



## Dundee Advanced Interventions Service

Annual Report

1 April 2010 to 31 March 2011

Host NHS Board: NHS Tayside



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**Foreword**

This year, the annual report is an abridged report as the service is currently undergoing a five-year review and this will report in much more detail on many aspects of the service's activity.

As before, readers are invited to refer to our 2008 Report for more detailed information on the interventions<sup>1</sup>. Up-to-date information on the service can also be obtained from our website. Finally, as previously, in order to ensure that readers have access to our current treatment recommendations, we continue to include our treatment recommendations for Obsessive-Compulsive Disorder (OCD) and major depression in Appendix 1 (page 41).

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<sup>1</sup> [http://www.advancedinterventions.org.uk/pdf/AIS\\_Annual\\_Report\\_2008.pdf](http://www.advancedinterventions.org.uk/pdf/AIS_Annual_Report_2008.pdf)

## Executive Summary

### Introduction

The Dundee Advanced Interventions (Neurosurgery for Mental Disorder) Service was first designated as a National Specialist Service in April 2006, and became fully staffed in the first quarter of 2007.

### 1 Activity

	Actual	Planned
Assessments	27	24
Vagus Nerve Stimulation	1	7
Anterior Cingulotomy	6	5
Follow-up	10	12

#### 1.1. Referrals

Forty-one referrals were received during the reporting period (16 men and 26 women); with a mean age of 48.5 years. This is a similar demographic to previous years. There were 37 referrals (87.8%) from Scotland, 4 referrals (9.8%) from England, and 1 referral (2.4%) from Northern Ireland.

#### 1.2. Assessments

Twenty-seven assessments were conducted during the 2010/11 financial year. Seventeen men and 10 women were seen, with a mean age of 47.9 years (range 26.1 – 69.1 years). Five assessments were conducted outwith the SLA.

Approximately 50% of patients had a diagnosis of unipolar major depression, and approximately 30% of patients had a primary diagnosis of obsessive-compulsive disorder; up from 20% last year.

#### 1.3. Procedures

Six Anterior Cingulotomy procedures and one VNS implantation were performed during 2010/11. Four patients came from England.

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## 2 Mortality Data & Adverse Effects

There were no deaths and no post-operative infections during the reporting year. One individual had a small post-operative haemorrhage which had no clinically-detectable effects and was only seen on MRI scan. One patient experienced non-stimulation-related voice alteration following implantation of a VNS stimulator – this is expected to resolve.

## 3 Waiting Times

The average ( $\pm$ SD) waiting time (from referral to assessment) for Scottish patients was  $8.6 \pm 3.7$  weeks. This is similar to the previous year. Where patients had to wait longer than 15 weeks, this could be accounted for by reasons such as delays in receiving formal confirmation of funding (for English patients) and delays in the service being sent clinical case notes which are necessary for assessment.

## 4 Quality of Care

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### 4.1. Formal Complaints

There were no formal complaints.

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### 4.2. Improving the Patient Experience – Patient Satisfaction

Patient satisfaction for outpatient assessment and inpatient admission continues to be high, with the overwhelming majority reporting positive experiences of the service.

## 5 Best Value Healthcare – Clinical Audit and Outcomes

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### 5.1. Outcome Data

Of the 2 patients who had undergone Anterior Cingulotomy for depression and were followed up in 2010/11, one met criteria for response, although none met criteria for remission (categories not mutually exclusive). The majority of patients undergoing ablative neurosurgery experienced reductions in symptoms ranging from 19% to 50%. One patient underwent cingulotomy for OCD and experienced full clinical remission one year after surgery.

Of the 6 patients who were reviewed following VNS, three met criteria for response. One met criteria for remission.

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## **6 Teaching and Research Activities**

Members of the team continue to deliver presentations at a regional, national, and international level. Staff continue to publish in peer-reviewed journals on fields such as: neurosurgery; ablative neurosurgery; vagus nerve stimulation; neuroimaging; and neuropsychology.

The service is research active, with a range of active research projects, some of which are part of international, multi-centre clinical trials of neuromodulation for depression.

## **7 Service Developments and Future Plans**

The service is participating in an international, multicentre, clinical trial of Deep Brain Stimulation (DBS) for refractory depression, and has currently enrolled the first participant. This will enable us to not only advance treatments in this refractory population but also to develop patient choice in this clinical area. Uniquely, in Dundee, we will have the opportunity to evaluate the outcomes for DBS alongside those for other neurosurgical therapies.

## **8 Summary and Conclusions**

Neurosurgical activity in 2010/11 continues to be variable but it is recognised that clinical activity varies from one year to the next and is dependent upon the nature of the patients referred. We believe that there are considerable numbers of patients with unmet needs and we are keen to ensure that they have the opportunity to be referred to the service.

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## Section A: The Advanced Interventions Service

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### A1. Overview of the Service

The Dundee Advanced Interventions Service provides comprehensive, multidisciplinary clinical assessments for patients referred with chronic, treatment-refractory depression and Obsessive Compulsive Disorder (OCD).

The Dundee service represents one of only a few clinical teams internationally who provide neurosurgical interventions for psychiatric disorders. The provision of psychiatric neurosurgery by a multidisciplinary/ multi-professional team with members drawn from psychiatry, neurosurgery, mental health nursing, clinical psychology, neuropsychology, and dynamic psychotherapy is, to our knowledge, unique. However, it is only by drawing on such multidisciplinary expertise within an integrated clinical team that patients with such disabling, long-term, healthcare needs can be provided with comprehensive, bespoke, treatment plans that best meet those needs.

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#### A1.a) What is Neurosurgery for Mental Disorder?

The standard definition of Neurosurgery for Mental Disorder (NMD) is that provided by The Royal College of Psychiatrists:

*“a surgical procedure for the destruction of brain tissue for the purposes of alleviating specific mental disorders carried out by a stereotactic or other method capable of making an accurate placement of the lesion”* (Royal College of Psychiatrists, 2000)

This definition is most relevant to ablative (lesion-based) neurosurgery procedures (for example - Anterior Cingulotomy). However, the term ‘NMD’ is often used to refer to non-lesion based neurosurgical procedures such as Vagus Nerve Stimulation (VNS) and Deep Brain Stimulation (DBS). However, the term NMD does not include other, non-neurosurgical, brain stimulation techniques such as Transcranial Magnetic Stimulation (TMS/ rTMS) or Direct Current Stimulation (DCS).

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#### A1.b) Designation as a National Service

The Dundee Advanced Interventions (Neurosurgery for Mental Disorder) Service was first designated as a National Specialist Service in April 2006, and became fully staffed in the first quarter of 2007. We have now been operating as a full service for four years (2007-2011).

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## A2. Description of Patient Pathway

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### A2.a) Target Group for Service

The service exists to provide specialist assessment and treatment options for patients with severe, chronic, treatment-refractory depression and OCD. Although chronic depression is usually defined as unremitting symptoms for at least two years (American Psychiatric Association, 1994), the patients we see are defined not only by prolonged periods of illness, but also by having not responded to a range of pharmacological (e.g. antidepressants), physical (e.g. ECT), and psychological (e.g. Cognitive-Behavioural Therapy) treatments.

It should be noted that tertiary-level services<sup>2</sup> for patients with mood disorders (e.g. depression), and anxiety disorders (e.g. OCD) do not exist in Scotland. Dundee AIS, whilst operating to some extent as a quaternary service, will often assess patients with complex mood and anxiety disorders for whom there is uncertainty about diagnosis or management. In some instances, we are also asked to see healthcare staff with complex mental health problems (typically mood disorders).

Whilst this means that some patients referred to the AIS might be at low likelihood of progressing to neurosurgical intervention, it does mean that: 1) Patients for whom future treatment is uncertain are able to benefit from a specialist, multi-disciplinary assessment; and 2) we may become involved with patients who will later enter a neurosurgical treatment pathway, but at an earlier stage. This improves communication between clinical services, provides improved clinical care for patients, and facilitates decision-making at a later date.

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### A2.b) Referral

Referrals to the AIS come from consultant psychiatrists who will usually retain clinical responsibility for the delivery of patient care during the assessment process. We do not usually accept referrals from psychiatrists working in the private sector, but would instead make recommendations for transfer of care to the NHS.

Referrals are accepted on the understanding that the referring consultant retains overall clinical responsibility for the ongoing care of the patient, including the implementation of any treatment recommendations made by the service.

Referrals are accepted from throughout the UK and Ireland. We would recommend that referrals from outside of the UK are only made following detailed prior discussion. In some cases, we are able to advise on accessing comparative services within the referring country.

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<sup>2</sup> Tertiary services are defined by seeing patients who do not respond to secondary care (i.e. community mental health teams and inpatient treatment) services.

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## A2.c) Assessment

We anticipate that patients will normally be able to travel to Dundee for assessment. However, it is acknowledged that there are clinical circumstances where it is better for us to travel to conduct the assessment:

- 1) Where the patient is currently a hospital inpatient and travel to Dundee may be impractical. Patients who are detained under the respective mental health act will usually be assessed locally.
- 2) Where the patient cannot attend for reasons such as: infirmity, risks related to mental state, legal status, or inability to leave home.
- 3) Where it is considered of additional importance to assess the patient at home. For example, in the case of severe obsessive-compulsive disorder.

Assessments will usually take place over the course of a full day. Prior to the patient's attendance, we will have reviewed all available case notes so that we have as much information as possible on previous treatments, response, and adverse effects.

