Intracranial depth electrodes for epilepsy

Neurosurgery Patient Information

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What are depth electrodes?

Intracranial depth electrodes are small wires that are carefully placed in the brain. They can detect seizures and help locate exactly where in the brain the seizures come from.

Do I need to have depth electrodes?

The decision is entirely up to you. Your epilepsy doctors and surgeons have offered you this operation because it will help them decide whether or not you could benefit from brain surgery to improve or cure your seizures.

What are the risks involved in depth electrodes?

Your surgeons will discuss this with you in detail in clinic and answer any questions. The overall risk of complication is 1–2%. Minor risks include small bleeds in, or on the surface of, the brain, surface infection, build-up of fluid on the brain, pieces of the electrode being retained in the brain and clots in the legs or lungs. Major complications are rare and occur in 0.5% of cases. They can include permanent weakness in the face, arms or legs, speech problems, numbness, visual loss, double vision, memory problems, deep infections, larger bleeds, seizures and very rarely, death.

What does the operation involve?

You will be admitted either the night before or on the morning of the operation. You will meet your surgical team, anaesthetist and Epilepsy Specialist Nurse to discuss the order of the day and to re-sign the consent form.

You will be taken down to the MRI scanner, meet the rest of the theatre team and will be put to sleep under a general anaesthetic. Once you are asleep the surgical team will fit a specialist frame to your
head and you will have an MRI scan with the frame in place.

You will then be transferred to the operating theatre whilst asleep and your surgeons use an advanced computer programme to plan in detail where to place the electrodes using the MRI scan you have just had.

The computer provides a map for your surgeons to use with the frame. Your hair and scalp will be thoroughly cleaned with medical soap. You will be covered in sterile (very clean) sheets and the rest of the frame attached to your head over the top of the sheets.

![Image of surgeons and frame]

Using the map made by the computer and surgeon the frame is changed for each electrode. A small cut (about half a centimetre) is made in the scalp and a thin drill is used to make a small hole in the skull. A bolt (like a small screw with a hole through the middle) is fixed in the skull. The electrode is passed through the bolt and fixed in place with a little cap.

Once the electrodes are in place, the frame will be removed, a head bandage put on and you will be woken up from your anaesthetic.
You will be transferred to our theatre recovery area to wake up properly and then moved to ward 409 (on the 4th floor). Your surgeon will visit you to answer any questions and let you know how the operation went.

**What happens after the operation?**

The morning after the operation you will be taken for another MRI scan. This is to check the electrodes are in the correct position. Your electrodes will then be attached to a computer by your neurophysiologist. This will start recording activity in the brain.

There will also be a video camera set up in your room that is monitored
by nursing staff. This is to video record any seizures you have and will be studied by your epilepsy team.

You will stay as an in-patient for at least 14 days to record as many seizures as possible. During this time you will have antibiotics once a day as well as an injection every evening to help prevent blood clots in the legs and the lungs. We will ask you to stay in your room during your stay to make sure we don’t miss any seizures on camera but you can walk around freely inside the room.

To make sure we record enough seizures your epilepsy medication may be reduced and we may have to keep you awake for long periods of time.

After 14 days when your recording period is over, you will undergo a short (30 minute) operation to remove the electrodes and you will be able to go home the next day.

**How long will the operation take?**

It depends on how many electrodes are needed but in general it will take most of the day. You should expect to be back on the ward in late afternoon or early evening. Your next of kin can leave contact details with your surgical team so they can be updated by telephone once the operation is finished.

**Will I have to shave my hair?**

You do not have to shave your hair. With certain lengths of hair your surgeons may have to remove a small patch for each electrode however.

**Will it hurt?**

If you have electrodes that are placed near the temples this may cause some discomfort when talking or chewing. You will be provided with
pain relief if this is the case. You won’t be able to feel the electrodes within the brain itself.

**Will I have stitches?**

Yes, you will have one stitch for each electrode when removed. The stitches may be dissolvable or non-dissolvable. If non-dissolvable these can be removed after one week by your GP or practice nurse. You can wash your hair two days after you go home.

**Will depth electrodes make my epilepsy worse?**

There is always a small risk that electrodes may make your seizures temporarily worse. Our experience however is that often, the number of seizures reduce temporarily once the electrodes are in place.

**When will I get the results?**

There is a lot of information for the epilepsy team to study after you have been discharged. This will be looked at by your epilepsy multidisciplinary team and you can discuss these results in your follow up appointment with your surgeon. This is usually around three months after you are discharged home.

**Useful contact numbers**

Ward 407: 0121 371 4070 (4th floor)
Ward 409: 0121 371 4090 (4th floor)
Ward 411: 0121 371 4110

Anna Leat (epilepsy specialist nurse): 07769 163677

**Visiting times:** 11:00-20:00, Monday–Sunday
Please use the space below to write down any questions you may have and bring this with you to your next appointment.

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Do you really need to go to A&E?
Check symptoms online quickly and safely.
A free service for NHS patients.
uhb.nhs.uk/ask

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