

Diagnostic Imaging Department

Everything you need to know about facilities at the Hermitage Medical Clinic



Diagnostic Imaging Department
The Hermitage Medical Clinic
Old Lucan Road
Dublin 20
Telephone (01) 645 9042
www.hermitageclinic.ie



HERMITAGE
MEDICAL CLINIC

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*welcome to the
HERMITAGE medical CLINIC
DIAGNOSTIC imaging DEPARTMENT*

The Hermitage Medical Clinic provides medical diagnostic imaging services which include a 64 Slice CT, MRI, PET/CT, SPECT/CT, Mammogram, Ultrasound, X-ray, Fluoroscopy and Angiography. This brochure is designed to give you a quick over view of all our services, what you can expect and some of the things that you need to do to prepare for your test.



At the *Hermitage Medical Clinic* we use a **Digital Radiography (DR)** system to acquire all of our Plain X-ray images. This system allows the radiographer to see the images within 10 seconds of making the exposure.

DR saves you from repeat exposures as a result of images being too dark or too light, as the computer can manipulate all digital images once acquired.

DR is an accurate and reliable way of obtaining helpful information in the diagnosis and treatment of many diseases, conditions and injuries.

A minimal dose of radiation is used to achieve the desired result and all X-ray examinations are within the “permissible levels” for diagnostic imaging.

You should always inform your doctor or radiographer if there is a possibility that you may be pregnant.

What should I expect during an X-ray examination and how should I prepare?

You may be asked to change into a gown depending on the body part being X-rayed.

You may be asked to hold your breath for a few seconds during the exposure and most examinations are completed within 5-15 minutes.



An **MRI scan (Magnetic Resonance Imaging)** uses a magnetic field and radio waves to generate images of tissues and areas within the body. Unlike X-ray and Computed Tomographic (CT) imaging, MRI does not use ionizing radiation.

An MRI scanner produces high-resolution, high-contrast, detailed images of tissues in the human body. MRI aides in the visualization and detection of pathological changes within organs, blood vessels, bones and various soft-tissue including injuries to muscles and ligaments.

What should I expect during an MRI and how should I prepare?

During the scan, you will be required to lie on the MRI bed while the area being scanned is positioned in the centre of a large ring magnet. This open ended tube like device may cause some people to feel claustrophobic. If you have experienced claustrophobic symptoms previously you should talk to your referring doctor before arriving for the appointment. In some cases your referring doctor may provide some medication to help you relax.

The acquisition of the MRI scan is noisy so ear plugs or ear defenders are used. You may listen to music during the MRI scan and therefore we encourage you to bring your favourite CDs.

On average an MRI acquisition takes 30 minutes. You are required to remain still, as movement will result in blurred images.

It is important to wear loose, comfortable clothing, free of any metal. Do not wear jewellery or metal objects because of the powerful magnetic field.

It is essential that you alert the radiographer if you have a cardiac pacemaker, artificial heart valve(s), joint prosthesis (hip, knee etc), surgical devices or metal objects in your eyes or elsewhere in your body.

There is no need to fast for most MRI scans.

You should always inform your doctor or radiographer if there is a possibility that you may be pregnant.



CT

CT (Computed Tomography), previously known as a CAT scan, uses ionizing radiation to acquire images of the inner structures or organs of your body. The CT scanner both generates and detects X-rays to compile the scan image.

CT scans show several types of tissue with great clarity - lungs or bones, but contrast dyes given by intravenous injection are needed to clearly see some soft tissues and blood vessels. Using the CT images, a radiologist can detect cancers, cardiovascular diseases, infectious diseases, fractures or musculoskeletal injuries. CT is also used to detect bowel diseases including bowel cancers. CT is also used in radiotherapy treatment planning. At the Hermitage Medical Clinic, we have a top of the range 64-slice CT scanner. Using this scanner, images are acquired extremely rapidly, in seconds, and this minimizes internal organ movements that unavoidably continue during image acquisition and results in higher quality images.

What should I expect during a CT and how should I prepare?

A CT scanner is a large ring-like device with a moveable bed. You will lie on the bed which slides through the scanner. With our modern extremely rapid CT scanner you will hear only a slight clicking noise as the imaging X-ray tube within the scanner gantry swings around you during the scanning process. The whole process takes only a few minutes.

Metal objects can distort the image, therefore you will be required to remove hairpins, jewellery, eyeglasses, hearing aids and any removable dental work. You may be asked to drink water or a liquid contrast material, which aids the visualization of your stomach, small bowel or colon. Some CT examinations require an injection of an iodine-containing contrast liquid. This will be injected through a cannula in your vein. Some patients are allergic to iodine-containing contrast agents. You should inform your doctor if you have had a previous allergic response to iv contrast.

You should inform the doctor or radiographer if there is a possibility that you may be pregnant.



ULTRASOUND

An **Ultrasound examination** produces images of the internal structures of the body with the use of sound waves not X-rays. These high frequency sound waves are transmitted through the skin, but are reflected by the internal organs to form a picture on a screen.

Ultrasound scanning is used to diagnose many different disease conditions.

Ultrasound scanning shows the structure and movement of the body's internal organs, including blood flowing through blood vessels. Ultrasound scanning is used to detect deep vein thrombosis, carotid artery disease and many disease processes in the abdomen. There are no radiation risks or side effects associated with an ultrasound examination.

What should I expect during an Ultrasound examination and how should I prepare?

During an ultrasound examination, the operator or ultrasonographer will apply a gel to your skin over the area to be examined. This helps the transmission of the sound waves through the skin. The ultrasonographer will then move a handheld probe transducer across the skin surface. There may be a slight degree of skin discomfort as the transducer is pressed and moved against the area being examined.

