



## Epilepsy Namibia Wo 292

P O Box 11822, Klein Windhoek, Namibia

Web: [www.epilepsynamibia.org](http://www.epilepsynamibia.org) Email: [namep@epilepsynamibia.org](mailto:namep@epilepsynamibia.org)

+264 81 3226834

1/2 Tests

### DIAGNOSTIC TESTS FOR EPILEPSY

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, called electrodes, are placed against the scalp at various points. They 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 or her eyes closed. The test takes about thirty 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 hours or days. A portable EEG machine can be attached to the person to perform the test while carrying out normal activities, including sleep. This is called EEG telemetry.

In certain circumstances it is necessary to admit the person to hospital and monitor the brain's 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 (or slices) of the brain. The person lies on an X-ray table which is moved slowly into the CT unit, which contains the scanner. Only the upper part of the head moves within 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 whole procedure takes about 45 minutes and provides valuable information for diagnosing epilepsy. The procedure is painless.

#### **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. The energy changes that result are used to produce computer images which look like two-dimensional slices through 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 right beside the person's hand so verbal communication can be maintained throughout. 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.

#### **PET Scanning**

**Positron Emission Tomography** (PET) is a non-invasive imaging technique that creates a three-dimensional image of the brain. Short-acting radioisotopes are injected into the blood. The person then 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 so the person can communicate with the operator at all times. The images are produced by analysing the uptake of glucose in the brain. For this to happen, it is necessary that the person must fast for a certain period prior to the PET. The scan takes between 30 and sixty minutes.

PET scanning is extremely costly and has been largely replaced by the SPECT Scan.

#### **SPECT Scanning**

**Single Photon Emission Computed Tomography** (SPECT) is similar to PET Scanning. It uses different radioisotopes which are 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 radioisotopes have been injected, up to 24 hours later. A mask is not required and an EEG is not taken. The actual scan usually takes about 20 to 30 minutes.

