

Understanding your pathology report

This booklet tells you about information in your pathology report, and may help you prepare any questions you want to ask your specialist team.

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Introduction

A pathology report describes the results of any tests done on tissue removed from the body. This booklet tells you about information in your pathology report when you have breast cancer. We hope it helps you understand your pathology report, and ask questions if you need your specialist team to explain anything more clearly.

If you have further questions or would like more information, please call Breast Cancer Care free on **0808 800 6000** (Text Relay 18001).

What is a pathology report?

Pathology is the branch of medicine that looks at how disease affects the body's cells and tissues. Each time you have tissue removed a report is written by a pathologist (a doctor who examines the tissue).

For example, a report will be written if you have a biopsy (removal of tissue to be looked at under a microscope), breast-conserving surgery (removal of the cancer and a margin of normal breast tissue around the cancer) or a mastectomy (removal of all the breast tissue including the nipple area).

The information in these pathology reports helps your specialist team decide which treatments work best for you. The amount of detail in each report will depend on what tissue you've had removed.

Not all the results will be included in every report. For example, a pathology report after a biopsy of a breast lump – where tissue is removed from a small, defined area – won't contain all the information that's in a report following surgery. You may need to wait for all your pathology reports before a full treatment plan can be decided.

For more information on different types of surgery see our **Treating breast cancer** booklet.

Waiting for your results

Most people feel anxious waiting for pathology results. How long you wait depends on the type of surgery you've had and where you're treated. Some tests take longer than others and different tests may be done in different laboratories.

Biopsy results may be ready in a few days (sometimes the same day), while results from breast-conserving surgery or a mastectomy usually take between one and two weeks. Your specialist or breast care nurse should be able to tell you when your results will be ready.

When you're first given your results you may find it hard to take it all in. It can help to take a relative or close friend with you. If you're told anything you don't understand, ask your specialist or breast care nurse to explain. You can ask for a copy of your pathology report to read through with a member of your breast care team or later in your own time. You can also call Breast Cancer Care on **0808 800 6000** to discuss the results.

Second opinions

Sometimes your doctor or you may want to get a second opinion about the pathology results. If this is important for you, you should talk with your doctor.

What's in a pathology report?

Not all pathology reports look the same. The layout and terms used vary between hospitals.

Your pathology report starts with general information such as your name, date of birth and hospital number, as well as your specialist's name and the date of your surgery or biopsy.

This is usually followed by a description of the breast tissue before it's looked at under a microscope. This section of the report is called the gross or macroscopic description and may include information about:

- the size, weight and appearance of the tissue
- where it was in the breast before it was removed
- how it was prepared for examination under the microscope.

Next follows the microscopic description, which points out all the features of the cancer seen under a microscope.

Finally, there's a summary of the main points, sometimes in a list at the end of the report.

All the information in the pathology report is considered together when deciding which treatments to offer you and their likely benefits. No one piece of information should be looked at on its own – it always needs to be related to all the other information in the report.

Information about your breast cancer

How much do you want to know?

You may want to learn everything you can about breast cancer and how it's treated. There's a huge amount of information available, especially on the internet. However, some of it can be misleading or outdated, so make sure you visit up-to-date websites. Your specialist team can suggest where to find information.

What is breast cancer?

Breast cancer starts when cells in the breast begin to divide and grow in an abnormal way. Breast cancer is not one single disease.

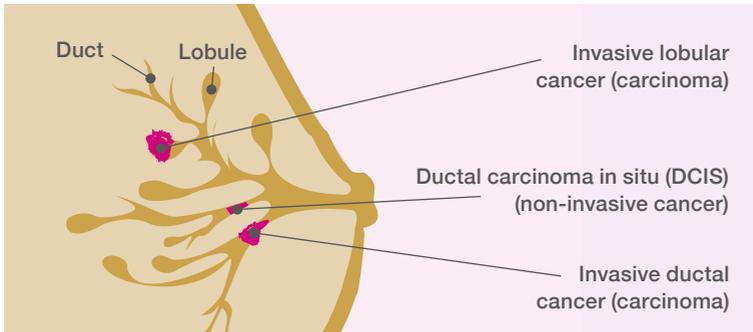
What type of breast cancer is it?

There are many different types of breast cancer, which are diagnosed depending on what the cancer cells look like under the microscope.

