

During the diagnosis and treatment of breast disease there are many radiological tests and procedures that may be requested for you in order to appropriately identify and treat your disease. Below are some of the common procedures and an outline of what they involve.

Mammogram

A mammogram is a low-dose x-ray that allows doctors called *radiologists* to look for changes in breast tissue. A mammogram uses a machine designed to look only at breast tissue and it has two plates that compress or flatten the breast to spread the tissue.

What to expect when getting a mammogram:

- You'll have to undress above the waist to get a mammogram. You and the technologist are the only ones in the room during the mammogram.
- To get a high-quality picture, your breast must be flattened. The technologist places your breast on the machine's plate. The plastic upper plate is lowered to compress your breast for a few seconds while the technologist takes a picture. You will then need to change position before the next picture is taken.
- The whole procedure takes about 20 minutes. The actual breast compression only lasts a few seconds each time. You might feel some discomfort when your breasts are compressed, and for some women it can be painful. Tell the technologist if it hurts.
- A full report of the results of your mammogram will be sent to your health care provider.

Breast Ultrasound

A breast ultrasound may be done alone or following a mammogram, especially if areas of concern are identified. It is an examination which uses high frequency sound waves to view the internal structure of your breast. It can help to distinguish fluid filled lumps in the breast (cysts), from solid lumps which may be cancerous or benign. It is not usually uncomfortable or painful.

What to expect when getting a breast ultrasound:

- You will be asked to lie on a bed and one breast at a time will be examined. Gel is applied to the skin and an ultrasound probe (called a transducer) is placed on the breast and gently moved around the breast to examine the breast tissue.
- Examination of the armpit (or axilla) will also be undertaken to assess for any enlarged lymph glands (or nodes – a lump or swelling).
- The examination takes between 15-30 minutes. Sometimes the sonographer will ask you to wait and have the images checked by the radiologist.
- Sometimes it will be necessary for the radiologist to attend the examination and they may also want to examine your breast if you have a symptom (like a lump or skin changes).
- The examination is performed by a sonographer. They may be male or female. If you are not comfortable with a male you should let the reception staff know this prior to having the test.

Magnetic Resonance Imaging or MRI

MRI is sometimes used in women who already have been diagnosed with breast cancer, to help measure the size of the cancer, look for other tumors in the breast, and/or to check for tumors in the opposite breast. But not every woman who has been diagnosed with breast cancer needs a breast MRI.

What you need to know about getting a breast MRI

Just as mammograms are done using x-ray machines specially designed for the breasts, breast MRI also requires special equipment. This MRI machine is called an *MRI with dedicated breast coils*. Not all hospitals and imaging centres have dedicated breast MRI equipment. If you are having a breast MRI, it's important to have it at a facility with dedicated equipment, and that can do an MRI-guided breast biopsy.

MRI uses strong magnets instead of radiation to make very detailed, cross-sectional pictures of the body. An MRI scanner takes pictures from many angles, as if someone were looking at a slice of your body from the front, from the side, or from above your head. MRI creates pictures of soft tissue parts of the body that would sometimes be hard to see using other imaging tests.

MRI scans are usually done on an outpatient basis. You will be asked to lie face down on a narrow, flat table. Your breasts will hang down into an opening in the table so they can be scanned without being compressed. The technician may use pillows to make you comfortable and help keep you from moving. The table then slides into a long, narrow tube and the test is conducted.

Please tell the radiologist or Doctor:

- If being in a tight space might be a problem for you
- If you have any of these types of medical implants, you should not even enter the MRI scanning area unless you're told it's OK to do so by a radiologist:
 - An implanted defibrillator or pacemaker
 - Clips used on a brain aneurysm
 - A cochlear (ear) implant
 - Metal coils inside blood vessels

Before the test, you'll be asked to undress and put on a gown without zippers or metal. Be sure to remove any metal objects you can, like hair clips, jewellery, dental work, and body piercings.

Breast Biopsy

A breast biopsy is a test that removes cells or tissue from the breast so that it can be examined by a pathologist under a microscope. It provides important information about your breast tissue, which helps to make a diagnosis and plan treatment.

There are several types of biopsy that can be used to take a sample of cells and or tissue from the breast. These biopsies include:

- Fine needle biopsy (also called fine needle aspiration biopsy, FNA or FNAB).
- Core biopsy (also called core needle biopsy or CNB).
- Vacuum-assisted core biopsy (also called VACB or Mammotome®).

These procedures all differ slightly in the way they are done and in the information they can give.

