



Unit of Functional Neurosurgery

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PARKINSON'S APPEAL: Unit of Functional Neurosurgery

Progress Report November 2007

The Unit of Functional Neurosurgery is based in the Sobell Department of Motor Neuroscience and Movement Disorders at the Institute of Neurology (IoN), Queen Square. The Unit was established in October 2002 when Professor Marwan Hariz was appointed to the first established University Chair of Functional Neurosurgery (The Edmond J. Safra Chair); Professor Hariz was also appointed Consultant Neurosurgeon at the National Hospital for Neurology and Neurosurgery (NHNN). The Unit of Functional Neurosurgery was established through the generous support of The Parkinson's Appeal, led by Mrs Lyn Rothman. The Unit is dedicated to the treatment of patients with Parkinson's disease and other movement disorders using the technique of Deep Brain Stimulation (DBS), a new technique for correcting abnormal function in brain circuits that control movement.

The mission of the Unit is both to provide a first-rate treatment for patients with Parkinson's Disease and other movement disorders, and to lead extensive research aimed at understanding, improving and extending the use of DBS treatment. This research is carried out at the Institute of Neurology.

Recent Developments in the Unit

Clinical Activity in the Unit

By November 2007, a total of 140 patients will have been treated with DBS in the Unit. 38 patients are part of the MRC PD Surgery Trial. 40 patients suffer from dystonia, for which DBS is also a very effective treatment. 2 patients with chronic deafferentation pain have also had DBS. The success rate of the Unit remains very good.

Current Staff Members in the Unit

Professor M Hariz (*Edmond J. Safra Chair of Functional Neurosurgery*)
Dr P Limousin (*Consultant Neurologist and Reader*)
Mr L Zrinzo (*Consultant Neurosurgeon and Research Fellow*)
Dr S Tisch (*Locum Consultant Neurologist, Clinical Research Fellow*)
Dr I Martinez Torres (*Clinical Research Fellow*)
Ms E Tripoliti (*Speech Therapist, PhD student*)
Professor M Jahanshahi (*Consultant Neuropsychologist*)
Dr L Wilkinson (*Postdoctoral Research Fellow*)

Staff changes in the Unit

Ms P Forsdick (*PA to Professor Hariz*) retired in September 07

Ms L Taib has been appointed as PA to Professor Hariz and Unit secretary, she will be taking up her position in December 2007.

Ms E Borrell (*Specialist Movement Disorder Nurse*) has taken a year's sabbatical from 1st November 2007, she will be replaced during this period by Mr J Candelario from the 1st December.

(Roger Lemon is standing down as Director of the Institute of Neurology at the end of the year; his successor will be announced shortly).

Long-term support for the Unit

Both the Monument Trust and Edmond J Safra Philanthropic Foundation have agreed to extend their financial support for the Unit into the next five-year period of the Unit (2007-2012).

'Meeting of Minds' Art Auction

A very successful art auction "Meeting of Minds" was organised by the Parkinson's Appeal on the 16th October 2007 in support of the Unit. This was hosted by Christie's who auctioned works especially donated to the Appeal by numerous contemporary British artists, including Damien Hirst and Tracey Emin (who attended the auction). With over 500 invited guests in attendance (including HRH Princess Michael of Kent and the UCL Provost, Malcolm Grant), the auction raised £460,000. This is a truly remarkable outcome.

Lyn Rothman, Chair of the Appeal and Fergus Henderson, owner and chef of St John's Restaurant (who is a successful beneficiary of DBS in the Unit) were the key organizers of this highly successful event. Guests were hosted very generously after the Christie's auction at St John's. We are extremely grateful to Lyn Rothman and her organizing committee. The funds raised will be used immediately to provide further neurological staff support for the Unit and its ever-increasing community of treated patients (see below).

DBS Support Group

The DBS support group had a very successful first meeting on the 25th September organised by Professor Jahanshahi and Ms Ellie Borrell. A full amphitheatre of operated patients and their relatives as well as a few patients at the stage of being assessed for DBS attended some lectures on subjects related to the Unit and to DBS. Afterwards refreshments were served which allowed patients to meet, talk between themselves as well as having informal discussions with members of the Unit. Patients seemed very pleased with the event. We will explore the possibility to organise another one-day event next year. In the mean time to try and facilitate communication between patients; an MSN group page has been created on the web. Membership of the Group is open to any patient who has been operated in the Unit of Functional Neurosurgery. Patients considering the possibility of DBS in the Unit can also be put in contact with patients who have already been treated.

Website

The Parkinson's Appeal website is completely up-to-date. Please visit it at

<http://www.parkinsonsappeal.com/>

International Meeting hosted by the Unit

Two international meetings were hosted by the Unit in 2007.

On February 8th and 9th 2007, the Unit hosted its second major international meeting "*Functional Neurosurgery for Movement Disorders and Mental Illness*", that was attended by over 230 delegates.

On July 2nd and 3rd 2007, Elina Tripoliti, Speech Therapist and PhD student in the Unit organised the first ever workshop on "*Speech disorders and deep brain stimulation*" attended by 26 international

speakers and an audience of over 80 (65 international) with an interest in speech and movement disorders. It is expected that this group will now meet every two years.

A new home for the Unit: Clinical Neurosciences Centre, 33 Queen Square

In October 2006 work got underway on our new Clinical Neuroscience Centre on the site of 33 Queen Square. The new building is a joint development between the National Hospital and the Institute of Neurology. It will accommodate the Unit and its patients on the east side of Queen Square, in close proximity to hospital wards, imaging facilities, operating theatre and the intensive care unit. The Wolfson Foundation has awarded a grant of £1m towards the cost of the new building. The new Centre was 'topped out' in September and is on schedule to open next April.

