

Personal Details:

Name: **Nick Ward**

Department: Sobell Department of Motor Neuroscience and
Movement Disorders, UCL Institute of Neurology

Present Appointment: Professor of Clinical Neurology and
Neurorehabilitation

Date of Appointment: October 2011

FTE (or APAs for clinical consultant staff): 5 NHS and 6
academic PAs

1. Education / Qualifications

<u>Dates</u>	<u>Detail of degree; diploma; other qualification</u>	<u>Institution</u>
2007	FRCP (UK)	Royal College of Physicians
2003	Programme for Professional Accreditation of Teaching and Learning in Higher Education	Institute of Education
2003	MD	University of London
1994	MRCP (UK)	Royal College of Physicians
1989	BSc Hons (Neuropharmacology/Physiology)	Charing Cross & Westminster Hospital Medical School
1986	MB BS	University of London

2. Professional History

<u>Dates</u>	<u>Detail of position held</u>	<u>Institution</u>
1/10/17- Present	Professor in Clinical Neurology and Neurorehabilitation, Sobell Department of Motor Neuroscience and Movement Disorders	UCL Institute of Neurology
1/10/11- 30/09/17	Reader in Clinical Neurology, Sobell Department of Motor Neuroscience and Movement Disorders	UCL Institute of Neurology
1/08/08- 30/09/11	HEFCE Clinical Senior Lecturer, Sobell Department of Motor Neuroscience and Movement Disorders	UCL Institute of Neurology
1/08/04- 31/07/08	Wellcome Intermediate Clinical Fellow	UCL Institute of Neurology
21/12/03- present	Honorary Consultant Neurologist	National Hospital for Neurology and Neurosurgery
1/07/00- 20/12/03	Clinical Research Fellow	Wellcome Department of Imaging Neuroscience, Institute of Neurology
1/12/99- 30/06/00	Clinical Fellow in Stroke Medicine	UCL Institute of Neurology
1/2/99- 30/11/99	Specialist Registrar in Neurology	The Royal Hospitals NHS Trust
1/2/98- 31/1/99	Specialist Registrar in Neurology	The National Hospital For Neurology and Neurosurgery

1/4/96- 31/1/98	Specialist Registrar in Neurology	The Royal Hospitals NHS Trust
1/08/95- 31/01/96	Senior House Officer	The National Hospital For Neurology and Neurosurgery
1/05/95- 31/07/95	Senior House Officer	National Society for Epilepsy
1/02/95- 14/04/95	Locum Registrar in Neurology	The Royal Hospitals NHS Trust
1/10/94- 31/01/95	Locum Registrar in Neurology	Radcliffe Infirmary, Oxford
1/10/93- 31/01/94	Senior House Officer	South East Thames Regional Neurological Unit, Brook General Hospital
1/02/93- 31/07/93	Senior House Officer	St. Helier Hospital, Carshalton
1/08/92- 31/01/93	Senior House Officer	Regional, Cardiothoracic Unit, St George's Hospital
1/08/91- 31/01/92	Senior House Officer	Ashford Hospital, Middlesex
1/08/90- 31/01/91	Senior House Officer	Watford General Hospital
1/02/90- 31/07/90	House Physician	Westminster Hospital, London
1/08/89- 31/01/90	House Surgeon	Watford General Hospital

3. Other Appointments and Affiliations

Commissions of Trust

- Co-Editor, Oxford Textbook of Neurorehabilitation (2012)
- Founder UCLP Centre for Neurorehabilitation (September 2012)
- Rehabilitation Section Editor - F1000 (April 2012)
- Member Association of British Neurologist Neurorehabilitation panel (April 2013)
- Member of Scientific Committee of British Association of Stroke Physicians (Dec 2014)
- Member Scientific Advisory Board, Cereneo, Switzerland (Feb 2015)
- Editorial Board of Neurolmage: Clinical (June 2015)
- European Academy of Neurology Scientific Panel – Association of British Neurologists representative for Neurorehabilitation (Oct 2015)
- Scientific Advisory Panel, Brain Research Trust (Oct 2016)
- *Continued as* Associate Editor of Journal of Neurology Neurosurgery and Psychiatry (since Jan 2010)
- *Continued as* Associate Editor journal Neurorehabilitation and Neural Repair (since Nov 2010)

Professional Body Membership

- Royal College of Physicians
- Association of British Neurologists
- Organisation for Human Brain Mapping
- British Association of Stroke Physicians
- Society for Neuroscience
- American Society of Neurorehabilitation

I continue to provide external peer review for the following journals:

- Annals of Neurology; Brain; Cerebral Cortex; European Journal of Neuroscience; Human Brain Mapping; Journal of Neurology, Neurosurgery and Neuropsychiatry; Journal of Neural Trauma; Journal of Neurology; Journal of Neurophysiology; Journal of Neuroscience; Lancet; Lancet Neurology; Nature Clinical Practice – Neurology; Nature Reviews Neurology; Neurobiology of Aging; Neurocase; Neuroscience Letters; Neuroimage; Neurorehabilitation and Neural Repair; Stroke

I continue to provide external peer review for research grants:

- Wellcome Trust; Medical Research Council; Action Medical Research; Alberta Heritage Foundation for Medical Research; Deutsche Forschungsgemeinschaft (German Research Foundation), AXA Research Fund

4. Prizes, Awards and Other Honours

- Fellow of the European Stroke Organisation (Jan 2012)

5. Grants

In total, my grant income since 2003 has been:

- Total research funding awarded as PI **= £2,377,959**
- Total research funding awarded as Co-I **= £9,490,738**
 - Of which **£635,808** held by me at UCL
- Total as research sponsor for awards held at UCL **= £1,783,942**

