 (high-grade).

Low-grade means that the cancer cells look very like the normal cells of the breast. They are usually slow growing and are less likely to spread.

In high-grade tumours the cells look very abnormal. They are likely to grow more quickly and are more likely to spread.

Moderate-grade or grade 2 cancers fall between these two grades and have a level of activity somewhere in between.

As well as describing the stage and grade of breast cancer, doctors will also check to see whether the tumour has hormone and HER receptors. Knowing the stage, grade and receptor status helps doctors to choose the most appropriate treatment for you.

Hormone and HER2 receptors

Some breast cancer cells have receptors, which allow particular types of hormones or proteins to attach to the cancer cell. A sample of the breast tissue will usually be tested to see if it has these receptors. Whether particular receptors are present or not will affect the type of treatment that you will need.

Hormone receptors

Many breast cancers have receptors for the hormone oestrogen. When oestrogen attaches to these receptors, it causes the cancer cells to grow. If a breast cancer has a significant number of oestrogen receptors it is known as being oestrogen-receptor positive (ER+). If it doesn't it is known as oestrogen-receptor negative (ER-). Knowing whether the tumour has oestrogen receptors or not helps the doctors to decide on the best treatment. A tumour that is ER+ is likely to respond to hormonal treatments, whereas a tumour that is ER- will not respond. Oestrogen-receptors are known as ER because of the American spelling of oestrogen as estrogen.

Some breast cancers have progesterone receptors and are known as progesterone-receptor positive (PR-positive). Usually, cancers that are ER+ will also be PR+. Progesterone receptors are less important than oestrogen receptors in predicting the likely response to hormone treatment.

HER2 receptors

Some cancers have receptors for a protein known as HER2. Tumours that have high levels of these receptors are known as HER2-positive and may respond to treatment with drugs such as trastuzumab (Herceptin®). Your doctor can tell you whether your cancer cells have these receptors.

Treating breast cancer

Treatment overview

The treatment of breast cancer is individual for each woman. Your doctor will discuss all the options available to you, and you can ask any questions that will help you decide on the best treatment for you.

The treatment you have will depend on many factors, including:

- the stage and grade of the cancer
- your age
- whether or not you have had the menopause
- the size of the tumour
- whether the cancer cells have receptors for certain hormones (such as oestrogen) or particular proteins (such as HER2).

Secondary breast cancer

This booklet discusses the treatments for primary (stages 1-3) breast cancer. Our booklet on secondary breast cancer discusses the treatments for breast cancer that has spread to other parts of the body (stage 4) or come back after treatment (recurrent breast cancer).

Most primary breast cancers will be treated with surgery to remove the tumour. All or part of the breast tissue may be removed. If the whole breast is removed (mastectomy), **breast reconstruction** may be carried out, either at the same time as the initial surgery or later.

Sometimes chemotherapy or hormonal therapy may be given to shrink a cancer before surgery. This is known as **neo-adjuvant therapy**.

After surgery, radiotherapy will be given to any remaining breast tissue, and may be given to the chest wall if the breast has been removed. This is to make sure that any cancer cells that may be left in the area are destroyed.

You may have further treatment with hormonal therapies, chemotherapy and/or a drug called Herceptin®, depending on how likely your doctors think it is that the cancer could come back.

Further treatment

After surgery, the doctors can tell the stage and the grade of the cancer, and they can look at several other factors to predict how likely the cancer is to come back or spread. Factors which affect the chance of the cancer coming back include:

- the size of the tumour
- whether the lymph nodes in the armpit were affected
- the grade of the tumour
- whether the cancer cells have spread into lymph or blood vessels close to the tumour (the pathologist checks for this)
- whether the cells have receptors for oestrogen or particular proteins (such as HER2) on their surface. Cancers with oestrogen receptors are less likely to recur in the short term, whereas those with HER2 receptors are more likely to come back unless Herceptin is given.

If the chance of the cancer spreading or coming back is very low, you won't need to have any further treatment. However, if there is a risk of recurrence, many women who have

oestrogen receptor negative (ER-) breast cancer will be advised to have treatment with chemotherapy, and those with oestrogen receptor positive (ER+) breast cancer are usually advised to have hormonal therapy. This treatment is known as **adjuvant therapy**. Many women who are ER+ will have both treatments, but not at the same time.

Some women have a large number of HER2 protein receptors on the surface of their cancer cells. This is known as being HER2-positive. In this situation, treatment with trastuzumab (Herceptin®) may be helpful. Your cancer specialist can discuss this with you.

Planning treatment for breast cancer

Learn more about the specialists who will plan your care and the factors they use to decide which treatments are best for you.

The multi-disciplinary team

If you have been diagnosed with breast cancer, you will be looked after by a breast care team. This is a team of staff who specialise in treating breast cancer and in giving information and support. It is known as a multidisciplinary team, and will normally include:

- surgeons who are experienced in breast surgery
- breast care nurses, who give information and support
- oncologists, doctors who have experience in breast cancer treatment using chemotherapy, radiotherapy, hormonal therapy and biological therapy
- radiologists, who help to read mammograms
- pathologists, who advise on the type and extent of the cancer.

Other staff will also be available to help you if necessary, such as:

- physiotherapists
- counsellors and psychologists
- social workers.

How do doctors plan my care?

Doctors can use various methods of calculating the chance of the cancer spreading or coming back. These are only a rough guide and can't predict what will happen to an individual woman with breast cancer. However, they can give some idea of the outlook (prognosis) and help your doctor choose the best treatment plan for you. These methods use the following factors:

- stage of the cancer
- grade of the cancer
- whether the cells have oestrogen or HER2 receptors.

One of the most commonly used methods in the UK is the **Nottingham Prognostic Index**, a formula developed by breast cancer specialists some years ago. Another method is **Adjuvant! Online**. This is a website that uses the factors above and results from clinical trials in breast cancer. The information helps to predict a woman's chance of being alive ten years after diagnosis, if she has particular treatments after surgery and radiotherapy. It can help to show which of these treatments are likely to reduce the chance of the cancer coming back or spreading, and by how much. Many women with early breast cancer will live for much longer than ten years.

These figures are often used because if someone has no sign of the cancer returning for ten years after their treatment, it is unlikely to come back and they have a good chance of being cured.

Surgery for breast cancer

Overview

Most women with breast cancer will have surgery to remove the tumour. There are two main types of surgery for breast cancer:

- Surgery to remove the breast lump and some of the breast tissue surrounding it (a **lumpectomy** or **segmental incision**). This is known as **breast-conserving surgery** and is usually followed by radiotherapy.
- Surgery to remove the whole breast (**mastectomy**) and sometimes the muscles underneath. Women who have a mastectomy may choose to have surgery to reconstruct the breast, either at the same time or later.

As part of any operation for breast cancer, doctors also will remove lymph nodes to check for cancer cells. This tells doctors whether the cancer has spread and whether further treatment is needed.

Your doctor will discuss with you the most appropriate type of surgery for you, depending on the size and position of the cancer. Some women with early breast cancer may have a choice of treatment. This can be a difficult decision to make, so make sure you have fully discussed your options with your surgeon, including the benefits and disadvantages of each.

Remember the choice of which type of surgery is used should always be fully discussed with you, including why the particular operation is being recommended and what it involves. You should also let your surgeon know your own preferences so that the two of you reach an agreed joint decision on what should be done.

In this section, you will learn more about:

- The types of breast cancer surgery , including the advantages and disadvantages to consider if you are given a choice of treatment
- The methods doctors use to check the lymph nodes
- What to expect after surgery , including when you're likely go home and what side effects you might experience

Types of surgery for breast cancer

This page describes the different types of surgery for breast cancer. You may be given a choice of treatment, depending on the size and position of the cancer. Your doctor will discuss your options with you. We also have information on the benefits and disadvantages of each type of surgery.

Breast-conserving surgery

Lumpectomy (wide local excision)

This is the removal of a breast lump, together with some surrounding tissue. A lumpectomy is usually followed by radiotherapy treatment to the remaining breast tissue. It removes the

least amount of breast tissue but leaves a small scar and sometimes a small dent in the breast. For most women, the appearance of the breast after lumpectomy is good.

Sometimes, if the lump is very small, a fine wire (guide wire) is used to mark the area so that the surgeon can find the lump more easily. A local anaesthetic is given, and the wire is then inserted by a radiologist, using x-ray or ultrasound guidance. This procedure is known as wire localisation.

After a lumpectomy, the breast tissue that has been removed is sent to the laboratory to be examined under a microscope by a specialist (pathologist). The pathologist looks to see whether there is an area of healthy cells all around the cancer – this is known as a **clear margin**. If there are cancerous or precancerous (DCIS) cells at the edge of the area of breast tissue that has been removed, there is a higher chance that the cancer will come back in the breast.

In this case, more breast tissue will need to be removed a few weeks later. Approximately 1 in 8 (12.5%) of women will need to have a second operation to remove more breast tissue. Sometimes, the results from the laboratory show that another lumpectomy is unlikely to remove all the cancer cells completely. In this situation, a mastectomy (removal of the whole breast) will need to be done.

Segmental excision (quadrectomy)

This is similar to a lumpectomy but involves removing more of the breast tissue. It is only used if a larger area of the breast needs to be removed. The effect of this type of surgery is more noticeable than lumpectomy, particularly in women who have small breasts. The treated breast is usually smaller than the other breast and may have a dent in the area where the surgery is done. In women with large breasts it is usually less noticeable. Radiotherapy to the breast is usually recommended after a segmental excision.

