DIAGNOSTIC IMAGING

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OPENING HOURS: On-call out of hours

The questions that may enter your mind before going for an examination within the x-ray department are covered in a pdf document (downloadable here). This document covers information regarding each of the procedures carried out within the department, listed below:

- Plain radiography
- IVP (Intravenous Pyelogram)
- IVU (Intravenous Urogram)
- Venogram
- Mammography
- Ultrasound
- Computed Tomography (CT)
- MRI (Magnetic Resonance Imaging) Scan
- Nuclear Medicine
- Isotope bone scan
- Isotope Thyroid
- VQ lung scan
- Isotope DMSA renal scan
- Isotope DTPA renogram scan

PATIENT INFORMATION
What is, how do I, can I take, what will happen?These are usual questions that may enter your mind before going for an examination within the x-ray department. The following questions and answers will explain the different departments.
• What is the procedure.
• How you prepare for it.
• The cans and cant's.
• What will happen during the examination.The following text is provided as an information service to the patient. Any further questions or queries please contact the radiology department at 021 4801657, we will be more than happy to help.
PLAIN RADIOGRAPHY (X-RAY)
IntroductionPlain radiography or x-ray, is the original and most commonly used form of diagnostic imaging. It uses small amounts of radiation that are passed through a selected part of the body to produce an image on film. ProcedureThe patient is positioned on a table by the radiographer and is asked to lie still while the x-ray is being performed. If still images are required, typically, two or more x-rays are taken from different angles to give the radiologist multiple views of the region being studied. PreparationMost x-ray examinations don't require any

special preparation by the patient. However, jewellery and metallic objects should be removed beforehand as they may interfere with the examination.

Barium swallow/meal

What is a barium swallow/meal?A barium swallow is an x-ray examination of the oesophagus and a barium meal is an x-ray examination of the stomach and duodenum (1st part of the small bowel). Frequently a barium swallow and meal are performed together. For these examinations, the patient is required to drink a liquid called barium. How do I prepare for this examination?You must not eat or drink anything from midnight the night before the examination. This is very important because if your stomach or bowel is not empty, the study will not be satisfactory and may have to be postponed. Can I take my usual medication?Yes, however, diabetics who are fasting are advised to alter their insulin intake appropriately.

What will happen during the examination? A radiologist and a radiographer will be present in the x-ray room. For a barium meal examination you will be asked to swallow granules in a fizzy liquid to produce gas in your stomach. You will then be asked to stand behind the x-ray machine and you will be given a white liquid (barium) to drink. This drink outlines the oesophagus, stomach and bowel. The radiologist will watch this on a special x-ray television screen. For a barium meal examination you will have to lie flat halfway through the test. Periodically, the radiologist will ask you to change your position or hold your breath so that “snapshots” or spot films may be taken. Will it hurt? No. How long will the examination take? The examination typically takes 15 minutes to complete. When may I eat? You may eat as soon as the examination is over. You should eat plenty of fruit and vegetables and drink extra fluids to remove any left over barium from the bowel. How will I learn the results? The results will be sent to your doctor who will discuss the results with you.

Small bowel follow through

What is a Small bowel barium follow through?A small bowel barium follow through is an x-ray examination of the small bowel. For this examination the patient is required to drink a liquid called barium. How do I prepare for this examination?You must fast from midnight the night before the examination.

Can I take my usual medication?Yes, however, diabetics who are fasting are advised to alter their insulin intake appropriately. What will happen during the examination?You will be given liquid barium to drink. After 20 minutes, the first x-ray will be taken by the radiographer. You will be asked to lie on the x-ray table on your stomach. After this, and x-ray will be taken every half hour, until all of the bowel is visualised. Will it hurt?No. How long will the examination take?The length of the examination depends on how quickly the barium passes through the bowel, typically 2-5 hours. It is advised to bring a good book with you. When may I eat?You may eat as soon as the examination is over. You should eat plenty of fruit and vegetables and drink extra fluids to remove any left over barium from the bowel. How will I learn the results?The results will be sent to your doctor who will also discuss them with you.

