The importance of an early, accurate diagnosis

An early and accurate diagnosis is important because it gives people time to come to terms with their condition. It also ensures that the appropriate treatment, support and information about lifestyle and risk reduction are given promptly. An early diagnosis is not always possible, however, as tests can be inconclusive; and time may be needed to record and monitor further events to enable a fuller assessment before confirming a diagnosis.

The tests

Most tests do not make or rule out a diagnosis of epilepsy; but there are a number of investigations that can guide epileptologists and help them form a complete picture of what is going on. These mostly take place in a hospital and are outlined below (please note that not everyone will need all of the tests described – some are only used in particular circumstances or if early tests are inconclusive):
Electroencephalograph (EEG)
In most cases of suspected epilepsy an EEG is likely to be recommended. This measures the brain’s electrical activity via electrodes placed on the scalp and identifies disruptions. It is pain free and takes up to an hour to complete. The EEG is frequently normal in people with epilepsy, so a normal EEG does not rule out epilepsy. Often, people are asked to over-breathe and/or flashing lights are used to provoke epileptic abnormalities in the EEG. Sleep or sleep deprivation are also used to increase the chances of recording abnormal activity.

Positron emission tomography (PET) scan
This is a non-invasive process that takes 30 to 60 minutes. It creates 3-dimensional images of the brain and uses a tracer to analyse brain function. The most common tracer used analyses glucose in the brain. This test is usually performed between seizures.

Single photon emission computerised tomography (SPECT) scan
This may be used when people are being assessed for epilepsy surgery. It is similar to a PET scan, and the most common tracer used measures blood flow. The injection of the dye into the vein is usually done during seizures, when video-EEG telemetry is taking place. The scan (which takes about 20 minutes) occurs soon after, and it highlights “hot spots” of seizure activity.

Magnetic resonance imaging (MRI)
This is the most sensitive brain scan used in epilepsy. It uses magnetic fields and radio waves to penetrate the brain in a non-invasive and painless way, to identify very small lesions and scars in the brain. It is very useful in cases where surgery is a possibility. Occasionally a dye is injected into a vein to enhance the images. The actual test takes approximately 30 minutes to complete, but some preparation time is also needed (about 30-40 minutes).

Computerised tomography (CT) scan
CT scans use X-rays of the brain to provide cross-section images of the brain that are stored on a computer. Sometimes a dye is injected into a vein to enhance the images. The actual scan takes about 10 minutes, but some preparation time (30-60 minutes) is needed.

Ambulatory EEG
During ambulatory EEG, the person wears a tape cassette recorder to provide up to several days’ and nights’ recording of the brain’s electrical activity.

Video-EEG telemetry
Video-EEG telemetry consists of simultaneous EEG recording of the brain’s electrical activity and video recording of seizures. It is usually carried out over a few days, and is mainly used when the diagnosis is uncertain or for assessment for surgical treatment of epilepsy.
Steps to an accurate diagnosis

These include:

• Written and verbal eyewitness accounts of the seizure episode – including what happened before, during and after the seizure
• A medical assessment by a GP as soon as possible after the event
• Prompt investigation by an epileptologist
• The person’s own account of the seizure episode
• A detailed medical history of the person and their family
• Appropriate diagnostic tests
• Close monitoring by the individual, their family or their carer following the event
• A written record of all subsequent seizure activity including unusual behaviour, feelings, sensations and events. A home video of seizures can be very useful
• Acceptance that an accurate diagnosis may take time to determine
• Recognition that the worst diagnosis is a wrong one arrived at too hastily