A special thanks to Dr Suraj Rajan, MSc, MD for his work on the title logo for Neurology 2017

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This meeting is sponsored by the Pharmaceutical Industry with the presence of exhibition stands. There has been no Pharmaceutical Industry input to the scientific content of the meeting.
Welcome to Neurology 2017: Leading-edge Neurology for the Practising Clinician

30 March 2017

Dear Colleagues,

On behalf of the Executive Committee of UCL Institute of Neurology, it is a pleasure to welcome you to Neurology 2017: Leading-edge Neurology for the Practising Clinician.

The aim of the course is to provide an update on the practical hospital management of common neurological diseases, with an emphasis on modern techniques and therapies. Its purpose is to be didactic, but also entertaining and informative.

This programme book contains speaker biographies and background reading, and full-text articles (reprinted with permission).

We hope the course will prove instructive, and we are keen to have feedback, so please do not hesitate to contact the organisers with any comments or suggestions. It is an annual event and your comments will be very helpful for planning for the future.

Many people have been involved in assisting with the organization. Particular thanks go to Daniel Cotfas and David Blundred in the Education Unit at the UCL Institute of Neurology for their tireless work in bringing this conference together in such as successful manner. Our sincere and grateful thanks also go to all the speakers and presenters. We would also like to gratefully acknowledge the support of our sponsors (listed at the end of the programme book) which has made this conference possible.

The title logo is kindly provided by Suraj Rajan, and the majority of speaker photos were provided by Medical Illustration.

With best wishes,

Simon Shorvon

(On behalf of the Conference Organising Committee: Professor Simon Shorvon, Dr Tabish Saifee, Mr David Blundred)
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Timetables for Thursday 30 &amp; Friday 31 March</td>
</tr>
<tr>
<td>2A</td>
<td>Speaker Pages for Thursday 30 March</td>
</tr>
<tr>
<td>2B</td>
<td>Speaker Pages for Friday 31 March</td>
</tr>
<tr>
<td>3</td>
<td>Background Reading</td>
</tr>
<tr>
<td>4</td>
<td>Acknowledgements</td>
</tr>
<tr>
<td>Time</td>
<td>Title</td>
</tr>
<tr>
<td>----------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>9.00 –</td>
<td>Registration and coffee</td>
</tr>
<tr>
<td>9.50</td>
<td>Introduction</td>
</tr>
<tr>
<td>10.00</td>
<td>HIV for the Neurologist</td>
</tr>
<tr>
<td>10.35</td>
<td>How do I manage my patient with difficult headaches?</td>
</tr>
<tr>
<td>11.10 –</td>
<td>Coffee</td>
</tr>
<tr>
<td>11.40</td>
<td>Caught on camera – epilepsy video</td>
</tr>
<tr>
<td>12.15</td>
<td>“Breakthrough Prize” lecture</td>
</tr>
<tr>
<td>12.45 –</td>
<td>Lunch</td>
</tr>
<tr>
<td>14.00</td>
<td>Paediatric movement disorders</td>
</tr>
<tr>
<td>14.35</td>
<td>Neurometabolic disorders for the adult neurologist</td>
</tr>
<tr>
<td>15.10 –</td>
<td>Tea</td>
</tr>
<tr>
<td>15.40</td>
<td>How do I interpret these neuropsychometric tests?</td>
</tr>
<tr>
<td>16.15</td>
<td>How do I interpret these nerve conduction studies and EMG?</td>
</tr>
<tr>
<td>16.50 –</td>
<td>Break</td>
</tr>
<tr>
<td>17.00</td>
<td>Managing Chronic Migraine* with BOTOX® (Botulinum Toxin Type A)</td>
</tr>
<tr>
<td>17.00</td>
<td>Introduction</td>
</tr>
<tr>
<td>17.05</td>
<td>BOTOX® mode of action; more than just a paralytic?</td>
</tr>
<tr>
<td>17.35</td>
<td>Evidence in Chronic Migraine; what have we learnt?</td>
</tr>
<tr>
<td>18.05 –</td>
<td>Q &amp; A</td>
</tr>
<tr>
<td>18.15</td>
<td>Drinks and snacks</td>
</tr>
<tr>
<td>19.00 –</td>
<td>Clinical Case Discussions</td>
</tr>
<tr>
<td>20.30</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Title</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------------------------------</td>
</tr>
<tr>
<td>8.25</td>
<td>Diagnosis of coma</td>
</tr>
<tr>
<td>9.00</td>
<td>Acute Neurology – what should our service look like</td>
</tr>
<tr>
<td>9.35</td>
<td>Update on treatment of acute stroke</td>
</tr>
<tr>
<td>10.10</td>
<td>Improving care for people with neurological conditions –</td>
</tr>
<tr>
<td></td>
<td>The commissioners viewpoint</td>
</tr>
<tr>
<td>10.45</td>
<td>Coffee</td>
</tr>
<tr>
<td>11.30</td>
<td>MRI Quiz – spot diagnosis</td>
</tr>
<tr>
<td>12.05</td>
<td>CPC</td>
</tr>
<tr>
<td>12.40</td>
<td>How do I manage my patient with difficult Myasthenia Gravis?</td>
</tr>
<tr>
<td>13.15</td>
<td>What do I need to know about deep brain stimulation?</td>
</tr>
<tr>
<td>13.50</td>
<td>End of course snacks and coffee</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Friday, 31st of March, 2017
HIV for the Neurologist

