

National Hospital for Neurology and Neurosurgery

Ablative Neurosurgery for Refractory Pain:

Anterior Cingulotomy

Unit of Functional Neurosurgery



If you would like this document in another language or format or if you require the services of an interpreter contact the unit directly. We will try our best to meet your needs.

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Introduction

This booklet was prepared by the Functional Neurosurgery Team at the National Hospital for Neurology and Neurosurgery, in collaboration with the Pain Management Service at UCLH.

This booklet is intended for patients with severe refractory pain that may benefit from ablative neurosurgery. It is not intended to replace discussion with your consultant.

This information is designed to help people understand this neurosurgical treatment. Some people want more detail of what is involved in the operation. Please ask us for as much information as you would like to help you understand the treatment.

We know that understanding and remembering information can be difficult when you are experiencing significant pain and are taking high doses of pain killers that might affect your level of alertness. Our advice is:

- Take your time
- Only read small sections of the guide at any one time
- Ask other people to help you read it
- Highlight any areas of concern so that we can discuss these with you. We suggest that you write on this

information sheet so that you can ask questions. We can provide you (or friends/ relatives) with another copy.

Why operate for pain?

For some people suffering from severe refractory pain, treatment with pain killers can sometime fail to relieve the symptoms and also result in significant side effects, mostly drowsiness and excessive somnolence. When pain does not respond to standard treatments, people endure great suffering, have a very poor quality of life, and may be at risk of depression. The consequences for the family and friends of the patient can also be severe.

There are many different treatments for pain, but some sufferers do not respond to any of them. After all clinically proven treatments have been tried, individuals may be considered for a neurosurgical operation.

What are the operations called?

There are several different operations that can be performed for the management of pain. This is to do with the type of pain being treated as well as patient specific factors such as the presence of infection and life expectancy. This operation is called an anterior cingulotomy (see figure 1, page 24). Other procedure commonly performed are called

thalamotomy, cordotomy, deep brain stimulation and intrathecal morphine pump implantation.

Is this a lobotomy?

No. Brain operations to relieve pain disorders have been carried out since the late 1960s. Other brain operations to relieve mental disorders has also been carried out since the late 1930s. In the past, such procedures were referred to as 'psychosurgery'. When surgery was used to treat schizophrenia in the 1940's and 50's, the operation was crude, destroying large areas of brain tissue. The extensive damage to those parts of the brain called the frontal lobes led to problems with apathy, personality changes and a blunting of emotional responses and feelings. *The operations conducted today are very different.*

How are these operations different from a lobotomy?

First, surgery is only offered to people suffering from widespread pain and only when all other reasonable treatments have been tried and failed. Second, the surgery involves the insertion of a 2mm-thin surgical probe into the brain causing a minimum of damage. The probe is guided into position very accurately using a frame that holds the probe and special imaging machines that produce detailed images of the brain; computerised tomography (CT) or

magnetic resonance imaging (MRI) scanners. When placed in position by the surgeon, the end of the probe is heated to damage the tissue immediately around the tip. This heat-damaged tissue stops the function of that small part of the brain. This effect is very localised and is permanent.

Anterior cingulotomy affects two areas, one on either side and close to the middle and front of the brain, called the cingulate gyrus. Within the small areas that are affected by a cingulotomy operation there are thought to be a range of different functions. These functions include some aspects of the regulation of emotion and of automatic bodily responses to events in the world around us. The cingulate gyrus is also involved in some aspects of learning, particularly learning which events in the outside world are pleasant and which are unpleasant.

Asking for your consent

We want to involve you in all the decisions about your care and treatment. If you decide to go ahead with treatment, by law we must ask for your consent and will ask you to sign a consent form. This confirms that you agree to have the procedure and understand what it involves. Staff will explain all the risks, benefits and alternatives before they ask you to sign a consent form. If you are unsure about any

aspect of your proposed treatment, please do not hesitate to speak with a senior member of staff again.

How should I prepare for this surgery?

You should continue taking your medications as normal unless your physician or neurosurgeon tells you otherwise. Medicines containing aspirin or aspirin-related drugs (non steroidal anti inflammatory drugs or NSAIDs) commonly used in cold remedies and off-the-shelf pain relief (for example diclofenac and ibuprofen) can thin the blood and increase the risk of a brain bleed. It is very important to avoid taking these medicines completely in the two weeks prior to the date of your surgery. The only off-the-shelf pain medicine that can be safely taken is paracetamol (with or without codeine). If you are unsure whether you should take a new type of medicine please contact us before you do so. You may also be seen in the Pre-operative Assessment Centre a few weeks prior to the planned surgical date. You may take this opportunity to clarify any concerns you have over medication usage.

