

Evoked Potentials

Information and advice for patients and carers

Clinical Neurophysiology

Why do I need to come for the test?

We have been asked by your doctor to perform Evoked Potential tests. These are done to assess the function of your nerve pathways if you are having symptoms in your arms or legs or with your vision. This leaflet is designed to answer some of your questions.

What is an evoked potential?

An evoked potential is an electrical potential recorded in the brain that occurs in response to a stimulus for example a light, sound or touch. There are different types of evoked potential depending on which stimulus is used but all are non-invasive.

How are evoked potential tests performed?

When you arrive we will explain the tests, discuss your medical history and answer any of your questions. First the head is measured and sites are marked with a soft crayon. Then a few electrodes are attached to the scalp in specific locations, depending on which type of evoked potential is being performed.

The different types of evoked potentials take about 45 minutes to an hour each to complete. Your appointment letter will tell you which one(s) you are having:

1. Visual evoked potential (VEP)- This evaluates the visual nervous system from the eye to the brain. After your head has been measured and the electrodes have been applied, a patch will then be placed over one of your eyes. Whilst seated, you will be asked to stare for short periods of time at a video monitor showing a moving chequer board pattern. You will be asked to concentrate on a small red dot in the centre of the pattern. Each eye is tested separately. If you have difficulty focussing on the screen, we might show you a flashing light instead. Sometimes you will also be asked to look at a flashing light and occasionally we may perform an additional test called Pattern Electroretinogram (ERG), which records the electric activity of the retina (part of the eye). This will not harm your eyes.
2. Brainstem Auditory Evoked Potential (BAEP)- This records the electrical activity of the brain in response to clicks from a set of headphones placed over the ears. After the electrodes are applied you lie down on a bed, relax and some headphones are applied. Clicking noises are then played into the headphones and we record the brain's response to this. Each ear is tested separately.

3. **Sensory Evoked Potential (SEP)**- This test can be performed on the arms, legs or both. SEPs are the brain waves that occur in response to short electrical impulses administered to a nerve in an arm or leg. After the electrodes are applied, you will be asked to relax on a couch. Some more electrodes will be applied to the back of the neck and to the shoulders if the arms are being tested, and behind the knees if the legs are being tested. A tapping, tingling sensation is then applied to the wrist or ankle. This produces some twitching movements in your thumb or toes, lasts for a few minutes only and each side is tested separately.

Once enough responses have been recorded for each type of evoked potential, the test will be completed by removing the electrodes with some warm water. You may need to wash your hair afterwards.

What preparation do I need to make?

- Wash your hair before coming to the test. Do not use sprays, oils or dressings of any kind. Toupees will need to be removed.
- Eat meals normally.
- Continue to take prescribed medications unless advised otherwise by your doctor and bring a list of your medications with you to the appointment.
- Bring glasses or contact lenses with you if you wear them and are having a visual evoked potential.
- Wear comfortable, loose clothing, particularly if you are having a sensory evoked potential.

Will I feel anything?

You will not feel anything for VEP or BAEP. During SEP you will feel a tapping, pulsing sensation which may cause slight discomfort but is usually easily tolerated.

What is the benefit of having an evoked potential test?

The benefit of the test is that it will help your doctor to diagnose if there are any problems and he/she will then be able to advise any appropriate treatment if required.

What are the risks of an evoked potential test?

- There is a rare chance you may experience some redness or soreness where the paste and/or tape is applied to stick on the electrodes.
- SEPs may affect the older generation of pacemakers, so if you have a pacemaker, please contact us on 0121 507 4319 so we can discuss this with you.
- Your hair/scalp will be a little sticky from the paste, however the paste dissolves with water and should come out easily with normal shampoo.
- There are no lasting effects from the test. You will be able to carry on normally after the investigation.

Are there any alternatives to the test?

This depends upon the condition you have been referred for and what information your doctor needs from the test. In some cases, scans such as MRI can give similar information but that is not always the case.

What are the risks of not having the test?

If you don't have the evoked potential test(s) there may be a delay in getting your diagnosis.

When will I get the results?

The report will be sent to the doctor who referred you for the test after about 2 weeks. He/she will then arrange to discuss the results with you.

Your appointment

If you are unable to keep this appointment, please contact us on 0121 507 4319 so that alternative arrangements can be made, and the slot can be given to another patient waiting for the test. Thank you for your cooperation.

Before the test we will ask you if you have read and understood this information and whether you consent to go ahead with the test(s). We will also answer any questions you have regarding the test(s).

Department of Clinical Neurophysiology

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How to contact us

You will be able to ask any questions or tell us any concerns before the test is carried out but if you would like to contact us before your appointment, please call us on:

Tel: 0121 507 4319

Monday-Friday 9am-4pm.

If you are unable to read or are unable to attend your appointment, please call us on the same number.

Other useful sources of information

www.bscn.org.uk

www.ansuk.org

For more information about our hospitals and services please see our website

www.swbh.nhs.uk, follow us on X @SWBHnhs and like us on Facebook

www.facebook.com/SWBHnhs.

Sources used for the information in this leaflet

- American Society of Clinical Neurophysiology (2006). *Guideline on evoked potentials: guideline 9A*. [Online]. Milwaukee: ASCN. Available at: <https://www.acns.org/pdf/guidelines/Guideline-9A.pdf> [Accessed 31 December 2024].
- Niedermeyer, E and Lopes da Silva, FH. (2005). *Electroencephalography: Basic Principles, Clinical Applications, and Related Fields*. Philadelphia: Lippincott, Williams and Wilkins.
- Chappa, KH (1997). *Evoked potentials in clinical medicine*. Philadelphia: Lippincott, Williams and Wilkins.
- International Society for Clinical Electrophysiology of Vision (2016) *ISCEV standard for clinical visual evoked potentials: 2016 update*. [Online]. Available at: <https://iscev.wildapricot.org/resources/Documents/StandardsEtc/Odom2016DOOP%20VEP%20Standard.pdf>. [Accessed 31 December 2024].
- Binnie, CD. et al. (2004). *Clinical neurophysiology: EMG, nerve conduction and evoked potentials*. Philadelphia: Elsevier.

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