In the morning, the patient will undergo an extensive diagnostic psychiatric assessment, using diagnostic interviews and standard rating scales to rate the severity of illness and associated disability.

In the afternoon, an experienced psychological therapist will focus on the previous psychological therapies that the patient has received and explores the patient's experiences of these. After review of all relevant information, we meet with the patient to provide feedback on our clinical opinions and to summarise and explain the treatment recommendations we are likely to make. This is an opportunity for the patient and accompanying carer or relative to ask questions and to seek further clarification.

For referrals of patients with severe, disabling OCD, it is often better to conduct the evaluation at home or elsewhere in their local environment. This may, therefore, require a series of visits by several members of the AIS team.

Following assessment, the patient and referrer is provided with a detailed clinical report on diagnosis, and advice on future management that will commonly include the combination of evidence-based pharmacological (drug) and psychological therapies. For some patients the treatment recommendations may also include neurosurgical interventions.

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**A2.d) Neurosurgical pathway**

The pathway from referral, via assessment, to neurosurgery is shown in simplified form below in *Section E: Referral and Treatment Pathway*. It is often the case that patients will be reviewed in Dundee on several occasions before settled agreement is reached to proceed with neurosurgery. Further care planning may involve additional visits with the patient and/ or the local psychiatric services.

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**A2.e) Follow-up**

All patients who have undergone neurosurgical intervention are reviewed by the service at 12 months, 24 months, and 5 years. In addition, the team retain contact with the patient's own clinical service, and rating scales completed prospectively help to provide complementary information on the patient's progress.

## Section B: Quality Domains

### B1. Efficient

#### B1.a) Report of Actual versus Planned Activity

Table 1 below shows the summary of activity for the service during 2010/11. Some planned follow-ups were disrupted by the severe weather conditions in 2010 and such follow-ups have been completed outwith this current reporting period.

**Table 1. Overview of Activity Data for Year Ending April 2011**

	Actual	Planned
Assessments	27	24
Vagus Nerve Stimulation	1	7
Anterior Cingulotomy	6	5
Follow-up	10	12

#### B1.a.1. Follow-up Assessments

Follow-ups (ACING): 4

Follow-ups (VNS): 6

#### B1.a.2. Referrals

Forty-one referrals were received during the reporting period (16 men and 26 women); with a mean age of 48.5 years. This is a similar demographic to previous years.

A number of referrals, after careful consideration, were not considered to fall within the remit of the service and this was discussed with the referrer, often with advice on further management. Reasons for referrals not being seen within this reporting period include: Not suitable for service (N=8); cancelled by referrer (N=1); awaiting funding decision (N=1); other (N=4).

#### B1.a.2.1. Referring NHS Organisation

Table 2 below shows the referring NHS Organisation. In total, there were 36 referrals (87.8%) from Scotland, 4 referrals (9.8%) from England, and 1 referral (2.4%) from Northern Ireland.

**Table 2. New Referrals - NHS Organisation referring**

NHS Organisation	Country	No. of Referrals
NHS Borders	Scotland, UK	1
NHS Dumfries and Galloway	Scotland, UK	2
NHS Fife	Scotland, UK	6
NHS Forth Valley	Scotland, UK	1
NHS Grampian	Scotland, UK	2
NHS Greater Glasgow and Clyde	Scotland, UK	5
NHS Highland	Scotland, UK	2
NHS Lanarkshire	Scotland, UK	2
NHS Lothian	Scotland, UK	3
NHS Tayside	Scotland, UK	11
NHS Western Isles	Scotland, UK	1
Bradford District Care Trust	England, UK	1
Hertfordshire Partnership NHS Trust	England, UK	1
South West Yorkshire Partnership NHS Foundation Trust	England, UK	1
Sutton and Merton Primary Care Trust	England, UK	1
Northern Health and Social Care Trust	Northern Ireland, UK	1
<b>Total</b>		<b>41</b>

### B1.a.3. Assessments

Twenty-seven assessments were conducted during the 2010/11 financial year. Seventeen men and 10 women were seen, with a mean age of 47.9 years (range 26.1 – 69.1 years).

#### B1.a.3.1. Referring NHS Organisation

The NHS organisation (Board or Primary Care Trust) responsible for each assessment is shown below in Table 3. Please note that NHS organisation names can change (and frequently do) and the name shown is the one at the time of referral/ assessment.

**Table 3. New Assessments: Referring NHS Organisation**

NHS Organisation	Country	No. of assessments
NHS Borders	Scotland, UK	1
NHS Dumfries and Galloway	Scotland, UK	2
NHS Fife	Scotland, UK	1
NHS Grampian	Scotland, UK	2
NHS Greater Glasgow and Clyde	Scotland, UK	2
NHS Highland	Scotland, UK	2
NHS Lanarkshire	Scotland, UK	1
NHS Lothian	Scotland, UK	2
NHS Tayside	Scotland, UK	8
NHS Western Isles	Scotland, UK	1
Bradford District Care Trust	England, UK	1
Derbyshire Mental Health Services NHS Trust	England, UK	1
Hertfordshire Partnership NHS Trust	England, UK	1
Sutton and Merton Primary Care Trust	England, UK	1
Northern Health and Social Care Trust	Northern Ireland, UK	1
<b>Total Number of Assessments:</b>		<b>27</b>
<b>No. of assessments not covered by SLA:</b>		<b>5</b>

### B1.a.3.2. Diagnosis of Patients Assessed

The distribution of primary diagnostic categories following assessment is shown below in Table 4. Secondary (or additional) diagnoses are not listed. The main categories of diagnosis are similar to previous years with approximately 50% of patients having a diagnosis of unipolar major depression. The percentage of patients with obsessive-compulsive disorder is up a little on the previous year (30% compared to 20%).

**Table 4. Category of Diagnosis for New Assessments**

Diagnosis	No. of patients	%
F25.2 Schizoaffective disorder, mixed type	1	3.7%
F31.3 Bipolar affective disorder, current episode mild or moderate depression	1	3.7%
F32.1 Moderate depressive episode	4	14.8%
F32.2 Severe depressive episode, without psychotic symptoms	3	11.1%
F33.1 Recurrent depressive disorder, current episode moderate	3	11.1%
F33.2 Recurrent depressive disorder, current episode severe without psychotic symptoms	3	11.1%
F42.0 Obsessive compulsive disorder, predominantly obsessional thoughts or ruminations	2	7.4%
F42.1 Obsessive compulsive disorder, predominantly compulsive acts	1	3.7%
F42.2 Obsessive compulsive disorder, mixed obsessional thoughts and acts	6	22.2%
F60.31 Emotionally unstable personality disorder - borderline type	2	7.4%
Other	1	3.7%
<b>Total</b>	<b>27</b>	<b>99.90%</b>

Note that percentages do not sum perfectly due to rounding.

#### B1.a.4. Procedures

A summary of neurosurgical procedures performed is given below in Table 5.

**Table 5. Procedures performed in 2010-2011**

<b>Anterior Cingulotomy (ACING)</b>	
As first operation:	1
As second operation:	4 <sup>†</sup>
As third procedure:	1
<b>Total:</b>	<b>6</b>
<b>Vagus Nerve Stimulation (VNS)</b>	
As first operation:	1
As second operation:	0
<b>Total:</b>	<b>1</b>
<b>Total number of Procedures:</b>	<b>7</b>

<sup>†</sup> Two patients had previous VNS, and two patients had previous ACING.

#### B1.a.4.1. NHS Organisation Referring for/ funding Surgery

The referring NHS Organisation for neurosurgical patients is shown below in Table 6.

**Table 6. NHS Organisation responsible for Neurosurgical patients**

NHS Organisation	Country	Procedure
NHS Fife	Scotland, UK	ACING
NHS Lothian	Scotland, UK	VNS
NHS Tayside	Scotland, UK	ACING
Bolton, Salford & Trafford Mental Health NHS Trust	England, UK	ACING*
Cornwall Partnership NHS Trust	England, UK	ACING*
Tees, Esk and Wear Valleys NHS Trust	England, UK	ACING*
West Kent NHS and Social Care Trust	England, UK	ACING*

#### B1.a.4.2. Procedures not covered by SLA

During this financial year, four procedures were performed out with the SLA. These are indicated in Table 6 by an asterisk.

#### B1.a.5. Inpatient admissions

##### B1.a.5.1. Inpatient Exposure and Response Prevention (ERP)

No inpatient ERP programmes were delivered during this financial year. Further discussions about inpatient treatment programmes for ERP are below in section B2.a.2.

### B1.a.5.2. Durations of inpatient stay

Details of inpatient admissions are shown below in Table 7.

**Table 7. Duration of inpatient stay (all categories)**

Type of Admission	N	SLA <sup>†</sup>	Non-SLA
Total inpatient stay - all NMD patients, Carseview (days)	5	26	119
Mean inpatient stay - all NMD patients, Carseview (days)	5	26	29.8
Total inpatient stay - all NMD patients, Ward 23 (days)	7	9	13
Mean inpatient stay - all NMD patients, Ward 23 (days)	7	3	3.3
Total inpatient stay - Inpatient ERP, Carseview (days)	-	-	-
Mean Inpatient stay - Inpatient ERP, Carseview (days)	-	-	-
Total inpatient stay - Other, Carseview (days)	-	-	-
Total inpatient stay - Reviews (days)	-	-	-

<sup>†</sup> SLA indicates that the admission was part of the Service-Level Agreement.

\* Inpatient ERP is not included in the SLA and must be funded by the referring NHS organisation.