Breasts are made up of lobules (milk-producing glands) and ducts (tubes that carry milk to the nipple). These are surrounded by glandular, fibrous and fatty tissue.

Breast cancer can be invasive or non-invasive (also called 'in situ').

- Invasive breast cancer has the potential to spread to other parts of the body.
- Non-invasive breast cancer has not developed the ability to spread out of the ducts, either within the breast or elsewhere in the body.



Most types of breast cancer are invasive. Often there are areas of both non-invasive and invasive breast cancer at the same time.

The most common type of invasive breast cancer is called no special type (NST), also known as invasive ductal cancer or not otherwise specified (NOS) in the pathology report.

The second most common type of breast cancer is invasive lobular.

However, there are many other, rare sub types of breast cancer that may also be named in the report. These sub types have patterns of cells that make them look different from each other under the microscope. They include tubular, cribriform, mucinous, medullary-like, invasive papillary, invasive micropapillary and metaplastic types, among others.

Ductal carcinoma in situ (DCIS) is an early form of breast cancer.

We produce a range of booklets and have information on our website on different types of breast cancer and their treatments. Call us on **0808 800 6000** or visit www.breastcancercare.org.uk for more information.

Treatment options

Different treatments will be recommended depending on the type of breast cancer you have.

Our booklet **Treating breast cancer** has more information on the factors that affect which treatments are recommended. You may also find our **Primary breast cancer resource pack** useful.

You may want to ask:

- What type of breast cancer do I have?
- Is the breast cancer invasive or non-invasive?
- Where can I get more information?
- Can I have a copy of the pathology report?

How big is the breast cancer?

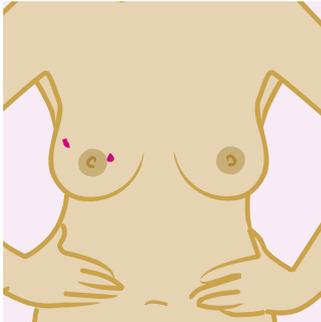
The size of the breast cancer is usually measured in millimetres (mm) or centimetres (cm). One inch equals about 2.5cm. Although in general smaller cancers may have a better outcome, size doesn't always give the whole picture and is just one part of the overall report. A small cancer can be fast growing while a larger cancer may be slow growing, or it could be the other way around.

Size in centimetres and millimetres

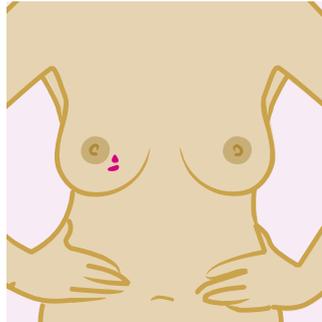


Sometimes there may be more than one area of breast cancer. In this case each area is measured. Multi-centric means there's more than one area of breast cancer in different quarters of the breast. Multi-focal means more than one area has been seen but only in one quarter of the breast. Your pathology report will probably say if the cancer is localised (which means there's only one area) or multiple foci (when there's more than one area of cancer).

Multi-centric breast cancer



Multi-focal breast cancer



Treatment options

The size and position of the cancer in relation to your breast size may affect what operation you're offered. For example, with smaller cancers it's often possible to have breast-conserving surgery (also called wide local excision or lumpectomy). This is where only the cancer and a margin (border) of normal breast tissue surrounding it are removed.

If you have a larger cancer (in relation to your breast size), you may be recommended to have a mastectomy or be offered the option of having chemotherapy before surgery (called neo-adjuvant or primary chemotherapy). This is sometimes given with the aim of shrinking the cancer before surgery.

Your specialist team will make a decision about whether to recommend chemotherapy depending on the size of the breast cancer and other features, such as whether or not the lymph nodes are affected (see page 13). Generally, people with larger breast cancers (greater than 2cm) are more likely to be offered chemotherapy. This is because larger cancers may have been there longer before being found and so may have had more chance to spread.

There are a number of different online decision-making tools that can help your doctors and you decide if chemotherapy is suitable. Some examples are below but your specialist team may mention others to you as well.

- Adjuvant! Online
- PREDICT
- Oncotype DX test

For more information read our **Chemotherapy for breast cancer** booklet.

You may want to ask:

- What size is the breast cancer?
- Is there more than one area of breast cancer?

What grade is the breast cancer?

Cancers are given a grade according to how different they are to normal breast cells and how quickly they are growing. In your pathology report this may also be called differentiation.

