Dundee Advanced Interventions Service

Neurosurgery for Mental Disorders – Operational Framework

NHS Tayside & University College London Hospitals NHS Foundation Trust

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Section A Scope of the framework

This document provides an overview of the framework and processes of the Neurosurgery for Mental Disorders (NMD) Service provided by the Advanced Interventions Service as part of its SLA with National Services Division of NHS Scotland. It establishes a framework whereby patients from NHS Scotland and NHS England can access specialist psychiatric neurosurgery; although funding arrangements may differ between the two countries.

A.1 Aims and objectives

A.1.1 Service aims

1. To provide specialist multidisciplinary assessment of referred patients from all areas of the United Kingdom[1] with chronic, severe, and treatment-refractory Depression (TRD) and/ or Obsessive Compulsive Disorder (OCD/ TR-OCD).
2. To provide specialist multidisciplinary advice, both pre- and post-neurosurgery, on the management of chronic, severe TRD and TR-OCD to secondary- and tertiary-care mental health services in all areas of the United Kingdom.[2]
3. To ensure that patients with chronic, severe, TRD and/ or TR-OCD who may be considering neurosurgical treatment have been demonstrated to fail to respond to (or are unable to engage with) all reasonable and available non-surgical treatments.
4. To provide, where appropriate, intensive/inpatient treatment for a small number of patients with TRD who are eligible for the Neurosurgical treatment pathway.
5. To provide detailed, multidisciplinary follow up and assessment of patients following neurosurgery at agreed time points: currently 12, 24 and 60 months post-surgery.
6. To provide ongoing support and advice on the management of all patients following NMD.

[1] The AIS is commissioned by NSD to provide services for NHS Scotland. Patients from other parts of the UK will be seen on an individually-commissioned basis. Please refer to the Service Level Agreement for more details on such arrangements.
[2] See above. Patients out with NHS Scotland will be assessed and treated once funding is confirmed.

A.1.2 Service objectives

1. To deliver appropriate neurosurgical interventions for, on average, 3-5 patients each year. Any increase in numbers will be discussed with commissioners and service providers.
2. To advise on pathways of care for patients with TRD and TR-OCD. Such pathways may include, for example, psychological therapies, ECT, and neurosurgical treatment.
3. To provide consultancy to, and where appropriate and within service capacity, training for clinical teams managing patients with TRD and TR-OCD.

A.2 Hours of operation

The usual hours of operation for the AIS are from 9am to 5pm, Monday to Friday. There may be occasions where it is appropriate and clinically-indicated for assessment and/or treatment to be delivered out with these hours. Such instances will be considered on the basis of clinical need and staff availability. Inpatient provision in both Dundee and London will be provided on a 24-hour basis.

A.3 Service location

The service is located at Ninewells Hospital & Medical School, Dundee. Inpatient provision for assessment and post-operative recovery (where provided) is provided in Ward 2, Carseview Centre, Medipark, Dundee. Neurosurgical treatment is provided at the National Hospital for Neurology and Neurosurgery (NHNN), Queen Square, London.

Surgical interventions are provided in collaboration with the University College London Hospitals NHS Foundation Trust at the National Hospital for Neurology and Neurosurgery (NHNN), Queen Square, London.

A.4 Costs of treatment

Neurosurgical treatment costs for Scottish NHS Board patients are covered by the commissioned costs for the AIS.[3] Neurosurgical treatments for patients from the rest of the UK and from Eire are commissioned on an individual case basis. This means that funding needs to be provided by the referring Primary Care Trust or Clinical Commissioning Group before the patient can be assessed or receive treatment.

[3] The AIS is funded via NSD by NHS Scotland Boards.

A.5 Role of local services

A.5.1 Community Mental Health Teams (CMHTs)

All patients referred to the AIS are required to remain embedded within local mental health services and will continue to have a named consultant psychiatrist who will retain primary responsibility for the ongoing care of the patient after discharge from the AIS and/ or NHNN. The AIS will work collaboratively with the local clinical team, including psychological therapists, CPNs, and support workers.

A.5.2 Unavailability of local CMHT services

We believe that what happens after neurosurgery is as important as the neurosurgery itself and a full package of post-operative care needs to be in place before someone can receive neurosurgery.