PhD

Dr Steve Tisch was awarded his PhD on the effect of DBS in dystonia, entitled "*Neuroplasticity following pallidal stimulation for dystonia*" in August. His examiners Dr Bain (Charring Cross Hospital, London) and Professor Krack (Grenoble) approved the Thesis.

FUTURE APPOINTMENTS IN THE UNIT

As the number of both new and follow-up patients increases, there is a pressing need for second **Consultant Neurologist** in the Unit. The Parkinson's Appeal, the Institute of Neurology and the National Hospital for Neurology and Neurosurgery have now agreed to create a Senior Lecturer/Honorary consultant neurologist position to answer this need.

A **Consultant Speech Therapist** specialising in movement disorders is being established. This post will be funded for two years by the UK Parkinson's Disease Society and thereafter by the National Hospital for Neurology and Neurosurgery. Ms Tripoliti is expected to be appointed to the position in June 2008 when she finishes her PhD. She will therefore be able to carry on her support to the patients treated in the Unit as well as carrying out clinical research work in this important area.

Roger Lemon
Director
Institute of Neurology

Marwan Hariz
Edmond J Safra Chair of Functional Neurosurgery
Institute of Neurology

November 2007

Research Grants/Awards

Professor Hariz

- 2007-2009 Neuro-engineering for navigation, intervention and implementation in neurosurgery. Swedish Foundation for Strategic Research (SSF), Swedish Research Council (VR) and Swedish Governmental Agency for Innovation Systems (Vinnova)
Co-Applicants: Prof M Hariz and Prof Karen Wardell (Univ of Linköping, Sweden)
2,510,000.SEK
- 2005-2007 Improving the accuracy and efficiency of surgical implantation of therapeutic DBS electrodes: Intra-operative use of local field potentials to identify the subthalamic nucleus. DANA Foundation Clinical Neuroscience Research Grant: Prof P Brown
Co-Applicants: Prof M Hariz and Dr P Magill.
\$136,000
- 2006-2008 Effective target volume from DBS and RF electrodes for functional neurosurgery – theoretical and experimental analysis. The Swedish Research Council.
Co-Applicants: Prof M Hariz and Prof Karin Waardell (Univ of Linköping, Sweden)
1,800,000 SEK
- 2005- Functional connectivity of the motor system in healthy subjects and in patients with movement disorders or stroke – to test if surgery changes the pattern of functional connectivity in the motor system using transcranial magnetic stimulation methods to detect connections from premotor and parietal areas to the motor cortex
Programme Grant from the Medical Research Council: Prof J Rothwell, in collaboration with the Unit
£1,031,803
- 2005- Deranged modulatory function of the basal ganglia in human movement disorders.
Programme Grant from the Medical Research Council: Prof P Brown, in collaboration with the Unit.
£876,436

Professor Jahanshahi

- 2005-2007 Does provision of visual cues through virtual reality glasses improve mobility in Parkinson's disease? A controlled study
Project Grant from the Parkinson's Disease Society
Co-applicants: Dr R Greenlaw, Prof N Quinn
£98,193
- 2004-2006 ESRC/MRC Postdoctoral Fellowship for Dr Leonora Wilkinson
£61,860
- 2005-2007 ParkService – Telematics application service for people with Parkinson's disease. A market validation proposal.
European Commission eTen (Trans-European Telecommunications Networks)
Co-applicant with OCC, Mestor, ICCS, Promitheas, Parkaid, Grigioni and Scheneckenhaus
€640,000
- 2006-2008 Career Development Fellowship for Dr Leonora Wilkinson
Parkinson's Disease Society, UK
£103,366

Dr Limousin

2008-2010	Pump priming grant for Consultant Speech Therapist in Movement Disorders. Parkinson's Disease Society	£133,052
2006-2008	Role of cortical plasticity in deep brain stimulation for primary and secondary dystonia Action Research (co-applicant, principal applicant Pr Rothwell)	£175,000
2005-2010	STN Stimulation – Neural control of movement and posture Medtronic Co-applicant: Prof J Rothwell	\$175,000
2006-2009	A therapeutic approach to freezing in Parkinson's disease MRC project grant Co-applicant: Dr B Day	£309,588
2005-2008	Impact of Deep Brain Stimulation on speech in patients with Parkinson's disease Project Grant from the Parkinson's Disease Society	£99,698
2004-2005	Pump priming grant for the position of specialist PD Nurse Parkinson's Disease Society	£40,000
2004-2005	Effect of DBS on speech in Parkinson's disease and dystonia Federation Francaise des Groupements Parkinsoniens	£12,000
2005-2006	Mechanisms by which effective subthalamic nucleus stimulation alters spatial and temporal patterns of motor cortical activity NIH/Medtronic (Co-applicants: J Rothwell, D Corcos, E Tripoliti)	\$175,000
2003-2005	Study of brain plasticity following GPi stimulation for dystonia Brain Research Trust studentship (Dr S Tisch)	£60,216
2006-2008	Quantification of the effect of stimulation parameter adjustment in PD. Rosetrees Trust.	£10000
2004-2009	Encapsulated GDNF-producing cells for neuroprotection in Parkinson's disease, Michael J Fox Foundation, (co-applicant, coordinating principal applicant Pr Lindvall)	

Research Publications from the Unit 2006 – 2007

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Kuhn AA, Doyle L, Pogosyan A, Yarrow K, Kupsch A, Schneider GH, Hariz MI, Trottenberg T, Brown P: Modulation of beta oscillations in the subthalamic area during motor imagery in Parkinson's disease. *Brain.* 2006 Mar; 129(Pt 3):695-706.

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