Mastectomy

Removal of the whole breast (mastectomy) may be necessary if:

- The breast lump is large in proportion to the rest of the breast tissue.
- There are several areas of cancer cells in different parts of the breast.
- The lump is just behind the nipple – although if the lump is very small it is usually possible to save the breast.
- There is a small invasive breast cancer but a widespread area of DCIS (ductal carcinoma in situ).

There are several different types of mastectomy, and the type you have will depend on a

Breast reconstruction

Breast reconstruction is an operation to try to restore the shape of the breast after surgery for breast cancer. The aim is to match the remaining natural breast as closely as possible. This can be done with an implant, your own body tissue, or a combination of these techniques. Your surgeon will advise you on the type of reconstruction that is most suitable for you.

number of factors, including your breast size, the size and position of the tumour, and whether it has spread.

A **simple mastectomy** removes only the breast tissue.

A **simple mastectomy** and **sentinel node biopsy** or **node sampling** removes the breast tissue and the lower lymph nodes, within the armpit.

A **modified radical mastectomy** removes all the breast tissue and all of the lymph nodes in the armpit. It may also be referred to as a total mastectomy and axillary clearance.

A **radical mastectomy** removes all the breast tissue and the lymph nodes in the armpit, together with the muscles behind the breast tissue. This is only done if the cancer is found in the muscle under the breast.

A new breast shape can often be created either at the same time as the mastectomy, or some months or years later. This is known as breast reconstruction. There are several different types of breast reconstruction. If you would like to consider having breast reconstruction, you can discuss it with your surgeon, so that he or she can tell you about the methods that would be suitable for you.

Choice of surgery

Research has shown that for many women with early breast cancer, lumpectomy followed by radiotherapy is as effective at curing the cancer as mastectomy. So you may be asked to choose the treatment that you feel suits you best.

The treatments have different benefits and side effects, which are described below. This can be a difficult decision to make. It is important to discuss both options fully with your doctor, breast care nurse, or one of the support organisations so that you feel confident you have made the choice that is right for you.

Lumpectomy followed by radiotherapy

Advantages

- It is as effective at curing the cancer as mastectomy.
- It keeps the shape of the breast but leaves a small scar.
- It causes less change to the body than mastectomy and so is less likely to affect a woman's feelings about her appearance and sexuality.

Disadvantages

- It is necessary to attend hospital each weekday for between 3–6 weeks for radiotherapy.
- The radiotherapy may cause short-term side effects such as skin soreness for a few weeks and tiredness for a few months.
- Some women worry that the cancer has not all been removed because some of the breast tissue is left. However, the risk of the cancer coming back is no higher than after mastectomy.
- The radiotherapy may cause long-term side effects – pain in the arm (in fewer than 1 in 50 women), lung damage (in fewer than 1 in 50 women) and a change in the size of the breast.

Mastectomy

Advantages

- After mastectomy it may not be necessary to have radiotherapy, which means avoiding the risk of radiotherapy side effects.
- Although the chances of a cure are the same with a mastectomy and with a lumpectomy and radiotherapy, some women feel that if all the breast

tissue is removed, there is less risk of the cancer coming back, and feel less anxious after their treatment.

Disadvantages

- The whole breast is taken away, which some women find very distressing. It may be possible to have immediate reconstruction to form a new breast, but it may take a few weeks or months until the reconstruction is complete.
- Your body will look different, which may reduce your confidence and affect sexuality and relationships.
- Sometimes radiotherapy is still required after a mastectomy, so if you have a choice and choose mastectomy, it doesn't mean you will always avoid radiotherapy.

Checking the lymph nodes

As part of any operation for breast cancer, the surgeon will usually remove lymph nodes (also known as lymph glands) from under your arm on the side of the cancer. There are approximately 20 lymph nodes in the armpit (axilla), although the exact number varies from person to person. The lymph nodes are examined to check if any cancer cells have spread into them from the breast. This helps the doctors to decide what other treatment is needed. Removing lymph nodes can sometimes lead to swelling of the arm on the affected side (lymphoedema). This usually starts some months or years after the breast surgery.

There are several approaches to checking the lymph nodes:

Sampling

A few lymph nodes may be removed, which is known as axillary (under the arm) node sampling. If any of the lymph glands contain cancer cells, the rest of them may need to be removed in a further operation (axillary clearance). Chemotherapy treatment may also be recommended or the nodes may be treated with radiotherapy. Lymph node sampling is not done that often, and you are more likely to have a sentinel lymph node biopsy.

Sentinel lymph node biopsy

Sentinel lymph node biopsy is a way of checking just one or two of the lymph glands to see if they contain cancer. It involves injecting a tiny amount of radioactive liquid into the area of the cancer before the operation. The lymph nodes are then scanned to see which has taken up the radioactive liquid first. A blue dye is also injected into the area of the cancer during the operation. The dye stains the lymph nodes blue. The nodes that become blue or radioactive first are known as the sentinel nodes. The surgeon removes only the sentinel nodes so that they can be tested to see whether they contain cancer cells.

Results of research trials suggest that sentinel node biopsy is as effective at detecting cancer cells in the lymph glands as lymph node sampling or clearance. Sentinel node biopsy does not increase the chance of a cure, but it does reduce the chances of side effects such as arm stiffness and swelling (lymphoedema) of the arm that can occur after sampling or clearance of the lymph nodes. It can also cause less pain and does not need a drain into the wound afterwards.

If the sentinel nodes do not contain cancer cells, no further surgery is needed. If the nodes do contain cancer cells, either a further operation will be done to remove the lymph nodes

from the armpit (axillary clearance – see below) or the rest of the lymph glands need to be treated with radiotherapy.

Axillary clearance

Sometimes, all the lymph nodes under the arm are removed. This is known as **axillary clearance** and allows the doctor to check all of the nodes. In this situation, any glands affected by cancer have been removed and so radiotherapy to the glands under the arm is not needed, although treatment with hormonal therapy or chemotherapy will usually be recommended.

If all of the lymph nodes are removed there is a risk of swelling (lymphoedema) of the arm. About 1 in 8 women who have a full axillary clearance will develop lymphoedema at some point. (Giving radiotherapy to the axilla after surgery also increases the risk of developing lymphoedema.)

After surgery for breast cancer

- After your operation
- Time in hospital
- Possible side effects
- Breast prosthesis
- Going home

Most women are able to go home within a week of their breast cancer operation and in as little as a day or two, depending on the extent of the surgery, age and general fitness. Each of us is unique and responds differently to treatment, but most women can get back to gentle everyday activities within a couple of weeks of surgery.

Like any operation, breast cancer surgery can cause scarring and discomfort. Other possible effects include a swelling of the arm (lymphoedema) due to a build-up of a fluid called lymph, shoulder stiffness, and numbness and tingling in the arm. If you experience any of these effects, talk to your doctor or specialist nurse. There are often medications and exercises that can help.

After your operation

You will be encouraged to get out of bed and start moving around as soon as possible after your operation. You may have a drainage tube to drain fluid from the wound. This will usually be taken out by the nurses on the ward within a few days of the operation. You may be able to go home with the drainage tube still in place. In this case, it will be removed a few days later by a community or district nurse.

Time in hospital

The length of time you are in hospital will depend on the type of surgery you have had. After a lumpectomy or segmental excision, your stay in hospital will probably only be 1–2 days. Women who have had a mastectomy, or have had all their lymph nodes removed, usually stay in hospital for 3–5 days after their operation. If you choose to have breast reconstruction

at the same time as the initial surgery, your stay in hospital could be up to a week, depending on the type of reconstruction.

A specialist breast care nurse will monitor your progress after the operation and ensure you do not go home until you are well enough. Before you go home, your nurse will give you detailed guidance on what you can and cannot do after surgery.

Possible side effects

Pain or soreness

After your operation you may have some pain or discomfort around your wound and under your arm. This may continue for some weeks. You will be given painkillers. If you still have pain it's important to tell your doctor or nurse as soon as possible, so that more effective painkillers or physiotherapy can be prescribed.

Some women find that their breast and arm are sore for up to a year after the treatment. It can sometimes continue after this. If you have continuing pain or soreness, you can ask your doctor to refer you to a pain control specialist. They can assess your pain and advise you on treatments that may help.

Some women have a pain which feels like a tight cord running from their armpit to the back of the hand. This is called **cording**. It is thought to be due to hardened lymph vessels. Sometimes it can make it difficult to move the arm. Physiotherapy can help, and sometimes antibiotics may be prescribed. The pain usually gets better gradually over a few months, but can sometimes come back.

Lymphoedema

Removing lymph nodes can sometimes lead to swelling of the arm on the affected side (lymphoedema). This usually starts some months or years after the breast surgery. Lymphoedema is more likely to occur if all of the lymph nodes are removed. Giving radiotherapy to the axilla after surgery also increases the risk of developing lymphoedema.

Stiff shoulder

Some women find that they have stiffness in the shoulder. This is more likely after a mastectomy than a lumpectomy. It is important to do exercises to help maintain the movement in the shoulder. Our cancer support specialists or Breast Cancer Care can send you a leaflet about the exercises. You will normally be taught how to do them by a physiotherapist.

Swelling around the wound

The area around the wound will be bruised and there may also be a build up of fluid, which can make it swollen and puffy for a while. This should gradually disappear over a few weeks. Occasionally, quite a lot of fluid can build up in the area around the wound; this is known as a **seroma**. It may need to be drained off by your nurse or doctor. If you have a seroma it can be very upsetting, but the amount of fluid gradually lessens. It will usually stop within a few weeks.

Numbness and tingling in the upper arm

You may have numbness and tingling in your upper arm. This is because nerves in the area have been affected by the surgery. These effects may last for some months and for some women can be permanent. It is more likely to occur after axillary clearance than after axillary sampling or sentinel node biopsy.