Research funding awarded as PI

- Brain Research Trust. **N Ward (PI)**, K Friston, G Barnes, N Forss. Investigating early spontaneous recovery after stroke. **£340,000** (3 years, commencing March 2019).
- UCLH Biomedical Research Centre **N Ward (PI)**, S Bestmann. Dose controlled tDCS for stroke recovery. £97,087 (3 years commencing Sept 2018).
- The Stroke Association (TSA 2017_04). N Ward (PI), J Rondina, P Nachev, R Simister. Improving predictions of upper limb recovery after stroke with structural brain imaging. **£141,813** (2 years commencing March 2018)
- UCLH Biomedical Research Centre (F204). Clinical Research and Development Committee Research Funding from the BRC and UCLH Charities - Fast Track Grant. **N Ward (PI)**, J Rondina. Predicting motor outcome after stroke with structural imaging. **£39,895** (1 year commencing April 2017).
- UCLH Charities - **N Ward (PI)**, funding for Tyromotion robotic rehabilitation equipment. **£113,800** (April 2015)

- The Stroke Association (TSA 2015/02). **N Ward (PI)**, A Kuppuswamy, J Rothwell. Does diminished motor cortical excitability cause post-stroke fatigue? **£210,000** (3 years commencing 1st January 2016).
- National Institute of Health Research – Research for Patient Benefit – **N Ward (PI)**, E Clark, F Jones, C Doogan, D Playford. Investigating the feasibility of a group self-management program after stroke **£209,683** (3 years commencing 1st March 2015).
- Swiss National Science Foundation. Brain reorganisation in chronic stroke: identifying altered connectivity patterns in the sensorimotor network. **N Ward (PI)**, N Estevez. **£52,400** (1.5 years commencing 1st May 2015).
- Swiss National Science Foundation. Distinct patterns of upper limb movements after stroke and their association with lesion location. **N Ward (PI)**, B Day, L Awai. **£52,400** (1.5 years commencing 1st September 2015).
- UCLH Charities - **N Ward (PI)**, funding for Hocoma Armeo Spring 3D exoskeleton upper limb rehabilitation robot **£35,000** (April 2015)
- Combined Friends of UCLH and National Brain Appeal Small Acorns Awards - **N Ward (PI)**, for upper limb rehabilitation technology, **£22,828** (2012-2015)
- UCL-ZNZ Neuroscience Collaborative funding **N Ward (PI)**, **£3,000** (June 2013).
- The Wellcome Trust (Ref WT088414AIA). Longitudinal changes in motor system connectivity after stroke. (N.Ward - PI). **£313,027** over 36 months from April 2010.
- Medical Research Council (Ref G0900637). Action observation after stroke. (N Ward – PI). **£411,948** over 36 months from February 2010.
- Wellcome Intermediate Clinical Fellow – The Wellcome Trust. A one year extension on the above award granted after peer review. **£111, 489** (commencing August 2007)
- Wellcome Advanced Fellowship – The Wellcome Trust (Ref: GR071398MF2003). A study of the functional anatomy of motor recovery after stroke. **£312,458** - 3 years (commencing August 2004).
- Glaxo Smith Kline sponsored study: **N Ward (PI)**. *Assessing brain plasticity and its modulation in the healthy brain and after stroke using behavioural and functional magnetic resonance imaging measures of motor learning. A pilot study.* **£8,216.43** – 2006.

Research funding awarded as Co-I

- Wellcome Trust Public Engagement Fund (210998/Z/18/Z). L Jarrett (PI), **N Ward (Co-I)**, O Gough, B Duke, M Charrier, C Rawlence, M Pappenheim, A Leff, P Clatworthy, S Homer. Stroke Odysseys. **£75,000** (2 years commencing September 2018).
- Brain Research Trust. S Bestmann (PI), **N Ward (Co-I)**. Re-opening the critical period for plasticity after stroke with dose-controlled non-invasive brain stimulation. **£419,202** (3 years, commencing March 2018).
- UCL Biomedical Research Centre. R Simister (PI), M Brown, X Golay, A Hingorani, R Jager, A Leff, R Macallister, P Nachev, R Perry, R Sofat, **N Ward (Co-I)**, D Werring, D Yellon. Stroke Investigation Group in North And central London (SIGNAL) **£500,000** (5 years commencing September 2015).
- Australian National Health and Medical Research Council. M Riding (PI), S Koblar, J Rothwell, **N Ward (Co-I)**, M McDonnell. Characterising post stroke neuroplasticity in humans – identifying a critical window for rehabilitation Aus\$361,924 (**£216,160**) (2 years commencing Jan 2014).

- The Stroke Association Project Grant (TSA 2012/04) - A Drummond (PI), **N Ward (PI for UCL)** Nottingham Fatigue After Stroke (NotFAST) **£170,802** (2.5 years commencing September 2013). Contribution to UCL **£25,462**
- Medical Research Council Project Grant. J Rothwell (PI), **N Ward (Co-I)**, M Edwards. Predicting the response to plasticity-inducing protocols of non-invasive brain stimulation (NIBS) **£485,400** (3 years commencing January 2013).
- Medical Research Council EME Award (Ref EME 10-60-30). V Pomeroy (PI), **N Ward (PI for UCL)**. FAST-INDICATE. Clinical efficacy of functional strength training for upper limb motor recovery early after stroke: neural correlates and prognostic indicators. **£1.3M** over 4 years (commencing January 2012). Contribution to UCL **£310,346**
- EU FP7 Grant. *Plasticise* – Promotion of plasticity as a treatment of neurodegenerative disease - funded by the European Commission under the 7th Framework Programme – HEALTH – Collaborative Project Plasticise (Contract number 223524) (N.Ward – local PI for UCL). Total award 6,263,520 Euros (**£5.3M**) (48 months from January 2009). Contribution to UCL 354,259 Euros (**£300K**) over.
- The Stroke Association (Ref TSA2007/14). D Playford (PI), E Burdet, S Cano, C Yeong, A Holland, **N Ward**. A feasibility study of use of a cheap, portable, robotic aid for delivering repetitive practice of arm rehabilitation in acute stroke. **£114,146** over 2 years (commencing June 2008).
- Medical Research Council (Ref G0501986). M Husain (PI), **N Ward**. *A specific dopamine D1 agonist, DAS-431, for the treatment of hemispatial neglect and motor deficits following stroke.* **£519,000** – 3 years (commencing June 2008).
- The Stroke Association (Ref: TSA 2005/03) V Pomeroy (PI), S Hunter, **N Ward**, R Tallis, A Rudd, S Chambers. *Mobilisation and tactile stimulation to enhance upper limb recovery after stroke: Phase I investigation of acceptable dose, efficacy and underlying mechanisms.* **£156,028** - 2.5 years (commencing January 2006).
- Medical Research Council (Ref: 6ECH) J Rothwell (PI), P Tallelli, **N Ward**, J Marsden, R Greenwood. *Modulation of post-stroke use-dependent plasticity with theta burst stimulation.* **£235,000** - 2 years (commencing October 2005).