What is a bowel enema

What is a large bowel barium enema (barium enema)?A barium enema is an x-ray examination of the large bowel. A liquid contrast called barium is administered rectally. How do I prepare for this examination?When your appointment is made, please follow the instructions below using Klean Prep (available in most pharmacies).Two days before test:Tea, coffee, bovril, soup, water, cereal, eggs, toast, jelly and ice cream. It is very important to increase your normal fluid intake.One day before test:8am light breakfast (tea and one slice of toast). Water, tea, bovril, jelly and diluted juices or flat seven-up during the day.As you are not eating, it is vital to maintain high fluid intake. Start your Klean Prep two hours after breakfast, you must take at least three sachets. To add flavour you can add some dilutable juice to Klean Prep. Nothing to eat or drink after 12 midnight.Day of test:All patients may take your normal morning medications with a sip of water. However diabetics who are fasting are advised to alter their insulin intake appropriately.

What will happen during the examination?A radiologist and a radiographer will be present in the x-ray room. You will be asked to lie on your side on the x-ray table. The radiologist will place a soft tube into your back passage and fill the bowel with a white fluid called barium. The fluid is a contrast which outlines the bowel, the radiologist will watch this on a special x-ray television screen. Periodically, the radiologist will ask you to change your position or hold your breath so that “snapshots” or spot films may be taken. At the end of the examination, the radiographer will take a few more x-rays. The tube will then be removed and you will be brought to the bathroom immediately.

Will it hurt?It will be mildly to moderately uncomfortable and there may be some cramping. The radiologist may give you an injection to relax the bowel.

How long will the examination take?The examination typically takes 30 minutes

When may I eat?You may eat as soon as the examination is over. You should eat plenty of fruit and vegetables and drink extra fluids, to remove any left over barium from the bowel. How will I learn the results?The results will be sent to your doctor who will discuss the results with you.

IVP (Intravenous Pyelogram)

IVU (Intravenous Urogram)

What is an IVP?An IVP is a special examination of the kidneys and the other parts of the urinary system (the ureters which are the tubes leading from the kidneys and bladder). How do I prepare for this examination?Four hour fasting and fluid restriction is required for this examination. What else do I need to know?If you suffer from asthma, hayfever or any allergies to food or medications or if you have had a previous reaction to x-ray contrast in the past, please inform the radiographer or radiologist. This is because you will be given and injection of contrast for the test and some people who have allergies may also be allergic to the contrast. What will happen during the test?Firstly, the radiographer will take an x-ray of your abdomen. Next, you will be given an injection in your arm. This injection of contrast will outline the kidneys, ureters and bladder so that we can

see them on the x-ray. After the injection a number of x-rays will be taken to record the flow of contrast through the urinary system. At the end of the examination you will be asked to go the bathroom and urinate. Finally, one more x-ray of you empty bladder will be taken. Will it hurt?No, however during the injection you may experience a warm feeling down your arms and a metallic taste in your mouth, this is completely normal. If you experience nausea or breathing difficulties please inform the staff. How will I learn the results?The results will be sent to your doctor who will discuss the results with you.

Venogram

What is a venogram?This is an examination of the venous system (usually the leg) with contrast media. How will I prepare for this exam?There is no preparation for this examination.

What will happen?You will be asked to lie on the x-ray table. A small fine needle is inserted into the veins in your lower leg by a Radiologist and the contrast is administered into the veins. The Radiologist will follow this up the leg with the x-ray machine. How long will the examination take?Usually 5 to 10 minutes.

Will it hurt?You might experience mild discomfort at the site of the injection.

How will I learn the results?The results will be sent to your doctor who will discuss the results with you.

Mammography

What is a mammogram?A mammogram is an x-ray of the breast that is used to detect breast cancer. The images are obtained by placing the breasts in a special mammography machine. In this machine, the x-ray beam can pass through the breast and an image is formed on an x-ray film. The breasts must be compressed during the x-ray, this is vital as it reduces the radiation necessary for good quality images. How do I prepare for a mammogram?On the day of the mammogram, you must not wear deodorant, talcum powder or lotion, since they can show up on the x-ray film. What will happen during the mammogram?The mammogram will be carried out by a female radiographer. She will ask you some questions that are relevant to the examination. You will then be asked to undress tothe waist. The radiographer will position your breast on a plastic tray and a second tray will be lowered onto it to compress it for the x-ray. Two images of each breast will be taken: one from the top facing down, and one from the side. On completion of the x-rays, the films will be shown to a radiologist who may requestfurther films or an ultrasound scan of the breasts. Is mammography safe?The radiation exposure that you will receive during a mammogram is minimal. Will it hurt?The compression is uncomfortable, but it will only last for a few seconds. It is very important that you try to tolerate optimum compression. Occasionally, there may be discomfort in the breasts for a few days after the mammogram. How will I learn the results?The results will be sent to your doctor who will discuss the results with you.