It should be noted that one patient undergoing VNS did not require inpatient admission to Carseview because pre-operative assessments could be completed as an outpatient. Further, we worked with another patient undergoing cingulotomy to help minimise (and indeed circumvent) the need for inpatient admission following neurosurgery. After a period of recovery in the neurosurgical unit, she was seen at home on a daily basis by members of the service and a multi-disciplinary approach to management ensured that admission was not required in this case.

### B1.a.6. Comments on variation between actual and planned activity

As previously discussed within previous reviews (and indeed, with NSD), the planned activity represents notional figures and we expect year-to-year variation in these. It is worth acknowledging that we continue to see more assessments than planned for, and whilst neurosurgical activity is lower than planned, it is determined by the clinical needs of the population being seen.

### B1.b) Resource Use

Details of inpatient admissions are given above in Section B1.a.5. A number of non-SLA procedures were undertaken during 2010-11 and this permits revenue from this activity to be offset against funding for the service.

## B1.c) Finance and Workforce

### B1.c.1. Financial Report

This is included below in *Section D: Financial Statement*.

### B1.c.2. Workforce

The staff members are listed below in Table 8.

**Table 8. Team members as of May 2011, listed alphabetically**

Name	Title/ Role
Dr David Christmas	Consultant Psychiatrist
Dr Rob Durham	Senior Lecturer in Clinical Psychology
Professor M. Sam Eljamel	Consultant Neurosurgeon
Bob MacVicar	Clinical Nurse Specialist
Anne Mather	Senior Mental Health Nurse and Systemic Family Therapist
Patricia McIntosh	Administrator
Professor Keith Matthews	Professor of Psychiatry and Honorary Consultant Psychiatrist
Professor Douglas Steele	Professor of Neuroimaging and Honorary Consultant Psychiatrist
Margaret Stewart	Medical Secretary
John Swan	Clinical Lecturer and Cognitive Behavioural Psychotherapist
Karen Walker	Senior Mental Health Nurse and Cognitive Behavioural Psychotherapist
Fiona Wilson	Senior Mental Health Nurse and Cognitive Behavioural Psychotherapist
Kath Yates	Top Grade Psychotherapist (Psychodynamic Psychotherapy)

At present Anne Mather remains on a 2-year NHS-career break and is currently working within Child and Adolescent Services in Vancouver, Canada. She is due to return later this year. Karen Walker was seconded to the service in August 2009 to cover for Anne's absence. Karen is a Senior Charge Nurse and Cognitive Behavioural Practitioner with experience working in a range of mental health settings. Latterly she worked in the Community Mental Health Teams in Angus, working with adults experiencing severe and enduring mental health problems; in particular people with depressive illnesses. We are pleased that Karen is now able to join us on a permanent basis.

## B1.d) Key Performance Indicators and HEAT targets

The HEAT targets most relevant to the service are those related to access (waiting times) – further details are given below in Section B4.a) . The service has had no unplanned readmissions.

## **B2. Effective**

The service assesses clinical effectiveness in a range of domains, and these are reported below.

### **B2.a) Clinical Audit Programme**

#### **B2.a.1. Multi-disciplinary team meetings**

The continuous review process governing all aspects of patient outcomes ensures that the AIS is able to track patient progress closely, and can work with patients, their families, and their care teams to maximise recovery and outcomes following neurosurgery.

The service has weekly multidisciplinary team meetings which embrace a range of activities:

- 1) Review of current patient pathways, team discussion about treatment issues, and allocation of referrals. Follow-up reviews are scheduled and inpatient admissions are planned.
- 2) Case discussions where issues have arisen in the treatment or management of particular patients.
- 3) Research meetings where team members will present either their own research, or review recent scientific papers of relevance to the service. In addition, the research activities of the service are discussed and updated.

The multidisciplinary meetings are chaired; have an agenda; and minutes are taken. The minutes reflect the current status of all patients involved with the service and mirror the patient pathway. The minutes provide a contemporaneous record of the clinical activity of the service, and ensure robust clinical governance.

#### **B2.a.2. Liaison with other clinical networks**

Within the reporting period, the AIS has, with the support of NSD, formalised its relationship with the nationally commissioned OCD services for England and Wales. The implication is that patients treated within the NCG-commissioned OCD services for England and Wales can now be referred directly to the AIS for assessment without the need for further detailed financial or commissioning negotiation. Similarly, patients originating from Scotland, after having been seen by the AIS, can be referred on to the NCG-commissioned services There is also a developing agreement to establish a

shared clinical audit programme to describe the long term effectiveness of the treatment interventions offered to patients with chronic, severe and disabling OCD in the UK.

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## **B2.b) Clinical Outcomes**

In this report we aim to provide a summary of outcomes for patients reviewed in 2010/11. More detailed, cumulative reporting will occur on a periodic basis when the accumulation of more data makes this process more meaningful. In standard annual reports, outcomes will be reported on a per-patient basis to clinical staff involved in their care and treatment.

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### **B2.b.1. Neurosurgery for Mental Disorder – Outcomes during 2010/11**

Ten patients were reviewed during this reporting period. Their outcomes are shown below in Table 9. Outcomes have been grouped by type of intervention, and reductions/ increases in scores are colour-coded accordingly. It should be noted that the reason for a second procedure is non-sustained or partial response to the first intervention. Not all patients reviewed underwent neurosurgery as part of the National Service, but outcomes will be reported nonetheless due to the importance of reporting of long-term outcomes from neurosurgical treatment for psychiatric illness.

**Table 9. Outcomes from NMD Procedures - Follow-up in 2010/11**

ID	Procedure	Indication for surgery	First or second procedure	Weeks post-op	% Change in HRSD-17	% Change in MADRS	% Change in Y-BOCS	Response?	Remission?
1	ACAPS	F32.2 Severe depressive episode, without psychotic symptoms	First	923	-76.9%	-72.5%	-	YES	NO
171	ACING	F42.2 Obsessive compulsive disorder, mixed obsessional thoughts and acts	First	57	-	-	-91.9%	YES	YES
291	ACING	F33.1 Recurrent depressive disorder, current episode moderate	Second	112	-56.5%	-50.0%	-	YES	NO
348	ACING	F32.2 Severe depressive episode, without psychotic symptoms	First	118	1.9%	-19.6%	-	NO	NO
78	VNS	F33.1 Recurrent depressive disorder, current episode moderate	First	339	26.2%	13.3%	-	NO	NO
79	VNS	F33.2 Recurrent depressive disorder, current episode severe without psychotic symptoms	First	57	-85.7%	-91.4%	-	YES	YES
88	VNS	F32.1 Moderate depressive episode	First	266	-51.0%	-48.8%	-	YES	NO
89	VNS	F33.1 Recurrent depressive disorder, current episode moderate	First	275	-50.0%	-44.4%	-	YES	NO
90	VNS	F33.1 Recurrent depressive disorder, current episode moderate	First	263	-10.0%	-30.8%	-	NO	NO
263	VNS	F33.1 Recurrent depressive disorder, current episode moderate	First	103	-12.8%	-25.0%	-	NO	NO

**HRSD-17** = 17-item Hamilton Rating Scale for Depression; **MADRS** = Montgomery-Åsberg Depression Rating Scale; **YBOCS** = Yale-Brown Obsessive Compulsive Scale.

**Depression Criteria: Response** is defined as a ≥ 50% improvement in baseline score on the HRSD-17 **OR** ≥ 50% improvement in baseline score on the MADRS. **Remission** is defined as HRSD ≤ 7, or MADRS ≤ 10.

**OCD Criteria: Response** is defined as ≥35% improvement in baseline Y-BOCS. **Remission** is a Y-BOCS score ≤ 10.

## B2.c) Service Improvement

### B2.c.1. Clinical Meetings

The team meets formally to discuss referrals, to review assessments, and to review care pathways on a weekly basis. The team also have research meetings where current research activity is discussed, along with reviewing treatment outcomes. In addition, members of the team present relevant research at these meetings.

## B2.d) Research

The following is an overview of research activities undertaken by the service and team members.

### B2.d.1. List of publications (in press/ published)

BAJBOUJ, M., MERKL, A., SCHLAEPFER, T. E., FRICK, C., ZOBEL, A., MAIER, W., O'KEANE, V., CORCORAN, C., ADOLFSSON, R., TRIMBLE, M., RAU, H., HOFF, H.-J., PADBERG, F., MÜLLER-SIECHENEDER, F., AUDENAERT, K., VAN DEN ABEELE, D., **MATTHEWS, K., CHRISTMAS, D., ELJAMEL, S.** & HEUSER, I. (2010) Two-Year Outcome of Vagus Nerve Stimulation in Treatment-Resistant Depression. *Journal of Clinical Psychopharmacology*, 30, 273-281. [\[LINK\]](#)

BRODIE, J. & **ELJAMEL, S.** (2011) Evaluation of a neurosurgical robotic system to make accurate burr holes. *International Journal of Medical Robotics and Computer Assisted Surgery*, 7, 101-106. [\[LINK\]](#)

**CHRISTMAS, D., ELJAMEL, M. S., BUTLER, S., HAZARI, H., MACVICAR, R., STEELE, J. D., LIVINGSTONE, A. & MATTHEWS, K.** (2011) Long term outcome of thermal anterior capsulotomy for chronic, treatment refractory depression. *Journal of Neurology, Neurosurgery & Psychiatry*, 82, 594-600. [\[LINK\]](#)