If you are having a pelvic examination, you may be asked to drink 1-1.5 litres of water 45 minutes before the test and told not to empty your bladder until after the scan. The full or distended urinary bladder may cause some discomfort but a full bladder is necessary for a satisfactory pelvic ultrasound examination. If you are having a gall bladder or pancreatic investigation you will be required to stop eating 6-8 hours before the test and to drink clear fluids only.



PET/CT (Positron Emission Tomography/Computed Tomography)

A PET/CT scanner consists of two scanners combined in one Imaging device, a PET scanner and a CT scanner.

PET/CT imaging is used most frequently in Oncology.

It is used to diagnose and to localize tumours. It is used to verify the outcome of successful therapy and is used to monitor the progress of treatment.

PET/CT scans are also used to detect some diseases of the Heart (Viability) and the Brain (Alzheimers Disease).

What should I expect during a PET / CT and how should I prepare?

You will be required to fast for six hours prior to your appointment but you may take your usual medications with a small quantity of water. You will be advised to avoid strenuous exercise the day before and also the morning of your scan. You should always inform your

doctor or radiographer if there is a possibility that you are pregnant.

If you have diabetes mellitus you will receive special instructions. Before the scan commences, you will be given a small (2-5ml) intravenous injection. The injection does not cause flushing or have any side effects. The injection contains a small quantity of a short lived radioactive compound.

Following the injection, you will wait, while lying down in a quiet dimly lit room for 60 minutes to allow the injected material to accumulate in tumour cells, if present. After the 60 minutes, the abnormal accumulation of the radioactive material will be visible to the PET scanner as a “hot” lesion. The CT scanner in addition will outline the structure of the organ or tissue where the PET scan has identified the “hot” lesion. The fused PET/CT image will show both the tumour and its location relative to structures or organs in its vicinity.



SPECT/CT scanner combines two scanners in one imaging device, a SPECT scanner and a CT scanner.

A SPECT/CT Image is a fused image of a SPECT image and a CT image.

SPECT/CT scans are used to detect and localise coronary artery disease, metastatic bony cancers, inflammatory arthritis, bony injury, blood clots, sites of infection and some specific cancers.

The SPECT portion of the scan “sees” and generates an image of the “active” disease and the CT portion of the scan localizes the organ or tissue containing the abnormal SPECT image.

The fused SPECT/CT image provides both the Diagnosis and the Location of the “active” disease process.

What should I expect during the procedure and how should I prepare?

Instructions regarding eating and drinking are specific for each SPECT/CT procedure and you will be instructed accordingly

One of a range of radioactive agents will be given to you either by intravenous injection or by inhalation (Lung)

This shortlived radioactive agent accumulates (within minutes to 3 hours) in the organ (i.e.parathyroid) or in the disease process (i.e.stress fracture) and gives off radiation which is detected by the externally rotating two headed SPECT scanner. You will lie on a scanning couch during the scan and the scan will take from 45 minutes to 90 minutes

You should always inform your doctor or radiographer if there is a possibility that you may be pregnant.



FLUOROSCOPY

Fluoroscopy is an imaging procedure that uses both X-rays and an intravenous or oral contrast agent. The contrast agent shows up white in the X-ray and highlights the abnormality. The most common contrast used is liquid barium, and this is administered orally or rectally.

The most common fluoroscopy studies are:

- **Barium Swallow and Barium Meal** which examine the oesophagus, stomach and the first part of the small intestine.
- **Small Bowel Series** which examines the small intestine.
- **Barium Enema** which examines the large intestine or colon.

Fluoroscopy is used to detect peptic ulcers, diverticular and inflammatory diseases and cancers of the gastrointestinal tract.

How should I prepare for a Fluoroscopic examination?

Many fluoroscopy procedures require the bowels to be completely clean so the area to be x-rayed can be visualised clearly. To get an unobstructed view of the gastrointestinal tract, it is necessary to avoid food or drink from midnight. Your usual daily medications should not be taken until after the examination. For some of the Fluoroscopic procedures, a “preparation kit” will be sent out a few days before the appointment and directions will be provided on how to prepare for the examination.

You should always inform your doctor or radiographer if there is a possibility that you may be pregnant.

Mammography is a specific type of imaging that uses a low-dose X-ray system to examine the breasts. The “softer” radiation that is used helps to visualise the different tissue within the breast and make abnormalities more readily visible. Mammography is used to aid in the diagnosis of breast diseases.

What should I expect during the procedure and how should I prepare?

During mammography, a specially trained radiographer will position your breast in the mammography unit. Your breast will be placed on a film cassette tray and a compression plate will be applied. You will be required to remain very still and will be asked to hold your breath for a few seconds to reduce movement which will blur the image.

You will feel some pressure on the breast during compression but the compression will last only a few seconds and will be applied very gradually by the radiographer. The compression is needed to ensure that all areas of the breast tissue are seen and to obtain a clearer image of the breast.

The compression may cause some slight skin discoloration or breast itching for a short time after the mammogram but will not cause any damage or long-term discomfort in the breast.

We recommend that you do not apply deodorant, talcum powder or lotion under your arms or on your breasts on the day of the examination. These can appear on the mammogram as calcium spots and mislead the radiologist reading the images. You must inform the radiographer if there is a possibility that you are pregnant.

Precautions

Occasionally, following the radiologist’s review of the scan you may be asked to return on another date for an extra mammogram or an ultrasound of the breast. This is usually to get a clearer image of an area which the previous routine images may not have shown in sufficient detail and should not be a cause for alarm. In the vast majority of cases this is simply to clarify a probably normal appearance and is precautionary.