Ultrasound

What is Ultrasound?Ultrasound uses sound waves of extremely high frequency (above 20,000Hz), inaudible to the human ear. It can be used to produce an image of internal structures in the body in the same way that x-rays can be used to build up pictures of parts of the body. However, with ultrasound the patient is not submitted to potentially harmful radiation. Types of examinationsThe Bon Secours Hospital provides a wide range of ultrasound examinations which include:
Abdominal ultrasoundIn order to perform an ultrasound scan of the abdomen it is necessary for the patient to be fasting from midnight the night before.
Pelvic ultrasoundThere is no need to fast before this exam. In order to perform an ultrasound scan of the pelvis it is necessary that the patients bladder is full. To achieve this the patient must drink at lest one and a half to two pints of water or whatever is necessary to reach a limit of fullness.
Transvaginal scanningA transvaginal ultrasound scan produces detailed views of the uterus and ovaries. It is an internal examination where a special sterilised high resolution probe is placed in the vagina. There is no preparation needed for a transvaginal scan. What happens during the scan?The patient will be escorted to the ultrasound room where she will be asked to lie on the table with her knees bent. An ultrasound probe will be carefully introduced into the vagina by a radiographer/radiologist. Pictures and measurements will then be taken.
Will it hurt? The scan should not be uncomfortable or painful.

Computed Tomography (CT)
IntroductionA CT scan (also known as “CAT scan” for “Computed Axial Tomography”) is a special type of x-ray examination that produces cross-sectional images of internal organs and soft tissue. The scans are produced by having the x-ray beam rotate around the patient. X-rays passing through the patient’s body are detected by an array of sensors. This information is then assembled in a computer into a three-dimensional picture from which the cross-sectional images can be obtained.
PreparationCT abdomen/pelvic scans:• If you have a morning appointment, you must fast from midnight (nothing to eat or drink).• If you have an afternoon appointment, you may have a light breakfast and then fast from 9am (nothing to eat or drink).• For all other CT exams, there is no preparation.
What happens in the CT room?The radiographer will ask you to lie either on your back or front on the scan table. The table is then moved into the large opening of the scanner and the radiographer positions you for the examination. During the scan, you may be given an injection of contrast to outline structures in the body. If you require this injection, a small needle will be inserted in a vein in your arm before the scan. As the pictures are being taken, the table will move rapidly, it is very important that you keep still during this time. You may communicate with the radiographer at any time, should the need arise.Prior to most CT exams of the Abdomen or Pelvis, you will be asked to drink almost a litre of a water solution. This will be given to you on your arrival in the CT department. You will then have to wait for up to 60 minutes (CT Abdomen) or up to 120 minutes (CT pelvis) before the scan can be commenced.

Will it hurt?No. CT scans are painless.
How will I learn the results?The results will be sent to your doctor who will discuss the results with you.

MRI (Magnetic Resonance Imaging) Scan
Before the scanThe MRI scanner consists of a large very powerful magnet. Because of this, there are some precautions we have to take at the time of making your scan appointment. You will be asked the following questions:1. Do you have a cardiac pacemaker?2. Do you have any aneurysm clips in your head?3. Do you have any kind of implanted devices in your body?4. Have you ever worked with metal or got metal fragments in your eyes or anywhere else in the body?If you answer YES to either question 1 or 2 you may NOT have an MRI scan. If you answer YES to either question 3 or 4 we will evaluate the situation before making your appointment.
PreparationThere is NO preparation for the vast majority of MRI examinations. Continue to eat and drink as normal and take your medication as prescribed. If we do require you to fast for your examination you will be given clear instructions when your appointment is being made. When you arrive for your exam you will be asked to change into a hospital gown. All metallic items, e.g., watches, coins, keys, hair clips, lighters, credit cards and jewellery must be removed before you enter the scan room. You will be asked to fill in a detailed safety questionnaire.
What the scan involvesThe MRI scanner consists of the large circular (tubular) magnet and the scanning table. The MR radiographer (operator of the scanner) will position you on the table and move you into the machine's tunnel. This remains open at both ends all the time and is illuminated. There is constant contact between you and the radiographer during the examination. MRI does not use 'radiation' rather it combines the use of the large magnet and radio waves. The study produces very detailed pictures of the body part being examined.
Noise During your scan you will hear a series of loud tapping and knocking sounds. This can last from a few seconds up to several minutes at a time. You will be given ear-plugs to wear to help block out this noise.
Duration of scanScan times vary between 30 minutes and one hour depending on the type of study requested. The average length of time for a scan is about 20-30 minutes. It is very important that you remain very still during the examination. If you move while the images are being acquired they will be useless and will have to be repeated.
Does it hurt? NO!, MRI is a painless examination. You will not feel any pain or abnormal sensations during the scan. Some examinations will require the injection of a contrast medium. This is a substance which improves the visualisation of certain structures within the body. The injection is given through a small needle inserted in a vein (usually) in your arm. There are no side effects from this injection.
After the scanOnce all your images are acquired and checked you are free to leave the department. All the films produced will be examined by a radiologist (doctor specialising in x-rays/scans). A report of the scan will be sent to your own doctor who will discuss the results with you.