**ELJAMEL, S.** (2010) Photodynamic applications in brain tumors: a comprehensive review of the literature. *Photodiagnosis and Photodynamic Therapy*, 7, 76-85. [\[LINK\]](#)

GOUNTOUNA, V. E., JOB, D. E., MCINTOSH, A. M., MOORHEAD, T. W., LYMER, G. K., WHALLEY, H. C., HALL, J., WAITER, G. D., BRENNAN, D., MCGONIGLE, D. J., AHEARN, T. S., CAVANAGH, J., CONDON, B., HADLEY, D. M., MARSHALL, I., MURRAY, A. D., **STEELE, J. D., WARDLAW, J. M. & LAWRIE, S. M.** (2010) Functional Magnetic Resonance Imaging (fMRI) reproducibility and variance components across visits and scanning sites with a finger tapping task. *NeuroImage*, 49, 552-60. [\[LINK\]](#)

GRADIN, V., GOUNTOUNA, V.-E., WAITER, G., AHEARN, T. S., BRENNAN, D., CONDON, B., MARSHALL, I., MCGONIGLE, D. J., MURRAY, A. D., WHALLEY, H., CAVANAGH, J., HADLEY, D., LYMER, K., MCINTOSH, A., MOORHEAD, T. W., JOB, D., WARDLAW, J., LAWRIE, S. M. & **STEELE, J. D.** (2010) Between- and within-scanner variability in the CaliBrain study n-back cognitive task. *Psychiatry Research: Neuroimaging*, 184, 86-95. [\[LINK\]](#)

- GRADIN, V. B., KUMAR, P., WAITER, G., AHEARN, T., STICKLE, C., MILDERS, M., REID, I., HALL, J. & **STEELE, J. D.** (2011) Expected value and prediction error abnormalities in depression and schizophrenia. *Brain*, 134, 1751-64. [[LINK](#)]
- LIU, J. Z., TOZZI, F., WATERWORTH, D. M., PILLAI, S. G., MUGLIA, P., MIDDLETON, L., BERRETTINI, W., KNOUFF, C. W., YUAN, X., WAEBER, G., VOLLENWEIDER, P., PREISIG, M., WAREHAM, N. J., ZHAO, J. H., LOOS, R. J., BARROSO, I., KHAW, K. T., GRUNDY, S., BARTER, P., MAHLEY, R., KESANIEMI, A., MCPHERSON, R., VINCENT, J. B., STRAUSS, J., KENNEDY, J. L., FARMER, A., MCGUFFIN, P., DAY, R., **MATTHEWS, K.**, et al. (2010) Meta-analysis and imputation refines the association of 15q25 with smoking quantity. *Nature Genetics*, 42, 436-40. [[LINK](#)]
- RHODES, S. M., RIBY, D. M., **MATTHEWS, K.** & COGHILL, D. R. (2011) Attention-deficit/hyperactivity disorder and Williams syndrome: shared behavioral and neuropsychological profiles. *Journal of Clinical and Experimental Neuropsychology*, 33, 147-56. [[LINK](#)]
- SPRENGELMEYER, R., **STEELE, J. D.**, MWANGI, B., KUMAR, P., **CHRISTMAS, D.**, MILDERS, M. & **MATTHEWS, K.** (2011) The insular cortex and the neuroanatomy of major depression [In Press. DOI: [10.1016/j.jad.2011.04.004](https://doi.org/10.1016/j.jad.2011.04.004)]. *Journal of Affective Disorders*.
- TEO, M. & **ELJAMEL, S.** (2010) Endoscopic resection. *Journal of Neurosurgery*, 112, 473-474. [[LINK](#)]
- TEO, M. K. & **ELJAMEL, M. S.** (2010) Role of craniotomy repair in reducing postoperative headaches after a retrosigmoid approach. *Neurosurgery*, 67, 1286-91. [[LINK](#)]
- TOZZI, F., MANCHIA, M., GALWEY, N. W., SEVERINO, G., DEL ZOMPO, M., DAY, R., **MATTHEWS, K.**, STRAUSS, J., KENNEDY, J. L., MCGUFFIN, P., VINCENT, J. B., FARMER, A. & MUGLIA, P. (2011) Admixture analysis of age at onset in bipolar disorder. *Psychiatry Research*, 185, 27-32. [[LINK](#)]

#### B2.d.2. Books/ Book Chapters

The service currently has on online CPD (continuing professional development) module being developed for the Royal College of Psychiatrists.

#### B2.d.3. Guideline Contributions

Members of the service have contributed to the following national documents, guidelines, and consultations:

1. *Specialised Mental Health Services (all ages) Definition No 22*. NHS Specialised Services. <http://www.specialisedservices.nhs.uk/doc/specialised-mental-health-services-all-ages>
2. Royal College of Psychiatrists Consultation on ICD-11. [http://www.rcpsych.ac.uk/pdf/ICD11%20One%20page%20summary%20response%20\(2009\).pdf](http://www.rcpsych.ac.uk/pdf/ICD11%20One%20page%20summary%20response%20(2009).pdf)
3. National Horizon Scanning Centre, National Institute for Health Research, University of Birmingham.

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#### **B2.d.4. Current Research Projects**

Below is a summary of current research projects that the service or members of the team are currently undertaking. The Principal Investigator (PI) is listed for each project:

**1) Neuropsychological Function as a Result of Chronic Exposure to Methadone and Other Opiates: Neural Responses to Rewards - A Study Using Functional Magnetic Resonance Imaging (fMRI) (PI: Dr Alex Baldacchino)**

- a) Recent research would suggest that substance dependence is related to an abnormal functioning of reward valuation systems in the brain - opiate-dependent individuals tend to overvalue drugs compared to natural rewards. Substance dependence has also been associated with impulsive behaviour *i.e.* opiate-dependent subjects discount delayed rewards at a larger rate than healthy subjects. This study will test whether chronic opiate exposure is associated with measurable executive dysfunction and if chronic, long-acting opiates are associated with greater behavioural and neuropsychological toxicity. Using fMRI the study will investigate the neural substrates of valuation and discounting of delayed rewards in healthy controls and cohort subjects.

**2) Study Title: Diffusion Tensor and Functional Imaging of Chronic Treatment Refractory Depression and Neurosurgical Treatments. (PI: Prof. Douglas Steele)**

- a) This study will use Diffusion Tensor Imaging (DTI) and functional magnetic resonance imaging (fMRI) to relate neuropsychological performance and clinical status (symptoms) with measures of white matter integrity and grey matter function in 'emotional-processing-relevant' brain networks. This will lead to a greater understanding of the consequences and side-effects of neurosurgery. Using DTI in addition to fMRI will help to map lesion topography and subsequent effects on communicating white matter tracts with great precision, helping to develop our understanding of the functional architecture of depression. This will help guide the development of novel and more effective treatment strategies.

**3) A Clinical Evaluation for the Management of Patients with Major Depressive Disorder, single or recurrent episode, with Deep Brain Stimulation: The BROADEN Study (PI: Prof. Keith Matthews)**

- a) To evaluate the safety and efficacy of Deep Brain Stimulation for patients with MDD, who have failed to respond to at least 4 treatments in the current episode. The primary outcome

assessment will occur at 6 months and all patients will be followed-up for 1 year. See Section C1. below for more information.

- b) The study will compare group 1 who will be implanted with the device and activated for stimulation and group 2 (the control group) who will be implanted with the device but will not receive active stimulation for the first six months of the study. This study will also aim to describe the effects of DBS on measures of regional brain metabolic activity using electroencephalography (EEG) and PET (positron emission tomography) scanning.

#### **4) Pilot investigation of clinical effectiveness and mediators of learning in the CBASP (PI: John Swan; CSO reference number: CZG/2/461)**

- a) A significant minority of depressive episodes (20-30%) respond poorly to antidepressant medication or standard psychological therapy and run a persistent course. Current clinical guidelines recommend a combination of psychotherapy and pharmacotherapy; the evidence base for which rests almost entirely upon a single North American clinical trial in which the Cognitive Behavioural Analysis System of Psychotherapy (CBASP) was significantly more effective than previous psychological or pharmacological therapies, especially in patients with a history of childhood adversity. A more recent clinical trial of comparing CBASP with supportive psychotherapy as an adjunct to pharmacotherapy did not lead to a repeat of the positive results reported in the initial trial. In 2010 the chief scientist office agreed to fund research examining CBASP in people with chronic depression. The primary purpose of this study is to conduct an extended case series of CBASP therapy in order to test the viability and acceptability of this approach in a UK NHS context. At the current time, Dundee AIS is one of the few UK centres with experience and expertise in this form of psychological therapy, which is the only one specifically developed for chronic depression.

### **B2.e) Teaching activities**

Many members of the team are involved in undergraduate and postgraduate teaching, both at a local level and on a national stage.

