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Having a PET/CT scan

Lymphoma association

The Lymphoma Association wishes to acknowledge Dr John Hall and Jayne Parratt, from Lodestone Patient Care, for their help with the preparation of this article.

Dr John Hall is a Consultant Radiologist at Frimley Park Hospital NHS Foundation Trust. Dr Hall's clinical interests focus on the use of PET/CT in oncology and he was appointed Clinical Director of PET/CT for Lodestone Patient Care in October 2003.


Dr John Hall

What is a PET/CT scan?

PET/CT is a powerful diagnostic imaging technology, which combines both a PET (positron emission tomography) scan and a CT (computed tomography) scan into one procedure. PET/CT scans are most commonly used for imaging cancer but can also be useful in other clinical applications such as neurology and cardiology. Prior to the scan, you will be required to have an injection of a radioactive form of sugar which is taken up by cells in the same way as a normal glucose.

A PET/CT scan detects changes in how cells utilise nutrients like sugar and oxygen. PET/CT scanning is very useful for accurately pinpointing these changes. More active cells, such as some cancerous and inflammatory cells will have a higher uptake of these nutrients than the surrounding tissue. The radioactive events in these cells will produce a greater number of photons of energy which are detected by the camera. These will act as a "beacon" to highlight any abnormal sites.

What do doctors use PET/CT scans for?

PET/CT is rapidly becoming the imaging technology of choice for staging, characterising and also assessing the recurrence of disease.

The images that are generated during the PET/CT scan together with the report that is produced by the Consultant Radiologist after the scan will provide doctors with important information in order to assess whether treatment is appropriate and will enable them to effectively plan and manage your treatment.

PET/CT is also extremely useful in monitoring the effectiveness of treatment that you may already be having.

When should I have a PET/CT scan?

In order to have a PET/CT scan, you must be referred by either your consultant or oncologist.


A PET/CT scanner

Your doctors will decide if this is an appropriate test for you, based on a variety of factors including symptoms you may be presenting with, your medical history and results of other scans and tests you may have had.

PET/CT scans are not necessarily appropriate for all types of cancer.

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What does a PET/CT scan involve?

Prior to your PET/CT scan appointment you must fast for at least 6 hours before the examination. There are no exceptions to this, including sweets/throat lozenges. You may only drink water. This is extremely important for the overall success of your examination. If you are a diabetic patient you should contact the scanning centre prior to your appointment in order to discuss taking your medication.

On arrival at the scanning centre you will be asked to complete a questionnaire. It is vital that all questions are answered accurately as this will provide the Consultant Radiologist with key information which may be helpful in the preparation of your report. You will then be given a contrast enhanced drink providing that you do not have any known contraindications to oral contrast – a member of the team will discuss this with you.

You will be asked to remove any loose metal objects such as jewellery and watches before changing into a gown.

One of the PET/CT team, either a radiographer or a nuclear medicine technician will administer an injection of a radioactive isotope. This is given via a small needle into a vein, usually in the arm. The main ingredient of the pharmaceutical injected is called flurodeoxyglucose or FDG. FDG is a radioactive form of sugar which is absorbed by cells in the same way as normal glucose.

After your injection you will be required to rest in the privacy of a designated patient rest area for up to one hour prior to your scan. This resting phase is vital in order to obtain high quality PET/CT images, as working muscles also use sugar as an energy supply. The FDG injection travels to these muscles if they are being used, resulting in the production of inaccurate images. By completely resting after your injection there is significantly more chance of the FDG being absorbed by the areas under investigation rather than normal muscle tissue therefore we strongly urge you not to partake in any excessive exercise prior to your appointment.

Following the resting period, your PET/CT scan will be performed. This is a painless procedure. You will be positioned on the scanner bed which slowly moves through the ring of the scanner; it is not enclosed. You will need to lie flat and keep as still as possible as this will enhance the quality of the images produced.

How long will it take?

The scan will take up to one hour to complete. The staff will spend time preparing you for the scan and making sure you rest afterwards so you will be in the scanning centre for approximately 3 hours.

Are there any risks to having a PET/CT scan?

A PET/CT scan is a very safe procedure. This imaging technique is well established and extensively used, with many thousands of examinations being performed safely on patients around the world each day.