This does sometimes highlight tensions between a patient's wish to receive a treatment that may offer them a meaningful chance of improvement and the ability of the AIS to ensure that a post-operative care plan is in place.

In certain situations, we may choose to delay or postpone surgery until it has been possible to set up an appropriate post-op care plan. We will explain the reasons to the patient and work with local teams to ensure that conditions are optimised for neurosurgery.

A.5.3 Withdrawal of local CMHT input

In a small number of cases, it is recognised that the patient's local CMHT wish to discharge a patient who is jointly-seen by the AIS from their care. This makes it difficult for the AIS to continue to provide treatment recommendations since there is no longer a service to implement recommendations and monitor progress.

In such situations, the AIS will attempt to discuss relevant issues with the responsible consultant with the intention of developing a shared understanding of the patient's difficulties and a collaborative treatment plan.

If the CMHT insists on discharging the patient, the AIS will write to the patient's GP and also the patient to explain what role the AIS will have in the patient's ongoing care. Where the patient has had some form of intervention the AIS will continue to provide annual and pre-determined reviews. However, the AIS does not believe that it is safe or clinically-appropriate to be making complex treatment recommendations in the absence of local secondary care MH services.

A.6 Legislative framework

Formal approval to provide ablative neurosurgical treatments for ALL patients requires assessment by the Care Quality Commission (CQC). Neurosurgical treatment can only proceed once surgery has been authorised under Section 57 of the Mental Health Act 1983 (amended by the Mental Health Act 2007).

All patients being considered for neurosurgery need to be able to provide and demonstrate sustained, informed consent to the procedure. The CQC is the legislative body responsible for confirming this prior to neurosurgery.

A.7 Criteria for referral to the Advanced Interventions Service

The following criteria are intended to act as a *guide* to referral, rather than an absolute determination of who will be accepted for assessment and/or treatment. All referrals are considered and accepted on a case-by-case basis. Clinicians are advised to contact the service if there are any uncertainties regarding suitability.

A.7.1 Inclusion criteria for assessment

1) Diagnoses of Depression and/ or OCD made according to ICD-10, ICD-11, DSM-IV, or DSM-5;
    a) Comorbid diagnoses are not contraindications, but, in general, TRD/ TR-OCD should be the primary diagnoses and full diagnostic criteria should be met. The severity of symptoms should be sufficient to lead to significant impairment in functioning.
2) Symptoms of TRD and/or TR-OCD should have persisted for ≥ 2 years without improvement and despite ongoing active treatment;
3) Severity of TRD and/or TR-OCD, measured using appropriate clinician-rated symptom scales, should be of at least moderate severity and accompanied by;
    a) A Global Assessment of Functioning (GAF) score of ≤ 40. This means that symptoms are severe and result in "…*major impairment in several areas, such as work or school, family relations, judgment, thinking, or mood*". It is unlikely, for example, that patients are able to work or function adequately in any major area and they will be dependent on family, carers, or services;
4) For both TRD and TR-OCD, the AIS has published recommended minimum treatments that ought to be explored and to have demonstrated to have failed before considering

neurosurgical intervention. Please note, these are a guide to decision making and are not considered 'absolute' requirements.

A.7.2 Exclusion criteria for assessment

The service is unable to provide extensive support and/ or supervision for patients that do not meet the above inclusion criteria. Please note, the AIS cannot, and will not, assume direct clinical responsibility for delivery of routine outpatient services to patients. The AIS cannot, and will not, replace local service provision. For example, the AIS cannot supervise or deliver behavioural or other psychological therapies for patients who are unable to access such treatment in their local area. In such cases, we may be able to advise referrers and/ or patients and carers on how to access such treatment.

A.8 Criteria for Neurosurgery for Mental Disorders

As a guiding principle, all of the so-called '*physical treatments'* that have been shown to be effective in managing TRD and OCD should have been tried in *'adequate'* dosage for an *'adequate'* period of time.

The following criteria will be used for assessing suitability to entry into the neurosurgical pathway.

