INSELSPITAL
UNIVERSITÄTSSPITAL BERN
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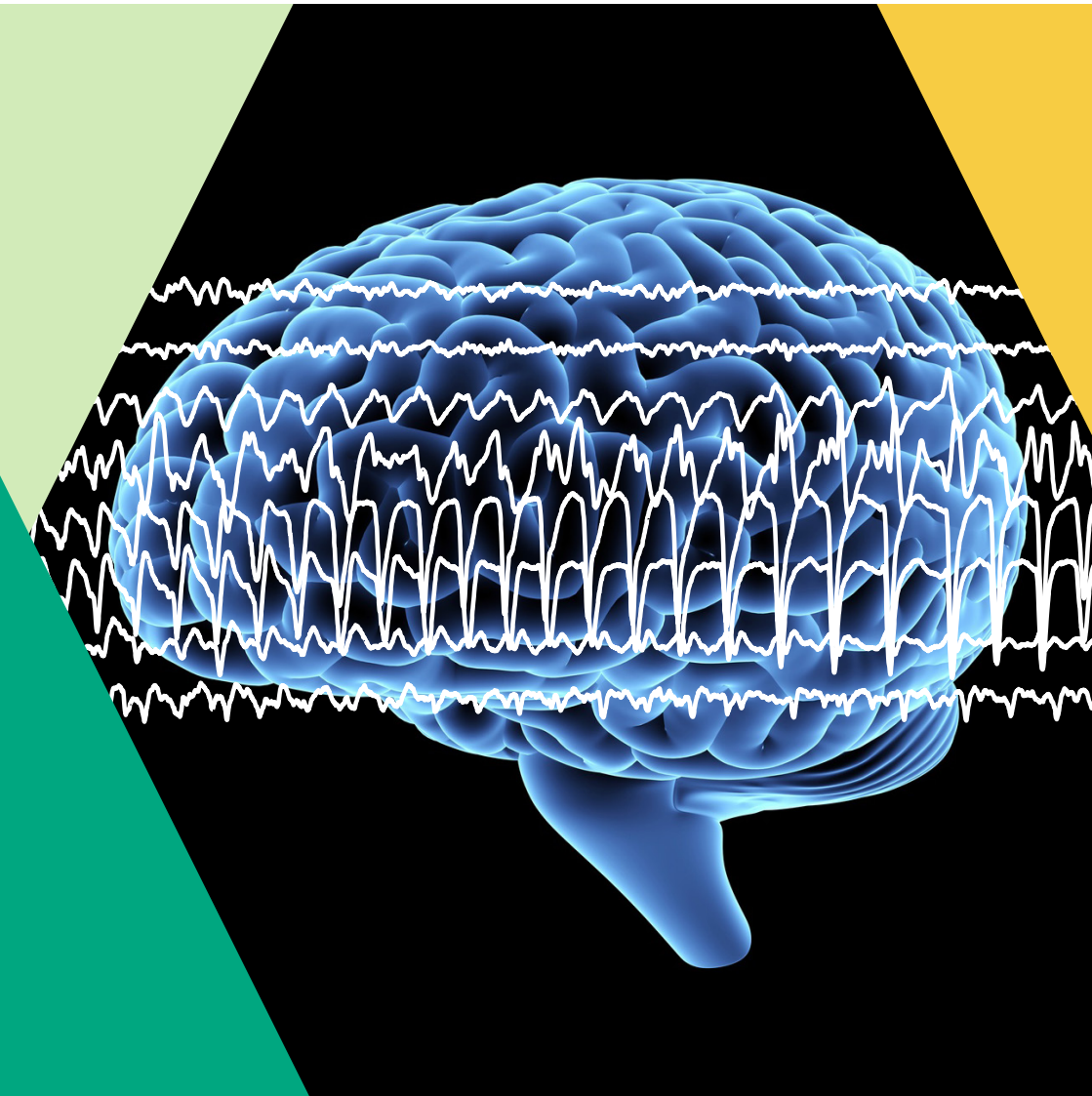
NEUROZENTRUM
Neurocentre | Neurocentro
Inselspital Universitätsspital Bern
Universitäre Psychiatrische Dienste Bern

Neurochirurgie
Neurologie
Neuropädiatrie
Neuroradiologie
Psychiatrie

Preoperative epilepsy diagnostics



Who are your Doctors?

