Advanced Interventions and Neurosurgery for Mental Disorder

Patient Information Sheet
Neurosurgery for Depressive Disorder: Anterior Cingulotomy

How to use this guide

This information is designed to help people understand one of the modern neurosurgical treatments for depressive disorder. 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 depressed. Our advice to you 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 would suggest that you write on this information sheet so that you can ask questions. We will happily provide you (or friends/ relatives) with another copy.

Why operate?

For some people suffering from depression, treatment with antidepressant drugs, electroconvulsive therapy (ECT) and psychological treatments (for example, Cognitive Behavioural Therapy, CBT) fails to relieve symptoms. They continue to suffer from depressed mood, a loss of interest in previously enjoyed activities and they can feel hopeless. Usually, they have negative and pessimistic views of themselves, others, the world around them, and their future. They usually have difficulties with sleeping, eating and concentrating. These persistent feelings and symptoms may lead to

thoughts of suicide. When depression does not respond to standard treatments, people endure great suffering, have a very poor quality of life, and may be at risk of suicide. The consequences for the family and friends of the patient can be severe.

There are many different treatments for depression, 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. This brain surgery is also known as Neurosurgery for Mental Disorder (NMD). Dundee is the only centre performing this type of surgery in Scotland. Currently, about 3-4 people per year have operations in Dundee.

What are the operations called?

Although there are several different operations performed around the world, the one that is used currently in Dundee is called an *Anterior Cingulotomy* (see figure 1). The other procedure performed most commonly worldwide is called an *Anterior Capsulotomy*. Sometimes, after a Capsulotomy has been unsuccessful, or only partly successful, a patient will have an Anterior Cingulotomy in an attempt to improve symptoms. The following information refers to Anterior Cingulotomy only.

Is this a lobotomy?

Brain operations to relieve the symptoms of mental disorders have 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 they different?

First, surgery is only offered to people suffering from prolonged depression, or from a condition called obsessive-compulsive disorder, and only when all other treatments have been tried and failed. Second, the surgery involves the insertion of thin surgical probes into the brain causing a minimum of damage. The probes are guided into position very accurately using special machines that produce detailed images of the brain; Computerised Tomography (CT) or Magnetic Resonance Image (MRI) scanners. When placed in position by the neurosurgeon, the ends of the probes are heated to damage the tissue immediately around the tip. This heat-damaged tissue stops functioning. This effect is permanent.

There are 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 is also involved in some aspects of learning, particularly learning which events in the outside world are pleasant and which are unpleasant.

What will I feel?

The operation is carried out under a general anaesthetic so people are asleep during surgery. While the person is unconscious the 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. However, the scalp and skull do have such nerves and when people wake up it is normal to feel a headache where the frame has been attached and the probes have been passed through the top of the skull for a few days after surgery. Normally, simple painkillers, such as paracetamol, relieve this. Some people require slightly stronger painkillers such as codeine or ibuprofen.

How effective is this kind of operation?

Research over many decades in different countries suggests that this kind of operation helps around one half (50%) of all people who have it. Overall, around one fifth (20%) to one third (33%) of people do well, with a significant improvement in symptoms. Approximately one third (33%) may experience a small improvement in symptoms. The remaining people get little benefit.

A small number of people notice a slight improvement in their symptoms in the weeks following surgery. However, this improvement in the days/weeks following surgery may not last. For the majority of people, it may take 6-12 months before a sustained improvement is obvious. This improvement is often very gradual, and is usually not noticed by the person themselves.

Is it a cure?

Even if the operation is very successful and most symptoms are relieved, there are often continuing difficulties. When someone has been depressed for a very long time, there are usually many problems and difficulties in their lives. These can take time to

try to resolve. The year following surgery can be a difficult one. It can be very frustrating to have to wait to see if the operation is going to help. If the operation brings improvement, it can be difficult to adjust to feeling well after such a long period of illness. Full support from family, friends and the local mental health services is very important. The individual's local mental health services are asked to be involved in a care plan for this period after the operation. Most people who have the operation remain in contact with psychiatric services for a lengthy period afterwards. Continuing treatment with antidepressant drugs and psychological treatments is almost always necessary, and we would certainly recommend that such treatment continues.

Sometimes, other treatments such as ECT are still required. Please note that some people find treatments (*such as antidepressant drugs or ECT*) that were previously unhelpful may become helpful after surgery.

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 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 complete 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%).