A.8.1 Inclusion criteria for surgery: Treatment-Refractory Depression

1) Diagnosis of Depression made according to ICD-10 [1], DSM-IV [2], or DSM-5 [3];
   a) Often individuals with chronic, refractory TRD may have unrecognised or 'undeclared' Bipolar Disorder. This should be considered when assessing treatment 'adequacy'.
   b) Similarly, co-morbid anxiety disorders (*e.g.* Generalized Anxiety Disorder, Agoraphobia, Social Phobia) are common in patients with TRD. These are **not** a contraindication to treatment. These should, however, be considered in assessing treatment 'adequacy'.
   c) Symptoms of Depression have persisted for ≥ 2 years without improvement and despite treatment. In the majority of cases, total duration of illness is expected to be in excess of 5 years.[4]

[4] The mean (±SD) duration of current depressive episode for patients undergoing cingulotomy is 14.1 ± 5.8 years.

2) The minimum number of antidepressant monotherapies prior to considering neurosurgery for TRD are:

   a) At least two '*adequate*' courses of treatment with a tricyclic antidepressant drug. One of these trials must be with either: clomipramine; imipramine; or amitriptyline.

   b) At least two '*adequate*' courses of treatment with a selective serotonin re-uptake inhibitor (SSRI);

   c) At least two ‘adequate’ courses of treatment with ‘atypical’ antidepressant drugs such as Venlafaxine, Mirtazapine, Duloxetine.

   d) At least one '*adequate*' course of treatment with a 'classical' monoamine oxidase inhibitor (*i.e.* not moclobemide);

3) At least one of the above (TCA, SSRI or MAOI) *plus* lithium carbonate augmentation for a period of 4-6 weeks, with a 12-hour post-medication plasma lithium level of 0.5-0.8 mmol/L;

4) At least one '*adequate*' course of treatment with a tricyclic antidepressant drug as defined above, *plus* thyroid hormone augmentation for a period of 6 weeks. This involves the administration of liothyronine sodium (a.k.a. tri-iodothyronine, T3; not T4) at a dose up to 20 micrograms three-times-a-day. Failure to respond within 6 weeks ought to lead to termination of T3 administration. Where the patient is known to suffer from hypothyroidism and is taking replacement T4 (biochemically euthyroid) this strategy of T3 augmentation is still advised.

5) At least one '*adequate*' courses of treatment with an antidepressant drug as defined above, *plus* the prescription of an atypical antipsychotic drugs for a period of six weeks, at a dose within the BNF recommended range. There is probably greatest evidence to support the selection of olanzapine and risperidone, although others (quetiapine, amisulpride, aripiprazole) may be worth considering. Where psychotic symptoms are prominent in the clinical presentation, trials of both typical (*e.g.* flupentixol) and atypical antipsychotic drugs should be considered.

6) At least two '*adequate*' trials of electroconvulsive therapy (ECT) spaced 6 months apart. Adequacy in this context is defined as a minimum of 12 bilateral applications of ECT with recorded evidence of seizure duration exceeding 15 seconds per treatment. Lower numbers of treatments (8-10) may suffice where there is documented evidence of intolerable adverse effects. Failure to respond is defined as: no clinical response; minimal

clinical response; or a brief response with relapse within a period of four weeks, despite adequate antidepressant maintenance treatment. Where available and considered more acceptable / appropriate for the patient, a trial of high dose unilateral ECT (5 times seizure threshold) can substitute for bilateral ECT.

7) Where there is a history of significant mood variability (suggestive of bipolar spectrum) and/ or a diagnosis of bipolar disorder, additional pharmacological treatments should have been considered/tried, for example:

    a) At least one trial of an anticonvulsant drug shown to have efficacy in Bipolar Depression should have been tried. This includes lamotrigine at a dose of <400mg/day; and divalproex sodium (Depakote®) at a dose of up to 2.5 grams per day;

    b) At least one trial of antipsychotic drug shown to have efficacy in Major Depression. This includes: olanzapine (5-20mg/day): quetiapine (300 - 600mg / day); and aripiprazole (5-15mg/day). There is also some evidence for increased response rates in the treatment of depression where olanzapine (6-12 mg / day) is combined with fluoxetine 25-50 mg/day).