Our interdisciplinary team of specialists works under the leadership of Prof. Claudio Pollo (Neurosurgery), Prof. Kaspar Schindler and Prof. Maxime Baud (Neurology). Bern University Hospital has one of the largest centres for epilepsy surgery in Switzerland. It is accredited by the Conference of the Cantonal Directors of Health (Konferenz der kantonalen Gesundheitsdirektorinnen und -direktoren) for highly specialised medicine in epilepsy.

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What is epilepsy?

Epilepsy is a common and chronic neurological disorder affecting approximately 1% of the population worldwide. Recurrent epileptic seizures are the hallmark of the disease. Epilepsy is often caused by pathological changes in the structure of the brain, such as scar tissue following a brain injury or developmental disorders of the neurons or blood vessels.

What are epileptic seizures?

Epileptic seizures stem from abnormal electrical activity in neurons and might manifest as disturbances in perception or involuntary twitching of the muscles. This activity can be measured using electroencephalogram (EEG) and, along with imaging techniques, helps determine which part of the brain seizures are coming from.

Can epilepsy be treated with medication?

Around two thirds of people with epilepsy become seizure-free when taking regular medication. For the rest of them, unfortunately, the probability of achieving seizure freedom decreases with each new drug treatment attempted.

By the third medication tried, chances are already less than 5%, although it is still possible that a treatment success occurs even after several attempts. At this stage, an in-depth evaluation is indicated to determine whether these individuals could benefit from epilepsy surgery.

What is epilepsy surgery?

Surgical interventions for epilepsy were first developed in the 1950s. Since then, technology and diagnostics have come a long way. Nonetheless, the basic approach has stayed the same and consists of the following three steps:

1. Find out in which brain region the seizures start.
2. Define which parts of the surrounding tissue are healthy and functional.
3. Remove the diseased, dysfunctional brain region.

In concrete terms, this means that various outpatient or inpatient examinations must be performed to precisely localise the epileptic region in the brain. The results of these examinations are then discussed in an interdisciplinary conference, so that we can give you a recommendation in favor or against epilepsy surgery.

When is surgery indicated?

In light of the therapeutic successes achieved in treating this chronic illness, neurologists throughout the world recommend referring patients to specialist providers at an early stage. More specifically, the patient should be referred to a specialist provider if they are still experiencing seizures after unsuccessful attempts with two different medications. The precise nature of the seizures is a decisive factor in assessing whether surgery might help.

What are the chances of success?

Overall, the chances of success are high. Depending on the type of epilepsy, the probability of completely eliminating seizures varies from around 30% to around 80%. If seizures are eliminated, medication intake can be reduced or even sometimes stopped entirely. Even if the person continues to have epileptic seizures after the operation, the frequency or severity of the seizures usually decreases. However, the assessment of the chances of success is always individual. The cognitive functions of the brain are also taken into account. For example, our team of neuropsychologists will test your concentration, language and memory skills in detail and advise you on possible changes after the operation.

What are the risks of surgery?

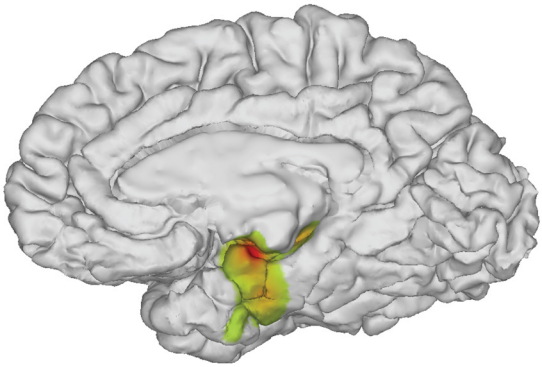
In rare cases, surgery may have no effect on seizures. Complications may also occur during surgery, but these usually result in only a short-term worsening. In less than 1% of cases, surgery can lead to permanent damage. However, the exact risk must always be weighed on an individual basis. In order to obtain more detailed information about the operation and its risks, we always make a joint appointment directly with the attending neurologist and neurosurgeon.