Primary research sponsor for other awards:

- The Stroke Association Postgraduate Fellowship – Ben Beare. Investigating the mechanisms of early post-stroke shoulder pain associated with restriction of shoulder external rotation. **£105,000** (3 years commencing October 2017)
- Wellcome Trust Sir Henry Dale Fellowship – A Kuppaswamy. Psychophysics of predictive motor control: a novel model of post-stroke fatigue. **£905,754** (5 years commencing September 2016).
- The Stroke Association - Senior Research Training Fellowship - A Kuppaswamy. An investigation of the contribution of sensori-motor cortical dysfunction to post stroke fatigue (PSF) using transcranial magnetic stimulation (TMS) and magnetic resonance imaging (MRI) techniques **£174,913** (3.5 years commencing August 2012)
- Brain Research Trust 4 year PhD studentship (S Bowen) - **£133,360** (2011-2014)
- UCL Institute of Neurology MRC 4 year PhD studentship (S Espenhahn) - **£98,740** (2014-2017)
- UCL MRC MB-PhD studentship (M Bhatt) - **£76,494** (2014-2017)
- Brain Research Trust PhD Studentship (Karine Gazarian, N Ward - PI). Does action observation facilitate corticospinal excitability after stroke? **£93,192** over 3 years (commencing October 2009).

- Canadian Institute of Health Research post-doctoral fellowship (Marie-Helene Boudrias, N Ward - PI). Changes in motor system connectivity after stroke. CAN\$180,000 (**£106,489**) over 3 years (commencing October 2009).

6. Invited Talks

<u>Date</u>	<u>Details</u> (* as session chairman, § keynote lecture)
27/04/2018	Future approaches in stroke recovery. At: Irish Heart Foundation Council on Stroke, 21 st Annual Stroke Conference, Dublin.
06/03/2018	Upper limb neurorehabilitation after stroke – the state of play. At: Joint UCL-Moss Rehabilitation Research Institute meeting, London.
10/02/2018	Prognosis of stroke – and how to change it. At: 10th World Congress of Neurorehabilitation, Mumbai, India.
17/01/2018	What's important in upper limb rehabilitation after stroke? At: VUMC, Amsterdam. Implications of the proportional recovery rule for upper limb recovery after stroke. At: UK Stroke Forum, Liverpool.
29/11/2017	Proportional recovery after stroke and what it means for neurorehabilitation. At: European Congress of NeuroRehabilitation, Lausanne, Switzerland.
26/10/2017	Developing an upper limb rehabilitation service. At: Brain Injury Research Trust Annual Meeting, Glasgow.
28/09/2017	Imaging in guiding rehabilitation. At: Stroke Imaging Mini-Symposium, University of Bristol.
21/09/2017	Is recovery after stroke proportional? Challenges and opportunities. At: International Bobath Instructors Training Association (IBITA) 33rd Congress Scientific and Educational Day, Dublin.
14/09/2017	Stroke Recovery- What is the Future? At: NIHR STROKE RESEARCH WORKSHOP, Cambridge.
11/09/2017	Changing approaches to rehabilitation of the upper limb after stroke. At: Department of Neurology, University of Newcastle.
07/09/2017	Restoring brain function after stroke - bridging the gap between animals and humans. At: Institute of Neuroscience, University of Newcastle
6/09/2017	Implications of the proportional recovery rule for neurorehabilitation after stroke. At: CeREN, University of Warwick, UK
19/07/17	Neuroimaging for predicting recovery after stroke. At: RehabWeek, London, UK
17/07/17	Post-stroke upper limb rehabilitation – the next steps. At 6 th Northern Ireland Stroke Conference, Belfast, N Ireland.
13/06/17	The Queen Square Upper Limb neurorehabilitation programme. At: COPA Series, ExCeL London, UK.
07/06/17	Potential use of biomarkers in upper limb rehabilitation after stroke. At: 26 th European Stroke Conference, Berlin, Germany.
26/05/17	Upper limb rehabilitation – Lessons from the past, perspectives for the future. At: 3 rd European Society of Stroke Congress, Prague, Czech Republic.