Scars

All breast surgery leaves some type of scar, and the appearance of the breast afterwards depends on the type of surgery used. It can help to discuss with the doctor or nurse beforehand what your breast will look like after surgery. The surgeon may have photographs that they can show you, and you can talk to women who have already had the surgery – contact them through Breast Cancer Care.

You could also ask your specialist or breast cancer nurse if they have anyone they have already treated who would be happy to speak with you. Your breast care nurse may be aware of a local breast cancer support group where you might be able to talk to someone who has had a similar operation.

Breast prosthesis

After a mastectomy, unless you've had breast reconstruction, you will be given a lightweight foam prosthesis (false breast), which you can put inside your bra. This is sometimes called a cumfie or softie. It is designed to be worn immediately after the operation when the area feels tender. Your breast care team will arrange this for you.

When your wound has fully healed, you will be able to choose a permanent prosthesis. This is a false breast that closely matches the size and shape of your other breast and is worn inside your bra. They are made of soft plastic (silicone) and feel pliable. Prostheses are available in all skin colours. Several types of prosthesis are available from the NHS. Breast Cancer Care can give you a list of stockists throughout the UK.

Going home

Outpatient appointment

Before you leave hospital, you will be given an appointment to attend the outpatient clinic so that the surgeon can check that the wound is healing properly. At the outpatient clinic you will also be told the stage of the cancer (how large it was and whether it had spread to the lymph nodes). Your doctors will discuss with you any further treatment that you may need. This is a good time for you to talk to them about any problems or questions you have.

Taking care of yourself

When you get home, take things gently for a while. You may feel physically and emotionally exhausted, so try to have plenty of rest and eat a well-balanced diet. You will be advised not to lift or carry anything heavy, nor to drive for a few weeks. Some insurance policies give specific time limits for not driving after surgery; you may need to check this with your insurance company.

Radiotherapy for breast cancer

Radiotherapy treats cancer by using high-energy rays to destroy the cancer cells, while doing as little harm as possible to normal cells. The treatment is often used after surgery for breast cancer, most commonly after surgery to remove part of the breast (lumpectomy or segmental excision). It may occasionally be used before, or instead of, surgery.

How it's given

The treatment is normally given in the hospital radiotherapy department as a series of short daily sessions. The treatments are usually given from Monday to Friday, with a rest at the

weekend. Each treatment takes 10–15 minutes. A course of radiotherapy for breast cancer may last from 3–6 weeks. It is usually given as an outpatient.

Radiotherapy can cause side effects such as skin soreness and tiredness, but most will improve once your treatment has finished. Sometimes radiotherapy can cause long-term side effects. Your doctor will discuss the treatment and possible side effects with you.

External radiotherapy does not make you radioactive and it's perfectly safe for you to be with other people, including children, after your treatment.

When it's used

If part of the breast has been removed (lumpectomy or segmental excision), radiotherapy is usually given to the remaining breast tissue to reduce the risk of the cancer coming back in that area. The radiotherapy is normally given to the whole breast area, and may also include the underarm (axilla), and the area around the collar bone and at the top of the chest by the breast bone (sternum), where there are lymph nodes.

After a mastectomy, radiotherapy to the chest wall may be given if your doctor thinks there is a risk that any cancer cells have been left behind.

If a few lymph nodes have been removed and these contained cancer cells, or if no lymph nodes have been removed, radiotherapy may be given to the armpit to treat the remaining lymph nodes. If all the nodes have been removed from under the arm, radiotherapy to the armpit is not usually needed.

Some women may have an extra dose given to the area of the breast where the cancer was. This is known as a **booster dose**.

Planning radiotherapy

To ensure that you receive maximum benefit from your radiotherapy, it has to be carefully planned. This is done using a CT scanner, which takes x-rays of the area to be treated. Treatment planning is a very important part of radiotherapy and it may take a few visits before the clinical oncologist (the doctor who plans and supervises your treatment) is satisfied with the result.

Marks are usually drawn on your skin to help the radiographer (who gives you your treatment) to position you accurately and to show where the rays will be directed. These marks must stay throughout your treatment, and permanent marks (tattoos) may be used. These are tiny and will only be done with your permission. You may feel a little discomfort while it is being done.

Treatment sessions

At the beginning of each session of radiotherapy, the radiographer will position you carefully on the couch and make sure you are comfortable. During your treatment you will be left alone in the room, but you will be able to talk to the radiographer, who will be watching you from the next room. Radiotherapy is not painful, but you do have to lie still for a few minutes while the treatment is being given.

Positioning

If you are going to have radiotherapy, you will need to be able to get your arm into position so that the radiotherapy machine can give the treatment effectively. After surgery for breast cancer, your muscles and shoulder joint may feel sore or stiff. If you can't move your shoulder normally, it may be painful or difficult to give the treatment. A physiotherapist may teach you some exercises to make the position for treatment feel easier.

Side effects of radiotherapy

Radiotherapy to the breast sometimes causes side effects such as:

- reddening and soreness of the skin
- tiredness
- feeling sick (nausea)

These side effects gradually disappear once your course of treatment has finished. The tiredness may continue for some months.

Preventing skin irritation

Perfumed soaps, creams or deodorants may irritate your skin and should not be used during the treatment. At the beginning of your treatment you will be given advice on how to look after your skin in the area being treated.

Long-term side effects

Radiotherapy may make your breast tissue feel firmer. Over a few months or years your breast may shrink slightly. The radiotherapy may also, rarely, leave small red marks on your skin, which are due to tiny broken blood vessels. For many women, however, the appearance of their breast is very good.

Radiotherapy to the breast can sometimes lead to other long-term side effects. Your doctor will give you more information about the possible side effects of radiotherapy, and we have more information you might find helpful.

Chemotherapy for breast cancer

Chemotherapy is the use of anti-cancer (cytotoxic) drugs to destroy cancer cells. The aim of chemotherapy is to do the maximum damage to cancer cells while causing the minimum damage to healthy tissue. Women with breast cancer may have chemotherapy:

- Before surgery to shrink the cancer. This is known as neo-adjuvant chemotherapy.
- After surgery if doctors think there is a risk of the cancer coming back. This is known as adjuvant chemotherapy.

How it is given

Chemotherapy drugs are usually given to you as an outpatient, either by injection into a vein (intravenously) or as tablets. Chemotherapy into the vein is given as a session of treatment, usually over a few hours. This is followed by a rest period of a few weeks, which allows your

body to recover from any side effects of the treatment. A complete course of chemotherapy is likely to take 4–6 months.

The drugs used

There are many different chemotherapy drugs used to treat breast cancer, and they are often used in combinations (called a chemotherapy regimen).

The commonly used chemotherapy drugs include:

- cyclophosphamide
- epirubicin
- fluorouracil (5FU)
- methotrexate
- paclitaxel (Taxol)
- doxorubicin (Adriamycin®)
- docetaxel (Taxotere®).

Other drugs may also be used.

Commonly used chemotherapy combinations are:

- FEC – 5FU, epirubicin and cyclophosphamide
- AC – doxorubicin (Adriamycin®) and cyclophosphamide
- CMF – cyclophosphamide, methotrexate and 5FU
- E-CMF – epirubicin and CMF
- FEC-T – FEC plus docetaxel (Taxotere®).

You may be offered a choice of chemotherapy treatments, as the different combinations have different side effects.

Research is always being carried out to improve the effectiveness of chemotherapy while reducing the side effects, and you may be asked to take part in research trials comparing different types of chemotherapy.

Benefits of chemotherapy

In women whose cancer is very unlikely to come back, chemotherapy may only reduce the chance of the cancer coming back (recurrence) by a small amount. In women whose chance of the cancer coming back is higher, chemotherapy may greatly reduce the chance of recurrence. Your doctor can let you know how likely chemotherapy is to make a difference in your case. They can also tell you about the possible side effects.

Side effects

Chemotherapy drugs can cause unpleasant side effects, but these can usually be well controlled with medicines. The side effects you experience will depend on the drugs you are given, but they may include:

- nausea and vomiting
- tiredness
- sore mouth
- increased risk of infection
- hair loss

Everyone is different and will react to chemotherapy treatment in a different way. Some people may have very few side effects while others will have a lot. Almost all side effects are only short-term and will gradually disappear once the treatment has stopped.

Contraception

It is not a good idea to become pregnant while taking any of the chemotherapy drugs used to treat breast cancer, as they may harm the developing foetus. It is important to use effective contraception during your treatment and for a year afterwards. You can discuss this with your doctor or specialist nurse.

Condoms should be used during sex within the first 48 hours after chemotherapy, to protect your partner from any of the drug that may be present in vaginal fluid.

Hormonal therapies for breast cancer

Hormonal therapies are treatments to reduce the levels of hormones in the body or block their effects on cancer cells. They are often given after surgery, radiotherapy and chemotherapy for breast cancer to reduce the chance of the cancer coming back.

Hormonal therapies are only effective in women whose cancer cells have receptors for oestrogen and/or progesterone on their surface. This is known as being oestrogen-receptor positive (ER+) or progesterone-receptor positive (PR+). It means that the breast cancer cells are affected by oestrogen or progesterone. These are female hormones that the body produces naturally and that can stimulate breast cancer cells to grow.

Treatment options

There are many different types of hormonal therapy, and they work in slightly different ways. Hormonal therapies for breast cancer include the drug tamoxifen, drugs known as aromatase inhibitors, and treatment to stop the ovaries from working (ovarian ablation).

There are many issues to consider when deciding which type of hormonal therapy is appropriate for you, including:

- your age
- whether you have had your menopause (change of life)
- the stage and grade of the cancer
- which other treatments are being used
- whether the cancer cells are HER2-positive.