Invasive breast cancer

There are three grades of invasive breast cancer:

- grade 1 (well differentiated) – the cancer cells look most like normal cells and are usually slow-growing
- grade 2 (moderately differentiated) – the cancer cells look less like normal cells and are growing faster
- grade 3 (poorly differentiated) – the cancer cells look most changed and are usually fast-growing.

Ductal carcinoma in situ (DCIS)

There are also three grades of DCIS which are usually referred to as low, intermediate and high.

Treatment options

People with grade 3 invasive breast cancers are more likely to be offered chemotherapy to help destroy any cancer cells that may have spread as a result of the cancer being faster growing.

You may want to ask:

- What grade is the breast cancer?

What does Ki67 mean?

Some specialist teams measure a protein called Ki67 as well as grade. The pathology report will say what percentage of cancer cells test positive for Ki67. A result of less than 10% is considered low, 10–20% is medium and more than 20% is high. The higher the score, the faster the cells are dividing and growing.

Ki67 results are not yet routinely used to inform decisions about whether chemotherapy is recommended.

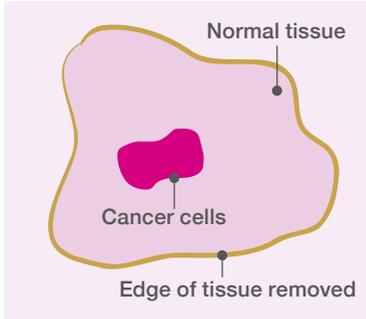
Has the breast cancer been completely removed?

Your pathology report will say how close the cancer cells are to the edges of the whole area of tissue that was removed. This is called the surgical margin. It's important that the cancer is removed with an area of healthy tissue around it to make sure no cancer cells have been left behind.

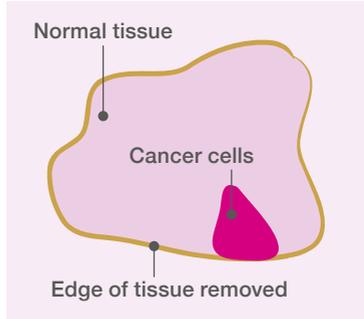
- Negative (clear) margins mean no cancer cells were seen at the outer edge of the tissue removed.
- Positive margins mean the cancer cells are very close to or do reach the edge of the tissue.

Your pathology report is likely to give the distance of the cancer to all the margins around it. Words you may see in your report include superior (top), inferior (bottom), medial (towards the middle), lateral (towards the edge), superficial/anterior (front) and posterior/deep (back). Different hospitals will have their own guidelines as to how large the margin of clear, healthy tissue should be, but it's usually a minimum of 1mm around the cancer.

Negative (clear) margins



Positive margins



Treatment options

If you have negative or clear margins, it's unlikely you'll need more surgery to the breast. If you have positive or close margins, you may need to have another operation to take out more tissue depending on which, and how many, margins are involved. This sometimes means having a mastectomy to ensure all the cancer has been removed.

You may want to ask:

- Has all the breast cancer been removed, as far as you can tell?

Are there any breast cancer cells in the lymph vessels or blood vessels (lympho-vascular invasion)?

The breast contains networks of lymph vessels and blood vessels that connect the breast to the rest of the body. If breast cancer cells break through (invade) the walls of these vessels, it's called lympho-vascular invasion. This increases the chances of the breast cancer spreading to somewhere else in the body. The pathology report will say if any lympho-vascular invasion has been seen in the tissue removed during surgery.

Treatment options

People with lympho-vascular invasion are more likely to be offered chemotherapy to help destroy any cancer cells that may be in the lymphatic system or bloodstream.

You may want to ask:

- Are there any signs of lympho-vascular invasion?

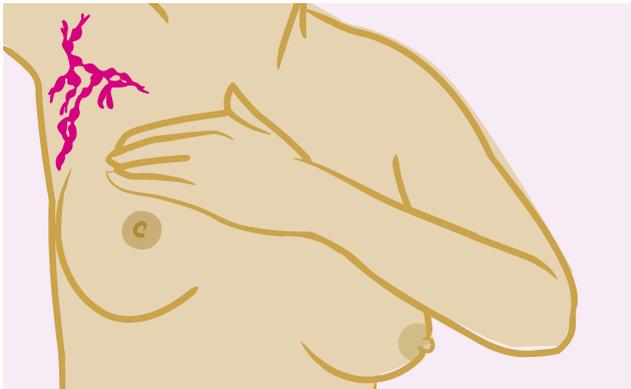
Are there any breast cancer cells in the lymph nodes?