- 18/05/17 Neurobiology of rehabilitation interventions: the stroke case. At: 22nd Annual RIMS Congress – Shaping the Future of MS Rehabilitation, Barcelona,
- 06/05/17 Using brain imaging in neurorehabilitation of stroke. At: Clinical Research Priority Program (CRPP) meeting, University of Zurich
- 16/03/17 Decoding post-stroke motor function from structural brain images. At: 2nd International Brain Stimulation Conference, Barcelona, Spain.
- 06/03/17 Variability in response to non-invasive brain stimulation in stroke patients. At: 2nd International Brain Stimulation Conference, Barcelona, Spain.
- 06/03/17 Brain plasticity after stroke. At: From bench to bedside: innovative rehabilitative approaches in post-stroke recovery, University of Padua, Italy.
- 03/02/17 §Promoting upper limb recovery after stroke. At: Danish Society of Neurorehabilitation, Odense, Denmark.
- 26/01/17 What is Neurorehabilitation? At: Controversies in Neurorehabilitation, American Society of Neurorehabilitation Meeting, San Diego, USA.
- 10/11/16 §Unravelling proportional recovery after stroke. At: Swedish Stroke Meeting, Lund, Sweden.
- 28/10/16 *Neuroscience of upper limb recovery. At: 4th Queen Square Upper Limb Neurorehabilitation Course, London, UK.
- 30/06/16 Prospects for brain repair after stroke. At: 9th World Congress of Neurorehabilitation, Philadelphia, USA.
- 13/05/16 *Does Neuroimaging help to predict recovery after stroke? At: 9th World Congress of Neurorehabilitation, Philadelphia, USA.
- 12/05/16 *Co-chair the ‘Stroke Recovery and Rehabilitation - Biomarker Roundtable Group’ at World Congress for Neurorehabilitation, Philadelphia, USA, 2016.
- 10/05/16 *Mechanisms of stroke recovery and restorative stroke therapeutics. At: 25th European Stroke Congress, Venice, Italy.
- 14/04/16 Restoring brain function after stroke. At: Cambridge Brain Repair Centre Spring School, Cambridge, UK.
- 08/04/16 Brain plasticity and neurorehabilitation. At: Brighton Stroke Meeting, Brighton, UK.
- 20/11/15 Brain repair after stroke. At: World Congress of Neurology, Santiago, Chile.
- 02/11/15 Changing approaches to rehabilitation of the upper limb. At: Stroke: Modern Medicine, Royal College of Physicians Teach-In, London, UK.
- 06/10/15 §Can we enhance neuroplasticity after stroke? Keynote Lecture At: Welsh Stroke Conference, Cardiff, UK.
- 25/09/15 Neuroscience of upper limb recovery. At: 3rd Queen Square Upper limb Neurorehabilitation Course, London, UK.
- 02/07/15

- Rehabilitation of hand function after stroke. At: 1st Congress of the European Academy of Neurology, Berlin, Germany.
- 22/06/15
- §Can neuroimaging improve the delivery of neurorehabilitation? Keynote Lecture At: International Neurorehabilitation Symposium, Valencia, Spain.
- 11/06/15
- §Neuroplasticity & Neurorehabilitation. At: National Brain Injury Symposium: Complexity & Best Practice, Royal Hospital for Neurodisability, Putney, London, UK.
- 13/03/15
- Measuring the effects of neuroplasticity enhancement after stroke. At: UK Stroke Forum Plenary Session, Harrogate, UK.
- 04/12/14
- §Structural and functional neuroimaging in neurorehabilitation. At: Österreichischen Gesellschaft für Neurorehabilitation, Graz, Austria.
- 07/11/14
- Assistive technology in stroke rehabilitation. At: Medicine & Me – Stroke, Royal Society of Medicine, London, UK. (<https://videos.rsm.ac.uk/video/assistive-technology-in-stroke>)
- 22/09/14
- Neuroimaging and neuroplasticity: predictions for recovery after stroke. At: Accelerating recovery from stroke: navigating the translational pipeline, Nottingham, UK.
- 12/08/14
- What can functional brain imaging tell us about the effects of brain lesions? At: International Congress of Psychiatry, London, UK.
- 25/06/14
- Imaging-based rehabilitation: evidence based optimism and pessimism. At: Hot Topic Symposium – Stroke, Royal College of Physicians, Edinburgh, UK.
- 18/06/14
- Changes in cortical organisation after stroke in humans – biomarkers in neurorehabilitation? At: 36th International Symposium Group de Recherche sur le Système Nerveux Central, Montreal, Canada.
- 12/05/14
- *Brain Imaging and Neurorehabilitation. At: 8th World Congress of Neurorehabilitation, Istanbul, Turkey.
- 09/04/14
- Healthy Lunches - Stroke: Information and Rehabilitation. At: Edinburgh International Science Festival, Edinburgh, UK.
- 15/04/14
- Utility of TMS in prediction of stroke outcome. At: 30th International Congress of Clinical Neurophysiology, Berlin, Germany.
- 21/03/14
- Brain imaging and recovery after stroke. At: Computational Neurorehabilitation Colloquium, Domaine de la Bretesche, France.
- 01/07/13
- *Imaging plasticity after stroke in humans. MiniSymposium- Network mechanisms in loss and recovery of function after stroke. At: European Stroke Conference, London, UK.
- 31/05/13
- *Rehabilitation after stroke. At: 22nd European Stroke Conference, London, UK.
- 28/05/13
- Why non-invasive brain stimulation may (not) work. At: 5th International Conference on Non-Invasive Brain Stimulation. Leipzig, Germany.
- 19/03/13
- *Modern approaches in motor neurorehabilitation. At: Understanding Stroke Recovery, Thames Stroke Research Network AGM, London, UK.