However, there are more common complications that individuals and relatives need to be aware of. Around 1 in 50 people develop epileptic seizures in the period after the operation, although this is usually controlled quite easily with drug treatment. Because of this risk of seizures, people are not permitted to drive motor vehicles for a period of six months after surgery, (see address for DVLA at end of this document) Over a period of 10 years post-surgery, the potential risk of epilepsy persists. However, it is

much less likely to occur if no seizures have occurred in the first few weeks following neurosurgery, and we are fairly confident that if there have been no seizures by about 3 weeks after surgery, the risk of epilepsy or further seizures is pretty low.

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, weeks for most people. There is no convincing evidence that the operation affects the personality of the patient in any negative way.

If I have the operation, what is involved?

To determine suitability for surgery, the service assesses people either at their own hospital base or in Dundee. This involves an extensive interview with the patient and usually also with their relatives. The doctors and nurses and other health professionals involved in their care are also involved in the assessment. The medical case records, including all aspects of psychiatric treatment, are examined in detail. If surgery appears to be an appropriate treatment for the patient, Dundee Advanced Interventions Service will ask representatives from the Mental Welfare Commission for Scotland to visit the patient. The purpose of this visit is to provide a second opinion about the suitability of surgery and to assess how well the patient and their family understand the potential risks and benefits of surgery. This is required by law.

Sometimes, the team will recommend other treatment options to be tried before surgery, or he may ask other psychiatrists or psychologists for their opinions regarding additional psychological treatments. The decision whether or not to proceed with surgery is made jointly with the patient.

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 with the psychiatrists in the service and/ or with the neurosurgeon, Mr M.S. Eljamel.

Where do I stay?

Once a definite decision has been made regarding suitability for surgery, arrangements are made for admission to the Carseview Centre, the psychiatric unit on the Ninewells Hospital site. Over a period of a week or so, a number of assessments and tests are conducted. These include clinical interviews, the completion of different questionnaires and rating scales, some computer-based psychological tests, tests of learning and memory, and a videotaped interview to record how the patient feels, speaks and behaves before surgery.

On the day before surgery, the patient is transferred to the neurosurgical unit at Ninewells Hospital (Ward 23b). The person will be introduced to the neurosurgical team. At this point, the technique and the risks of the surgery will be discussed again, and final consent will be obtained. The patient will also be seen by the neurosurgeon, the neuroanaesthetist, and often by the neurotheatre nurse on the day of the operation.

What is involved in the operation?

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, behind the hairline to hide the scars (although this is not always possible). The scalp around the incisions is shaved, but 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 where it has been shaved. The skin is closed by a variety of different methods, but, currently staples or skin glue is used. Staples are normally removed in about 3-5 days depending on how well the wound has healed. After surgery, people remain in the Neurosurgical Unit for 24-48 hours, depending on how quickly they recover from the anaesthetic.

What will I feel after surgery?

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.

On waking up from the anaesthetic, most people usually have 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. Simple painkillers are given to make the patient more comfortable. This does not usually last longer than a couple of days.

Most people are able to return to the psychiatric ward the day after surgery, and most people are walking and eating within 24 hours of surgery. The length of stay after surgery depends on the patient's progress. Most are ready for transfer back to their base hospital or home within three weeks. Before leaving Dundee, everyone has some of their tests repeated. The patient has a repeat MRI scan and a repeat of the some of the interviews. Everyone brought back to Dundee for repeated testing (*for example, after 12 months*) to follow progress and to advise on further treatments as necessary.

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. This is short lasting and requires no specific treatment.

What happens after I leave Dundee?

People return to the care of their local mental health services. Professor Matthews will discuss drug treatments with the patient's own psychiatrist and will usually recommend as few changes as possible. The post-operative plan for the patient is then put into action. It is very important that the local mental health services provide a programme of assistance that will maximise the chances of sustained improvement. This may involve psychological and/or behavioural treatments. The team will review progress after surgery at 12, 24 months, and five years. We will usually ask to you complete regular rating scales of your symptoms and we will remain in touch with the local psychiatric team.

What if the operation doesn't work?

As explained above, around 1 in 3 people may not feel any benefit in the two years 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. If this is not considered likely to help, the team will review and discuss other non-surgical treatment options with you and your local mental health services.