#### **B2.e.1. Conference Presentations**

- 1) *“Deep Brain and Vagus Nerve Stimulation for Refractory Depression”* | Keith Matthews | 21st May 2010 | The Royal College of Psychiatrists in Scotland Summer Meeting | Edinburgh

- 2) *“Where have we reached with Neurosurgery for Mental Disorder?”* | David Christmas | 23 June 2010 | International Congress of the Royal College of Psychiatrists | Edinburgh
- 3) *“Treatment-Refractory Depression and OCD: Is there a role for neurosurgery and neurostimulation?”* | David Christmas | 11 January 2011 | Royal Society of Medicine: ‘Treatment Resistant Illness in Psychiatry: What do you do when the evidence runs out?’ | London
- 4) *“Neurosurgery for Mental disorder in the UK”* | Keith Matthews | 10th March 2011 | World Society for Stereotactic and Functional Neurosurgery, Psychiatric Surgery Forum | Shanghai, China
- 5) *“The role of the psychiatrist in contemporary psychiatric neurosurgery”* | Keith Matthews | 11th March 2011 | World Society for Stereotactic and Functional Neurosurgery, Psychiatric Surgery Forum | Shanghai, China
- 6) *“Selection of Patients for Psychiatric Neurosurgery”* | Keith Matthews | 11th March 2011 | World Society for Stereotactic and Functional Neurosurgery, Psychiatric Surgery Forum | Shanghai, China

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#### **B2.e.2. Other Presentations**

- 1) *“Neurosurgery for Mental Disorder”* | Keith Matthews | 12th October 2010 | Fife Post Graduate Psychiatry Educational Programme
- 2) *“Neurosurgery for Psychiatric Disorders”* | Keith Matthews | 16th March 2011 | Mental Welfare Commission for Scotland | Edinburgh

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#### **B2.e.3. Other teaching activities**

Members of the team continue to contribute to the University of Dundee undergraduate medical course, and also teach on the postgraduate MRCPsych course in Tayside.

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#### **B2.f) Supporting local services**

We continue to work with local services to improve the pathways of patients on a neurosurgical pathway. One patient who is likely to undergo ablative neurosurgery in 2011 is only able to do so because of longstanding relationships between the AIS and staff involved in local care provision. Such arrangements allow cross-boundary coordination of patient care and ensure that an understandably anxiety-provoking journey is managed as smoothly as possible.

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## **B3. Safe**

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### **B3.a) Risk Register**

Risk management is managed within the framework of the host service, NHS Tayside.

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### **B3.b) Clinical Governance**

Dundee AIS is subject to the clinical governance framework operated by the host NHS Board. For example: appraisal; job planning; continuing professional development; knowledge and skills framework (KSF); *etc.*

The NHS Tayside Safety, Governance and Risk framework is being aligned with the new Quality Strategy announced by the Cabinet Secretary for Health and Wellbeing in February this year. The three key drivers are: Person Centredness (*sic*); Effectiveness; and Safe.

The quality and governance approach of Dundee AIS measures up to the key drivers for NHS Scotland strategies as well as local frameworks.

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### **B3.c) Healthcare Associated Infection and Scottish Patient Safety Programme**

Details of HAIs are given below in Section B3.d.2.

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### **B3.d) Adverse Events**

Significant adverse events are discussed first, followed by a more detailed discussion of adverse effects relating to the treatments provided.

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#### **B3.d.1. Survival Data**

Survival following neurosurgical intervention continues to be 100%.

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#### **B3.d.2. Number of Hospital Acquired Infections**

**Number:** None

**Description:** N/A

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#### **B3.d.3. Number of Critical Incidents**

There were no critical incidents in the last 12 months of activity.

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#### **B3.d.4. No. of Deaths**

No deaths have occurred as a result of neurosurgical intervention since such interventions were first offered in 1992. We were informed this year of the death (of an unrelated cause) of a patient who underwent neurosurgery in the early 1990s.

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#### **B3.d.5. Adverse effects**

We continue to systematically collect information on adverse effects from both Anterior Cingulotomy and VNS. In addition, we conduct extensive neuropsychological assessments (clinical battery and computerised testing) to identify post-surgical impairments in cognitive function.

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##### **B3.d.5.1. Anterior Cingulotomy**

Attributing adverse effects to the neurosurgery is challenging, since some potential adverse effects (such as lack of energy and/ or motivation) are common symptoms of the underlying disorder. We continue to attempt to attribute patient complaints to neurosurgical intervention, adverse effects from medication, or symptoms of the underlying disorder.

The most common adverse effects in the first 2-3 weeks after surgery are: Headache (36.4%); Tiredness (22.7%); Nausea (13.6%); Concentration problems (9.1%); Dizziness (9.1%); and Incontinence (9.1%). These are expected to have resolved in the first 2-4 weeks after surgery. The adverse effect profile of Anterior Cingulotomy continues to be relatively benign, with few effects persisting beyond the immediate post-operative period.

During the reporting period, one individual who had undergone cingulotomy was found to have had a small post-operative haemorrhage on routine scanning following the procedure. This had not been detected clinically and the patient had been asymptomatic.

Neuropsychological assessment, conducted prospectively for many years, has failed to evidence consistent changes in performance, with most patients demonstrating improvements which are probably mediated by the reductions in symptom burden.

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##### **B3.d.5.2. Vagus Nerve Stimulation**

VNS continues to be well-tolerated at follow-up with the majority of patients being largely unaware of active stimulation after the first year. At longer-term follow-up the most common adverse effects in Dundee patients have been: Voice alteration (36.4%); Throat Discomfort (27.3%); and Facial Numbness (9%). These are consistent with the literature on VNS. All adverse effects are stimulation-

related and are generally tolerated. There have been no instances where adverse effects have necessitated discontinuation of active stimulation. Magnet use<sup>3</sup> is infrequent.

One individual in the last two years experienced paralysis of one of the vocal cords, causing hoarseness and some swallowing difficulties, following implantation of a VNS device. This is a rare complication of VNS implantation and had not occurred previously. The patient is being closely monitored to ensure that this resolves over time.

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### **B3.e) Formal Complaints**

The service has received no complaints in the last 12 months of operation and has yet to receive any formal complaints since designation.

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## **B4. Timely (Access)**

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### **B4.a) Waiting Times**

The national standard for patients referred by a GP to be seen at a new outpatient appointment is 15 weeks from 31 March 2009. For referrals coming from out with Scotland, assessment is dependent on confirmation of funding being available and this frequently increases the time before a patient can be appointed.

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#### **B4.a.1. Waiting times from referral to assessment**

Waiting times for 2010/11 are shown below in Table 10. All times are expressed (in weeks) from date of referral received to the first appointed date for assessment. Table 10 averages do not contain Scottish waits where there was an identifiable reason for delay, but maximum waits may be affected by factors out with the control of the service.

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<sup>3</sup> Patients are given a magnet which can be used to temporarily stop active stimulation in response to problematic adverse effects.

**Table 10. Waiting times for the service in 2010/11**

	N	Average waiting time (weeks) from referral to assessment (SD/ range)	Max waiting time (weeks)
 Scotland	22	8.6 ± 3.7	36
 England/ Wales	4	28.6	53.1

Please note that the number of patients included in this table may be less than the total number of assessments reported in Section B1.a.3.

#### B4.a.2. Waiting times from assessment to surgery

There is often a significant period of time between when patients are assessed and when they subsequently proceed to neurosurgical intervention. In all cases, it is appropriate and/ or necessary for the patient to have sufficient time to make informed choices about such treatments. In many cases, additional treatment trials need to be completed before it can be considered reasonable to proceed to neurosurgery, and all patients proceeding to ablative neurosurgery (regardless of country of residence) have to be reviewed by the Mental Welfare Commission for Scotland (MWC) who must approve and certify the procedure before the treatment can proceed. Assessment by the MWC typically takes 8-10 weeks, depending on where the patient needs to be seen.

#### B4.a.3. Compliance with NHS Scotland Waiting Time Targets

In the last 12 months, eight patients had a time from referral to assessment that exceeded 15 weeks, although four of these were from England. Reasons for these delays are listed below in Table 11. Assessments from all geographical areas are included in the table.

**Table 11. Reasons for delays in assessments.**

Reason for delay in assessment	N
Delays occurred because of lack of confirmation for funding assessment and travel costs.	1
Further information requested.	3
Information requested - long delay in receiving it.	2
Long delay in confirming funding for assessment from PCT.	2
<b>Total</b>	<b>8</b>

The service works hard to minimise delays in patients being seen, but often such delays are due to referring PCTs in England taking time to provide either confirmation of funding, or having to wait for additional information which enables the AIS to process the referral. Whilst we work hard to minimise such delays, we are unable to affect aspects of the pathway prior to the patient being seen by us.

#### **B4.b) Review of Clinical Pathway**

The clinical pathway is continually reviewed in order to ensure maximum benefit for patients and minimum burden. It is acknowledged that the need to accurately assess baseline functioning does mean that patients often find the pre-operative work-up tiring. However, the completion rate is 100% and no patients have declined to undergo detailed pre-operative and post-operative assessment.

The self-report measures that all patients complete in order to provide important complementary data on symptom burden, quality of life, and functioning is currently as streamlined as is possible and any additional assessments must demonstrate utility.

Members of the team continue to provide teleconferencing when delivering ongoing follow-up for some patients in more remote areas of Scotland. Further, in a number of cases in the last year, members of the team have attended clinical meetings in the patient's locality in order to minimise travel for patients, and their clinical team.

### **B5. Person-Centred**

All assessments result in a specific set of treatment recommendations which take into account the individual's previous experiences, treatment history, and wishes regarding treatment. In the run-up to neurosurgical intervention, individualised care plans are developed which involve identifying the patient's strengths, resilience, and future goals.

#### **B5.a) Patient / Carer / Public Involvement**

As previously reported, the AIS has facilitated the setting up of an internet-based, 'social networking' forum for current and former patients. This closed group is managed/ moderated by two current/ former patients and an employee from one of the local Mental Health Associations. The intention of the group is to provide independent expert advice and information for any patients entering a prospective neurosurgical treatment pathway and to provide support and information for anyone

who has already entered such a pathway. The AIS staff role is restricted to directing appropriate patients to the website and we have no access to the content. However, we do discuss, in general terms, how the forum is functioning and how we might contribute to its improvement on a regular basis with the moderators.