Nuclear Medicine

IntroductionIn nuclear medicine exams, a radioactive material is administered to a patient, usually by injection. This substance produces radiation, which is detected by a gamma camera. This differs from x-ray or CT examinations where the radiation comes out of a machine and passes through the patient's body.The idea of introducing a radioactive material into a patient's body sounds risky, however, it is very safe. The substances used have a very short half-life, meaning that they decay into non-radioactive forms very quickly. Therefore, they remain in the body for a very short period of time and the total radiation dose received by the patient is relatively small.

Why a nuclear medicine scan?Nuclear medicine exams provide functional information, i.e. they can tell us whether an organ is working properly, where as, X-rays give structural information, i.e. they can show us what an organ looks like. Often, functional changes on nuclear medicine scans can be detected much earlier than structural changes on X-rays, e.g., bone destruction. Nuclear medicine exams may therefore, enable the earlier diagnosis and treatment of certain abnormalities.Types of nuclear medicine exams:

- Bone scan
- DTPA renogram- kidney function
- DMSA scan- kidney anatomy
- V/Q lung scan
- Thyroid scan
- Lymphoscintogram – lymphatic system
- Meckel`s scan

Isotope bone scan

What is a bone scan?This is an investigation in which pictures of the bones are taken with a special camera following a small injection of a radioactive material.

What does a bone scan entail?On arrival in the nuclear medicine department, you will be given the injection into a vein in your arm. This material travels through the bloodstream, into the soft tissue, eventually localizing in the bones. We may take some pictures during the injection to examine the blood flow to a particular area where you may be experiencing pain. You should experience nothing as a result of this injection apart from of the slight discomfort of the needle prick.You will then have to wait for 2 to 3 hours for the radioactive substance to accumulate in your bone before your pictures are taken. During this waiting period, you will be free to leave the hospital if you wish. After this waiting period, it will take approximately 30 minutes to take your pictures and complete the scan.

Is there any special preparation for this scan?No special preparation is required before the scan. You may eat and drink normally beforehand. The injection will not impair your ability to drive a vehicle. You will be asked to drink fluids in the three hours between the injection and scan and to empty your bladder frequently. This helps to clear the injected material from your soft tissue and improves the quality of the bone scan.

N.B If you are pregnant or if there is any possibility that you may be pregnant please tell us before you receive your injection. Should I take any precautions after having a bone scan? Some of the radioactive material will remain in your body for approximately 12 hours after the scan. Since it emits a small amount of radiation you should take the following precautions during this period.1. Drink plenty of fluids and empty your bladder as frequently as possible. When using the toilet you should avoid spills, flush the toilet twice and wash your hands thoroughly.2. If possible avoid contact with infants and children.3. If you are a nursing mother express and discard the first feed after your injection. You may resume normal breast feeding at the next feed.
How will I learn the results? The results will be sent to your doctor who will discuss the results with you.
N.B. Pregnant women and young children should not attend with the patient.