- 07/03/13 Modern approaches in neurorehabilitation. At: Recent advances in medicine and surgery, Royal Society of Medicine, London, UK.
- 29/01/13 Structural and functional brain imaging in neurorehabilitation after stroke. At: CHUV, Lausanne, Switzerland.
- 31/10/12 Translational and Computational Motor Control: From Theory to Neurorehabilitation. At: Society for Neuroscience/American Society of Neurorehabilitation Joint Meeting, New Orleans, USA.
- 12/10/12 *Prediction after stroke – what do we want to know? At: Moving from correlation to prediction in clinical neuroscience. Human Brain Mapping, Beijing, China.
- 09/05/12 Brain imaging in stroke recovery. At: SINAPSE, Glasgow, UK.
- 30/05/12 Can brain imaging help predict recovery after stroke? At: Neuroplasticity and Neurorehabilitation, University of Birmingham, UK.
- 27/04/12 Motor recovery after stroke. At: Pan-London Calman Training day, Queen Square, London, UK.
- 18/04/12 Neuroanatomy of motor impairment after stroke. At: 12th Neuroradiology and Neuroanatomy Course, Queen Square, London, UK.
- 18/04/12 Imaging brain reorganization after stroke: implications for neurorehabilitation. At: British Association of Stroke Physicians Training Weekend, Queen Square, London, UK.
- 23/03/12 Imaging brain reorganization after stroke: implications for neurorehabilitation. At: Association of Academic Psychiatrists, Las Vegas, USA.
- 03/03/12 Studying neuroplasticity in humans with MRI. At: Association of Academic Psychiatrists, Las Vegas, USA.
- 02/03/12 Functional aspects of reorganization: human MR studies. At European Stroke Science Workshop, Garmisch-Partenkirchen, Germany.
- 17/12/11 Brain imaging and motor recovery after stroke. At Addenbrookes Hospital, Cambridge, UK
- 13/12/11 Imaging neuroplasticity in humans. At, Columbia University Hospital, New York, USA.
- 18/11/11 Human hand function: the limitations of brain and brawn - Rehabilitation matters? At: The Physiological Society, Oxford, UK.
- 13/12/11 How does functional imaging show the brain's potential for plasticity? At: Medicine & Me: Stroke, Royal Society of Medicine, London, UK.
- 17/06/11 FMRI to probe motor recovery from stroke rehabilitation: I. Insights into mechanisms related to recovery of upper limb function. At: European Neurological Society, Lisbon, Portugal.
- 28/05/11 Can advanced imaging help predict recovery? Lessons from fMRI. At: European Stroke Conference, Hamburg, Germany.
- 25/05/11

Imaging neuroplasticity in humans. At: Balgrist Hospital, Zurich, Switzerland.

03/05/11 Action observation after stroke. At: Vision For Action workshop, Queen Square, London, UK.

14/05/11

Neuroplasticity- does it occur in the older brain? At: British Geriatrics Society Annual Training Meeting, BMA House, London, UK.

27/01/11

How does contralesional premotor cortex support recovered motor function after stroke? At: UK Stroke Forum, Glasgow, UK.

02/12/10

7. Academic Supervision

Summary:

Since my last application*:

- I have taken on 5 new PhD students (4 as 1st supervisor, 1 as 2nd supervisor)
- I have had 2 Phd students complete, both passed with minor corrections
- I have had 1 MB-PhD student submit within 2 years 8 months
- I have taken on 4 new post-doctoral research associates (as 1st supervisor)
- I have taken on 2 new research assistants (as 1st supervisor)
- I have taken on 12 MSc students and 6 BSc students (as 1st supervisor)

<u>Date</u>	<u>Details</u>
	<u>PhDs</u>
Oct 2017 - present	Ben Beare (1 st supervisor), Stroke Association postgraduate Fellowship
Oct 2017 - present	Ang Dawson, Eve Gregoriou, Jenny Lee (2 nd supervisor)
March 2015 – Feb 2018	Ella Clark (1 st supervisor), National Institute for Health Research grant
Oct 2014 – Dec 2017	Svenja Espenhahn (1 st supervisor), Brain Research Trust/ Medical Research Council Student
Jan 2014 – Sept 2016	Mrudal Bhatt (1 st supervisor), MB PhD student
Oct 2012 – Oct 2013	Stephanie Bowen (1 st supervisor), Brain Research Trust/ Medical Research Council Student
Feb 2012 – Aug 2012	Marta Gandolla (2 nd supervisor), visited lab for 6 months from Milan
Oct 2009 – Dec 2014 [§]	Karine Gazarian (1 st supervisor), Brain Research Trust Student (completed, [§] including maternity leave).
Oct 2005 - July 2009	CC Chen (1 st supervisor), Funded by personal stipend from Taiwan Government. Currently Assistant Professor, Graduate Institute of Biomedical Engineering, National Central University, Taiwan.
	<u>Post-doctoral fellows</u>
January 2017 - present	S Ondobaka (1 st supervisor)
Sept 2015 – April 2016	Lea Awai, Swiss National Science Foundation, Early Post-Doctoral Mobility Fellowship (1 st supervisor).
May 2015 – Dec 2016	Natalia Estevez, Swiss National Science Foundation, Early Post-Doctoral Mobility Fellowship (1 st supervisor).

- Nov 2013 - present Jane Rondina (1st supervisor).
- Jan 2012 - present Anna Kuppuswamy, Stroke Association Fellowship and now Sir Henry Dale Wellcome Trust Fellow, UCL Institute of Neurology, London, UK (1st supervisor)
- May 2009 – Dec 2012 Marie-Helene Boudrias (1st supervisor). Now Associate Professor, McGill University, Montreal, Canada.
- April 2010 – Feb 2013 Chang-Hyun Park (1st supervisor). Now Associate Professor, Ewha Medical Research Institute, Ewha University School of Medicine, Seoul, Korea.
- July 2010 – Dec 2014 Holly Rossiter (1st supervisor). Now postdoctoral research associate, CUBRIC, Cardiff University, UK.

Research Assistants

- May 2016 - present Katie Eves (1st supervisor)
- Oct 2012 – March 2015 Ella Clark (1st supervisor). Now PhD student in my group
- Feb 2010 – Oct 2010 Christel Gudberg (1st supervisor). Currently MRC PhD student, FMRIB, Oxford University.