8) Psychological therapies. As a guiding principle, it is necessary to demonstrate, as a minimum, that any patient being considered for entry to the neurosurgical treatment pathway has had ‘adequate’ exposure to at least one of the treatment modalities that have been shown to have efficacy in the treatment of Depression (*e.g.* Behavioural Activation, CBT, IPT, CBASP).

    a) This should usually have been delivered by a therapist of appropriate, demonstrable and accredited competence in the therapeutic modality and to have been for an ‘adequate’ duration of time.

    b) Documentation of treatment should be sufficient to appraise the content, delivery, and outcome of such treatment.

A.9 Inclusion criteria for surgery: Treatment-refractory OCD

The following criteria will be used for assessing suitability to entry into the intensive/inpatient service and all of these criteria need to be met before neurosurgical treatment for OCD will be considered.

A.9.1 Inclusion criteria

1. Diagnosis of Obsessive-Compulsive Disorder made according to ICD-10 [1], ICD-11, DSM-IV [2], or DSM-5 [3];
    a. Comorbid diagnoses of Obsessive-Compulsive Personality Disorder (OCPD) or Asperger's Syndrome (autism spectrum disorder) are **not** absolute contraindications, but they should not be the primary diagnosis and full criteria for OCD should be met. The severity of symptoms should be significant enough to indicate that personality disorder or autism is insufficient to account for the impairments in functioning.
    b. Similarly, comorbid anxiety disorders (*e.g.* Generalized Anxiety Disorder, Agoraphobia) and depression are common in OCD. These are not a contraindication to treatment, but it is expected that efforts have been made to determine that OCD is the primary source of the anxiety symptoms. Such efforts are likely to involve targeted treatment of the other conditions.
2. Symptoms of OCD have persisted for ≥ 2 years without improvement and despite treatment. In the majority of cases, total duration of illness is expected to be in excess of 5 years;
3. Severity of OCD, measured using the clinician-rated Y-BOCS, is likely to be ≥ 28 (severe). In most cases, it is expected that symptoms will be in the 'extreme' range (≥ 32);
4. Global Assessment of Functioning (GAF) should be ≤ 40. This means that symptoms are severe and result in "…***major impairment*** *in several areas, such as work or school, family relations, judgment, thinking, or mood*". It is unlikely, for example, that patients are able to work or function adequately in any major area and they will be dependent on family, carers, or services.
5. The patient has had ≥ 3 trials of serotonin re-uptake inhibitors at maximum (or maximum-tolerated) dose – one of which should be clomipramine. Each trial should have been for ≥ 12 weeks;

6. The patient has had *at least* one trial of antipsychotic augmentation with each of: risperidone and aripiprazole. The augmentation trial should be ≥ 10 weeks at an adequate dose, and ideally 12-16 weeks. Augmentation of clomipramine with an antipsychotic drug (wherever tolerated) is desirable.
7. The patient should also have had at least one trial of augmentation with other drugs with evidence to support their use in OCD. These would include Lamotrigine and Memantine. The augmentation trial should be ≥ 10 weeks at an adequate dose in duration, and ideally 12-16 weeks.
8. The patient has had *at least* one unsuccessful trial of Exposure and Response Prevention, with a minimum duration of treatment in excess of 20 hours. This should usually have been delivered by a therapist of appropriate, demonstrable (and, ideally, accredited) competence in the therapeutic modality and to have been for an 'adequate' duration of time. Therapy should have been home-based where symptoms relate to the home environment. Documentation of treatment should be sufficient to appraise the content, delivery, and outcome of such treatment.
9. For most patients entering the neurosurgical pathway, it is expected that at least two extensive trials of ERP will have been attempted, with one course of intensive/ inpatient treatment delivered by a team with experience in treating OCD.

A.10 Exclusion criteria

The following exclusion criteria apply to both TRD and TR-OCD.