Glossary

Anterior	Towards the front, front
Capsulotomy	To divide, cut or place a lesion in the internal capsule of the brain
Cingulate	Part of the brain known as the cingulate gyrus
Cingulotomy	To divide, cut or place a 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	A convoluted elevation or ridge; one of the 'folds' of the brain
Mental Welfare Commission	An independent body who have the legal power to protect the welfare and rights of people with mental disorders in Scotland

Other helpful sources of information

Driver and Vehicle Licensing Agency (information about driving after neurosurgery):
http://www.dft.gov.uk/dvla/medical/aag.aspx

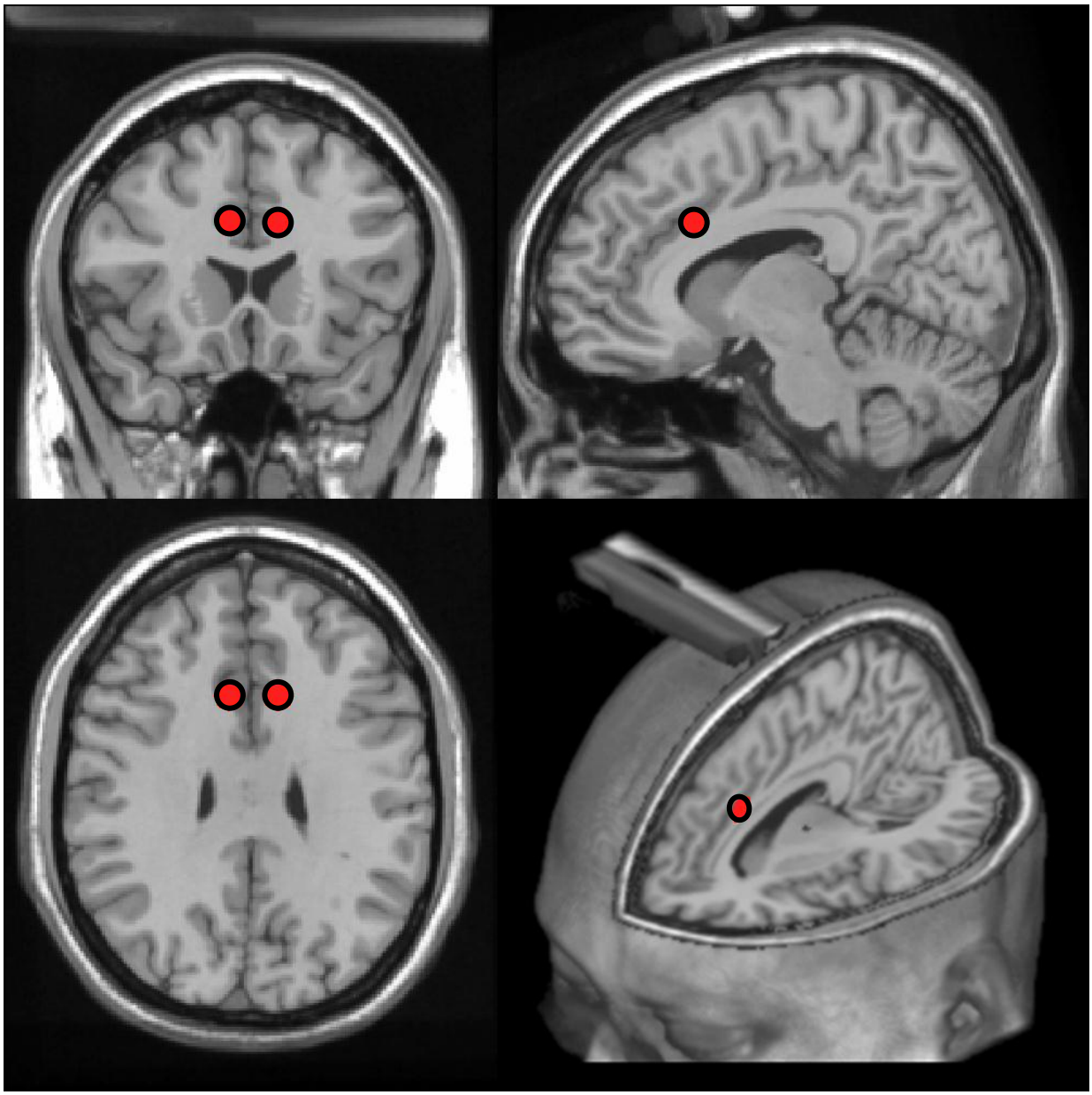
Dundee Advanced Interventions Service Website:

www.advancedinterventions.org.uk

Mental Welfare Commission for Scotland:

http://www.mwcscot.org.uk/

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



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