MSc students (projects – 1st supervisor)

- 2005-2016 **17 students:** J Chand (2005), G Cocco, F Asif, J Seamons (2008) , M Owen (2009) C Eaves, E Davis (2011), N Kou, M Borrelli, H Seddon (2012), I Turner (2013), G Attard, U Suhaime (2015), M Younan, F Vella, M Lagoudaki, M Gillen (2016),

Prizes: Two of my students were awarded prizes for their project work.

Mimi Borrelli (2011/12): Shallice Prize for best student project, Cognitive Neuroscience MSc - *Mirror Therapy Changes to Motor Cortical Oscillations in Stroke Patients*

Giulia Attard (2015/6): Best project, Clinical Neurology MSc – *Detecting patterns of abnormal upper limb movement in chronic stroke patients.*

BSc students (projects – 1st supervisor)

- 2004-2015 **6 students:** F Rasul (2004), W Waddingham, A Ewas (2006), A Poon, W Pleming, R Jolly (2007), Y Man, D Sommer (2008), N Kamalu (2009), I Cane (2011), S Chotai (2012), R Borchert, Kurren Sandhu (2013), E Tang (2014), N Redman (2015)

Student elective project

- 2009 C Goncalves (2009), R Borchert, (Wellcome Trust Vacation Studentship)

8. Research Career Summary / Activity

In 1999, I was awarded the first **Clinical Fellowship in Stroke Medicine** at the National Hospital for Neurology and Neurosurgery, Queen Square, under the supervision of Professor Martin Brown (Vascular Neurology Section) and Professor Alan Thompson (Department of Neurorehabilitation), and funded by the Stroke Association.

I subsequently joined the research group of Professor Richard Frackowiak at the Wellcome Trust Centre for Neuroimaging (WTCN), UCL, as a **Wellcome Trust funded clinical research fellow**. Here I gained experience in the use of fMRI to study motor recovery after stroke and carried out work which led to the award of my M.D. (University of London).

In 2003 I was awarded a **Wellcome Intermediate Clinical Fellowship** which allowed me to run a research programme at WTCN entitled 'A study of the functional anatomy of motor recovery after stroke' involving the design and implementation of a series of experiments using functional magnetic brain imaging, magnetoencephalography and transcranial magnetic stimulation to investigate (i) the relationship between reorganisation of the cerebral motor system and recovery of motor function after stroke, and (ii) the relationship between healthy ageing and reorganisation within the cerebral motor system.

In 2006 my **Wellcome Intermediate Clinical Fellowship** was extended by 1 year after peer review.

In 2007 I was awarded a **HEFCE 'new blood' Clinical Senior Lectureship**, which I took up in the Sobell Department of Motor Neuroscience and Movement Disorders. Since this time I have held a 50:50 contract, with half of my time devoted to NHS duties and half to UCL.

In 2011, I was promoted to **Reader in Clinical Neurology** in the Sobell Department of Motor Neuroscience and Movement Disorders.

In total, my grant income since 2003 has been:

- Total research funding awarded as PI **= £2,377,959**
- Total research funding awarded as Co-I **= £9,490,738**
 - Of which **£635,808** held by me at UCL
- Total as research sponsor for awards held at UCL **= £1,783,942**
-

I have taken on:

- 6 PhD students, 6 as first supervisor (3 completed, 1 submitted, current)
- 7 post-doctoral researchers (all first supervisor)
- I have been primary supervisor for 32 MSc and BSc student research projects

My current **h-index is 40** and average citation rate is 67.6.

Outside of UCLH, my **clinical and research excellence** has been recognised not only in international invitations to lecture, teach and advise, but also journal appointments, editorships and advisory appointments (see Other Appointments and Affiliations)

My research is concerned with the use of imaging techniques, particularly functional magnetic resonance imaging, to study the relationship between reorganisation within the cerebral motor system and (i) recovery of motor function after stroke, (ii) healthy ageing and (iii) motor skill learning. I am particularly interested in developing an empirical understanding of cerebral reorganization after stroke and how this will inform treatment strategies for patients with significant motor impairment. I investigate how patterns of brain activity during hand movement change after stroke and as part of normal ageing. Current work is concentrating on further characterisation of these differences using a combination of fMRI, MEG, DTI and TMS in order to determine whether imaging and neurophysiological measures will prove useful as biomarkers of the likelihood of responding to various forms of impairment based treatment. This is important because the power of future clinical trials to detect real improvements in function will be greatly enhanced if we are able to stratify patients

according to likelihood of response based on strong mechanistic hypotheses. Clinical trials performed without this approach are unlikely to be feasible because the great variability in the population of stroke patients will mean excessively large numbers of patients for these complex interventions.

Recently I have set up the **Upper Limb Neurorehabilitation service at The National Hospital for Neurology and Neurosurgery**, the only dedicated upper limb rehabilitation facility in the world. This is supported through (i) a successful NHS business case which generates £0.75M a year for UCLH Trust, and (ii) awards totalling £60,828 to purchase state-of-the-art robotic upper limb rehabilitation devices, including the first ever Armeo Spring exoskeleton robot in the NHS at UCL/UCLH. This clinical facility will increasingly become the focus for clinically related research into mechanisms of stroke motor recovery at UCL. The quality of the service is demonstrated by:

- Clinical outcomes better than published studies (a clinically meaningful 10 pt gain in Fugl-Meyer score at 6 month follow up compared to 2 pts in international robotic rehabilitation trials)
- Gains are maintained at 6 week and 6 month follow up.
- Service responsive through quantitative (98% satisfaction) and qualitative (focus groups) patient feedback. Regularly praised for providing hope to stroke survivors.
- Web based clinic details and referral information.
- In-clinic multi-disciplinary team teaching to maintain up to date practice.
- I introduced the self-management programme Bridges to help maintain clinical gains after discharge and obtained NIHR funding (March 2015, £209K) to optimise delivery.