1. The patient has had insufficient or 'inadequate' pharmacological and/or psychological treatment. In some cases, there may be uncertainty about the adequacy of previous treatments and there will be an expectation that further treatment trials may be required to confirm non-response to all reasonable treatments.
2. There is significant untreated comorbidity that would affect prognosis following surgery. Such comorbidity would not act as a permanent exclusion, but comorbid conditions would be expected to be treated prior to consideration of neurosurgery.
3. There is clear evidence of a major personality disorder which accounts for a significant part of the patient's impairment of functioning and which would not be expected to respond to targeted treatment.

4. There is comorbid substance misuse, which requires treatment and a period of stability before neurosurgical treatment planning can take place.
5. The patient is unable to provide fully-informed, sustained consent to the procedure.
6. There is absent, or inconsistent, support from local services in the development (or potential delivery) of post-operative management planning.
7. Although previous suicide attempts / self-harming behaviour is not an absolute contra-indication to neurosurgery, active and dangerous levels of self-harm may mean that the neurosurgery is unsuitable until such risks are being actively managed.

A.11 Entry to the neurosurgical pathway

Entry of any patient onto the neurosurgical pathway will be contingent upon completion of a full multidisciplinary assessment and in-depth discussion of options following formal case presentation to the AIS and relevant NHNN staff.

A.12 Exit from service

Post-surgery, all patients will enter into the long-term follow-up programme and will be invited to participate in review by the AIS at 12, 24, and 60 months for a full reassessment (clinical interviews, neuropsychological testing, and brain imaging).

A.13 Waiting list

The service will not operate a waiting list. In most cases, priority will be decided on the basis of where the patient is on the care pathway. Where a patient is waiting for treatment, the AIS will continue to liaise with local services, and will continue to make arrangements for treatment and follow-up. In some cases, the service may be able to provide support and/or supervision for complex treatment plans.

Section B Neurosurgical treatment pathway

B.1 Overview of the pathway

Neurosurgical treatment for mental disorders is offered to only a small number of people per year. The treatment pathway is conceptualised as a series of steps that are progressed through in a logical manner.

The status of any given patient engaged with the service will be one of the following:

1. Patient has been assessed by the AIS and surgical treatment is considered appropriate by the patient, the AIS, and the local team;
2. The patient has been reviewed alongside colleagues from NHNN and neurosurgical treatment is offered;
3. Patient has been referred to the Care Quality Commission (CQC) for approval of neurosurgery;
4. Authorisation for operation has been received from the CQC and the onward request for an operation date at NHNN has been made;
5. The date of operation is confirmed and admission planned;
6. The patient is admitted to NHNN for neurosurgery;
7. Discharged from NHNN and post-op follow-up and liaison with local services (AIS);
8. Long-term follow-up programme: 1 year, 2 year, and 5 year post-op;[5]
9. Discharged from formal (*i.e.* funded) follow-up.[6]

B.1.1 Offer of neurosurgical treatment

Following initial referral, a detailed case review will be conducted by an AIS consultant psychiatrist and senior nurse. Typically, assessment may require several meetings, collection of information from previous case notes, and independent history from carers and relatives. Further trials of therapy may also be required. Neurosurgery will not usually be considered unless the minimum inclusion and exclusion criteria are met (see above).

[5] This is the standard duration of follow-up described in the AIS' service-level agreement with National Services Division of NHS Scotland. In reality, the relevant services will endeavour to provide a degree of follow-up (on an informal basis) up to 10 years.
[6] The AIS will endeavour to maintain some form of contact with the patient for as long as practicable.

Once established that the AIS wish to recommend neurosurgery, a referral will be made to the clinical team at NHNN. Subsequently, the AIS and NHNN team will arrange to meet JOINTLY with the patient (at a suitable venue or remotely) to discuss treatment options, including the offer of a neurosurgical therapy. After this meeting, if all still in agreement with a proposal for neurosurgery, the patient will enter the neurosurgical treatment pathway.

B.1.2 Role of the Care Quality Commission (CQC)

Once confirmation of funding for neurosurgery is confirmed, and once the patient has indicated they wish to pursue neurosurgical treatment, the AIS consultant psychiatrist will write to the Care Quality Commission to request approval for the proposed therapy.

This review may take place in the patient's local area or it may take place remotely. The CQC will expect to meet with the local psychiatric services, possibly members of the AIS, and interview the patient. Prior to the review by the CQC, the AIS will have considered and proposed arrangements for post-surgery treatment and care.