Your doctor will be able to discuss which type of hormonal therapy treatment is best for you, based on your relevant medical details.

The side effects will depend on the type of hormonal therapy you are given, but the most common are menopausal symptoms such as hot flushes, vaginal dryness and a reduced sex drive.

Hormonal therapy for postmenopausal women

Postmenopausal women may be offered hormonal treatment with either an anti-oestrogen (such as tamoxifen) or an **aromatase inhibitor** (such as Anastrozole), or a combination of the two different types, where one type is given after the other.

Tamoxifen has been the most widely used hormonal therapy for breast cancer and has been shown to be highly effective in reducing the chance of the cancer coming back. Research

has shown that for some women, giving aromatase inhibitors instead of tamoxifen, or after a period of tamoxifen treatment, can further reduce the chance of the cancer coming back.

Your doctor will be able to discuss which type of hormonal therapy treatment is best for you, based on all your relevant medical details. You may be advised to have:

- tamoxifen on its own for five years
- an aromatase inhibitor on its own for a few years
- tamoxifen for 2–3 years followed by an aromatase inhibitor for a few years
- tamoxifen for five years followed by an aromatase inhibitor for a few years.

Hormonal therapy for premenopausal women

Premenopausal women may be offered hormonal treatment with:

- an anti-oestrogen medicine (such as tamoxifen)
- treatment to stop the ovaries from producing oestrogen (ovarian ablation). This can be done using surgery, radiotherapy, or a drug called goserelin (Zoladex®).

Unfortunately, ovarian ablation by surgery or radiotherapy brings on an early menopause, which can be very upsetting, especially for women who were hoping to have children. The effects of medicines are usually temporary. Once treatment has stopped the ovaries will begin working again, usually within six months.

Your doctor may give you a choice between treatments. It's important to ask any questions you may have to help you make a decision about the right treatment.

Tamoxifen

Tamoxifen is a hormonal therapy used to treat breast cancer. It is known as an anti-oestrogen drug, and it works by preventing oestrogen in the body from attaching to breast cancer cells and encouraging them to grow.

It can be used for women who have had their menopause and also for those who haven't. For women who have not yet had their menopause and women with very early-stage breast cancers, tamoxifen is the standard treatment. It is available as tamoxifen and Nolvadex® and is taken as a daily tablet. The side effects may include:

- hot flushes and sweats
- a tendency to put on weight (although this may be due to other effects such as going into the menopause)
- dryness of the vagina or an increased discharge from the vagina.

For many women, these side effects are mild and may reduce over time.

Some women continue to find the side effects of tamoxifen are a problem. If this happens, it can help to discuss it with your doctor, as there are sometimes ways of reducing the effects. Our section on breast cancer and menopausal symptoms has some helpful tips.

In postmenopausal women, tamoxifen can slightly increase the risk of womb cancer, blood clots in the leg, and strokes. Although this sounds very frightening, these effects are very rare and are usually curable and treatable. The benefits of tamoxifen in reducing the chance of the breast cancer coming back far outweigh the risks of side effects for most women.

Aromatase inhibitors

Aromatase inhibitors (AIs) are a type of hormonal therapy that reduce the levels of oestrogen in the body. They work by blocking the production of oestrogen in body tissues. For many postmenopausal women it is helpful to have an aromatase inhibitor as part of hormonal therapy treatment. AIs may be given on their own or in combination with the drug tamoxifen.

There are three AIs currently in use:

- anastrozole (Arimidex®)
- exemestane (Aromasin®)
- letrozole (Femara®).

Many women can take aromatase inhibitors without any problems, but some may experience mild to moderate side effects, including hot flushes, feelings of sickness, joint pains and vaginal dryness.

How do they work?

To understand how AIs work, it helps to know a little about the way oestrogen is made.

In women who have not had their menopause (premenopausal women), the main source of oestrogen is the ovaries. In women who have had their menopause (postmenopausal women) oestrogen is made by a process known as aromatisation. This is an activity in which sex hormones (androgens) produced by the adrenal glands are turned into oestrogen in the fatty tissue of the body. A chemical in the body called aromatase makes this happen.

Aromatase inhibitors block the process of aromatisation, and so reduce the amount of oestrogen in the body. This means that the hormone receptors are exposed to less oestrogen and the cancer cells receive fewer signals to grow. AIs are currently only suitable for post-menopausal women, although research is being carried out into using them in pre-menopausal women who have been put into a temporary menopause by using medicines such as Zoladex®. Your doctor can give you more information on this or you can talk to our nurses.

When are they given?

Aromatase inhibitors and early breast cancer

Several studies have looked at the effectiveness of AIs in primary (early) breast cancer when compared with tamoxifen. The results have been encouraging, and the three main aromatase inhibitors are now licensed to treat post-menopausal women with ER-positive early breast cancer.

Aromatase inhibitors and advanced breast cancer

Aromatase inhibitors have been used to treat women with advanced (secondary or metastatic) breast cancer since the mid-1990s, and their use in this situation is well established. This information is about AIs for early breast cancer, but if you would like information about their use in advanced breast cancer you can contact our nurses.

How are they taken?

Arimidex, Aromasin and Femara are all taken as tablets once a day. They should ideally be taken at around the same time every day.

Deciding which hormonal therapy to use

Your doctor will discuss the different types of hormonal therapy with you and will outline the possible side effects. Together you can decide which one is right for you. NICE (National Institute for Clinical Excellence) published its recommendations for the treatment of early and localised breast cancer in February 2009. This includes information on aromatase inhibitors.

NICE recommends anastrozole or letrozole as the first line hormonal therapy for postmenopausal women with early breast cancer if their cancer has a more than low-risk of coming back. Aromatase inhibitors can also be used in people who aren't able to take tamoxifen, or for whom tamoxifen causes severe side effects.

NICE recommends that women who have already had 2–3 years treatment with tamoxifen can be offered exemestane or anastrozole.

For women who had cancer in their lymph nodes when they first had surgery, and who have already had 5 years of tamoxifen, NICE recommends offering treatment with letrozole for another 2–3 years.

Things to remember about taking AIs

- AIs may interact with other medicines. Let your doctor know about any medicines you are taking, including non-prescribed drugs such as complementary therapies and herbal drugs.
- Keep the tablets in a safe place where children can't reach them.
- If your doctor decides to stop the treatment, return any remaining tablets to the pharmacist. Do not flush them down the toilet or throw them away.
- If you are sick just after taking the tablet tell your doctor, as you may need to take another.
- If you forget to take your tablet, do not take a double dose. Let your doctor or nurse know. Don't worry, the levels of the drug in your blood will not change very much, but try not to miss more than one or two tablets in a row.
- Remember to get a new prescription a few weeks before you run out of tablets, and make sure that you have plenty for holidays, etc.

Herceptin® (trastuzumab) for breast cancer

Trastuzumab (also known as Herceptin®) is a treatment that may be given to some women with breast cancer. It is a type of drug known as a monoclonal antibody. It works by attaching to HER2 receptors (proteins) on the surface of breast cancer cells. This stops the cancer cells from dividing and growing. It may also allow the body's defences to fight better against the cancer cells.

Herceptin can reduce the chance of breast cancer coming back after initial treatment for early breast cancer. However, it is only effective for women whose breast cancer cells have a large number of the HER2 receptors on their surface. This is known as being HER2-positive. Around 1 in 5 women (20%) with breast cancer are HER2-positive. When your breast cancer is diagnosed, the cells will be tested for the HER2 protein.

In women who have early breast cancer and are HER2-positive, Herceptin may be used alongside, or after, other treatments.

Side effects are usually mild, but some women may have:

- flu-like symptoms

- diarrhoea
- headaches
- an allergic reaction.

In some women, Herceptin may cause damage to the heart muscle, which could lead to heart failure. If this happens the Herceptin® will be stopped. Usually, the effect on the heart is mild and reversible. Because the long term effects of any heart damage is not known, Herceptin is not given to women who have serious heart problems. You can discuss with your doctor whether Herceptin may be a suitable treatment for you.

Herceptin and early breast cancer

Recent research suggests that Herceptin is useful for women with early breast cancer to help reduce the risk of the cancer coming back. It is currently known that chemotherapy and/or hormonal therapy can reduce this risk. A number of research trials looked at giving Herceptin alongside chemotherapy (comparing the results of this with those of using chemotherapy alone) to see if this further reduced the risk of cancer coming back. The results of the trials were very promising: the cancer came back in half as many women who had Herceptin combined with chemotherapy, compared to those who had chemotherapy alone.

Herceptin was licensed in the UK for early breast cancer in 2006. The National Institute for Health and Clinical Excellence (NICE), which advises doctors on the prevention and treatment of ill-health, produced guidance on the use of Herceptin for women with HER2 positive early breast cancer in June 2006. The guidance states that Herceptin should be considered as a possible treatment after surgery and adjuvant chemotherapy (and radiotherapy, if appropriate). The guidance recommends that Herceptin is given every three weeks for one year.

Herceptin and secondary breast cancer

Herceptin is also licensed to treat secondary or advanced breast cancer (cancer that has spread). It can be used on its own or in combination with chemotherapy.

In 2002, NICE published guidance on Herceptin for women with secondary breast cancer and approved its use in particular circumstances:

- Women with HER2 positive advanced breast cancer who have not had any previous chemotherapy treatment and can't have a type of chemotherapy called an anthracycline (epirubicin or doxorubicin) should be treated with Herceptin and a chemotherapy called Taxol.
- Women who have had two or more previous chemotherapy treatments which included an anthracycline drug (epirubicin or doxorubicin) and a taxane (Taxol or Docetaxel) should have Herceptin alone.