VQ lung scan
What is a VQ scan? This is a two part investigation in which pictures of the lungs are taken with a special camera after you have 1) inhaled a radioactive gas and 2) received a small injection of a radioactive material. The 1st part of the test demonstrates the airflow to the lungs and the 2nd part of the test shows the blood supply to the lungs. What does a VQ lung scan entail? On arrival in the nuclear medicine department, you will be brought into the scan room and positioned for the examination. The radiographer will demonstrate the first part of the scan to you. You will be required to inhale the radioactive gas through a special breathing apparatus, pictures of the lungs will be taken for a few minutes. Breathing in this gas in just like breathing in normal air and will not affect you in any way. Next you will be given the injection into a vein in your arm and a few more pictures will be taken. You should experience nothing as a result of this injection apart from the slight discomfort of the needle prick. It will take approximately 60 minutes to take your pictures and complete the scan.
Is there any special preparation for this scan?No, there is no special preparation for this scan. Neither the gas inhaled or the injection received during the scan will impair your ability to drive a vehicle.
N.B If you are pregnant or if there is any possibility that you may be pregnant please tell us before you receive your injection.
Should I take any precautions after having a VQ lung scan?Some of the radioactive material will remain in your body for approximately 12 hours after the scan. Since it emits a small amount of radiation you should take the following precautions during this period.1. Drink plenty of fluids and empty your bladder frequently as possible. When using the toilet you should avoid spills, flush the toilet twice and wash your hands thoroughly.2. If possible avoid contact with infants and children.3. If you are a nursing mother express and discard all feeds for 24 hours after your injection. You may resume normal breast feeding the next day.
How will I learn the results? The results will be sent to your doctor who will discuss the results with you.
N.B Pregnant women and young children should not attend with the patient.

Isotope DMSA renal scan

What is a DMSA renal scan? This is an investigation in which pictures of the kidneys are taken with a special camera following the small injection of radioactive material.

What does a DMSA renal scan entail? On arrival in the nuclear medicine department, you will be given the injection into a vein in your arm. This material travels through the bloodstream of the kidneys. You should experience nothing as a result of this injection apart from the slight discomfort of the needle prick. You will then have to wait for 2 hours for the radioactive substance to accumulate in your kidney before your pictures are taken. During this waiting period, you will be free to leave the hospital if you wish. After this waiting period, it will take approximately 30 minutes to take your pictures and complete the scan.

Is there any special preparation for this scan? No special preparation is required before the scan. You may eat and drink normally beforehand. The injection will not impair your ability to drive a vehicle.

N.B If you are pregnant or if there is any possibility that you may be pregnant please tell us before you receive the injection.

Should I take any precautions after having a DMSA renal scan? Some of the radioactive material will remain in your body for approximately 12 hours after the scan. Since it emits a small amount of radiation you should take the following precautions during this period:1. Drink plenty of fluids and empty your bladder as frequently as possible. When using the toilet you should avoid spills, flush the toilet twice and wash your hands thoroughly.2. If possible avoid contact with infants and children.3. If you are a nursing mother express and discard the first feed after your injection. You may resume normal breast feeding at the next feed.

How will I learn the results? The results will be sent to your doctor who will discuss the results with you.

N.B Pregnant women and young children should not attend with the patient.

Isotope DTPA renogram scan. This is an investigation to measure kidney function. Pictures of the kidneys are taken with a special camera following a small injection of radioactive material.

What does a DTPA renogram entail? On arrival in the nuclear medicine department, you will lie on a scanning couch and will be given the injection into a vein in your arm. This material travels through the bloodstream to the kidneys. You should experience nothing as a result of this injection apart from the slight discomfort of the needle prick. The pictures are started immediately. It will take approximately 30 minutes to take your pictures and complete the scan.

Is there any special preparation for this scan? No special preparation is required before the scan. You may eat and drink normally beforehand. The injection will not impair your ability to drive a vehicle.

N.B If you are pregnant or if there is any possibility that you may be pregnant please tell us before you receive your injection.

Should I take any precautions after having a DTPA renogram? Some of the radioactive material will remain in your body for approximately 12 hours after the

scan. Since it emits a small amount of radiation you should take the following precautions during this period:1. Drink plenty of fluids and empty your bladder as frequently as possible. When using the toilet you should avoid spills, flush the toilet twice and wash your hands thoroughly.2. If possible avoid contact with infants and children.3. If you are a nursing mother express and discard the first feed after your injection. You may resume normal feeding at the next feed.

How will I learn the results? The results will be sent to your doctor who will discuss the results with you.

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