



epilepsy

SOUTH AFRICA

Diagnostic Tests for Epilepsy

www.epilepsy.org.za

There are a number of procedures available to assist the doctor in making an accurate diagnosis of the type of epilepsy a person has. The names can be confusing and what follows is a brief summary of the various tests which might be recommended.

The EEG

An electroencephalogram or EEG is a written record of the brain's electrical rhythms. To record these rhythms, a number of small metal discs (electrodes) are placed against the scalp at various points. These are held in place by a glue-like substance which can easily be washed off later. With the electrodes in place, the person will either sit or lie down in a restful state with his/her eyes closed.

The test takes about 30 minutes. During this time the person will be asked to perform certain simple tasks, such as blinking, breathing deeply or some form of mental activity. The test usually includes a series of flashing lights at various frequencies since some forms of epilepsy may be stimulated in this way.

When testing young children who may become restless, it may be necessary to give them a mild sedative. Sometimes it is necessary to obtain a recording over a period of several hours/days. A portable EEG machine can be attached to the person to perform the test while carrying out normal daily activities/routines, including sleep. This is called EEG telemetry.

In certain circumstances it is necessary to admit the person to hospital and monitor brain activity through EEG telemetry and continual video recording at the same time. This enables the doctor to match brain rhythms with behaviour and seizure activity.

The CT Scan

Computerised Tomography (CT) provides cross sectional images (slices) of the brain. The person lies on an X-ray table which is moved slowly into the CT unit containing the scanner. Only the upper part of the head moves into the scanner. An X-ray device rotates around the person's head in an arc formation, recording a number of images of the brain. To make the images clearer, a dye is injected into a vein in the person's arm. The entire procedure takes about 45 minutes and is painless. It is used to diagnose a probable cause for seizures.

The MRI Scan

Magnetic Resonance Imaging (MRI) is a method of scanning the brain without using X-rays. During the MRI scan the person's head is surrounded by a magnetic field. Radio frequency waves are produced to stimulate the brain.

Resulting energy changes are used to produce computer images which look like two-dimensional slices of the brain.

The magnetic field and the radio frequency waves are completely painless and cause no known physical harm. At worst the person may feel some discomfort from having to lie still in the "tunnel" while the machine is scanning their head. To minimise discomfort, a fan circulates air and a mirror at the end of the tunnel allows the person to see the room and scanner operator.

An intercom call button is beside the person's hand to maintain verbal communication throughout the procedure. Some people choose to wear earplugs to block out the metallic thumping noise of the machine. The MRI scan takes about an hour and a half.

The PET Scan

Positron Emission Tomography (PET) scanning is a non-invasive imaging technique that creates a three-dimensional image of the brain.

Short-acting radio-isotopes are injected into the blood where after the person rests for about 30 minutes. During the scan a mask is placed gently over the person's face to limit movement. An EEG recording is taken at the same time.

There are microphones in the scanner to enable the person to communicate with the operator at all times. As images are produced by analysing the uptake of glucose in the brain it is necessary for the person to fast for a period prior to the PET scan.

A PET scan takes between 30 and 60 minutes. However, it is extremely costly and has been largely replaced by the SPECT scan.

Your pharmacist is also able to assist with information and advice about your medication.

The SPECT scan

Single Photon Emission Computed Tomography (SPECT) is similar to PET scanning, but uses different radio-isotopes able to hold the image of the blood flowing through the brain for up to 24 hours. The SPECT scan looks at blood flow through the brain during a seizure (ictal phase) and compares this with the inter-ictal (seizure-free) scan. This highlights the "hot spot" or origin of the seizure in the brain.

The scan can be performed anytime from an hour after the radio-isotopes have been injected for a period no longer than 24 hour.

A mask is not required and an EEG is not taken.

A SPECT scan usually takes about 20 to 30 minutes.

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TOTAL



EEG Scan



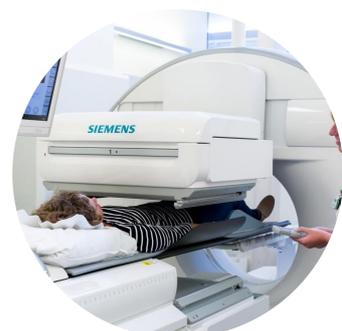
CT Scan



MRI Scan



PET Scan



SPECT Scan