



Unit of Functional Neurosurgery

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PARKINSON'S APPEAL: Unit of Functional Neurosurgery

Progress Report May 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 May 2007, a total of 126 patients 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 also benefited from 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*)

Ms P Forsdick (*PA to Professor Hariz*)

Dr P Limousin (*Consultant Neurologist and Senior Lecturer*)

Mr Ludvic Zrinzo (*Consultant Neurosurgeon and Research Fellow*)

Dr S Tisch (*Clinical Research Fellow, PhD student*)

Dr I Martinez Torres (*Clinical Research Fellow*)

Ms E Tripoliti (*Speech Therapist, PhD student*)

Ms E Borrell (*Specialist Movement Disorder Nurse*)

Professor M Jahanshahi (*Consultant Neuropsychologist*)

Dr L Wilkinson (*Postdoctoral Research Fellow*)

Long-term support for the Unit

We are delighted to report that both the Edmond J Safra Philanthropic Foundation and the Monument Trust have agreed to extend their financial support for the Unit into the next five-year period of the Unit (2007-2012). UCL, ION and the NHNN are all very grateful for this very welcome news. The new grants will help to secure the long-term future of the Unit and its important work. The Sobell Department, in which the Unit is based, is generously supported by the Sobell Foundation.

DBS Support Group

With the increasing number of operated patients, and increasing demands on the Unit's personnel, it has been considered helpful to set up a DBS Support Group, to provide patients and their families with extra psychological and emotional support in the immediate pre- and post-operative periods. Professor Jahanshahi and Ms Ellie Borrell are in the process of setting up such a DBS Support Group. Initially, the Support Group will be run from Queen Square, with Professor Jahanshahi and Ms Ellie Borrell having a major input. It is envisaged that, over time, one or more of the patients operated in the Unit of Functional Neurosurgery would take over the running of the Support Group. Membership of the Group will be open to any patient who has been operated in the Unit of Functional Neurosurgery.

Website

The Parkinson's Appeal website is completely up-to-date. Please visit it at <http://www.parkinsonsappeal.com/>

NEW: Second Major International Meeting to be hosted by the Unit

On February 8th and 9th 2007, the Unit of Functional Neurosurgery, Institute of Neurology, hosted its second major international meeting "**Functional Neurosurgery for Movement Disorders and Mental Illness**". This meeting brought together the leading international figures in DBS, with major contributions from all over the world on functional neurosurgery, clinical neurology, neuropsychology and neuroscience. The meeting also commemorated the 150th anniversary of the birth of Sir Victor Horsley, who worked at the National Hospital and was the founder of stereotactic neurosurgery. The meeting was attended by over 230 delegates.

NEW: First International Symposium on Basal Ganglia Speech Disorders and Deep Brain Stimulation

On July 2nd and 3rd 2007, Elina Tripoliti, Speech Therapist and PhD student in the Unit of Functional Neurosurgery, is organising a workshop on speech disorders and deep brain stimulation. This meeting will be held in the Gilliatt Lecture Theatre, Institute of Neurology. International speakers are invited and an international audience with an interest in speech and movement disorders is expected to attend. (www.ion.ucl.ac.uk/education/dbs)

NEW: Work is now well advanced on the new Clinical Neurosciences building, 33 Queen Square, providing new accommodation for the Unit

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. We hope that the Unit will move to its new accommodation in April 2008.

NEW APPOINTMENT:

Mr Ludvic Zrinzo was appointed Consultant Neurosurgeon and Research Fellow to the Unit on May 1st, 2007 following the resignation of Mr Ashkan in November 2006. Mr Zrinzo first worked with the Unit as Registrar in 2003 and has since spent 2 years as Clinical Fellow to the Unit. In October 2006, he was awarded the prize for the best presentation at King's College London following his talk on *Improving Frame-Based Stereotactic Targeting in Functional Neurosurgery: Preliminary Lessons from a Multicentre Study* at the Clinical Course and Workshop in Adult and Paediatric Movement Disorders.

Roger Lemon
Director
Institute of Neurology

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

May 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, SCHENECKENHAUS
€640,000
- 2006-2008 Career Development Fellowship for Dr Leonora Wilkinson
Parkinson's Disease Society, UK
£103,366

Dr Limousin

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| 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 |
| 2006-2007 | Quantification of the effect of stimulation parameter adjustment in Parkinson's disease. Rosetrees Trust. | £5000 |

Research Publications from the Unit Jan 2006 – May 2007

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Åström M, Johansson JD, **Hariz MI**, Eriksson O, Wårdell K: The effect of cystic cavities on deep brain stimulation in the basal ganglia: a simulation-based study. *J Neural Engineering* 2006; 3:132-138.

P. Blomstedt, Hariz G-M, **Hariz M.I.**: Pallidotomy versus pallidal stimulation. *Parkinsonism and Related Disorders, Parkinsonism Relat Disord*. 2006; 12:296-301.

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Blomstedt P, Olivecrona M, Sailer A, **Hariz MI**: Dittmar and the History of Stereotaxy or Rats, Rabbits and References. *Neurosurgery* 2007; 60:198-202.

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Ashkan K, Blomstedt P, **Zrinzo L, Tisch S**, Yousry T, **Limousin-Dowsey P, Hariz MI**: VARIABILITY OF THE SUBTHALAMIC NUCLEUS: THE CASE FOR DIRECT MRI GUIDED TARGETING. *Br J Neurosurg*, 21:197-200, 2007.

Wårdell K, Blomstedt P, Richter J, Antonsson J, Eriksson O, Zsigmond P, Bergenheim T, **Hariz M**: Intracerebral microvascular measurements during deep brain stimulation implantation using laser Doppler perfusion monitoring. *Stereotact Funct Neurosurg*, accepted

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