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EEG

What is an EEG?

EEG stands for electroencephalogram. It is a recording of the 'brainwaves' – the electrical activity of the brain. The many nerve cells that make up the brain produce continuous electrical activity when a person is awake, asleep or even in a coma. This can be recorded using small metal discs called electrodes, which are placed on the scalp. The electrical signals are then amplified by specialized equipment to produce what is seen in the EEG tracing. The signals show up on the EEG tracing as wavy lines, representing the fluctuations in electrical activity from moment to moment. Doctors can gain a great deal of information about the workings of the brain by examining these tracings.

What can I expect during an EEG?

After the EEG technician has asked you a few questions about your medical history, they will explain what will happen during the test. The whole procedure normally takes one to one-and-a-half hours, with the recording itself usually running for about 30-45 minutes. The EEG is carried out either with you sitting up in a comfortable chair or lying on a couch.

Preparation for an EEG

The first step is to apply the electrodes - usually about 20 in all - to the scalp. These are placed in standard positions, according to an internationally agreed convention. The technician will begin by measuring around the head with a tape measure to determine the position for each electrode, which they will mark with a skin pencil. The skin where each electrode is to be placed will be cleaned to ensure that the electrical contact is good enough to allow the weak signals from the brain to be recorded properly. You will usually find that your appointment letter asks you to come for your EEG with 'clean, dry hair'. The request is made because hair products and even the hairs natural oils can make it difficult for the technician to get a good electrode contact with the scalp. The electrodes, which are like little cup-shaped discs, are usually stuck in place with a special paste that also helps to conduct the electrical signals. Some of them may have a special conducting jelly put in them before they are stuck onto the scalp. The technicians are very skilled at doing this and it is not uncomfortable.

What happens during the EEG?

When everything is ready, the technician will ask you to sit or lie in as relaxed a state as you can. This can be quite difficult if you're feeling nervous in unfamiliar surroundings, but once the test is underway, people usually find that they are gradually able to settle down. It is quite important to relax, since a tense person will have tense muscles around the face and forehead and these will produce electrical signals of their own. The electrodes on the scalp will pick these signals up too, obscuring the EEG and making the recording less useful. During the recording, you will be encouraged to close your eyes, relax and drowse, since this may give more information than if the recording takes place when you are fully awake. Despite being in strange surroundings, people often drop off to sleep during an EEG.

The technician will ask you to open or close your eyes from time to time. This is so that they can observe certain changes in the brainwaves. The brainwaves of someone sitting quietly with their eyes closed doing nothing in particular have a characteristic appearance. In this state, the **alpha rhythm** will commonly be recorded from the back of the head. This is one of the brain's 'resting rhythms'. It may become slowed or disappear altogether in many conditions affecting the brain, such as infections, coma or dementia. When the eyes are opened, the alpha rhythm may either disappear altogether or become less prominent. The technician will be testing for this as he or she gets you to open and close your eyes. As well as asking you to open and close your eyes, the technician is also likely to carry out so-called **activation procedures**. These are methods that are known to reveal abnormalities that might not otherwise be seen.

The first of these procedures is hyperventilation or over breathing. The technician will ask you to breathe more deeply than usual, taking regular deep breaths in and out for about three minutes. Most people will tolerate this quite well, although some may feel slightly light-headed or giddy. **Over breathing** in this way will commonly produce a change in the brain's electrical activity and may bring out abnormalities not otherwise seen in the EEG. The second activation procedure used routinely is **photic stimulation**. In this, a quite bright strobe light is flashed in front of the person at different speeds –producing an effect very similar to the strobe lighting in a disco. This is usually done with the eyes open and then closed.

What happens after the EEG?

The technician will carefully remove all the electrodes from your scalp. There are no after effects from the EEG so you can carry on with your normal activities immediately.

When will I receive the results of the EEG?

A detailed report on the EEG will be sent to your study doctor, usually within 7 to 14 days. These should be available for your outpatient consultation.