

Fig 6: Lymphatic channels drain fluid from the body and carry it to the lymph nodes.

The sentinel node biopsy is now used as a way to assess all the nodes in the axilla. This technique has become the standard way of checking whether or not the lymph nodes in the axilla are involved. The sentinel node acts like a guardian node for the rest of the nodes in the axilla, and is the first node that will be involved if the breast cancer spreads to involve these glands. It has been proven that if the tumour is to spread using the lymph system that it would involve the sentinel node first before spreading to other lymph nodes and other areas of the body via the bloodstream.

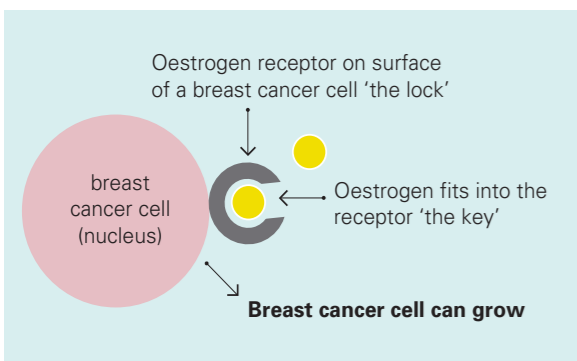


Fig 7: Oestrogen receptors on the surface of the nucleus inside the cell allow oestrogen from the bloodstream to fit into these receptors like a key fits into a lock. This causes the breast cancer cells to grow.

Sometimes if there is disease detected in the lymph nodes before surgery (and confirmed with a biopsy), all the lymph nodes in the arm pit will need to be removed. Also if the sentinel lymph node is involved then the surgeon will need to discuss with you about further treatment for the remaining lymph nodes in the arm pit. The pathologist will examine all the lymph nodes in the tissue removed from the arm pit at surgery and measure the amount of cancer present in the nodes and whether or not this has spread outside the lymph node itself (extranodal spread).

Oestrogen and Progesterone Receptors

On the surface of many breast cancer cells there are receptors which can interact with oestrogen present in the normal bloodstream of women. These signals can make the breast cancer cells multiply and grow.

The pathologist will test for these receptors on the breast cancer cells and the report will contain information on the percentage of the breast cancer cells that bear the oestrogen receptor. About 90% of breast cancers bear this receptor and are referred to ER positive (oestrogen receptor positive) breast cancer. Therapies that block this effect of oestrogen such as Tamoxifen and aromatase inhibitors help to block the effect of oestrogen on the breast cancer.

HER2 receptors

Like oestrogen receptors, HER2 receptors can promote growth and proliferation in breast cancers. Specific genes in the breast cancer signal the cells to make the HER2 receptor on the breast cancer cells. When these receptors bind to chemicals in the bloodstream, this causes the breast cancer cells to grow and multiply uncontrollably.

Extremely successful treatment is now available that target the proliferating cells in HER2 positive breast cancers.

Proliferation in breast cancers

The rate at which a breast cancer is able to grow can be estimated in a couple of ways. Firstly by assessing the mitotic rate. A mitotic figure is a cell in the process of dividing, and is seen under the microscope. The pathologist will count the number of these types of cells in a defined area. A second way is to estimate the number of cells which contain Ki67. Ki67 is a protein which is expressed in cells which are proliferating or about to proliferate. The pathologist will estimate the number of cancer cells which contain this protein.

How will the information in my pathology report be used?

The information in the pathology report will be discussed at a multidisciplinary tumour meeting. Present at this meeting are the treating surgeons and oncologists together with the pathologist and radiologist. Also present are many other members of the breast cancer team such as breast care nurses, occupational therapists, clinical psychologists, clinical trial nurses and researchers. The information in the pathology report is critical for making decisions about the next steps in your management.

How are decisions about my treatment made?

There are many factors that are taken into consideration in determining further treatment following surgery. The features in the pathology report will give your treating doctors an indication of the aggressiveness of the tumour. The presence of receptors on the cancer cells will also be an important factor, taken together with the size of the tumour and whether or not the lymph nodes in the arm pit contain cancer. Your general health at the time is also taken into consideration. These decisions are made in the multidisciplinary meeting and then will be discussed with you by your treating doctors.

You may feel overwhelmed as there is great deal of information to process. This is normal, and you should write down any questions that you have and even ask for a copy of your pathology report to take home. This will give you time to understand things and note down any questions that you may have to ask at your next visit.

Useful contacts/websites

Cancer Australia	canceraustralia.gov.au
Cancer Council	cancer.org.au
Cancer Council Helpline	13 11 20
Breast Cancer Network Australia (BCNA)	1800 500 258 bcna.org.au

Supporting People with Breast Cancer Today and Every Day

- ✿ Providing screening, diagnosis, treatment and care by expert teams
- ✿ With world-class research, education and innovation
- ✿ Engaging the help of our community and supporters
- ✿ To shine a Ray of Hope



westmead
breast cancer
institute

PO Box 143
Westmead NSW 2145
T +61 2 8890 6728
F +61 2 8890 7246
www.bci.org.au



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IMPORTANT At all times you should rely on the expert judgement of your medical advisor(s). This information guide is not a substitute for medical advice. It is designed to help you understand and discuss your treatment.