What does the operation involve?

The operation takes about 3 hours, although much of this time is taken up by brain scans to locate the correct position for the probes. The surgery itself takes about one hour. The

two incisions are usually placed on either side of the top of the patient's head, around 2 cm from the midline, behind the hairline to hide the scars (although this is not always possible). Most times, no shaving is required at all, but sometimes the scalp around the incisions is shaved. People do not have their whole head shaved. The scars will eventually fade to a pale line within three to six months and the hair will usually grow back normally if it has been shaved. The skin is closed by a variety of different methods using stitches or skin staples. Stiches or staples are normally removed after about 5-7 days depending on how well the wound has healed.

What should I expect after surgery?

The operation can be carried out either under local anaesthetic (with the patient awake, similar to a dental procedure) or under a general anaesthetic (with the patient asleep). A frame for the surgery is attached firmly to the patient's skull, using local anaesthetic to numb the skin and tissue. Unlike skin, bone and other parts of the body, the brain has no sensory nerve supply and cannot 'feel' pain.

If the surgery is performed under local anaesthetic, parts of the procedure can be uncomfortable, but it is *not* painful and your surgeon will guide you at every step.

Although many people feel their symptoms improve immediately, it is important to be aware that there may be NO EFFECT at this stage. This does not mean that the operation will not be successful over a longer time.

Although some people feel the pain starts to improve soon after surgery, it is important to be aware that there may be NO EFFECT at this stage. This does not mean that the operation will not be successful over a longer time.

After surgery, most people usually complain of a headache. This tends to be around the areas where the frame has been attached to the head and the incisions where the probes have been inserted through the skull. This does not usually last longer than a couple of days.

The patient may experience some confusion and problems with their memory, for example – remembering which day it is. This usually settles quickly. Also, there can be problems controlling the bladder, although normal ability to hold urine will return.

There can be some bruising and swelling of the face around the eyes. However, this is rare, short lasting and requires no specific treatment.

How effective is this kind of operation?

Research over many decades in different countries suggests that this kind of operation helps the majority of all people who have it. Overall, around 60% - 80% of people do quite well, with a significant improvement in pain. They require less pain medication and can have improvement in their mobility. The remaining people get little benefit, but the pain is not worsened by the operation. The improvement is sometimes gradual and may not be noticed by the patient initially.

What are the risks of the operation?

With all surgical operations and general anaesthetics, there are risks. When carrying out operations on the brain, the two main risks are of introducing infection and of bleeding into the brain. The risk of infection or bleeding is very low, but these rare events can lead to serious problems; similar to having a stroke. This happens approximately one time in a hundred procedures. Effects can vary, but do not necessarily result in paralysis. Recent reviews of the outcome of a large number of brain operations reveal that the risk of death is about one in a 1000 (0.1%).

Occasionally people develop epileptic seizures in the period after the operation (around 1 in 50), although this can

usually be controlled, if required, with drug treatment. Because of this risk of seizures, people are not permitted to drive motor vehicles for a period of at least **six months after surgery**, (see address for DVLA at end of this document).

Other, more common, short term side effects of the procedure may include swelling of the face, tiredness, weight gain and problems with holding urine in the bladder, particularly while sleeping. In most cases, these problems resolve in the weeks after surgery. Sometimes, the person can have periods of confusion, with impairments of memory and attention, during the immediate post-operative period. For example, the patient may become confused about which day it is. This does not usually persist for more than a few days or, at worst, a couple of weeks for most people. There is no convincing evidence that the operation affects the intellectual functioning or personality characteristics of the patient in any negative way.

What will happen if I choose not to have this surgery?

The choice to have surgery is entirely yours. If you choose not to have surgery you will continue to receive the best possible care from your oncology, palliative care and pain management services.

If I decide to have the operation, what is involved?

Prior to you being offered the operation, a multidisciplinary team meeting is carried out to decide on what is the best management option, including surgery. The team involves neurosurgeons, a neuropsychiatrist and pain medicine specialists. Any decision whether or not to proceed with surgery is made jointly with the patient. You will have an assessment by a psychologist as well as an assessment by a psychiatrist. An MRI scan of the brain will be taken to rule out any brain pathologies that might affect the operation.

Surgery is **never** carried out unless the patient wishes to proceed. The patient is able to withdraw from surgery at any time. Test results and details of the procedure can be discussed at any stage with members of the multidisciplinary team.