B.1.3 Planning of operation date

Once authorisation documentation is received, the AIS consultant psychiatrist will contact the neurosurgical and mental health inpatient team at NHNN for an operation date. Once this is received the AIS will liaise with the patient and local services regarding the admission and treatment plan.

Any difficulties around the surgery date offered will be re-negotiated by the AIS consultant psychiatrist.

B.1.4 Pre-surgery liaison with local services

Prior to surgery, AIS nurses will meet with the patient's local services to assist with increasing their knowledge and understanding around neurosurgery for mental disorders and the post-discharge care of patients having had this procedure.

The AIS nurses will also spend working with the patient and local services to begin the development of the post-discharge treatment package.

On a case-by-case basis, patients may be offered a post-surgery admission to the Carseview Centre in Dundee, for on-going support and treatment. If this should be offered, the AIS nurses will continue to liaise with local services and, along with them, develop and implement a collaborative post-discharge treatment package.

B.2 Admission and neurosurgical treatment

B.2.1 Baseline assessment

Baseline assessment (videotaped clinical assessments and neuropsychological assessment) will be undertaken by the AIS approximately two weeks prior to the patient's admission to NHNN. This will take place in Dundee. Baseline and follow-up assessments are summarised below in Section D below.

B.2.2 Admission

Patients on the neurosurgical pathway will be admitted to the NHNN approximately three days before their planned operation. During this pre-surgery phase they will be assessed by the neurosurgical team and also undergo the standard pre-operative neuroimaging. They will also be invited to participate in any additional research projects that are being undertaken.

B.2.3 Risk assessments

A semi-structured risk assessment will be completed prior to the individual's admission to NHNN. In most cases this will be undertaken by AIS staff but relevant information from the patient's local team will also be incorporated. This risk assessment will assist the medical and nursing teams in NHNN to ensure that the care pathway is as safe as possible.

B.2.4 Mental Health Act

The AIS will ensure that Section 57 documentation is sent to Queen Square in advance of admission.

B.2.5 Neurosurgical treatment

Where needed, patients will be accompanied to NHNN by at least one member of AIS staff familiar to them. This will include attendance at theatre. Where appropriate, patients may choose to be escorted to London by a close family member.

Patients will be admitted to Hughlings Jackson ward at the National Hospital for Neurology and Neurosurgery, Queen Square, London. This is a 12-bedded dedicated neuropsychiatry ward staffed by dually trained RMN/RGN nurses. They will be under the joint care of a consultant neuropsychiatrist and consultant neurosurgeon. They will remain on Hughlings Jackson ward throughout their stay except for the 24 hours following surgery when they will usually be admitted to a neurosurgical ward for post-operative care.

Written consent will be taken by the neurosurgery consultant who will also meet members of the family if there are any outstanding concerns.

Obtaining surgical consent for the procedure is a process that will commence in the months leading up to the procedure. The Consultant Functional Neurosurgeon will be responsible in ensuring that formal consent is obtained and documented prior to the procedure.

Lesion placement will be confirmed by intra-operative imaging.

B.2.6 Post-surgical recovery (London)

Following surgery and immediate surgical recovery, patients will return to the Hughlings Jackson ward where the neuropsychiatric team will continue to manage the patient.

The duration of inpatient treatment will depend on the individual needs of the patient and the procedure being undertaken.

In the case of Cingulotomy, it is likely that the total duration of inpatient stay will be less than seven days (2-3 days pre-op; 3-5 days post-op). For Capsulotomy, the duration of post-op admission is likely to be longer, although in most cases this can be shared with the patient's local inpatient services (for example, one week in NHNN and a further two weeks in a local ward, or in Carseview, Dundee).

B.2.7 Post-surgical recovery (Dundee)

Where a period of extended post-operative inpatient care is required for Scottish patients, arrangements will be made for their return to the Carseview Centre. Depending on post-surgery care arrangements, the stay in the Carseview Centre can be up to three weeks. During this time the patient will have daily contact with the therapy staff from the AIS and a schedule of pleasant activities and behavioural activation will be started.