Figures 1-7 Westmead BCI

A Guide To Your Breast Cancer Pathology Report

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If you have recently had an operation for breast cancer, the surgical specimen(s) would have been sent to a pathology laboratory where it is processed for examination by a pathologist (a specialist doctor who has expertise in diagnosing and interpreting findings by examining tissues under a microscope). The pathologist will issue a pathology report that contains all the relevant information that your doctors and you will require to make a plan for your ongoing treatment.

Please be aware that the information provided in this factsheet is of a general nature. Your pathology report contains information that is specific to you and it is important that this is discussed with your treating doctor.

What happens to the tissue that is removed during my surgery?

These samples are placed in formalin, this is a chemical which preserves the tissue and prevents it from degenerating. The tissue is then sent to a pathology laboratory where it is carefully examined and relevant areas are sampled and made into paraffin wax blocks. Very thin sections are cut from these blocks and stained with special dyes for the pathologist to examine as slides under a microscope. Following the report being issued these blocks are kept for several years in case additional tests are required.

When will my pathology report be ready?

Many of the processes required to produce the slides from the tissue removed at surgery will take many hours. For example the tissue usually needs to be within a preservative (formalin) overnight to ensure the chemical is well absorbed so that the tissue does not degenerate, in addition, the slides require at least 24 hours in a processing and staining machine before they are ready for the pathologist to analyse. The whole process usually

takes 2 to 3 days in total. A preliminary report is usually available 4 or 5 days after surgery and results on the receptors (oestrogen, progesterone and HER2) are available 1 or 2 days later.

What information does my pathology report contain?

The pathology report contains detailed information about your breast cancer and is essential in helping to guide your treatment. This includes information on the size of the tumour, whether the lymph nodes in the armpit (axilla) are involved, how aggressive the tumour is and also whether or not the tumour has hormone receptors. These features will help the treating doctors decide on what additional treatment you may or may not need.

Macroscopic/Gross description:

This part of the report describes the tissues that were removed at surgery and is a description of the appearances of the tissue seen with the naked eye. This will include details on which parts of the tissue were selected to make the slides and inking of the specimen with special dyes to help the pathologist assess if all of the tumour has been removed.

Microscopic description

This part of the report describes the findings seen by the pathologist under the microscope. There will be a detailed description of all the features that are required for your treatment team to decide on the next treatments that will be required.

Tumour type

Many types of breast cancer exist and many of these will behave in a different manner. The tumour type depends on the way the breast cancer looks under the microscope. More than 80% of tumours are ductal tumours of no special type (NST). The second most common type of breast cancer is invasive lobular carcinoma.

Tumour size

This is an important aspect of the breast cancer and helps to determine the stage of the breast cancer and an indication of how much disease there is in the breast. This is one of the factors that assists with decisions on what additional treatment is required.

Ductal carcinoma in situ

This is a breast cancer that is non-invasive or confined to the ducts of the breast, as compared with invasive breast cancer which has spread beyond the ducts into the surrounding breast tissue.

The DCIS can be low, intermediate or high grade depending on how different the cells look compared with normal breast cells. As with invasive breast cancers the higher the grade the more likely they are expected to grow beyond the normal breast duct and spread into the adjacent breast tissue.

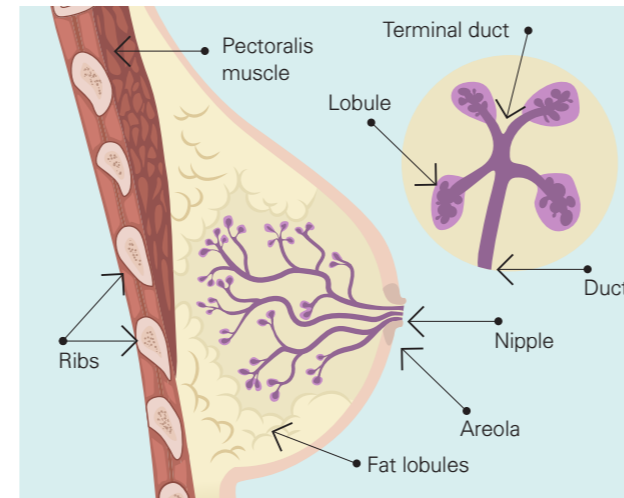


Fig 1: Breast cross-section. The ducts leading to the nipple can be affected by ductal carcinoma in situ (DCIS)

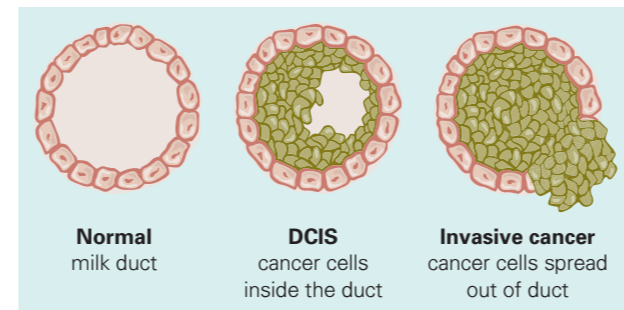


Fig 2: Normal cells lining a milk duct may develop into DCIS; sometimes this will progress to invasive cancer.