Where does the surgery take place?

Once a definite decision has been made regarding suitability for surgery, arrangements are made for admission to The National Hospital for Neurology and Neurosurgery, London.

The Neurosurgical team will discuss the technique and explain the risks of the surgery again, will answer any of your questions and ask for your final consent to proceed with surgery. This is a new indication for this procedure to

this hospital, but the neurosurgical team has experience of performing the same procedure for conditions other than pain. The neuroanaesthetist and other members of the team will also see the patient. After surgery, people remain in the neurosurgical ward for 24-48 hours, depending on how quickly they recover from the operation.

Most people are able to return to the ward the day after surgery, and most people are awake and eating within 24 hours of surgery. The length of stay after surgery depends on the patient's progress.

Before leaving the ward, everyone has some of their tests and some of the interviews repeated.

Can I drive after surgery?

Because of the small risk of seizures following this type of procedure, the DVLA normally recommends a 6-month driving ban after this type of surgery. However, you will have to inform the DVLA that you have undergone this procedure and you should wait for permission from the DVLA before returning to driving.

What if the operation doesn't work?

As explained above, around 20-40% of people may not feel any benefit after surgery. Depending on the results of the clinical ratings, the neuropsychological testing, and the MRI

scans, people may be offered an additional procedure to extend the cingulotomy. This means that the lesions from the previous operation are increased in size. Another alternative is to consider one of the other operations described if appropriate.

Glossary

Anterior - Towards the front

Cingulate - Part of the brain known as the cingulate gyrus

Cingulotomy - To place a thermal lesion in the cingulate gyrus of the brain

Confusion - A mental state characterized by a lack of clear and orderly thought and behaviour (in this case temporary)

Gyrus - one of the 'folds' of the brain

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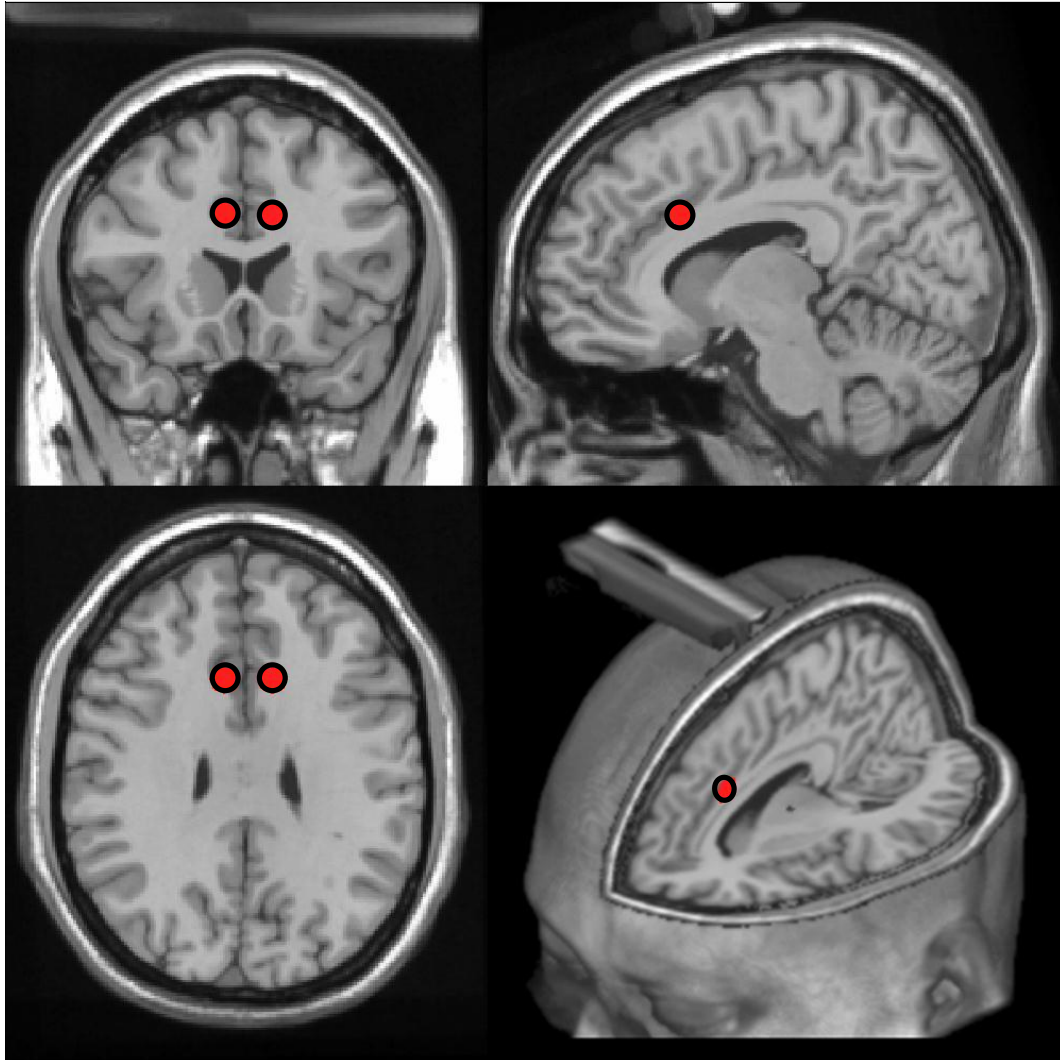