The AIS was one of the first national services to have its own website which acts as a portal for professionals and patients. All up-to-date information is provided, along with rating scales and tools for the use of patients, and current guidelines used within the service. The website has had over 100,000 page impressions since its inception and in the last year has had between 3,000 and 4,000 visits per month.

### **B5.b) Better Together Programme**

Although the service hasn't participated directly in the *Better Together* programme, the service ensures that patient feedback is continually obtained and acted upon in order to improve the quality of care provided. The specialised nature of the service provided has meant that bespoke tools have been developed in order to get patient feedback on the activities of the AIS. We believe that the feedback obtained is not only important to improving patient care, but is more extensive than currently exists in most parts of mental health services.

### **B5.c) Patient Feedback**

We continue to collect patient satisfaction data on a routine basis. Patients are asked to complete and return a questionnaire after outpatient assessments and inpatient admissions. Responses are categorised as follows and averaged:

<b>Score</b>	<b>Represents</b>	
1	Strongly Disagree	Much worse
2	Disagree	Worse
3	Neutral	Neutral
4	Agree	Better
5	Strongly Agree	Much better

Responses continue to be cumulative since the case mix will vary from year-to-year.

### B5.c.1. New Assessments

The mean scores, for each question are given below in Table 12. The demographics of the sample were: Male (15; 35.0%), Female (27; 65.0%) | *Country of Residence*: Scotland (36; 88.7%), England/Wales/ NI (5; 9.5%), Eire (1; 1.8%) | *Reason for Referral*: Depression (22; 52.4%), OCD (13; 31.0%), Other (7/ 16.7%).

**Table 12. Results of outpatient satisfaction questionnaire (N=42)**

Question	Mean	Type of Scale
Explained to me what would happen during the day	4.3	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Easy to complete questionnaires	3.4	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Helpful for partner/relatives/friend to come	4.2	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Pleased that partner/relatives/friend were also seen	4.4	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Helpful to be seen by two people	4.2	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Good to meet at end to discuss recommendations	4.7	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Information given at feedback was helpful	4.4	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Staff were interested in me and not just my illness	4.3	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Felt staff listened to what I had to say	4.5	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Felt staff were honest and open with me	4.5	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Felt I could talk freely with those meeting with me	4.3	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Had confidence in doctors and nurses who assessed me	4.5	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Staff seemed knowledgeable about my condition	4.7	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Felt staff involved me in decision-making about my care	4.2	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Staff seemed to respect my decisions about my treatment	4.4	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Overall, I am satisfied with care I received	4.4	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
I found it helpful to be seen by the service	4.6	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
I learned something new about my problems and available treatments	4.2	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
After attending I feel more optimistic about treatment	3.8	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Compared to attendance at other outpatient assessments, my attendance at AIS was:	4.1	Much Worse, Worse, Neutral, Better, Much Better

The overall responses continue to be favourable, with average responses being very much positive. In terms of negative responses, the only items that received more than 3 negative responses were: “Easy to complete questionnaires” (N=9); and “After attending I feel more optimistic about treatment” (N=4). We acknowledge that the rating scales we ask patients to complete are sometimes difficult, but we continue to believe that the additional information on symptoms, social functioning, and quality of life are important to the assessment process. In addition, the composition of the questionnaires is continually revised.

Average scores on some items (“Good to meet at end to discuss recommendations”, “Felt staff listened to what I had to say”) have increased as numbers of questionnaires returned has increased. It is likely that previous ‘low’ scores on these items reflected response bias.

Responses on “After attending I feel more optimistic about treatment” are interesting since they contrast with very positive responses on other components on the feedback process. We suspect that this reflects complex interactions between individuals’ experiences of being seen by a service that they may perceive as a ‘last resort’ and having additional information about diagnosis and prognosis that they might not have received previously. We will continue to monitor this part of the patient satisfaction questionnaire to understand this in more depth.

Comments from free-text parts of the questionnaire are listed below in *Section G: Appendix 2*. The source (number of the questionnaire received in sequence) of the quote is given in parenthesis after each quote. Responses quoted in previous reports are not included.

### B5.c.2. Inpatient Admissions

Responses to the inpatient questionnaire are given below in Table 13. Scoring is similar to that given above, with higher scores representing greater satisfaction. The demographics of the sample were: Male (6; 35.3%), Female (11; 64.7%) | *Country of Residence*: Scotland (11; 60.1%), England/ Wales/ NI (5; 35.9%), Eire (1; 3.9%) | *Reason for Referral*: Depression (11; 57.5%), OCD (5; 35.3%), Other (1; 7.2%).

**Table 13. Results of inpatient satisfaction questionnaire (N=17).**

Question	Mean	Scale Items
Ward staff were welcoming	4.0	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Ward staff knew purpose of admission	4.0	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
I had a named nurse	3.9	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
My named nurse knew about purpose of admission	3.8	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree

Question	Mean	Scale Items
I was orientated to the ward	3.8	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Staff could respond to my physical needs	3.9	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Staff could respond to my emotional needs	3.7	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Able to discuss problems with staff during daily one-to-one contact	3.8	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Ward staff & nurses from AIS were in close communication with ward	3.9	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
My accommodation (room, shower, bed) was of acceptable standard	4.0	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Ward nursing staff were consistently approachable, courteous, trustworthy, friendly & responsive to my needs	3.9	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Written info was made available to me	4.0	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
I was clear about arrangement for discharge	4.0	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
I knew who to contact if problems following discharge	4.0	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Ward staff & nurses from AIS were in close communication	4.0	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Staff were interested in me and not just my illness	3.9	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
I felt staff listened to what I had to say	3.9	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
I felt staff were honest and open with me	3.9	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
I felt I could talk freely with those looking after me	3.9	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
I had confidence in doctors & nurses in ward	4.0	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Staff seemed knowledgeable about my condition	4.0	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
I felt staff involved me in decision-making about my care	3.9	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Staff seemed to respect my decisions about my treatment	4.0	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Compared to inpatient admission in other units, my stay in Dundee was:	4.3	Much Worse, Worse, Neutral, Better, Much Better

It should be noted that the total number of questionnaires is lower than for the outpatient setting, and some respondents didn't answer all questions. This means that small numbers of less positive responses can bring the mean down.

However, we are pleased that patients rate their stay in the inpatient unit as being ‘Better’ or ‘Much better’ than other units.

## B6. Equitable

### B6.a) Age limits

The service has no upper or lower age limit, although it is realistically expected that the time needed to demonstrate resistance to a range of treatments, and to result in referral to the service, will mean that most patients are in their 20s by the earliest time of referral. Illness characteristics play a role, since the time from onset of symptoms in OCD (for example) and the time of diagnosis is approximately eight years.

### B6.b) Demographics

A brief description of the demographics of referrals since 2006 is given below in Table 14 (N=213). Again, it should be noted that the female:male ratio in depression is unequal, and differences in these rates may reflect differences in prevalence rates.

**Table 14. Demographics of patients referred since 2006**

Characteristic	Number of patients	Mean	Range
<b>Gender</b>		-	-
Male	88		
Female	125		
<b>Age (years)</b>	-	48.8	20.0 – 84.0

### B6.c) Fair for All

The service has completed an Equality and Diversity Impact Assessment in the last 3 years. No actions were required as a consequence of the assessment process.

Ethnic group has only been recorded systematically in the last few years, but is not complete for every patient. However, the ethnicity of assessments seen in 2010/11 is given below in Table 15. The distribution of ethnic groups is broadly comparable to the Scottish population as a whole (Office of the Chief Statistician, 2004).

**Table 15. Ethnicity of assessments in 2010/11.**

<b>Ethnicity</b>	<b>N</b>	<b>%</b>	<b>% of Scottish Population (2001)</b>
WHITE - Scottish	13	48.1%	88.1%
WHITE - English <sup>†</sup>	7	25.9%	7.4%
WHITE - Irish	2	7.4%	1.0%
NOT RECORDED	4	14.8%	-
ASIAN - Pakistani	1	3.7%	0.6%
<b>Grand Total</b>	<b>27</b>	<b>100.0%</b>	-

<sup>†</sup> Classed as 'Other White British' in the 2001 Census.

#### **B6.d) Geographical Access**

The geographical distribution of referrals (not assessments) is given below in Table 16.

**Table 16. Geographical distribution of referrals 2006 - 2010.**

<b>Country</b>	<b>N</b>	<b>Percentage</b>
<b>Eire</b>	3	1.4%
<b>England, UK</b>	25	11.7%
<b>Northern Ireland</b>	5	2.4%
<b>Scotland, UK</b>	180	84.5%
	<b>213</b>	<b>100.00%</b>

It continues to be apparent that the majority of referrals come from the central belt, with an eastern predominance. Undoubtedly, this reflects the proximity to Dundee, and this is something that is seen with a number of National Services – the majority of referrals come from either the host NHS Board, or neighbouring Boards.

#### **B6.e) Socioeconomic status of referrals**

This is discussed in last year's annual report and has not been repeated this year.