Corresponding arrangements will be made for non-Scottish patients as part of the post-operative care planning, and will be made on a case-by-case basis.

Prior to discharge the patient will again complete a range of rating scales and neuropsychological tests.

B.2.8 Discharge & initial follow-up

Patients will be discharged from the NHNN with a planned appointment date with their local services and with the AIS. The AIS nurse therapists, where practical, may offer between four and six home visits over a six month period (Scottish domiciled patients) and up to two home visits for other patients to assist in the transfer of care back to local services and to

troubleshoot any problems that arise. Surgeons and the AIS team may wish to review the patient at NHNN approximately three months after surgery for evaluation of initial clinical results, to discuss effect and eventual side effects and for performing a thin slice stereotactic MRI (without frame) to evaluate the exact size and site of the final lesion when significant postoperative oedema has subsided.

B.3 Entry into the long-term follow-up programme

All patients who undergo neurosurgery for their mental disorder are placed in a long-term follow-up programme. The primary follow-up points are as follows:

1. **12 months after surgery**: The AIS will liaise with local services and NHNN team in order to review progress and ongoing treatment. The patient will be invited to participate in a further videotaped interview, to repeat baseline assessments and neuropsychological testing. They will also have a follow-up MRI scan. A report and any further recommendations will be made in writing to the local consultant psychiatrist.
2. **2 years after surgery**: This will follow the same format as the 1 year review.
3. **5 years after surgery**: This will follow the same format as the 1 year review.

B.4 Support for local services

To some extent, this is outlined above. The AIS will endeavour to provide telephone support for therapists who are continuing to provide ongoing treatment for patients that have been treated as part of the neurosurgical treatment programme. This support is likely to take the form of '*troubleshooting*' problems that are arising and re-focusing of treatment.

The AIS is unable to provide formal supervision for local therapists. Provision for this should be available locally.

Section C Service Delivery

C.1 Links and interfaces

C.1.1 Local services

Within this framework, 'local' refers to services local to the patient.

C.1.2 Other specialist services

The service will seek, initiate, and maintain links with other similar specialist services in the UK and beyond. Benchmarking against other services and sharing of treatment models will be an important component of our quality improvement programme.

C.2 Patient disengagement

It is recognised that not all patients are able to adhere to a programme of follow-up. Where a patient indicates a wish to discontinue treatment, the team will endeavour to work with the patient to address the difficulties that are arising. This may require modifications to the treatment plan and may involve completing partial assessment in the patient's own locality.

Where all reasonable adjustments have been tried and have been ineffective, the team will liaise with the patient, carers, and local services in order to ensure that discharge is safe, and supported.

C.3 Training and Development

All staff working in the service are experienced clinicians. However, the intensity and complexity of delivering such treatment will necessitate high levels of therapeutic expertise. The service will maintain a development programme for staff, and will continue to seek opportunities to develop staff to the maximum.

The service will have an active programme of continuing professional development, and each member of the team will have a personal development plan that includes specific learning objectives relating to all aspects of AIS activity.

C.4 Evaluation and audit

C.4.1 Outcome reporting

The service will report activity and outcomes as part of its annual reporting process. Annual reports will be submitted to NSD and reports will also be submitted to NHNN as part of their governance structures. These reports will also be made available to the public on our website.[7]

C.4.2 Audit

All staff members have a role in contributing to audit, research, and service improvement. Outcome data will be collected continuously and outcomes for individual patients will be subject to regular review and discussion.

The personal development plans for each member of staff will include specific objectives relating to audit and/or research.

[7] https://www.advancedinterventions.org.uk

Section D Outcome measurement

D.1 Clinical Assessments

The following section lists most of the rating scales used to measure symptom burden and social functioning. Outcomes will be described in our annual report. The 'core' assessments are listed below in section D.2 Others will be used on a discretional basis.

D.1.1 Diagnostic tools

1. Diagnosis will be established/confirmed prior to admission using the Mini-International Neuropsychiatric Inventory, Version 5.0 [4].
2. Personality will be assessed using semi-structured interviews (*e.g*. PAS, SCID II, in conjunction with informant histories (where consent has been obtained).