9. Teaching Activity

Background:

- I have completed the **Programme for Professional Accreditation of Teaching and Learning in Higher Education** at the Institute of Education (IoE), University of London (2004).
- I was the editor of the neurology section on **Medical Masterclass** - a collaboration between the Education Department of the Royal College of Physicians and Blackwell Science, an educational resource for those preparing for the MRCP examination.

Current activity:

- **Lead - undergraduate Stroke teaching at UCLH** (since Oct 2014). I have improved standards with approaches learned at IoE: regular course evaluation; novel self-assessment exercises; peer observation and feedback to all lecturers; providing teaching material online. Undergraduate stroke teaching at UCLH are consistently rated highly.
- Since my last application, I have been primary supervisor for **12 MSc student projects** and **6 BSc student projects**. Two of my students have won prizes for best MSc project.
- I recently took on the role of a **UCL MBBS Years 1-2 Personal Tutor** (October 2015)
- I convene modules on the **Clinical Neuroscience MSc** (since 2009) and **Stroke MSc** (since 2015), Queen Square – delivering 2 lectures/year, selecting other lecturers, writing exam questions, marking and moderation of exam essays.
- **Annual Queen Square Upper Limb Neurorehabilitation Course** - I developed and lecture on this 2 day UCL Partners course, now in its 5th year (>100 external delegates/yr) (started 2013)
- I **teach allied health care professionals on the neurorehabilitation unit** at The National Hospital for Neurology and Neurosurgery (monthly, since May 2015).
- I lecture twice a year on the **Instructor course for Action for Research in Neurological Injury** (since 2009) teaching trainers and family members in stroke rehabilitation.
- I co-organise **UCLP Centre for Neurorehabilitation seminar series** which started in 2013 - <http://www.ucl.ac.uk/cnr/seminars>. These seminars are attended by clinicians and researchers

from throughout UCL Partners. Attendance over the last 3 years has ranged between 28 to 120 (mean 61 per lecture).

- Submitted successful bid to organise and host the workshop **‘Moving from correlation to prediction in clinical neuroscience’ at Organisation of Human Brain Mapping Annual Meeting** in June 2012.
- I organised and convened the **Centre for Neurorehabilitation Symposium ‘What’s the use of technology in rehabilitation?’** October 2014
<http://www.ucl.ac.uk/cnr/seminars/cnrsymposia/technology> (85 attendees).
- I am co-editor of the **Oxford textbook of Neurorehabilitation**. This involved co-editing the 1st edition (2013-4), editing the online update (2015), and developing the 2nd edition (2016).

PhD Examiner:

2011 MA Wright (University College London)
 2011 E Al-Yahya (Oxford Brookes University)
 2011 E Buch (University of Oxford)
 2011 N Wright (University College London)
 2012 D Durecki (Kings College London)
 2014 W Huynh (University of New South Wales, Australia)
 2014 P Zeidman (University College London)
 2015 P Rinne (Imperial College, London)
 2016 J De Havas (University College London)
 2017 I Weinberg (University College London)
 2018 C Winters (University of Amsterdam)
 2018 E Parkkonen (University of Helsinki)

10. Knowledge Transfer / Exchange Activity

1. Working with industry

- I **work with rehabilitation technology companies**, including Hocoma, VirtualWare and Tyromotion on the implementation of robotic technology in neurorehabilitation.
- I provide feedback to these companies on the practical implementation of technologies in a real world clinical setting.
- I have been a **co-applicant on a grants** to develop novel technological approaches to hand rehabilitation (with Technalia and Hocoma) (unsuccessful Sept 2015) – re-application to European Commission (2016).

2. Public engagement

- Took part in a panel discussion before performance of Stroke Odysseys (produced by Rosetta Life) (May 2018) <https://www.theplace.org.uk/whats-on/ben-duke-orlando-gough>
- Interviewed for **The Naked Scientists podcast** (April 2018) <https://www.thenakedscientists.com/articles/interviews/new-drug-could-aid-stroke-rehabilitation>
- Interviewed for **Guardian Science podcast** (March 2018) <https://www.theguardian.com/science/audio/2018/mar/09/is-it-possible-to-enhance-and-rewire-the-adult-brain-science-weekly-podcast>
- Interviewed on **BBC Breakfast television** (February 2018)
- Featured in **BBC Horizon documentary – My Amazing Brain: Richard’s War**

(Feb 2018) <https://www.bbc.co.uk/programmes/b09rdg0z>

- Featured in **article in Observer newspaper** by Robert McCrum about his experience in the Upper Limb Neurorehabilitation program (February 2015) <http://www.theguardian.com/science/2015/feb/08/robert-mccrum-lucky-survivor-stroke-treatment-revolution>
- Interviewed for **BBC Radio 4 documentary** 'The Life Inside My Head: From Stroke to Brain Attack' (March 2015) <http://www.bbc.co.uk/programmes/b054pmgy>
- **Filmed by Associated Press** discussing the use of robotic technology in upper limb neurorehabilitation at Queen Square (June 2015).
- *I spoke at the **Edinburgh International Science Festival** at the 'Healthy Lunches - Stroke: Information and Rehabilitation' session to members of the public (April 2014)
- ***Social media** – I have a twitter account dealing with neuroscience and neurorehabilitation - @dr_nickward with 2,028 followers (on 13/03/2017)
- * I have worked with **Rosetta Life**, an organisation promoting, amongst other things, the use of creative arts in stroke rehabilitation. This collaboration has led Rosetta Life and The Place (a London based dance studio) to run weekly sessions in the Neurorehabilitation Unit at The National Hospital for Neurology and Neurosurgery, Queen Square. This work is documented in two videos; (i) Stroke and the Dancers <https://www.youtube.com/watch?v=kOuOkssD7KA>; and (ii) Remembering Who I Am <https://www.youtube.com/watch?v=xxVq8IU9RbM>. It has led to £75,000 Wellcome Trust Public Engagement grant.
- Furthermore, I continue to lecturer on the Instructor course for **Action for Research in Neurological Injury (ARNI)**, an organisation which trains trainers and family members in the care of stroke survivors in the community

3. Informing national policy

- *Member of **parliamentary group on stroke rehabilitation**, House of Lords (2014) convened by Lord Lingfield, Chairman of Action for Rehabilitation from Neurological Injury (ARNI)
- *Member of the **Association of British Neurologists Neurorehabilitation panel** (April 2013).

