Definition

Neurosurgery for Mental Disorders was introduced more than 50 years ago, preceding most modern psychiatric interventions and brain imaging techniques. It involves the creation of focal lesions in the brain, using stereotactic neurosurgery, to treat severe mental disorders.

Neurosurgery for Mental Disorders (previously called “psychosurgery”) is an established treatment which is effective for a proportion of highly selected patients. Neurosurgery is not carried out to alter behaviour. It is used to treat severe and incapacitating mental disorders when all other attempts at treatment have failed and the alternative is continuing suffering for the patient. Nowadays, it is most commonly used to treat severe depression, chronic anxiety and obsessive compulsive disorder.

There are some recent brain stimulation techniques, notably deep brain stimulation (DBS) and vagus nerve stimulation (VNS), that involve surgical intervention, but in which the primary objective is not to produce an irreversible lesion in the brain but to stimulate one or more brain regions. These brain stimulation techniques are not included within the purview of this position statement on ‘neurosurgery for mental disorders’ or ‘psychosurgery’, which is restricted to ablative neurosurgery.

The numbers of persons on whom neurosurgery for mental disorder is carried out in Australia and New Zealand have been very low over the past few years. Since 1986, it is estimated that only two or three operations have been performed per year. Consideration of its benefits and risks must therefore be based on recent data from appropriate contexts.

Evidence

With regard to efficacy, while no sham- or placebo-controlled trials have been conducted, clinical follow-up studies have suggested that 40-60% of patients with unipolar and bipolar depression who undergo neurosurgery, 40-50% of patients with obsessive compulsive disorder and 40-50% of those with chronic anxiety have a satisfactory response. There is no evidence that neurosurgery is an effective treatment for resistant schizophrenia. Its use for the treatment of severe, explosive aggression has been abandoned.

With current stereotactic procedures, the operative mortality rate is considered to be no more than 0.1%. Post-operative epilepsy is reported in between 0.4% and 5% (generally well controlled with anticonvulsants) while hemiplegia occurs in 0.3%. Reported frequencies of minor personality changes have varied from 3% to 7%. There is no evidence to suggest that patients will demonstrate any decline in intellectual functioning following such surgery using modern techniques.

There are four frontal lobe procedures in current use worldwide; all are stereotactic and bilateral. There is no good evidence to suggest that one procedure is to be favoured over the others. Cingulotomy, developed in the USA, involves the creation of lesions in the cingulate bundle and cingulate gyrus. In subcaudate tractotomy, developed in London, the use of beta radiation emitting Yttrium has been supplanted by radiofrequency thermocoagulation to create circumscribed lesions beneath the head of the caudate nucleus. Limbic leucotomy, also developed in the UK, involves a combination of lesions in the cingulum and in the orbito-medial area of the frontal lobe, while capsulotomy, developed in Sweden, involves lesions in the anterior limb of the internal capsule. MRI or CT scans are used to visualise the targets and the operations are conducted via burr holes in the skull.
Temporal lobe neurosurgery is not currently used to treat mental disorders even though it is well established as a treatment for resistant complex partial epilepsy of medial temporal lobe origin.

**Regulation**

Neurosurgery for mental disorders is regulated by legislation in various jurisdictions in Australia and New Zealand. This legislation is not uniform across the various states and territories.

**Recommendations**

- The RANZCP recognises that there is public apprehension about the procedures and the selection of patients for neurosurgery.
- The RANZCP supports careful safeguards including legislation in Australia and New Zealand which allows the appointment of an independent multidisciplinary body comprising doctors, lawyers and lay people to review issues such as consent, the merits of new procedures and the skills and qualifications of the clinicians involved.
- Neurosurgery for mental disorders should only be carried out in highly specialised centres that have demonstrated experience with these disorders. Ideally this should involve teaching hospitals where clinical research experience will allow the careful and structured screening and selection of cases and greater surgical expertise with ongoing evaluation.
- An intensive ongoing postoperative program with ongoing care and rehabilitation is essential to achieve the best results.
- Quality assurance should be undertaken, with continuous monitoring of outcome and unwanted effects, and comparison with centres overseas. Where possible results should be scientifically evaluated and routinely published.
References