D.1.2 Symptom ratings

1. Yale-Brown Obsessive-Compulsive Scale – Clinician-rated and self-report (Y-BOCS).[5, 6]
2. PADUA Inventory – Revised (PADUA-R).[7]
3. Hamilton Rating Scale for Depression (HRSD-17).[8]
4. Montgomery-Åsberg Depression Rating Scale (MADRS).[9]
5. Inventory of Depressive Symptomatology – Self-Report (IDS-30-SR).[10]

D.1.3 Social functioning and quality-of-life measures

1. WHODAS.[11]
2. EQ-5D.[12]
3. Global Assessment of Functioning (GAF).[13]

D.1.4 Other rating scales[8]

1. Inventory of Interpersonal Problems (IIP-64).[14]
2. Family Accommodation Scale – Self Report (FAS-SR).[15]

[8] Not all scales will be used and will be employed depending on the primary diagnosis and comorbid conditions (*e.g.* anxiety disorders). The AIS will accept responsibility for licensing arrangements for specific scales.

3. Modified Thought-Action Fusion Scale (MTAFS).[16]
4. OCD Family Functioning Scale (OFF).[17]
5. Brown Assessment of Beliefs Scale (BABS).[18]
6. State-Trait Anxiety Inventory (STAI).[19]
7. GAD-7 [20].

D.2 Assessment timetable (OCD)

Please note that ratings listed at time points are in addition to other ratings being completed prospectively. For example, at six months, it is expected that the patient will still be completing a monthly self-report Y-BOCS.

Time	Rating Scales to be completed (Patient)	Rating Scales to be completed (Clinician)
Baseline (Pre-Op)	Y-BOCS (self-report) PADUA IDS EQ-5D WHODAS IIP-64 MTAFS OFF	Y-BOCS HRSD; MADRS (where applicable) BABS GAF
Immediate Post-Op	Y-BOCS (self-report) PADUA IDS EQ-5D WHODAS	Y-BOCS HRSD; MADRS (where applicable) BABS GAF

Time	Rating Scales to be completed (Patient)	Rating Scales to be completed (Clinician)
Subsequent follow-up (12, 24, and 60 months)	Y-BOCS (self-report) PADUA IDS EQ-5D WHODAS IIP-64 MTAFS OFF	Y-BOCS HRSD; MADRS (where applicable) BABS GAF

D.3 Assessment timetable (Depression)

Time	Rating Scales to be completed (Patient)	Rating Scales to be completed (Clinician)
Baseline (Pre-Op)	IDS EQ-5D WHODAS IIP-64	HRSD MADRS GAF
Immediate Post-Op	IDS EQ-5D WHODAS IIP-64	HRSD MADRS GAF
Subsequent follow-up (12, 24, and 60 months)	IDS EQ-5D WHODAS IIP-64	HRSD MADRS GAF

D.4 Neuropsychological testing

Patients will be assessed using the CANTAB battery [21, 22] at baseline and all subsequent follow-up visits. The CANTAB battery has been extensively tested in mood and anxiety disorders and is particularly sensitive to changes in executive functioning associated with a range of mental disorders.

D.5 Neuroimaging

On the day of surgery stereotactic imaging will be obtained before and after surgery. Where possible, MRI will be the imaging modality of choice with T1, T2 and proton density sequences being obtained to assist targeting. Diffusion weighted MRI sequences will be obtained prior to and 6 to 12 months following surgery to allow tractography and connectivity analysis.

More detailed neuroimaging protocols are to be agreed depending on the clinical and outcome-research requirements of the services involved.

D.6 Personality Assessment

Before neurosurgery, all patients will have structured personality assessments completed (using the PAS and/or SCID-II). These will be conduced by AIS staff.

At baseline, patients and spouse/ main carer may be asked to complete the Iowa Scales of Personality Change [23]. This will be completed by the patient and spouse at 12-months post-op.

D.7 Adverse Effects

Ratings of adverse effects will be made using the Structured Assessment of Treatment-Emergent Effects (SAFTEE) [24], completed at baseline and subsequent follow-up visits. This will allow the detection of changes in adverse effects in a wide range of domains.

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