About clinical trials

Cancer research trials are carried out to try to find new and better treatments for cancer. Trials that are carried out on patients are known as clinical trials.

Clinical trials may be carried out to:

- test new treatments, such as new chemotherapy drugs, gene therapy or cancer vaccines

- look at new combinations of existing treatments, or change the way they are given, to make them more effective or to reduce side effects
- compare the effectiveness of drugs used to control symptoms
- find out how cancer treatments work
- see which treatments are the most cost-effective.

Trials are the only reliable way to find out if a different operation, type of chemotherapy, radiotherapy, or other treatment is better than what is already available.

Taking part in a trial

You may be asked to take part in a treatment research trial. There can be many benefits in doing this. Trials help to improve knowledge about cancer and develop new treatments. You will also be carefully monitored during and after the study. Usually, several hospitals around the country take part in these trials. It's important to bear in mind that some treatments that look promising at first are often later found not to be as good as existing treatments, or to have side effects that outweigh the benefits.

If you decide not to take part in a trial your decision will be respected and you don't have to give a reason. There will be no change in the way that you're treated by the hospital staff and you will be offered the best standard treatment for your situation.

Blood and tumour samples

Many blood samples and tumour biopsies may be taken to help make the right diagnosis. You may be asked for your permission to use some of your samples for research into cancer. If you're taking part in a trial you may also be asked to give other samples which may be frozen and stored for future use, when new research techniques become available. These samples will have your name removed from them so you can't be identified.

The research may be carried out at the hospital where you are treated, or it may be at another hospital. This type of research takes a long time, and results may not be available for many years. The samples will, however, be used to increase knowledge about the causes of cancer and its treatment. This research will, hopefully, improve the outlook for future patients.

Follow up after treatment for breast cancer

After your treatment has ended, you may have regular check-ups, which will include a physical examination, and mammograms. These check-ups will usually be once a year, but may be more frequent at first. You may also need to see your specialist or GP every few months if you are having ongoing treatment with hormonal therapy, or if you have any side effects following surgery, radiotherapy or chemotherapy treatment. If you have had a mastectomy, the breast prosthesis fitter will also be at your first appointment.

The appointments are a good opportunity to discuss with your doctor any worries or problems you may have. However, if you notice any new symptoms or are anxious about anything else between your appointments, you can contact your doctor or nurse for advice. Many people find that they get very anxious for a while before the appointments. This is natural and it may help to get support from family, friends or a support organisation during this time.

Our booklet on life after cancer gives useful advice on how to keep healthy and adjust to life once treatment has ended.

Living with breast cancer

Life after breast cancer surgery

In this section you'll learn more about emotions you may experience after breast cancer surgery and find links to information to help you cope.

Emotional effects

Breast cancer surgery can be a deeply traumatic experience. You may feel that your breasts are very important to your idea of yourself as a woman. The first months are likely to be very upsetting. Many women have conflicting emotions, such as grief, fear, shock, anger and resentment. These emotions may be mixed with relief that the cancer has been found and treated.

Coping with a changed appearance

Any change to your appearance may lower your self-confidence, and you may need time to come to terms with this. Women find different ways of dealing with the change to their bodies. Some prefer to see the results of the surgery for the first time alone. Other women may want the support of a partner or close friend, or doctor or nurse, when they take their first look at the scar.

Effects on your sex life

Although breast surgery will not affect your physical ability to have sex, the emotions you feel may reduce your desire for sex for a while. Women often need to feel relatively happy with their bodies to have a fulfilling sex life. Fear that a partner – even a long-standing one – may be put off by scars or a change in body shape, can make women very nervous about letting anyone see or touch their body. There is no right or wrong time to take this step. You can wait until you and your partner feel ready.

Our section on sexuality and cancer discusses these issues in detail.

While you are still in hospital, the nurses can prepare your partner for how the scar may look. A nurse, or your doctor, can be with you both when you let your partner see it. Alternatively, you may prefer a close relative or friend to be there and talk it over with you both afterwards.

Getting on with life

You will find that the difficulties and emotions get less with time. After the operation, the swelling will go down, the bruising will fade and the scar will gradually become less obvious. As you become more used to the soft breast prosthesis, your confidence should gradually come back.

Getting used to having had breast cancer can take months or years. The emotions and anxieties may come back each time you have to go for a follow-up appointment or if you see cancer mentioned in papers, magazines or on the television.

Many women cope well with the surgery and treatment for breast cancer. This is partly due to support from hospital staff and friends and family. However, women are often surprised that they find it very difficult to cope once the treatment has finished. Instead of feeling able to forget about the cancer and get on with normal life, it is common to feel anxious and tearful for a while once the treatment is over.

Some women are very anxious that the cancer may come back. They worry that any ache or pain is a sign that the cancer has returned. Anxieties and worries can make it hard to sleep. It is not unusual to feel depressed and isolated. These feelings can often feel worse at night.

After breast cancer surgery you may feel emotionally and physically drained. It is important for you to allow yourself plenty of time to recover and to get help if you feel you need it.

Our booklet on adjusting to life after cancer discusses how to cope once treatment has finished.

After radiotherapy

This information is for women who are concerned about the possible long-term (delayed) side effects of radiotherapy to the breast. With modern day radiotherapy equipment and the careful preparation and planning done before radiotherapy for breast cancer, most of these side effects are very uncommon, and most that do occur are treatable.

If you develop any new symptoms after your treatment is over, or if you are concerned that the side effects you developed during your treatment are not clearing up, you should contact your doctor, radiographer or nurse at the hospital for advice. There is often a simple explanation for these symptoms and they do not necessarily mean that you are developing long-term side effects.

Possible long-term side effects include:

- Skin reactions
- Breast changes, including swelling and shrinking
- Soreness or pain
- Restricted shoulder movement
- Changes in the way your heart works
- Breathlessness due to lung problems
- Effects on the bones
- Swelling in the arm (lymphoedema)
- Numbness or tingling in the hand, arm or shoulder (brachial plexopathy)
- Radiation-induced second cancers

We also have information on feelings you may have if your radiotherapy treatment causes long-term side effects.

Changes to the skin

During treatment some women develop a skin reaction similar to sunburn, known as **erythema**. Pale skin may become red and itchy, and darker skin may appear darker with a blue or black tinge. Usually this side effect will settle down two to four weeks after radiotherapy, but sometimes it can continue. A few women find that their scar remains tender or sensitive for some time after radiotherapy.

Some women may develop changes which can include red blotches on the breast caused by dilated blood vessels under the skin. This condition is known as **telangiectasia**. Although this affects how the breast looks, it shouldn't cause any other problems.

Skin care

If you have a skin reaction, your doctor, nurse or the radiographer will give you advice on how to look after your skin. The following tips may be helpful:

- avoid using perfumed soaps, talcum powder and deodorants/antiperspirants until the reaction has settled
- avoid shaving under your arm on the affected side
- showers are better than baths, and you should avoid soaking the affected area for too long if you have a bath
- after washing, pat the area dry rather than rubbing it with a towel
- loose clothing may be more comfortable to wear
- avoid exposing the area to strong sunlight for at least a year, as your skin will continue to be more sensitive.

Breast changes

Most women will develop changes in the look and feel of their treated breast due to radiotherapy, although for many women these changes are very slight.

Breast swelling

A few women will develop swelling of the breast area during, or shortly after treatment. The swelling is known as **oedema**, and it should go away a couple of months after treatment has finished.

Sometimes, a different type of swelling called lymphoedema can develop. This can occur if the lymph nodes have been removed or are damaged by radiotherapy, causing a build-up of lymph fluid. It more commonly affects the arm, but can also cause swelling of the breast. Lymphoedema can develop many months or years after treatment has finished. Talk to your breast care nurse or doctor if you think you may have lymphoedema. If necessary they can refer you to a lymphoedema specialist.

Shrinking of the breast

It is fairly common for the breast to shrink slightly over time, but for it to feel the same. A few women may develop a hardening or thickening of the breast tissue (fibrosis). This can cause the breast to become harder and smaller than it was, although the effect is mostly very mild. In severe cases this can make the breasts look very different to each other.

It is fairly common for a woman's breasts to get bigger as she gets older, or if she puts on weight. A breast that has been treated with radiotherapy may not increase in size as much as the untreated breast. If this is a problem for you, talk to your doctor or breast care nurse, as surgery can sometimes be done to correct an imbalance.

Soreness or pain

Many women find that the area in the breast that has been treated feels uncomfortable or sore. This tends to become less of a problem year by year. If this occurs and is causing you a problem, your doctor can prescribe painkillers to help relieve any pain. Some women find that the pain can be relieved by wearing a support bra. It can also help to wear a soft bra at night, but to make sure it has no under-wire.

Restricted shoulder movement

Radiotherapy can affect how well you can move your shoulder. It is fairly common for women who have radiotherapy to the underarm (axilla) to experience some restriction in shoulder movement, especially if they have had surgery to their underarm area as well. This may make it difficult to carry heavy bags, do household chores or some types of exercise, such as swimming. A physiotherapist can show you exercises to help improve the movement of the shoulder.

Changes in the way your heart works

There is a very small risk of damage to the heart muscle or the major blood vessels around the heart. This is only a possible problem if you have had cancer in your left breast, as the heart is on the left side of the chest. Radiotherapy is now very carefully planned so that the heart is not within the radiation area. As a result, the risk of developing any heart problems has been greatly reduced.

If your heart has been damaged by radiotherapy you may find that you get tired very easily or get breathless when climbing the stairs. You may also notice that you sometimes feel dizzy or get chest pains. It is important to remember that these symptoms can be caused by many things and that they are not always a result of damage to the heart.