Figure 1. Illustration of the lesions in anterior cingulotomy (shown in red). Lesions are not to scale.

Contact details

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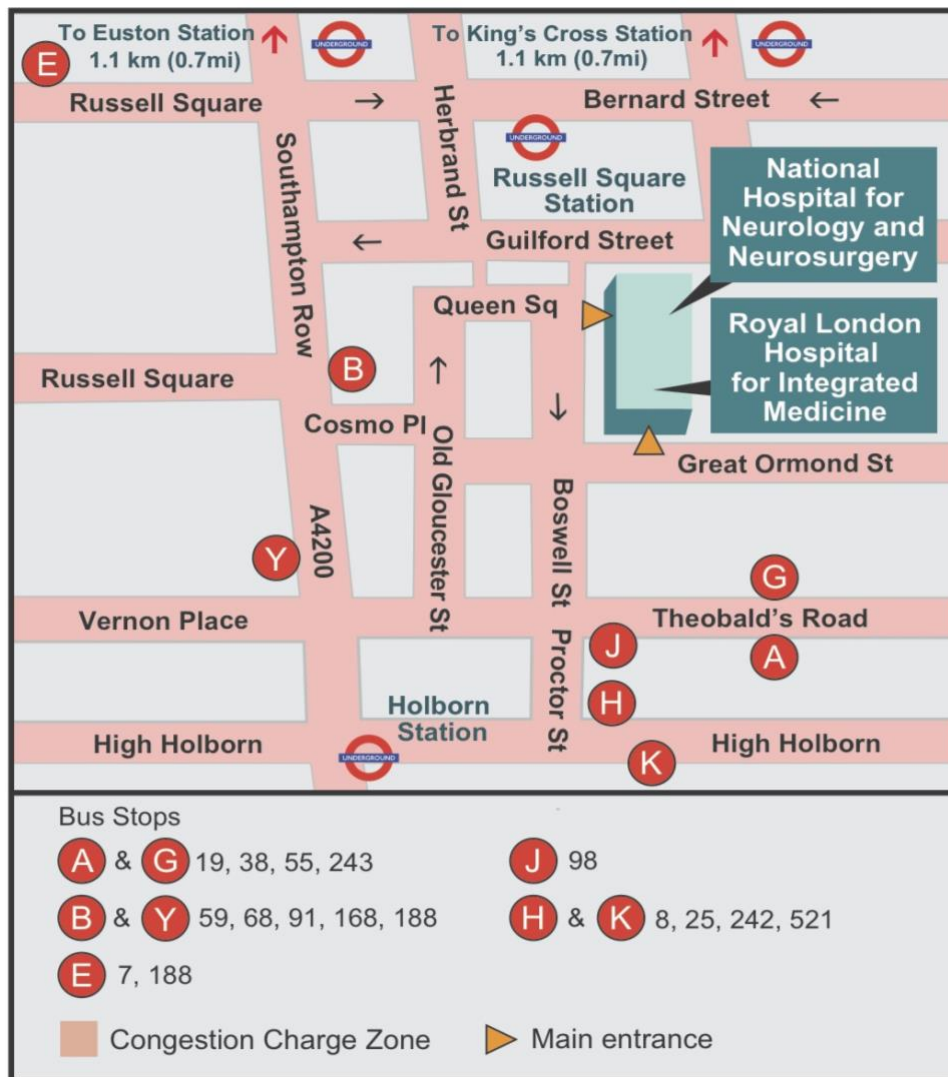
Direct line: 020 344 88722

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Website: [www.uclh.nhs.uk /nhnn](http://www.uclh.nhs.uk/nhnn)

Space for notes and questions

How to find us



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