by Dr Robert Miller

Reader in Clinical Infection

UCL Institute of Epidemiology & Health
Dr. Robert Miller was educated at University College London and St George’s Hospital Medical School. He trained in General Medicine, Respiratory Medicine, and Intensive Care. He was appointed Honorary Consultant Physician in 1991. He is also Reader in Clinical Infection at University College London, and Honorary Professor at The London School of Hygiene and Tropical Medicine. He is Editor-in-Chief of British Journal of Hospital Medicine.

His research focuses on the respiratory complications of HIV infection, specifically Pneumocystis jirovecii pneumonia and tuberculosis, ICU outcomes for HIV-infected patients, and infectious and malignant pleural disease among the general population. Aside from heading up a large clinical TB & HIV service, he also leads on providing/delivering inpatient services for patients with HIV infection and an outpatient service for HIV-infected patients with complex medical problems (PATH clinic).


Selected background reading:


Dr. Robert Miller
For more information visit: www.tiny.cc/rmiller
robert.miller@ucl.ac.uk
How do I Manage my patient with difficult headaches

by Dr Manjit Matharu
Consultant Neurologist
Professor of Clinical Neurology
UCL Institute of Neurology
Dr Matharu is a Senior Lecturer at the Institute of Neurology and Honorary Consultant Neurologist at the National Hospital for Neurology and Neurosurgery, Queen square, London, UK. He is the Academic and Clinical lead of the Headache Group. His major research interests include interventional therapies for intractable headaches, trigeminal autonomic cephalalgias, and functional imaging in primary headaches. He is a member of the Headache and Pain Subcommittee of The Association of British Neurologists (ABN). He was a member of the National Institute for Health and Clinical Excellence (NICE) guideline development group (GDG) for Headache Disorders.

Chronic daily headache (CDH) is a major worldwide health problem that affects 3–5% of the population and results in substantial disability. Besides migraine, several other primary headaches can cause CDH including tension-type headache, new daily persistent headache and the trigeminal autonomic cephalalgias. The management of these headaches involves addressing lifestyle factors and treatment with acute and preventive medical treatments. Recent advances are leading to the introduction of new therapies for these headache disorders. Advances in the management of headache disorders have meant that a substantial proportion of patients can be effectively treated with medical treatments. However, a significant minority of these patients are intractable to conventional medical treatments. Neurostimulation therapies that entail non-invasive and invasive peripheral or central nervous system targets are emerging as very promising approaches.

Selected background reading:
Caught on Camera:

Epilepsy Video

by Professor Matthew Walker

Consultant Neurologist
Professor of Clinical Neurology
UCL Institute of Neurology
Matthew Walker is currently Head of the Department of Clinical and Experimental Epilepsy and Professor of Neurology at UCL Institute of Neurology, and the National Hospital for Neurology and Neurosurgery, Queen Square, London.

He studied medicine at Cambridge University and St. Thomas' Medical School, London and trained in Neurology at St Thomas' Hospital, Guy's Hospital and the National Hospital for Neurology and Neurosurgery, Queen Square.

