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The booklet has been written by the Jules Thorne Telemetry Unit at The National Hospital for Neurology and Neurosurgery (NHNN).

The booklet is intended for patients (or their family or carers) referred to our service and who may be offered this test. It is not intended to replace discussion with your consultant. The booklet explains what to expect when you come for an ictal SPECT investigation.

Please do not hesitate to contact a member of the team caring for you if you have any questions about SPECT scans. They will be happy to answer them for you.

**What is an ictal SPECT scan?**

A SPECT scan is used to look at the blood flow in the brain. When you have a seizure, there is increased blood flow in the part of the brain that generates the seizure. In between seizures, there is a reduced blood flow in this area. This means that the ictal (during a seizure) and inter-ictal (between seizures) scans can give information about the location of seizures and their spread in the brain.
How can an ictal SPECT scan help?
You need this test to examine your seizures in more detail, to find out the location of the onset of seizures and whether they are confined to certain areas of the brain. This has been suggested taking into account all the testing that has been performed so far, such as your results of video EEG recordings, MRI studies, memory testing and any other tests you may have undergone.

What are the risks of having an ictal SPECT scan?
All treatments and procedures have risks and we will talk to you about the risks of having an ictal SPECT scan.

- You will be given an injection containing a small amount of radioactive material called a ‘radiotracer’. The radioactivity leaves your body quickly and will not make you feel unwell. Your doctor has considered that the low risk linked to the radiation from this valuable test is safe for you to receive. However, as radiation can harm unborn babies you must let us know before the test if you are or could be pregnant. We also need to know if you are breastfeeding.
- As you know from your previous video telemetry, it is sometimes necessary to reduce the anticonvulsant (antiepileptic) medications to increase the chances of
catching a seizure while you are in the hospital. With drug reduction, there is a small risk that your seizures might be longer or more intense, or that you have seizures back to back.

**What will happen if I choose not to have an ictal SPECT scan?**

If you choose not to have this test, your doctor may have less information to understand where your seizures start. As you are going forward to explore if surgery is an option to help your seizures, this may lead to greater difficulties to reach a conclusion.

It could also mean that there is not enough information to proceed with surgery. What this means in your situation will depend on the results of all other testing.

**What alternatives are available?**

Your doctor has proposed this test because the results of your other tests do not provide enough information about where your seizures are coming from. The information obtained from the ictal and inter-ictal SPECT scans cannot be obtained in another way.
How should I prepare for an ictal SPECT scan?

You will first be scheduled to come in for video EEG monitoring and the ictal SPECT scan. You may have to stay in hospital for up to five to seven days, depending on the frequency of your seizures. You will be admitted to the telemetry ward on a Monday morning and start video EEG monitoring. During the ward round, we will discuss reducing your anticonvulsant medications with you.

The ictal SPECT scan will usually take place on a Wednesday and if not successful another attempt will be made on the following day. A cannula (small, thin plastic tube) will be inserted into a vein in your arm so that the radiotracer can be injected.

What happens during an ictal SPECT scan?

You will have two types of scans, an ictal SPECT scan and an inter-ictal SPECT scan. The word ‘ictus’ means attack or seizure. An ‘ictal SPECT scan’ is performed during an epileptic seizure and an ‘inter-ictal SPECT scan’ is performed between seizures.

The ictal SPECT study requires a radiotracer to be injected into the cannula during a seizure. The radiotracer marks the
area of brain that has an increase in blood flow during the seizure. After the injection a scan of the brain will be taken. A similar scan (inter-ictal SPECT) will be taken in between seizures. The two scans are compared to see how the images differ. Both scans are necessary to obtain the desired information.

A nurse will sit by your bedside ready to inject the radiotracer as soon as a seizure starts. The nurse will put aside about five hours for this test, the duration for which the radiotracer can be injected. If no seizure occurs after this time the radiotracer will be discarded. When a seizure occurs, the radiotracer is injected into the cannula as quickly as possible. We will then give you your full dose of anticonvulsant (antiepileptic) medication plus an extra dose to make up for some of the dose that you may have missed during dose reduction. If you do not have a seizure within this time, the test will be rearranged for the next day.

Once the injection has been given and you have recovered sufficiently from the seizure, you will be taken by ambulance to the Nuclear Medicine Department at University College Hospital (UCH) for your scan. UCH is about half mile away from the NHNN. A nurse from the telemetry unit will
accompany you. They will bring extra anticonvulsant medication with them in case another seizure was to occur.

You will need to lie still for about an hour during the scan. Once the scan is completed you will be brought back to the NHNN. Most people are allowed to go home from hospital the day after the scan.

**The Inter-Ictal SPECT scan**

The inter-ictal SPECT will be done as an outpatient at the Nuclear Medicine Department at UCH. It will be scheduled after a successful ictal SPECT scan has been obtained.

A radiographer will inject radiotracer into a cannula, just as was done for the ictal SPECT study. After the inter-ictal SPECT scan, you will be able to go home without any restrictions. You will need to tell the radiographer when you had your last seizure.

If you wish to contact the Department of Nuclear Medicine regarding the scan, please call 020 3447 0562 or email inmclinic@uclh.nhs.uk
Asking for your consent

We want to involve you in all the decisions about your care and treatment. If you decide to go ahead with treatment, by law we must ask for your consent and will ask you to sign a consent form. This confirms that you agree to have the procedure and understand what it involves. Staff will explain all the risks, benefits and alternatives before they ask you to sign a consent form. If you are unsure about any aspect of your proposed treatment, please don’t hesitate to speak with a senior member of staff again.

What should I expect after an ictal SPECT scan?

You will usually be able to go home the day after the ictal SPECT scan. The results will be available to your doctor once both ictal and inter-ictal scans have been read and interpreted. Your doctor will explain the result to you and also send a report to your GP.
Where can I get more information?
NHS Clinical Knowledge Summaries www.cks.nhs.uk
Society of Nuclear Medicine www.snm.org
UCL Hospitals cannot accept responsibility for information provided by external organisations.

How to contact us
The Jules Thorne Telemetry Unit
The National Hospital for Neurology and Neurosurgery
Queen Square
London
WC1N 3BG
Direct line: 020 3448 3686
Please contact the unit directly if you have any questions regarding your admission.
Epilepsy Nurse Specialists: 020 3448 8627
The epilepsy nurse specialists can be contacted for general information on investigations for epilepsy surgery.
Switchboard: 0845 155 5000 /020 3456 7890
Fax: 020 3448 4764
Website: www.uclh.nhs.uk/nhnn
Space for notes and questions