Treatment for heart changes

The treatment will depend upon the part of the heart that has been damaged and how it is affecting you. You may just be advised to avoid things that could cause further damage, such as alcohol, smoking and stress, or to improve your diet.

Treatment may include medicines to improve the heart rhythm (anti-arrhythmics), or improve the blood flow around the heart to help reduce chest pain (anti-anginals).

Your doctor or nurse will explain more about the treatment that you need and can answer any questions you may have.

Lung problems

Approximately one in 50 women develop symptoms such as breathlessness, a dry cough or chest pain. These symptoms may happen because the radiotherapy can affect the cells lining the lungs, causing inflammation or a hardening and thickening (fibrosis). If you are going to get these symptoms, they usually develop two to three months after the radiotherapy has finished. The changes are usually temporary, lasting a month or two, but occasionally can become a long-term side effect.

Your risk of developing lung problems is slightly higher if:

- radiotherapy is also given to the lymph nodes in your chest area
- you are older when you have the treatment
- if you have had chemotherapy.

These symptoms may be made worse if you already have a lung problem such as asthma, or if you smoke.

Treatment for lung problems

Most lung problems are treatable, and it is unusual for them to remain a problem over time. Treatment depends on exactly what is wrong with your lungs and may simply involve advice on cutting down or giving up smoking and maintaining a healthy weight.

You may be given inhalers that contain drugs to help open up the airways (bronchodilators). Steroids can be given as tablets or inhalers to reduce inflammation. You may be given antibiotics if you have an infection in the lung.

Your doctor or nurse will explain more about the treatment you need and will teach you how to use an inhaler if necessary.

Effect on the bones

A rare late side effect of radiotherapy to the breast is damage to the bones, especially the ribs and collar bones. This affects fewer than one in 100 women. The bones can become thinner and more brittle. If this happens, it can cause pain and make it hard for you to lift heavy objects or to exercise. The bone may become infected and may break if it is weakened enough. This is rare.

It is important to be aware that this problem can occur, so that if you have any symptoms you can get them checked by your doctor. Radiotherapy damage to the bones is uncommon so it is likely that if you have any symptoms they will have another cause.

Treatment for bone damage

You may be treated to relieve any symptoms that occur. This may involve taking painkillers or anti-inflammatory drugs. Sometimes calcium supplements, vitamin D, or drugs called bisphosphonates, which can help to strengthen the bones, may be helpful.

Very rarely, if the bone has been severely damaged, a treatment known as hyperbaric oxygen therapy may help to prevent further weakening of the bone and improve symptoms. This is a new type of treatment, and the exact benefits are still being researched. It is not available in many places in the UK. The treatment involves being given high concentrations of oxygen while under pressure in a hyperbaric chamber. The chamber is similar to those used to treat divers who have decompression illness (the 'bends'). The treatment may help the bones to repair.

If you have pain, this can usually be controlled with painkillers. If the bone is infected, it can often be treated with antibiotics. You may also need to see a physiotherapist or occupational therapist if the damaged bone is making it difficult to carry out daily activities. Very occasionally surgery may be suggested to remove the damaged ribs.

Lymphoedema in the arm

Lymphoedema can occur in women who had radiotherapy to the armpit (axilla) as part of their treatment for breast cancer. Some women have radiotherapy after having a few lymph nodes removed from under the arm; in this situation, lymphoedema is uncommon, affecting approximately one in 25 women. In women who have radiotherapy after removal of most or all of their lymph nodes, lymphoedema is more common, affecting one in three women.

Lymphoedema in the arm can also occur after radiotherapy to the breast and chest wall, but this is very rare.

Treating lymphoedema

If you develop lymphoedema, you will usually be referred to a lymphoedema specialist for treatment and advice. This may be a nurse, physiotherapist or doctor. The treatment will depend upon how much lymphoedema you have, and aims to help reduce the swelling,

prevent further swelling and to relieve any discomfort. There are four main types of treatment:

- care of the skin
- supporting the arm using compression stockings or bandages
- positioning and movement, or exercising the arm
- a particular type of massage called manual lymphatic drainage (MLD) or simple lymphatic drainage (SLD).

We have a separate booklet on lymphoedema you might find helpful, including tips for preventing it and how it's treated.

Numbness, pain and weakness in the arm

About one in 100 women who have radiotherapy to the underarm as part of their treatment will develop some numbness and tingling in the hand; weakness in the hand; or pain around the shoulder, arm or hand. These symptoms will usually be quite mild but very occasionally may be more severe and troublesome.

They are due to damage to the nerves going into the arm, which can sometimes occur after radiotherapy to the armpit. These nerves are known as the brachial plexus, and the long-term side effect is often called radiation-induced **brachial plexus neuropathy** or **brachial plexopathy**.

Treatment of brachial plexopathy

Usually this is a mild symptom, but if severe brachial plexus neuropathy develops it can't be reversed. However, treatments can help to control symptoms such as pain, and make the practical aspects of life easier.

One of the priorities of treatment is to find the best way of controlling the pain. People often describe the pain as 'shooting' or 'burning', but you may also have pins and needles, numbness or tightness. There are various painkillers that may be helpful, depending upon how severe the pain is, and your doctor will be able to give you advice on these. Your doctor may prescribe low-dose antidepressants or antiepileptic drugs, as these can be effective in controlling nerve pain. You may be referred to a specialist pain clinic for further advice.

Your doctors may also suggest other treatments, such as massage or applying heat and cold to the painful areas. Another possibility is using a TENS (transcutaneous electrical nerve stimulation) machine. This can be very effective at relieving pain. It involves placing sticky pads that contain electrodes onto your skin. A weak electrical current is passed through the pads. The electrical current can make the body release its own natural painkillers (endorphins), which can help to control pain.

Some women find acupuncture helpful, and some GP or hospital clinics now offer this. Other complementary therapies may also be useful, but you should always discuss these with your doctor first.

You may be referred to a physiotherapist and an occupational therapist (OT). A physiotherapist will help you to keep your arm as mobile and strong as possible. This will involve exercises to strengthen the muscles and keep them supple. The physiotherapist will also be able to show you how to use slings or splints to support your arm. The OT will assess how the nerve damage has affected the use of your arm, and look at how this interferes with your daily life. The physiotherapist and OT can then suggest practical ways of helping you to carry on as normally as possible.

Radiation-induced second cancers

This is a very rare long-term problem following radiotherapy for breast cancer. Fewer than one in 1000 women will develop a second cancer, known as a sarcoma, within the treatment area. This can occur many years later. Secondary cancers are very rare but any new symptoms should always be checked with your doctor.

Your feelings

You may have all kinds of emotions if you are diagnosed as having damage caused by your radiotherapy treatment. Radiotherapy damage is uncommon, and it can take a long time to find out that the problem is related to radiotherapy. You may feel angry about this. You may be relieved that you now know the reasons for your symptoms, or feel cheated that you have survived cancer only to be damaged by the treatment. You may be worried about how you will cope with any disability or about money problems if you have to give up work.

These are all normal reactions and part of the process that many women go through. Everyone has their own way of coping. Some women find it helpful to talk to friends or family members, while others prefer to seek help from people outside their situation, such as counsellors. Other people prefer to keep their feelings to themselves. There is no right or wrong way to cope, but help is there if you need it.

Fertility after breast cancer treatment

Breast cancer treatment can affect a woman's ability to have children (fertility). If you want to have a children, be sure to talk to your doctor about the effects your treatment is likely to have. If your treatment is likely to cause infertility, your doctor can refer you to a counsellor for support and a fertility specialist to discuss options such as egg and embryo storage.

Contraception

It is important not to get pregnant while having chemotherapy treatment for breast cancer, as some treatments can cause harm to a developing foetus. But women who have had breast cancer are usually advised not to take the contraceptive pill because of the risk that the hormones (oestrogen and progesterone) in the pill may stimulate the growth of breast cancer cells. Your cancer specialist or GP can give you advice on contraception.

Choice of contraception

Barrier methods of contraception such as condoms or the cap are the most suitable. Lubricating jelly (available without prescription from the chemist) is completely safe to use with barrier contraceptives if extra moisture is needed during sex. Your GP can also fit you for a cap if this is the method of contraception you choose. Coils (IUDs) can be an effective alternative method of contraception, and your GP can fit you with one. Some women choose to be sterilised (tubal ligation) to prevent the risk of pregnancy.

The choice of an effective contraceptive is a very personal one. Your likes and dislikes, and those of your partner, are obviously important. Some women may also choose to take into account religious and moral considerations. Unfortunately, the withdrawal and rhythm methods of contraception are not safe enough to be effective as protection against pregnancy. Some women find that, if necessary, talking through their situation with their religious leader or a trained counsellor helps them to find acceptable alternatives.

Pregnancy after treatment

Research suggests that becoming pregnant after treatment for breast cancer does not make the breast cancer more likely to come back.

If you want to have a child, it's important for you and your partner to discuss this with your breast cancer specialist, who knows your full medical history and can talk over the risks and implications. It's usually advisable to wait a while after your initial treatment has finished before trying to become pregnant. The longer you are free of the cancer, the less likely it is to come back. However it is very important to carefully consider what might happen if, after having a baby or while pregnant, the cancer did come back, and whether you want to take that risk.

Infertility

Unfortunately, women who have had radiotherapy to their ovaries or an operation to remove their ovaries will not be able to have children naturally. Sometimes chemotherapy can also cause infertility by bringing on an early menopause. Generally, the older a woman is when having chemotherapy the more likely she is to be infertile afterwards.

Becoming infertile can be very hard for some women to live with – whether or not they already have children. Fertility is a very important part of many people's lives, and not being able to have children can seem especially hard when you already have to cope with cancer. Some people find it helpful to talk through their feelings about this distressing situation.