What are the next steps?

After the diagnosis of drug-resistant epilepsy was made, further examinations will be performed to obtain as much information as possible about your epilepsy. A comprehensive picture is crucial for doctors to understand your seizures. Preparing for brain surgery is a long process that involves multiple tests over a period of 3 to 12 months:

- Advanced imaging techniques, such as high-field magnetic resonance imaging (MRI) and positron emission tomography (PET), to visualise the diseased tissue.
- A detailed examination of your cognitive abilities.
- One to three inpatient hospital visits at our seizure unit, each lasting one to two weeks in order to record your seizures, during which time you will constantly be wearing an EEG.

During this preparatory period, you will have several consultations with specialists from neurology, neurosurgery and neuropsychology to discuss the various aspects of undergoing surgery for epilepsy. In case you undergo surgery, your post-operative care will include additional appointments with neurosurgery (after six to 12 weeks), neurology (after 3, 12 and 24 months) and neuropsychology (after four to six weeks and after one year). We will maintain contact with your personal neurologist (if you have one) and involve them in the decision-making process.



3D reconstruction of the brain of a person with epileptic activity

What information do neurologists need?

To better understand your epilepsy, the following is necessary:

- Description of the seizures from the patient's point of view.
- If possible: description of the seizure by another person who has observed it.
- An EEG recording of at least one seizure, although it is often necessary and helpful to record multiple seizures.
- Obtain images of the brain.

In some cases, the information provided by scalp EEG is insufficient and an invasive diagnostic step may be necessary. This involves placing intracranial electrodes directly on or in the brain. The necessity of this diagnostic step is discussed individually with the attending neurologist and neurosurgeon.

For more information on neurology at Inselspital, please visit the website.

What information do neurosurgeons need?

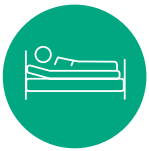
After all necessary examinations have been performed, the results are presented for evaluation to an interdisciplinary team of experts from neurology, neuroradiology, neurosurgery and neuropsychology. Prospects of success and risks of the surgery as well as possible alternative treatments are discussed among specialists in our team and communicated to you in a subsequent visit to our clinic.

For more information on neurosurgery at Inselspital, please visit the website.

Information about staying in our seizure unit:

When staying in the seizure unit, you will be monitored by video and EEG for 24 hours a day in order to record epileptic seizures. EEG sensors, usually connected to a portable bag, will be attached to your head for this purpose.

Medication intake will often be reduced to increase the likelihood of epileptic seizures. This will hasten the occurrence of seizures, but might also make them more severe.



For safety reasons, your physical movement will be restricted to within a couple of metres of the bed for the duration of your stay. You will sleep with the bed rails raised. Showering is generally not permitted.

Smoking is prohibited while in the unit.

We recommend bringing entertainment for the duration of your stay (books, iPad, notebook etc.).

The duration of your diagnostic stay in the seizure unit depends on the number of seizures you experience and varies from person to person. However, it will not usually exceed 14 days.

A junior doctor, nursing staff and EEG technicians will care for you every day, while the specialised epileptologist will have consultations with you once or twice a week.

You will have the option of taking part in scientific studies. In this case, you will also meet researchers.

How do I make the right decision?

The decision for or against epilepsy surgery belongs to a process that may be long. It can be helpful to discuss the arguments together with family members or a close person. Weigh the risk of surgery against the risks associated with recurrent epileptic seizures. The seizures and their consequences affect quality of life, increase the risk of injury and in rare cases can even be fatal.

Over the months leading up to surgery, you can change your mind and decide to stop the investigations. It is very important that you express your hopes and fears so that we can adjust our care to your specific expectations.

We want you to feel well in yourself and to be satisfied with the decisions you have made by the end of the investigation. We will support you throughout your decision-making process and provide you with the best care we can. We recommend that you write down any questions that remain unanswered so that we can answer them at the next consultation.

Questions for my doctor:

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