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**Section C: Looking Ahead – Service Developments and Expected Changes****C1. Deep Brain Stimulation**

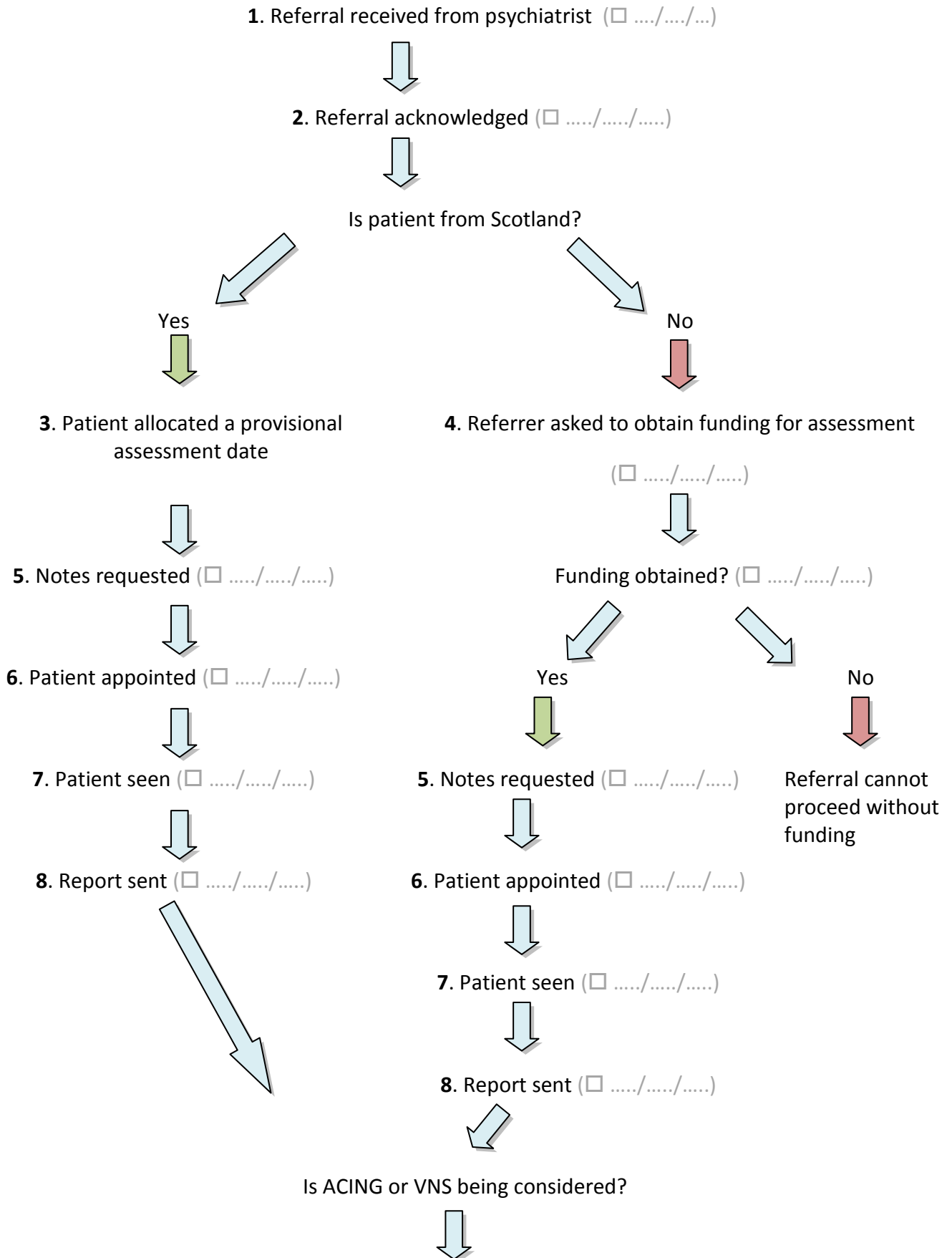
The BROADEN study (<http://www.broadenstudy.com>) is a detailed study of the efficacy of electrical deep brain stimulation of a specific brain area (Brodmann Area 25) as a treatment for disabling and treatment refractory depression. We are now able to offer this experimental treatment to a small number of carefully selected patients as an alternative to the established therapies (VNS and Anterior Cingulotomy) in Dundee. This would be on the basis of participation in an ethically approved research study. Because the study has been designed to evaluate this novel therapy to a very high standard of scientific rigour, we believe this represents an excellent opportunity to not only advance patient care but also to develop patient choice in this clinical area. Uniquely, in Dundee, we will have the opportunity to evaluate the outcomes for this DBS alongside those for other neurosurgical therapies.

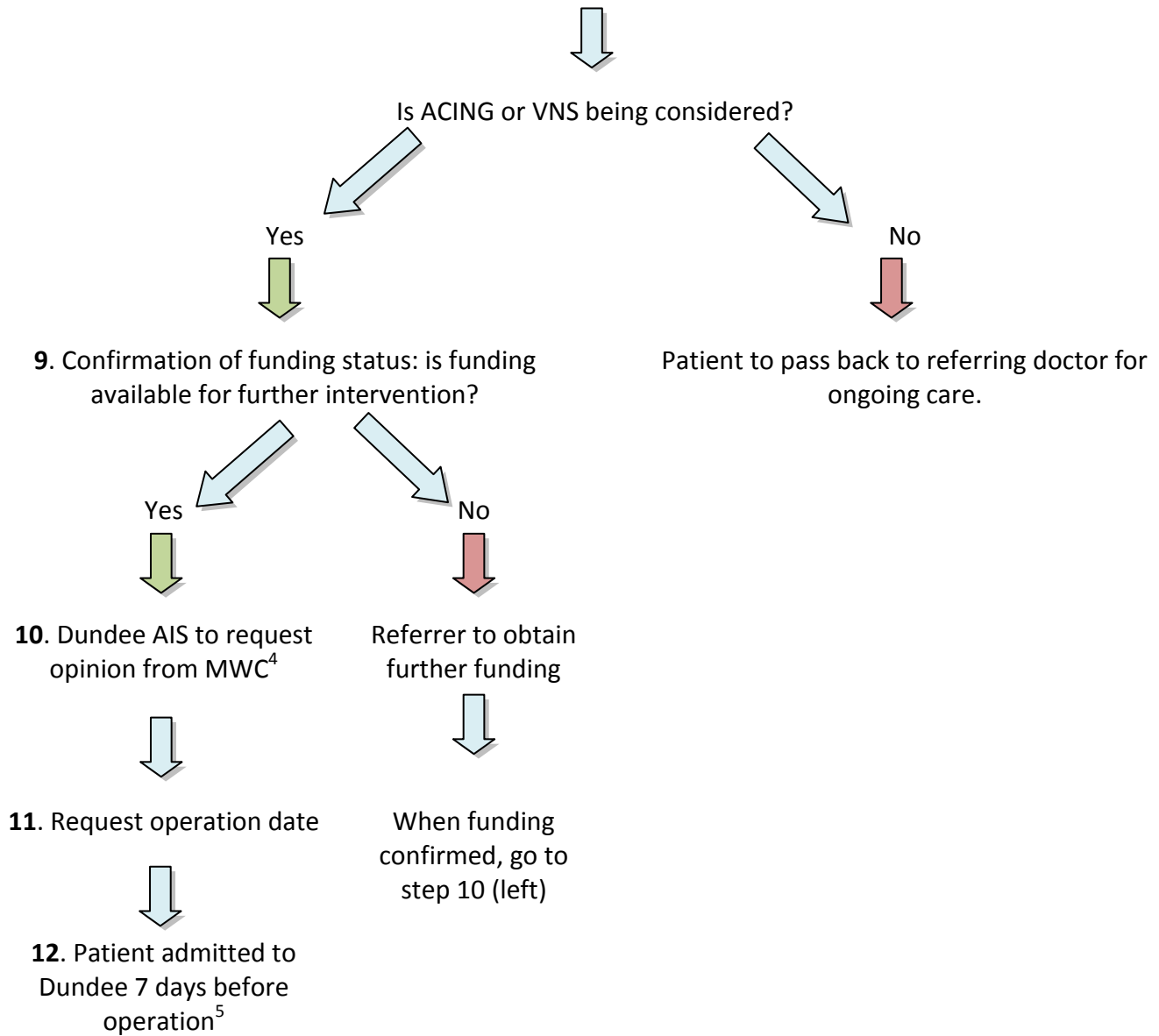
The AIS is planning on implanting the first DBS stimulator in the third quarter of 2011 and looks forward to reporting on more detail on the outcomes from this therapy.

**Section D: Financial Statement**

This will be submitted separately by NHS Tayside finance department.

## Section E: Referral and Treatment Pathway





<sup>4</sup> Mental Welfare Commission for Scotland

<sup>5</sup> This may not be necessary for local patients who can attend for assessments in the pre-operative week

## Section F: Appendix 1 – Treatment recommendations prior to ablative neurosurgery

These recommendations are up-to-date at the point of writing (May 2011), but they may change depending on the emergence of compelling new clinical evidence. Please check our website for the most up-to-date recommendations.

### 1 Depression

#### 1.1. Physical Treatment Methods

As a guiding principle, all of the physical treatments that have been shown to be effective in ‘*treatment-resistant-depression*’ (preferably in randomised, controlled trials) must have been tried in adequate dosage for an adequate period. In general terms, this will reflect the prescription of antidepressant drugs within, or above, the dose range recommended by the British National Formulary (BNF) for a period of at least six weeks.

It is important to note that a proportion of individuals with chronic, refractory depression will have unrecognised or ‘undeclared’ Bipolar Disorder. Therefore, the following also considers the application of “*bipolar depression*” treatment strategies as part of the framework for treatment ‘adequacy’ prior to ablative NMD.