Breasts have a network of lymph vessels that drain into the lymph nodes (glands) under the arm (axilla). The number of nodes under the arm varies from person to person.

If you have invasive breast cancer, your specialist team will want to check if any of the lymph nodes under the arm contain cancer cells.

Sentinel lymph node biopsy is widely used for people with breast cancer whose tests before surgery show no evidence of the lymph nodes containing cancer cells. It identifies whether or not the first lymph node (or nodes) is clear of cancer cells.

Lymph nodes under the arm



- Negative lymph nodes mean the nodes tested are free of cancer cells.
- Positive lymph nodes mean there are cancer cells in the nodes.

The pathology report will state how many lymph nodes were removed during surgery and how many contain breast cancer cells. This is often written as a number. For example, 2/10 means 10 lymph nodes were removed and 2 had cancer cells inside them. The more positive lymph nodes there are, the higher the likelihood that the cancer has spread to somewhere else in the body.

Sometimes there's only a very tiny area of breast cancer in the lymph nodes. Where the cancer in the lymph node is between 0.2mm and 2mm, this is called a micrometastasis. Where the area of cancer within the lymph node is less than 0.2mm, these are called isolated tumour cells (ITCs).

Treatment options

If you have micrometastases or isolated tumour cells in your lymph nodes, it's unlikely you'll be offered any further treatment to the underarm.

People whose sentinel lymph nodes contain cancer cells (known as positive sentinel lymph nodes) may be offered further treatment to the underarm. This may involve surgery to remove more lymph nodes or radiotherapy to the underarm. Whether you are offered further treatment will depend on how many lymph nodes are affected and other features of the breast cancer, such as the grade.

Anyone with lymph node positive breast cancer is more likely to be offered chemotherapy to help destroy any remaining cells, either in the nodes or elsewhere in the body.

You may want to ask:

- Has the cancer spread to the lymph nodes?
- How many lymph nodes are affected?

Is the breast cancer oestrogen receptor positive (ER+)?

All invasive breast cancers are tested for oestrogen receptors using tissue from a biopsy or after surgery. As the hormone oestrogen can play a part in stimulating some breast cancers to grow, there are a number of hormone therapies that work in different ways to block the effect of oestrogen on cancer cells.

Hormone therapy will only be prescribed if your breast cancer has receptors within the cell that bind to the hormone oestrogen and stimulate the cancer to grow (known as oestrogen receptor positive or ER+ breast cancer).

When oestrogen receptors are not found (oestrogen receptor negative or ER-) tests may be done for progesterone (another hormone) receptors. The benefits of hormone therapy are less clear for people whose breast cancer is only progesterone receptor positive (PR+ and ER-). Very few breast cancers fall into this category. However, if this is the case for you your specialist will discuss with you whether hormone therapy is appropriate.

Sometimes a score (usually out of 8) is used to indicate a combination of the average amount of hormone receptors per cancer cell and the proportion of cells with receptors. The overall percentage of cells with hormone receptors is also sometimes given (from 0% to 100%).

Treatment options

If your cancer is oestrogen receptor positive, your specialist will discuss with you which hormone therapy they think is most appropriate.

For more information see our booklets on individual hormone therapy drugs.

If your breast cancer is hormone receptor negative, hormone therapy drugs will not be of any benefit to you.

You may want to ask:

- Is the breast cancer hormone receptor positive (ER+)?
- Will I benefit from hormone therapy and why?
- What type of drug would be best for me and are there any alternatives?

Are the breast cancer cells HER2 positive?

All invasive breast cancers are tested for HER2 levels. The results are usually available between one and three weeks after your biopsy or surgery. Some breast cancer cells have a higher than normal level (known as overexpression) of a protein called HER2 on their surface, which stimulates them to grow. Around 15–20% of invasive breast cancers have this and are called HER2 positive. These cancers tend to grow and spread faster than HER2 negative breast cancers.

There are various tests to measure HER2 levels. The three most commonly used tests are IHC (immunohistochemistry), FISH (fluorescent in situ hybridisation) and CISH (chromogenic in situ hybridisation).