As previously mentioned the PET component of the scan requires the use of a small amount of radioactivity to successfully produce images of the body. This is given in the form of an injection prior to your scan. At present, the most common radiopharmaceutical (a radioactive compound) used in PET/CT is FDG (Flurodeoxyglucose). FDG and all other radiopharmaceuticals must pass numerous quality control procedures before they are given to patients, assuring you of their safety. There are no known side effects to an injection of FDG.

FDG has a half life of 110 minutes. This means that approximately every two hours, the radioactivity within your body has halved, thus 24 hours after your scan there is an insignificant amount of radioactivity remaining.

In addition to this a CT scan, which uses ionising radiation, acquires detailed images of the body's anatomical structure which are combined with the PET scan images. By doing this it is possible to produce a picture of what the body looks like and how it is functioning in a single examination.

The benefits of having the scan and finding out important information about your cancer outweigh any potential risk from the radiation to which you are exposed.

If you are pregnant or think there is any likelihood you may be pregnant, you must contact the scanning centre prior to confirming your appointment as further consultation with your doctor will need to be arranged.

It is advised that you avoid close contact with pregnant women, babies and young children for 24 hours after your PET/CT scan in order to avoid exposing children to unnecessary radiation.

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When will I get the results?

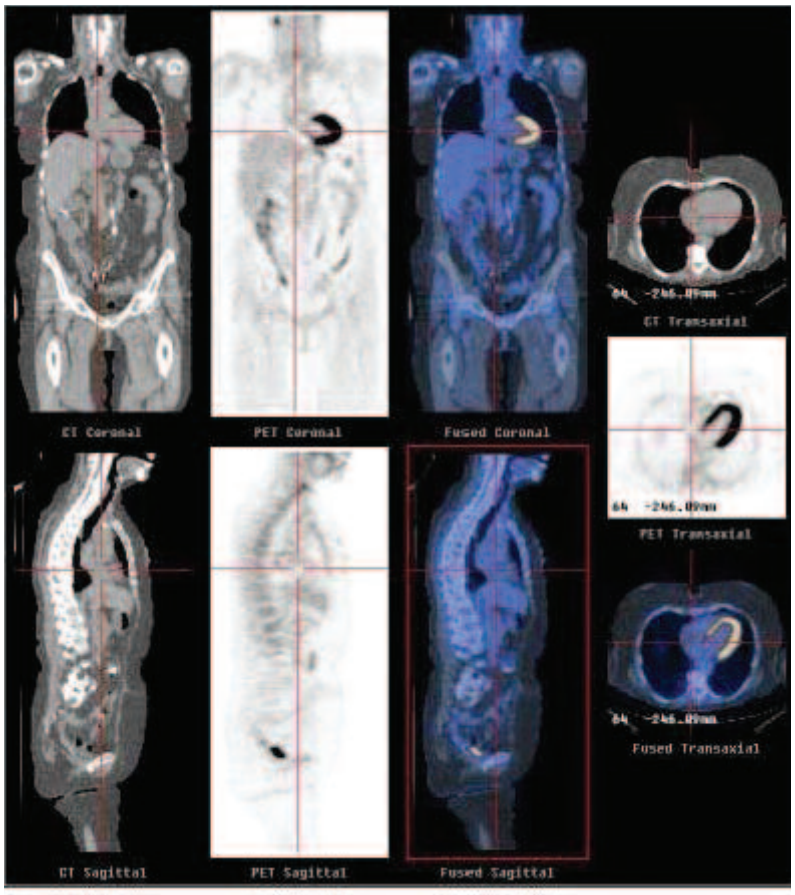
Following your scan, a Consultant Radionuclide Radiologist will write a report on the images that have been generated during the PET/CT scan.

This report will be sent directly to the consultant who referred you for your PET/CT scan and he/she will discuss the results with you during your follow-up appointment.

How available are PET/CT scanners in the UK?

Earlier this year the Department of Health introduced a national procurement programme, the purpose of which is to provide a PET/CT service via a fleet of mobile scanners to UK-wide locations on a rotational basis. For example, each location will offer a service one day per fortnight.

There are also a small number of static scanners in the UK located within hospitals or in purpose built facilities such as Lodestone Patient Care's PET/CT centre in Guildford. This particular centre provides a PET/CT service to both NHS and private patients five days per week.



An example of a PET/CT scan image