Tumour grade

The tumour grade provides an indication on how aggressive a tumour is and is based on an assessment of various features seen in the tumours. The tumour grade ranges from 1 to 3, with grade 1 tumours being the lowest grade tumours which resemble normal cells in the breast and are expected to grow at a slower rate and less likely to spread to the lymph nodes or other areas of the body. Grade 3 tumours on the other hand show marked differences from normal breast cells, generally are expected to grow faster and may spread to the glands in the arm pit and other areas of the body if left untreated.

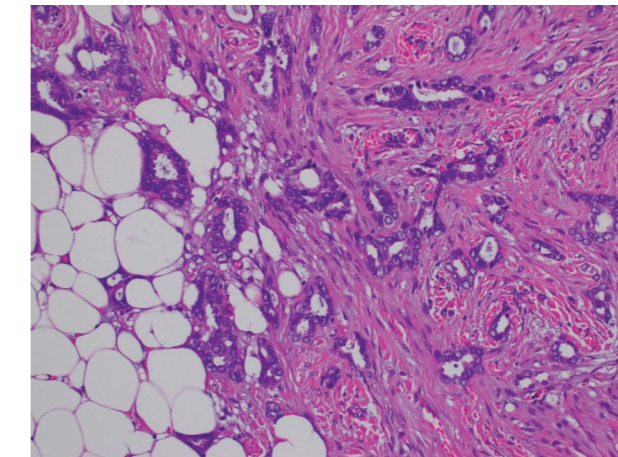


Fig 3: Grade 1. Invasive Carcinoma

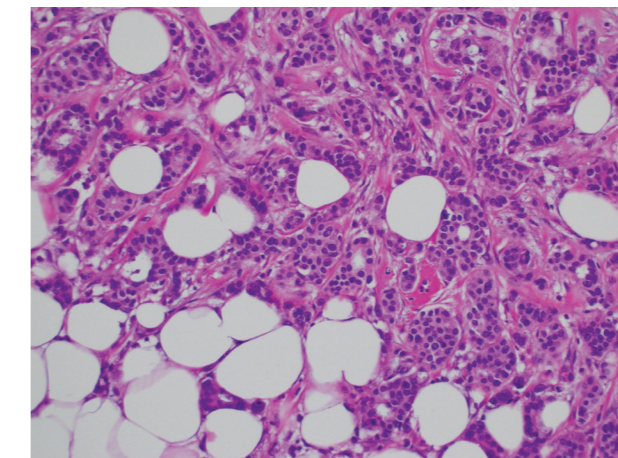


Fig 4: Grade 2. Invasive Carcinoma

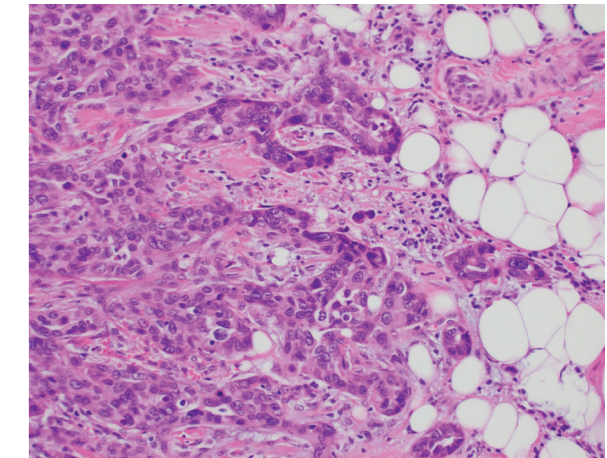


Fig 5: Grade 3. Invasive Carcinoma

Margins of resection

One of the main aims of surgery is to remove all the breast cancer with an area of normal breast around it wherever possible. The pathologist will measure how far the tumour cells are from the edges (margins) of the removed tissue to make sure all the tumour has been removed. Even very narrow margins may be adequate and sometimes even if there are some tiny areas of tumour at the edge of the tissue, there may be no further tissue to take. The pathologist and the surgeon will discuss your case at the multidisciplinary meeting to decide whether or not further surgery is required.

Lymphatic or lymphovascular space invasion

Within the breast there is a network of tiny vessels that help circulate fluid and cells that help fight infections and remove waste products. Sometimes cancer cells are seen within these vessels and use these vessels as a mechanism to escape from the breast. If these cells are seen there is an increased risk of more aggressive behaviour by the cancer.

Lymph nodes

The lymph vessels described above help to drain fluid from the breast to the lymph glands in the arm pit. Fluid and debris are carried to the lymph nodes in the arm pit which act as filters in the breast. If the breast cancer spreads beyond the breast these lymph nodes are the first to be affected.