SPECT-CT

Consumer Information

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What is a SPECT-CT scan?

SPECT-CT is where two different types of scans are taken and the images or pictures from each are fused or merged together. The fused scan can provide more precise information about how different parts of the body function and more clearly identify problems such as tumours (lumps) or Alzheimer's disease, etc.

Single photon emission computed tomography (SPECT): SPECT images are obtained following an injection of a radiopharmaceutical that is used for nuclear medicine scans. The injected medication sticks to specific areas in the body, depending on what radiopharmaceutical is used and the type of scan being performed, for example. it will show bone for a bone scan, and gall bladder and bile ducts for a hepatobiliary scan.

The radiopharmaceutical is detected by a nuclear medicine gamma camera. The camera or cameras rotate over a 360 degree arc around the patient, allowing for reconstruction of an image in three dimensions (see *Nuclear Medicine*).

Computed tomography (CT): CT images are obtained while you lie on a bed that moves into a ring, or 'donut' shaped X-ray machine. Again, the X-ray machine rotates over a 360 degree arc around the patient, allowing for image reconstruction in three dimensions. The X-ray machine from the CT scanner rotates much faster than the gamma camera, so the CT part of the study takes less time than the SPECT study.

The similarity between SPECT and CT in the method of image processing allows the images to be combined. Combining the information from a nuclear medicine SPECT study and a CT study allows the information about function from the nuclear medicine study to be easily combined with the information about how the body structure "looks" in the CT study.

How do I prepare for a SPECT-CT scan?

No extra preparation is required for being imaged on a SPECT-CT machine, as this is usually done at the same time you are having other types of scans that use a nuclear medicine gamma camera.

It is important that you let staff at the hospital or radiology practice where you are having the scan done know if you are (or think you could be) pregnant or are breast feeding.

This study may not be suitable for pregnant women because of the radiation dose to the growing foetus. Please discuss this with your doctor.

Women who are breastfeeding and people who are the primary or sole carer for small children may need to make special preparations for after the test, to stop breastfeeding for a short time, and to avoid close contact with young children. This is due to the small amount of radioactivity your body may release for a while after the test. Talk to your referring doctor or the nuclear medicine practice where you will have the test for details. The Australian Radiation Protection and Nuclear Safety Agency has recommendations about breastfeeding and close contact with children after nuclear medicine tests.

If you are having a SPECT-CT scan along with another type of scan you will need to follow the preparation instructions for that particular scan. If you are unsure of the preparations you should speak with the hospital nuclear medicine department or private radiology practice where you are having the scan done before you go for the appointment.

What happens during a SPECT-CT scan?

You are required to lie still in a ring shaped scanner for at least 30-40 minutes. The first 3-5 minutes involves the CT scan component, with the remainder of time is required for the SPECT study. It is very important that you remain still for the entire duration of the two studies so that the SPECT and CT can be accurately combined. If you do not lie still, the images from one study will not exactly correspond to the images from the other study, and the study may be difficult to interpret.

When you are positioned for the scan, please make sure you are in a position that will allow you to keep still. If you do not think you will be able to lie still for 30-40 minutes during the scan please inform your doctor or the nuclear medicine staff.

Are there any after effects of a SPECT-CT scan?

There are no after effects from a SPECT-CT scan.

However, if you are breastfeeding or caring for young children, see the "how do I prepare" section for more information about special precautions you may need to take.

How long does a SPECT-CT scan take?

It takes 30-40 minutes to obtain the SPECT and CT images, then you are allowed to leave.

After you have left the hospital department or radiology practice a nuclear medicine technologist will process the images and accurately fuse (merge) the SPECT and CT images. The time taken for this will depend on the computer software used and the workload but may take up to 1-2 hours.

What are the risks of a SPECT-CT scan?

There are no risks involved in the nuclear medicine SPECT scan or the CT scan procedures. The test involves a small dose of ionising radiation from the radiopharmaceutical injected into your vein, and also from the CT scan. (See *Radiation Risk of Medical Imaging for Adults and Children)*

Importantly, the SPECT component of the test requires no additional injection of radiopharmaceutical beyond what you would have been given for the nuclear medicine test without the SPECT part. The CT is usually done using a low-dose radiation technique which is around 20-25% the radiation exposure of a normal CT scan.

Your doctor has weighed up the benefit versus risk for having a SPECT-CT scan and has decided that the benefit of having the information gained from the scan outweighs any risk.

What are the benefits of a SPECT-CT scan?

SPECT-CT provides the ability to merge or combine the images often allowing the nuclear medicine specialist to more accurately pinpoint the site of any abnormality on your nuclear medicine scan. This may be of particular importance in certain clinical situations, when the interpretation of an area of interest may change depending on its location. For example, in small areas like the spine or feet, it is sometimes hard to determine from the nuclear medicine imaging alone whether the abnormality lies in the bone or the adjacent joints – fusing a SPECT with CT provides added confidence in identifying where the abnormality is.

Who does the SPECT-CT scan?

Nuclear medicine technologists perform the scans which are then analysed and interpreted by nuclear medicine specialist who also provide a report of the scan to your referring doctor. See *Nuclear Medicine* for more information about these health professionals.

Where is a SPECT-CT scan done?

A SPECT-CT scan is done at a nuclear medicine facility with a dedicated SPECT-CT machine. Many large public and private hospitals as well as some private radiology practices now have SPECT-CT scanners

When can I expect the results of my SPECT-CT scan?

The time that it takes your doctor to receive a written report on the test or procedure you have had will vary, depending on:

- the urgency with which the result is needed
- the complexity of the examination
- whether more information is needed from your doctor before the examination can be interpreted by the radiologist
- whether you have had previous X-rays or other medical imaging that needs to be compared with this new test or procedure (this is commonly the case if you have a disease or condition that is being followed to assess your progress)
- how the report is conveyed from the practice or hospital to your doctor (in other words, email, fax or mail)

Please feel free to ask the private practice, clinic, or hospital where you are having your test or procedure when your doctor is likely to have the written report.

It is important that you discuss the results with the doctor who referred you, either in person or on the telephone, so that they can explain what the results mean for you.

Please note:

This information is of a general nature only and is not intended as a substitute for medical advice. It is designed to support, not replace, the relationship that exists between a patient and his/her doctor. It is recommended that any specific questions regarding your procedure be discussed with your family doctor or medical specialist

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