Egg or embryo storage

If your treatment is likely to make you infertile, and you would like to have children in the future, it is sometimes possible to remove eggs from the ovaries, fertilise them and store the embryos to use later. It is also sometimes possible to store unfertilised eggs, although this is very experimental. Eggs need to be removed before you start treatment.

At a later date the fertilised eggs can be thawed and implanted into the womb to start a pregnancy. These techniques may allow some women with breast cancer, who had become infertile due to treatment, to have children in the future. If you want to have children it's very important to discuss this with your doctor before treatment begins. Your doctor can refer you to a fertility specialist for advice on the possible options available to you.

Lymphoedema and breast cancer treatment

Lymphoedema is a type of swelling of the arm or hand that sometimes happens as a result of breast cancer treatment. It can occur if the lymph nodes in your armpit have been removed by surgery, or you have had radiotherapy to the armpit. It is usually mild and develops gradually a few months or several years after treatment. Lymphoedema is more likely if you have had both surgery and radiotherapy to the underarm.

Sometimes swelling of the arm may occur after the initial surgery, but this usually goes back to normal within a few weeks and is not lymphoedema. If you are concerned about any swelling, get it checked by your doctor or nurse.

If your arm is swollen because of lymphoedema it may become stiff, uncomfortable and awkward to move. This can make daily activities like dressing difficult. The skin of your arm may become tight and stretched. Once lymphoedema occurs it can never be completely

cured. However, many things can be done to help reduce the swelling and discomfort and allow women to use their arm normally.

If you have lymphoedema, the arm and hand are more prone to infection. These simple tips can help you look after your skin and reduce the risk of infection.

- Treat even small grazes and cuts with antiseptic and keep them clean until they heal.
- See your GP at the first sign of any infection – if the cut is inflamed or feels warm and tender.
- Avoid getting sunburnt.
- Wear gloves for washing up, DIY and other household tasks.
- Try to avoid being scratched – wear gloves and long-sleeved clothing when handling animals or gardening.
- Use a thimble if you sew.
- Use an electric razor if you shave under your arms.
- Keep your skin clean and dry and use moisturising cream daily to keep it supple.
- Use nail clippers instead of scissors to cut your nails.
- Never push back or cut the cuticles – use cuticle cream instead.

Breast cancer treatment and menopausal symptoms

Overview

Some of the treatments for breast cancer, including chemotherapy and hormonal therapy, can affect the function of the ovaries or the level of hormones in the body. As a result, you may begin your menopause earlier than expected, or have menopausal symptoms due to the treatment itself.

The change in hormone levels can cause a number of symptoms. These can include:

- hot flushes and sweats
- vaginal dryness
- passing urine more often (increased frequency)
- lower sex drive
- tiredness
- sleeplessness
- dry skin
- aches and pains
- mood swings
- poor concentration
- loss of confidence and memory.

Women may have one or more of these symptoms, and symptoms can range from being very mild to more severe. There are different ways of controlling these symptoms. Some women find complementary therapies helpful.

Menopause, particularly if it occurs early in life, may cause other effects on the body, such as thinning of the bones (osteoporosis) and heart disease. These effects develop at different rates in different people. Their tendency to develop is, at least partly, passed on from your parents (genetically determined).

Women who have had breast cancer are usually advised not to take hormone replacement therapy. However, if you have troublesome menopausal symptoms, medicines can be used to treat them.

Breast cancer treatments and menopause

Women naturally stop having regular periods, usually at some time between their mid-40s and mid-50s. The menopause, or change of life, happens because the ovaries stop producing the sex hormones **oestrogen** and **progesterone**.

The following breast cancer treatments also can affect the levels of these hormones in the body:

Stopping the ovaries from working (ovarian ablation)

Women who develop breast cancer at a young age may be advised to have treatment to stop their ovaries producing oestrogen, as oestrogen could stimulate the growth of breast cancer cells. The ovaries can be permanently stopped from producing oestrogen, using surgery or radiotherapy:

- **Surgery** will bring on a sudden and permanent menopause. Menopausal symptoms may start within a few days of the operation.
- **Radiotherapy** will bring on the menopause, although it may take a few months before menopausal symptoms occur and your periods stop.

Chemotherapy

Some chemotherapy drugs will stop the ovaries from working. This can be temporary, but the nearer you are to your natural menopausal age, the more likely it is to be permanent. If it is permanent, the treatment will bring on the menopause and you may develop some of the symptoms described earlier. Even if the treatment does not cause an immediate menopause, it may prompt the menopause start earlier than it would otherwise have done.

It is not possible to predict before your treatment whether the chemotherapy will affect you temporarily or permanently. Your periods could return to normal in time, so you could still get pregnant and should use contraception after your chemotherapy has ended.

Hormonal therapy

Because the sex hormones oestrogen and progesterone can affect the growth of breast cancer cells, treatments for breast cancer often involve hormonal therapy that blocks oestrogen from getting to breast cancer cells, or reduces the level of oestrogen in the body. These treatments may cause an early menopause or menopausal symptoms.

The two main types of hormonal therapy used to treat breast cancer are:

- drugs that block oestrogen from attaching to the cancer cells (anti-oestrogen drugs)
- drugs that stop oestrogen from being produced.

Anti-oestrogen drugs

Hormonal therapy drugs that block the effects of oestrogen (such as **tamoxifen**), may cause side effects similar to the symptoms of the menopause. Periods may become irregular or sometimes stop (this is uncommon). However, if the treatment is ended, the menopausal symptoms usually stop – although this can take a few months.

As with chemotherapy, the nearer you are to your natural menopausal age, the more likely it is that hormonal therapy will bring on an early menopause, and that your periods will not

start again when treatment has ended. Women who have already had their menopause may have menopausal symptoms again when they begin hormonal therapy.

LHRH analogues

LHRH analogues such as goserelin (Zoladex®) , stop the ovaries from producing oestrogen altogether, but unlike surgery or radiotherapy, this is reversible. These drugs cause menopausal symptoms while you are taking them. However, your periods usually start again when treatment is stopped.

Women who are close to their natural menopause when they start treatment may find that their periods do not begin again after treatment.

Coping with menopausal symptoms

- Hot flushes and sweats
- Vaginal dryness
- Dry skin
- Difficulty sleeping
- Psychological effects
- Hormone replacement therapy
- Your feelings

In this section you will learn about menopausal symptoms that can result from breast cancer treatment, including ways to control them.

Hot flushes and sweats

These are the most common menopausal symptoms, although the exact cause is unknown. Body temperature control seems to be affected by falling oestrogen levels. It is difficult to stop hot flushes and sweats, but their frequency or intensity can often be reduced.

There are a range of medicines that your doctor can prescribe, to try to reduce the severity and number of flushes and sweats.

- Research trials have shown that **low-dose progestogens** (megestrol acetate, norethisterone and medroxyprogesterone acetate) can help some women. However, they can take at least 3–4 weeks to reduce the number of hot flushes and sweats. Some women have an initial increase (or flare) in the number of the flushes that they have. Other side effects such as breast tenderness and a bloated feeling can also occur.
- **Antidepressants** such as venlafaxine (Efexor®) may also be helpful when given in low doses. Some women have found that they reduce the number and severity of hot flushes, although research trials have shown differing results. These drugs can take several weeks to work and can cause side effects, such as sickness (nausea), a dry mouth, and a decreased appetite. Your doctor or breast care nurse can discuss the possible side effects with you.
- **Clonidine** (Catapres®, Dixarit®) is a drug that is usually used to treat high blood pressure or migraines, and it is sometimes prescribed for hot flushes and sweats. However, it can take four weeks to work, and for a lot of women it may not work at all, or only work for a short while. Side effects include constipation, a dry mouth, and drowsiness.

- **Tibolone** (Livial®) is a type of hormone replacement therapy (HRT) that does not contain oestrogen and does not cause a monthly bleed. It can help to reduce flushes and sweats, and may also protect against bone thinning (osteoporosis). It may also help to reduce feelings of depression, and improve your sex drive. However a large research study has recently found that tibolone increases the risk of breast cancer coming back. Especially for those women taking hormonal treatments like tamoxifen, anastrozole, letrozole and exemestane. You may wish to discuss this further with your specialist. Possible side effects include weight gain, fluid retention, dizziness, irregular vaginal bleeding, headaches, increased growth of facial hair, joint pains, and skin rashes.
- **Other types of HRT** can be prescribed if the symptoms are severe and nothing else helps. However, taking HRT that contains oestrogen after you have had breast cancer can increase the risk of the cancer coming back if your cancer is oestrogen-dependent. Your cancer specialist can discuss with you the possible benefits and risks of HRT in your situation. You may be offered HRT as part of a clinical trial.
- **Progesterone cream**, when applied to the skin, may help to reduce hot flushes. However, research trials have not proved that this cream provides any benefit.

Helpful tips for reducing hot flushes and sweats

- Wear several layers of light clothing (preferably cotton) that you can easily take off or put back on, depending on your body temperature.
- Cut down on alcohol and hot drinks that contain caffeine, such as coffee and tea. Sipping cold drinks may help.
- Avoid spicy foods.
- Lukewarm showers and baths are less likely to trigger sweats than hot ones.
- Flushes and sweats are often worse at night. Put a soft cotton towel on your bed that you can easily change if it gets wet during the night.
- Lowering the room temperature and making sure there is good air circulation, by opening a window or using a gentle fan, can sometimes help.
- A yoga breathing technique known as the 'cooling breath' or sheetali, can help to reduce your body temperature. Contact the British Wheel of Yoga (BWY) to find a registered yoga teacher.
- If you are taking tamoxifen, changing the brand, or having half the dose in the morning and half in the evening, can sometimes reduce hot flushes and sweats. Halving the daily dose may help some women.