4. Innovation in application of knowledge

- I have set up and am clinical lead for the **Upper Limb Neurorehabilitation service** at The National Hospital for Neurology and Neurosurgery. This service assesses patients with upper limb impairment following stroke and offers a 3 week period of in-patient neurorehabilitation. It is the only service of its kind in the world. It has become the focus for clinically related research into mechanisms of motor recovery after stroke at UCL.

5. Promoting dissemination within the scientific community

- I was the only UK based member of **European Stroke Science Workshop** writing committee producing 2 articles summarising scientific work in the field of stroke.
 - Mattle HP, Brainin M, Chamorro A, Diener HC, Hacke W, Leys D, Norrving B, **Ward N**. European Stroke Science Workshop. *Stroke* 2012;43(9):e81-8.
 - Mattle HP, Brainin M, Chamorro A, Diener HC, Hacke W, Leys D, Norrving B, **Ward N**. European Stroke Science Workshop. *Cerebrovasc Dis* 2012;26;34(2):95-105.
- Submitted successful bid to organise and host the morning workshop '**Moving from correlation to prediction in clinical neuroscience**' at **Organisation of Human Brain Mapping Annual Meeting** in June 2012.

11. Enabling Activity

1. Co-Director of UCLPartners Centre for Neurorehabilitation

UCLP Centre for Neurorehabilitation was launched in February 2013. Its aim is to improve the lives of people with neurodisability by delivering solutions to major challenges in neurorehabilitation care, research and education. Its purpose is to generate and translate cutting edge research into measurable health gain for patients, carers and society.

UCLP Centre for Neurorehabilitation aims to align research, education and clinical practice in neurorehabilitation to maximise the health of the population we serve in both community and hospital. This will require a clear strategy, which will need to incorporate a number of key elements:

- (1) to prioritise the integration of neurorehabilitation clinical services across UCLP
- (2) to adopt national guidelines and where necessary develop whole system measures of quality
- (3) to define major new neurorehabilitation research initiatives
- (4) to improve links with potential partners in both technology and pharmaceutical industry
- (5) to increase patient access to neurorehabilitation research studies
- (6) to improve public, patient and carer engagement in neurorehabilitation research
- (7) to establish an education and training programme

Current Executive Group: N Ward (Co-director), A Leff (Co-director), D Playford, V Stevenson, R Farrell, O Swayne, R Sylvester, A Thompson, F Brander, K Kelly, C Doogan, S Daniels. Executive group meets every 2nd Tuesday of the month

Seminar series for UCLP Centre for Neurorehabilitation <http://www.ucl.ac.uk/cnr/seminars>. These seminars are attended by clinicians and researchers from throughout UCL Partners. Attendance over the last 2 years has ranged between 28 to 120 (mean 61 per lecture)

Symposia: 3 whole day symposia have taken place (average 80 delegates per symposium)

- Decision making in neurorehabilitation (October 2013)
- What's the use of technology in neurorehabilitation (October 2014)
- Goal setting in neurorehabilitation (April 2015)

The Clinical Networking Group brings clinical rehabilitation teams together from across UCL Partners (both hospital and community based teams) to provide information on services available and develop common pathways and treatment protocols.

I am currently solely responsible for all UCLP CNR social media output:

- Website: <http://www.ucl.ac.uk/cnr>
- Twitter: @NeurorehabUCLP (1451 followers at 13/03/2017)
- Facebook: <https://www.facebook.com/uclpcnr>

2. Local Principal Investigator for current industry sponsored research

- ReNeuron: Phase II Stem Cell Therapy for Stroke Disability (N Ward PI for UCLH)
- Re Neuron: A non-interventional observational clinical study to document the clinical course of patients following ischaemic stroke and to establish a pool of patients who may be approached to participate in future Clinical Trials in the Ischaemic Stroke Setting (N Ward PI for UCLH).

This allows patients at UCLH to have access to participate in novel ground-breaking therapeutic trials

3. Current local Principal Investigator for Participant Identification Centre (PIC) Agreement

- RATULS: Robot Assisted Training for the Upper Limb after Stroke

This allows patients at UCLH to have access to participate in novel ground-breaking therapeutic trials

4. Enabling excellence in clinical services

- I have successfully applied for **equipment grants totalling £174,628 from UCLH Charities and The National Brain Appeal**. New equipment includes the Armeo Spring 3D exoskeleton neurorehabilitation robot (£35,000), and 'Tyrosolution' (£113,800) the first time these devices have been available in the NHS.

12. Administration

- I am **Chair of the Sobell Department Research Assessment Pathway** which provides expert and independent assessment of non-peer reviewed research applications prior to submission for ethics approval.
- I co-convene modules on the **Clinical Neuroscience MSc** (since 2009) and **Stroke MSc** (since 2015), Queen Square – delivering 2 lectures/year, selecting other lecturers, writing exam questions, marking and moderation of exam essays.

13. Publications

Peer reviewed articles

Clark E, MacCrosain A, **Ward NS**, Jones F. The key features and role of peer support within group self-management interventions for stroke. A systematic review. *Disability and Rehabilitation* (in press).

Larivière S, **Ward NS**, Boudrias MH. Disrupted functional network integrity and flexibility after stroke: Relation to motor impairments. *Neuroimage Clin*. 2018 Jun 9;19:883-891.

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