Fine Needle Biopsy (FNB)

Fine needle biopsy is a quick and simple test. It removes a collection of cells from the breast with a tiny needle in much the same way as a blood sample is taken. These cells are examined by a pathologist under a microscope. It usually only takes a few minutes and no preparation is required.

How is a fine needle biopsy done?

- Local anaesthetic is not usually needed for this procedure.
- A fine needle is put through the skin into the breast tissue.
- The needle stays in the breast for 20-30 seconds, gently moving through the tissue to collect cells.

Core Biopsy (also called core needle biopsy or CNB)

This test removes tiny pieces (cores) of tissue from the breast for examination by a pathologist. A specialised biopsy needle is used to take the sample. Most people describe a core biopsy as uncomfortable, but not painful.

How is a core biopsy done?

- Local anaesthetic is injected to numb the skin and breast tissue; the anaesthetic takes about 30 seconds to take effect.
- A tiny cut is made in the skin and the core biopsy needle is put through this into the breast tissue.
- The biopsy uses an automatic needle that makes a loud click as a sample is taken.
- The procedure is usually repeated several times (usually 2–5 times) through the same point until enough tissue has been collected.
- Pressure is applied to the breast to help stop bruising and a dressing is put on the wound. There are no stitches needed after a core biopsy.

You may have a waterproof dressing that needs to stay in place for a few days. You will be given information about how to look after the biopsy wound before you leave the clinic.

You may need to take some simple pain medication such as paracetamol when the local anaesthetic wears off. An ice pack is also useful to reduce pain and bruising after a core biopsy.

Vacuum-Assisted Stereotactic Core Biopsy (VACB) (Mammotome® or Vacora®)

VACB is a specialised type of core biopsy. This procedure removes lots of small pieces of tissue from the breast. It is similar to a standard core biopsy, but uses specialised needles with suction to help get the sample from the breast.

These procedures may use computer technology to accurately guide the biopsy needle to the right position. It can also be done under the guidance of ultrasound. It usually takes an hour or more to perform the biopsy. Depending on what type of VACB to have, you will be either lying down or sitting up during the procedure.

How is a stereotactic VACB done?

- The breast will be gently compressed to hold it in place. An image is taken to locate the required area.
- The doctor will numb the skin of the breast with an injection of local anaesthetic.
- The needle is put into the breast and a vacuum is applied, several small samples of tissue are removed. You will hear a whirring noise as the sample is taken.
- A further mammogram picture is taken at the end of the procedure.
- An X-ray is taken of the tissue that is removed to confirm that it contains the abnormal area.
- Paper tapes and a dressing are put on the wound (stitches are not normally needed).

Breast Hook wire (Guidewire)

Guide-wire localised breast surgery is a technique used to remove an abnormal area in the breast that can be seen on ultrasound or mammogram but cannot be felt clinically. A tiny wire (similar to fine fuse wire or fishing line) is placed in the breast before the operation. This wire guides the surgeon to the correct area in the breast during the operation.

Inserting the guide -wire

The guide-wire will be put in by a radiologist a few hours before the operation.

The abnormal area in the breast will be found with mammogram or ultrasound. An injection of local anaesthetic will be given to numb part of the breast and the guide-wire will be inserted under the guidance



of the mammogram or ultrasound. The method of guidance used depends on the type of abnormality in the breast.

Often a mammogram will be performed after the wire has been inserted. The mammogram is performed with minimal pressure on the breast so that it does not make the wire move. This checks the position of the wire and helps the surgeon plan the operation. Once the wire is in position, it will be taped in place and a dressing will be put on. Most patients don't have any pain once the wire is taped in place.

Nuclear Medicine Sentinel Node Examination (Scintigraphy or Scintigram)

Sentinel node biopsy is a technique where the first lymph node/s that normal fluid in the breast drains to is sampled during surgery.

A nuclear medicine test called lymphoscintigraphy (lymphatic mapping) is performed before the operation. This technique produces a 'road map' to help the surgeon find the sentinel node for removal during the operation.

Lymphatic mapping is performed within the radiology department the day before, or a few hours before surgery. A small amount of radioactive material is injected around the edge of the areolar. The radioactive tracer travels to the sentinel node along the same lymphatic channels that cancer cells could travel. This can take a few minutes or a few hours. A series of scans is taken to show where the sentinel node is located and the skin is marked with ink. The procedure can vary in duration from approximately thirty minutes to two hours.

The injection of tracer makes the sentinel node radioactive so it can be found by the surgeon with the use of a gamma probe during the operation.

If you have any further questions regarding the tests listed above, please feel free to contact the clinic nurse or discuss further with the referred Radiology team.

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