Vaginal dryness

A low level of oestrogen in the body causes vaginal dryness, and sometimes itching. Some creams can be helpful when applied directly to the vagina (topical treatment).

Some of the creams contain a small amount of the hormone oestrogen. The long-term risks of using creams containing oestrogen after breast cancer are unknown. There is a possibility that these products could increase the risk of the cancer coming back, although this is uncertain. Topical oestrogen treatments may also affect the cells that line the womb.

Your doctor can tell you which of the products below is most suitable for you. Your treatment should be regularly reviewed by your doctor, and you should tell them about any new symptoms.

Some of the creams may damage condoms and diaphragms, so care should be taken to avoid pregnancy.

- **Replens MD®** is a non-hormonal cream that you apply 2–3 times a week. The cream binds to the vaginal wall and helps to rehydrate cells. It boosts blood flow in the vagina.
- **Vagifem®** is a tablet that you insert into the vagina (a pessary). It is normally used daily for two weeks, and then dosage is reduced to just twice a week. A small research study has shown that Vagifem can increase the amount of oestrogen circulating in the body. Because of this risk, Vagifem may not be recommended for women who are taking aromatase inhibitors, such as anastrozole (Arimidex®), exemestane (Aromasin®), or letrozole (Femara®). Your specialist or breast care nurse can give you further advice and information about this.
- **Ovestin®** and **Ortho-Gynest®** are creams, or pessaries, that can reduce dryness and itching for a short time. They contain a small amount of oestrogen.
- **Estring®** is a vaginal ring that is worn for three months. It slowly releases a small amount of oestrogen and may help to reduce dryness.
- **Water-based lubricants** such as Senselle®, KY-Jelly®, Astroglide® and Sylk® can help to reduce discomfort from vaginal dryness during sex.

Dry skin

A little baby oil, or a few drops of bath oil in your bath, helps to moisturise the skin. Some women have found taking one or more of zinc, vitamin B, and linseed oil supplements helpful.

Difficulty sleeping

You may experience sleeplessness, due to hot flushes and sweats or anxiety. The following suggestions may help you to relax and sleep well, and can help you to feel more in control during the day:

- Have a lukewarm bath to relax before bedtime
- A warm herbal or milk drink before bed can help you to relax
- Wear nightwear that is made of absorbent lightweight cotton.
- If you can't sleep, don't just lie in bed - get up and read, listen to the radio or audio-books, or watch TV until you feel sleepy.
- Your GP can prescribe sleeping tablets for a short period of time; these may help to re-establish a sleep pattern.
- Techniques such as listening to relaxation tapes/CDs, doing relaxation exercises, visualisation, massage or meditation can help to reduce anxiety and sleeplessness.

Psychological effects

The psychological effects of menopausal symptoms can be hard to cope with when you already have to deal with the physical effects of cancer.

Some menopausal symptoms are very difficult to deal with. These include a lower sex drive, mood swings, poor confidence and a loss of concentration and memory. You may feel very emotional or anxious without really knowing why. These symptoms may be quite distressing for you and for your partner, if you have one.

A number of organisations provide support to women going through the menopause. Helpful books are also listed later in this section.

HRT is probably the only effective way of treating severe psychological menopausal symptoms. You will need to discuss with your cancer specialist whether or not HRT is appropriate for you.

Hormone replacement therapy

Women who have had breast cancer are usually advised not to take hormone replacement therapy. This is because there is a risk that the oestrogen it contains can increase the chance of the cancer coming back.

However, if you have troublesome menopausal symptoms, medicines can be used to treat them. If the menopausal symptoms continue despite the medicines, your doctor can prescribe a short course of low-dose progesterone to deal with these. It is important that your progress is very carefully monitored if you take HRT.

Your feelings

Coping with menopausal symptoms after cancer treatment can often be very difficult. You may feel anxious, angry, or frustrated that you are now having to cope with more symptoms. These are all normal reactions.

An early menopause and infertility are often difficult to come to terms with, particularly for women who hoped to have children, or who would have liked to have more children. Many people find it helpful to talk through their feelings with their doctor or nurse, or with friends and family members.

Reducing long-term complications

An early menopause can increase your risk of bone thinning (osteoporosis) and heart disease. There are ways of reducing these risks.

Osteoporosis

Oestrogen helps to maintain bone calcium levels and bone density. The risk of osteoporosis therefore increases after menopause. Regular weight-bearing exercises such as walking, dancing, hiking and gentle weight-lifting help to maintain bone density. Swimming is not so helpful, as your bones are not supporting your weight while you swim. If you already have osteoporosis you should avoid exercises that put too much strain on your bones, such as jogging. A physiotherapist or your breast care nurse can give you further advice about exercise after breast cancer.

It is important to make sure that you get enough calcium and vitamin D in your diet. Dairy products are the best source of calcium but, if you prefer not to eat them, you can get calcium from eggs, green leafy vegetables, nuts, and whole fish such as whitebait, sardines, and pilchards. Vitamin D helps the body to use calcium effectively. A well-balanced diet will normally give you all the calcium and vitamin D you need, but calcium and vitamin D supplements may also be helpful. Be aware that smoking and drinking alcohol can reduce your calcium levels.

If other people in your family have had osteoporosis, you may wish to talk to your cancer specialist about using medicines such as bisphosphonates. These drugs can help to prevent osteoporosis and reduce bone weakening.

The drug tamoxifen, which is commonly used to treat breast cancer, helps to protect the bones in post-menopausal women. Another drug, raloxifene (Evista®), can also help to prevent osteoporosis. However, aromatase inhibitors such as anastrozole (Arimidex®), which are also commonly used to treat breast cancer, can increase the risk of developing osteoporosis. Women taking aromatase inhibitors may need to have their bone density monitored during their treatment.

If you already have osteoporosis, you can talk to your doctor about taking calcium and vitamin D supplements. Warm baths can help to relax stiff joints and regular exercise will keep you supple. Be aware of dangers or trip hazards that could lead to falls. The National Osteoporosis Society can give you more information about prevention of osteoporosis and can let you know about helpful treatments.

Heart disease

The risk of heart disease increases in women after menopause, so you need to follow the well-established advice on reducing your risks:

- Stop smoking if possible, or at least cut down the number of cigarettes smoked each day
- Eat less animal fat and dairy produce, and eat more fresh fruit and vegetables
- Take regular gentle exercise.

If there is heart disease in your family, you may wish to talk to your cancer specialist or GP about using medicines to try to prevent it.

Complementary therapies

There are a variety of complementary therapies that may help you to control your menopausal symptoms. Some of these have been researched, but for others the evidence is only anecdotal (based on personal accounts rather than facts).

Some of these therapies may be available on the NHS, and your GP can give you further details. If you would like to find a complementary therapist, make sure that they are properly qualified and registered. The British Complementary Medical Association has lists of registered therapists throughout the UK.

It is a good idea to discuss the use of any complementary therapy with your doctor, as some therapies may interfere with your cancer treatment.

Types of therapies

Acupuncture

Acupuncture involves putting sterile needles through the skin and into energy points, to help restore health and balance in the body. There is some evidence that acupuncture may help to reduce the number and severity of hot flushes.

Homeopathy

Homeopathy aims to cure 'like with like' by using tiny amounts of substances that would normally produce the symptoms being treated. There is no scientific proof that this works, but some women find that it helps to improve their menopausal symptoms.

Mind therapies

Different **relaxation** techniques, such as progressive muscle relaxation (slowly tensing then releasing each muscle group), audio tapes/CDs, or paced respiration (a technique using slow controlled breathing), may help to reduce hot flushes.

There is some evidence to suggest that **hypnosis** can help to reduce the length and severity of hot flushes. It is unlikely to be available on the NHS.

Dietary supplements

Some women find **evening primrose oil** helpful for relieving menopausal symptoms, although it is expensive and there is no scientific evidence that it works.

Plant oestrogens (phytoestrogens) can have a very weak oestrogen-like effect, and may help to improve menopausal symptoms. However, there is concern that they may also increase the risk of a recurrence of an oestrogen-dependent breast cancer, so it is wise to discuss their use with your doctor. The two most commonly used plant oestrogens are black cohosh and red clover.

- **Black cohosh** contains phytoestrogens and may help to improve flushes, although the evidence is inconclusive. Side effects include sickness (nausea), vomiting, headaches, and possible liver disease. It should not be taken for more than six months at a time.
- **Red clover** contains chemicals called isoflavones, which are a type of phytoestrogen. There is conflicting evidence as to whether or not it can help to reduce menopausal symptoms. It may increase the risk of bleeding and should not be used by women taking medication to thin their blood (anticoagulants).

Vitamin E may help to reduce the frequency of hot flushes, and has very few side effects. Women with heart disease, diabetes, or high blood pressure should consult their doctor before taking vitamin E supplements.

Questions you might like to ask your doctor

You can fill this in before you see the doctor or surgeon, and then use it to remind yourself of the questions you want to ask, and the answers you receive.

1. _____

Answer _____

2. _____

Answer _____

3. _____

Answer _____

4. _____

Answer _____

5. _____

Answer _____

JASCAP : We need your help

We hope that you found this booklet useful.

To help other patients and their families we need and intend to extend our Patient Information Services in many ways.

Our Trust depends on voluntary donations. Please send your donation by Cheque or D/D payable in Mumbai in favour of "JASCAP".

Note for Reader

This JASCAP booklet is not designed to provide medical advice or professional services and is intended to be for educational use only. The information provided through JASCAP is not a substitute for professional care and should not be used for diagnosing or treating a health problem or a disease. If you have, or suspect you may have, a health problem you should consult your doctor.

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