IHC is usually done first. It involves a special staining process performed on a sample of breast cancer tissue. It's reported as a score ranging from 0–3. A score of 0 or 1+ means the breast cancer is HER2 negative. A score of 2+ is borderline and a score of 3+ means the breast cancer is HER2 positive.

Breast cancers with a borderline result (2+) should be retested with FISH or CISH to determine if they are truly HER2 positive. These are more specialised tests and are reported as positive or negative.

Treatment options

People with HER2 positive invasive breast cancer are likely to be advised to have chemotherapy and also drug treatments called targeted therapies. The most well-known targeted therapy is trastuzumab (Herceptin).

Trastuzumab works by attaching itself to the HER2 proteins (also known as receptors) so that the cancer cells are no longer stimulated to grow. It also helps the body's immune system destroy breast cancer cells.

For more information see our **Trastuzumab (Herceptin)** booklet.

You may want to ask:

- Is the breast cancer HER2 positive (HER2+)?
- Will I benefit from HER2 targeted treatment such as trastuzumab (Herceptin) and why?

Questions you may want to ask

What type of breast cancer do I have?

Is the breast cancer invasive or non-invasive?

What size is the breast cancer?

Is there more than one area of breast cancer?

What grade is the breast cancer?

Was the breast cancer tested for Ki67?

Has all the breast cancer been removed as far as you can tell?

Are there any signs of lympho-vascular invasion?

Has the cancer spread to the lymph nodes?

How many lymph nodes are affected?

Is the breast cancer hormone receptor positive (ER+)?

Is the breast cancer HER2 positive (HER2+)?

Helping you face breast cancer

If you've been diagnosed with breast cancer there's a lot to take in. It can be an emotional time for you, your family and friends. Our free information and support services are here to help – on the phone, or online 24 hours a day.

Ask us

Calls to our free Helpline are answered by specialist nurses and trained staff with personal experience of breast cancer. They'll understand the issues you're facing and can answer your questions. Or you can Ask the Nurse by email instead via our website.

Free Helpline **0808 800 6000** (Text Relay 18001)
Monday–Friday 9am–5pm, Saturday 10am–2pm
www.breastcancercare.org.uk/ATN

Expert information

Written and reviewed by healthcare professionals and people affected by breast cancer, our free booklets and other information resources cover all aspects of living with breast cancer. Download or order booklets from our website or call the Helpline.

Talk to someone who understands

Our Someone Like Me service puts you in contact with someone else who's had breast cancer and who's been fully trained to help. This can be over the phone or by email.

You can also chat to other people going through breast cancer on our online discussion Forum. It's easy to use, professionally moderated and available to read any time of day.

Find out more about all of our services for people with breast cancer at www.breastcancercare.org.uk/services or phone the Helpline.

We're here for you: help us to be there for other people too

If you found this booklet helpful, please use this form to send us a donation. Our information resources and other services are only free because of support from people such as you.

We want to be there for every person facing the emotional and physical trauma of a breast cancer diagnosis. Donate today and together we can ensure that everyone affected by breast cancer has someone to turn to.

Donate by post

Please accept my donation of **£10/£20/my own choice of £**

I enclose a cheque/PO/CAF voucher made payable to
Breast Cancer Care

Donate online

You can give using a debit or credit card at
www.breastcancercare.org.uk/donate

My details

Name _____

Address _____

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Email address _____

We might occasionally want to send you more information about our services and activities

- Please tick if you're happy to receive email from us
- Please tick if you don't want to receive post from us

We won't pass on your details to any other organisation or third parties.

Please return this form to Breast Cancer Care, Freepost RRRKZ-ARZY-YCKG,
5-13 Great Suffolk Street, London SE1 0NS



About this booklet

Understanding your pathology report was written by Breast Cancer Care's clinical specialists, and reviewed by healthcare professionals and people affected by breast cancer.



**For a full list of the sources
we used to research it:**

Phone 0345 092 0808

Email publications@breastcancercare.org.uk



You can order or download more copies from
www.breastcancercare.org.uk/publications



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the breast cancer
support charity

Breast Cancer Care is the only UK-wide charity providing specialist support and tailored information for anyone affected by breast cancer.

Our clinical expertise and emotional support network help thousands of people find a way to live with, through and beyond breast cancer.

Visit www.breastcancercare.org.uk or call us free on **0808 800 6000** (Text Relay 18001).

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Diagnosed with breast cancer