At present, the use of plasma drug concentration monitoring (where possible) is not included as a mandatory requirement, but is sometimes desirable. Most patients referred for assessment will have been exposed to many different treatment trials. The following represent those deemed ‘*essential*’ before proceeding to ablative surgery.

The **minimum** inclusion criteria for neurosurgery are:

- 1) At least two ‘adequate’ courses of treatment with a tricyclic antidepressant drug. One of these trials must be with either clomipramine, imipramine or amitriptyline.
- 2) At least two ‘adequate’ courses of treatment with a selective serotonin re-uptake inhibitor (SSRI).
- 3) At least one ‘adequate’ course of treatment with a ‘classical’ monoamine oxidase inhibitor (i.e. not Moclobemide).
- 4) 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.
- 5) 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

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administration of liothyronine sodium/ T<sub>3</sub> hormone (*not T<sub>4</sub>*) [at a dose up to 20 micrograms three-times-a-day.]. Failure to respond within 6 weeks ought to lead to termination of T<sub>3</sub> administration. Where the patient is known to suffer from hypothyroidism and is taking replacement T<sub>4</sub> (biochemically euthyroid), this strategy of T<sub>3</sub> augmentation is still advised.

- 6) At least two '*adequate*' courses of treatment with an antidepressant drug as defined above, plus the prescription of two 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.
- 7) 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 s per treatment. Failure to respond is defined as either 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.
- 8) At least one '*adequate*' course of treatment with an antidepressant drug as defined above plus the essential fatty acid ethyl-eicosapentaenoate (EPA) at a dose of 1g per day.
- 9) At least one '*adequate*' course of treatment with an SSRI as defined above plus the addition of bupropion (Sustained Release) at a dose of 150-300mg/day.
- 10) At least one trial of an anticonvulsant drug shown to have efficacy in bipolar depression. This includes Lamotrigine at a dose of <400mg day, Divalproex sodium (Depakote®) at a dose of up to 2.5g per day and Carbamazepine at a dose of 800-1200mg per day.
- 11) At least one trial of an antipsychotic drug shown to have efficacy in bipolar depression. This includes olanzapine (5-20mg/day) and quetiapine (300-600mg /day). NB there is also some preliminary evidence for increased response rates in the treatment of Bipolar I depression where olanzapine (6-12mg/day) is *combined* with fluoxetine (25-50mg/day).
- 12) At least one of the following:
  - a) Combination therapy with clomipramine, lithium carbonate and L-tryptophan. The clomipramine to be administered at the maximally tolerated dose (150-250 mg/ day), with a 12 hr post-medication plasma lithium level of 0.5-0.8 mmol/l. This ought to be administered for a minimum period of 6 weeks.

- b) Combination therapy with phenelzine, lithium carbonate and L-tryptophan. The phenelzine to be administered at the maximally tolerated dose (45-90 mg / day), with a 12 hr post-medication plasma lithium level of 0.5-0.8 mmol/l. This ought to be administered for a minimum period of 6 weeks.

### **1.2. Alternative Recommended Pharmacological Treatment Strategies**

*Desirable but not essential prior to ablative NMD.* Either: an absence of unequivocal evidence of efficacy in TRD, or, only suitable for selected patients on the basis of increased risk to physical health:

- 1) **Prescription of an antidepressant drug beyond BNF recommended maximum daily dose.**
  - a) For example, gradual escalation to highest tolerated dose of venlafaxine (>500 mg / day). Beyond 375 mg / day, weekly ECG recordings are advisable, with regular BP monitoring required beyond 200 mg / day.
  - b) Alternatively, gradual escalation to highest tolerated dose of imipramine (>300 mg / day). Similar close physiological monitoring is required. Measurement of plasma levels may be indicated, with a target concentration of 200-250 ng/ml. This ought to be continued for 6 weeks.
  - c) Combination of venlafaxine (375mg/day or maximally tolerated dose) with mirtazapine (30-45mg/day) with appropriate physiological monitoring (BP measurements and ECG recordings)
- 2) **Psychostimulant Drug Treatment.**
  - a) Prescription of a maximally tolerated dose of a tricyclic drug (preferably imipramine), to which methylphenidate (Ritalin®) is added, initially as a single 10 mg test dose, gradually increasing to 30 mg *t.d.s.* This ought to be continued for 6 weeks.

### **1.3. Psychological Treatment Methods**

- 1) At least one sustained trial of structured, manualised, cognitive-behavioural therapy of 20 sessions duration (with either a cognitive or a behavioural emphasis), with long-term follow-up. Treatments ought to be delivered by a therapist with British Association for Behavioural and Cognitive Therapies (BABCP) accreditation. Where there is significant doubt over the adequacy of previous trials of psychological treatment, it may be appropriate to offer the patient at least a brief trial of a suitable psychological therapy. In some cases, this might suggest that a more intensive course of therapy ought to be instigated in either Dundee or elsewhere.

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## 2 Obsessive-Compulsive Disorder (OCD)

### 2.1. Physical Treatment Methods

As a guiding principle, all of the physical treatments that have been shown to be effective in OCD (preferably in randomised, controlled trials) must have been tried in adequate dosage for an adequate period of time. In general terms, this will reflect the prescription of antidepressant drugs within, or sometimes above, the dose range recommended by the BNF for a period of 12-16 weeks.

Treatment gains can accrue slowly and premature termination of treatment trials should be avoided. Most patients referred for assessment will have been exposed to many different treatment trials. The following represent those deemed 'essential' before proceeding to surgery.

The minimum inclusion criteria are:

- 1) At least one course of treatment with the tricyclic antidepressant drug clomipramine for 12-16 weeks in a dose in excess of 150 mg/day. Except in exceptional circumstances, the dose should be titrated upwards towards a target of 250 mg/day (or above) depending on tolerability. Compliance may be determined by plasma level estimation where deemed necessary.
- 2) At least two courses of treatment with different selective serotonin re-uptake inhibitors (SSRI's) (fluoxetine, fluvoxamine, paroxetine, citalopram, sertraline or escitalopram) at a maximally tolerated dose for a period of 12-16 weeks. This may involve the prescription of these drugs at a dose in excess of the BNF maximum recommended dosage. Other than in exceptional circumstances, ALL of the drugs from the SSRI class ought to be tried, sequentially, in full dosage (or maximum tolerated dosage), for an adequate period of time. (the target dose for fluoxetine would be at least 60 mg/day, fluvoxamine at least 300 mg/day, sertraline at least 200mg/day, citalopram at least 60 mg/day and paroxetine 60-80 mg/day).
- 3) A single trial of a maximally tolerated dose of the serotonin and noradrenaline reuptake inhibitor venlafaxine.
- 4) At least one trial of clomipramine or an SSRI plus antipsychotic drug augmentation for a period of 12 weeks. Please note – antipsychotic drugs are not effective as monotherapy for OCD and should be avoided other than as augmenting agents. The drugs which have been demonstrated to exert some benefit in resistant OCD are risperidone (up to 3mg daily) and quetiapine (up to 200-300mg daily).
- 5) The value of olanzapine, amisulpride and clozapine is uncertain. Clozapine has been reported to provoke OCD symptoms, in the absence of co-morbid schizophrenia, should generally be avoided. (NB: older antipsychotic drugs such as pimozide and haloperidol may be tried particularly where OCD is co-morbid with Tic disorders or psychotic symptoms).

- 6) It is also anticipated that additional strategies may have been tried (e.g. combination of two SSRI's or SSRI with clomipramine, intravenous administration of clomipramine) but these are not absolute requirements. There is insufficient evidence upon which to base a recommendation for a trial of either ECT or transcranial magnetic stimulation (rTMS) for refractory OCD. However, for patients with severe co-morbid depression, ECT may be considered.

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**2.2. Psychological treatment methods**

- 1) At least one sustained trial (>26 weeks) of exposure and response prevention under the supervision of a BABCP-accredited therapist (minimum therapist contact time 90min per week). Whenever possible, we would expect a period (12 weeks) of in-patient behavioural therapy, conducted in a specialist unit. However, many sufferers are unwilling, for a variety of reasons, to consent to this. Cognitive therapy can also be an effective adjunct to exposure treatment if intrusive thoughts and ruminations are prominent. Again, trials of cognitive therapy ought to be conducted under the supervision of a BABCP-accredited therapist.

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**Section G: Appendix 2 – free text responses from patient satisfaction questionnaires**

1. *“Everything about the AIS in Dundee was far better than any previous assessment. Everyone was extremely professional and put me at ease at all times.” (#40)*
2. *“I am extremely grateful for having the chance to be assessed at the AIS in Dundee. I feel more optimistic about the future.” (#40)*
3. *“There was more time and more attention given to assess my problem(s). Prof Keith Matthew was pleasant and interested, and helped me feel at ease.” (#41)*
4. *“I felt like the doctor took his time with the assessment, not rushing on to the next patient. He discussed all the relevant issues and treatment options and made me feel as if my health mattered to him.” (#42)*
5. *“I was treated with kindness and consideration. My overall experience was informative, reassuring and pleasant. Thank you!” (#42)*

## **Section H: References**

American Psychiatric Association, 1994. Diagnostic and Statistical Manual of Mental Disorders. American Psychiatric Press. Washington, DC.

Office of the Chief Statistician (2004) Analysis of Ethnicity in the 2001 Census - Summary Report. Edinburgh, Scottish Executive.

Royal College of Psychiatrists (2000) Neurosurgery for mental disorder. Report from the Neurosurgery Working Group of the Royal College of Psychiatrists. London, Royal College of Psychiatrists.