He carried out a PhD on the treatment of status epilepticus. He is one of the Consultants on the video-EEG telemetry unit at the National Hospital for Neurology and Neurosurgery, Queen Square, where he is involved in the diagnosis of paroxysmal neurological disorders, presurgical epilepsy assessment and diagnosis of neurological sleep disorders.

He is an Associate Editor of Brain. He is treasurer of the British branch of ILAE, secretary of the ILAE Commission of European Affairs. He was awarded the ILAE Ambassador for Epilepsy award in 2013.

Professor Walker’s main research interests are the mechanisms regulating cortical excitability, the treatment and consequences of prolonged seizures, and the development of new therapies for epilepsy. His clinical research includes the surgical treatment of epilepsy, novel diagnostic methods and neurological sleep disorders. He has published over 200 papers, book chapters and books on epilepsy.

Selected background reading:


Derry CP, Harvey AS, Walker MC, Duncan JS, Berkovic SF. NREM arousal parasomnias and their distinction from nocturnal frontal lobe epilepsy: a video EEG analysis. Sleep. 2009 Dec;32(12):1637-44
Breakthrough Prize Lecture

by Professor John Hardy

Professor of Clinical Neuroscience
UCL Institute of Neurology
Professor Hardy received his B.Sc. (Hons) degree from the University of Leeds, UK (1976) and his Ph.D. from Imperial College, London, UK where he studied dopamine and amino acid neuropharmacology. He received his postdoctoral training at the MRC Neuropathogenesis Unit in Newcastle upon Tyne, UK and then further postdoctoral work at the Swedish Brain Bank in Umeå, Sweden where he started to work on Alzheimer’s disease. He became Assistant Professor of Biochemistry at St. Mary’s Hospital, Imperial College, London in 1985 and initiated genetic studies of Alzheimer’s disease whilst there.

Professor Hardy was appointed Associate Professor in 1989 and then took the Pfeiffer Endowed Chair of Alzheimer’s Research at the University of South Florida, in Tampa in 1992. In 1996 he moved to the Mayo Clinic in Jacksonville, Florida, as Consultant and Professor of Neuroscience. He became Chair of Neuroscience in 2000 and moved to NIA as Chief of the Laboratory of Neurogenetics in 2001. He won the MetLife, the Allied Signal and the Potamkin Prize for his work in describing the first genetic mutations, in the amyloid gene in Alzheimer’s disease, in 1991. He was Head of the Neurogenetics Section, National Institute of Ageing, Bethesda, USA and in 2007 took up the Chair of Molecular Biology of Neurological Disease at the UCL Institute of Neurology.

In recognition of his exceptional contributions to science, he was elected a Fellow of the Royal Society in 2009. In 2015, he was awarded the prestigious Breakthrough Prize.

Selected background reading:
https://breakthroughprize.org/Laureates/2/L168
Paediatric Movement Disorders

by Dr Manju Kurian

Consultant Paediatric Neurologist
UCL Great Ormond Street Institute of Child Health
Dr Manju Kurian completed her medical undergraduate training at Cambridge, and continued her training in Paediatrics, initially completing an SHO rotation at Guys/St Thomas’ Hospital. She undertook subspecialty training in Paediatric Neurology at a number of different centres including Dublin, Birmingham and Belfast.

Dr Manju Kurian is an Honorary Consultant Paediatric Neurologist at Great Ormond Street Hospital and Wellcome Intermediate Clinical Fellow at UCL Great Ormond Street Institute of Child Health. She has clinical expertise in childhood movement disorders. Her research encompasses gene discovery, molecular neuroscience, including the use of patient-derived induced pluripotent stem cell models, and novel therapeutics for childhood neurological disorders.

Dr Kurian became an academic consultant paediatric neurologist at the Great Osmond Street Hospital in 2011. In 2012 she secured a Wellcome Trust Intermediate Clinical Fellowship. Her research group is a mixture of clinical research fellows, PhD/MSc students and post-doctoral fellows. Her research now focuses on identification of novel genes causing neurological disorders of childhood as well as using cell and animal models to elucidate disease mechanisms and explore novel treatment strategies.

Selected background reading:
Movement Disorders Presenting in Childhood.
Neuro-metabolic disorders for the adult neurologist

by Dr Robin Lachmann
Consultant Neurologist
UCL Institute of Neurology
Dr Robin Lachmann is clinical lead of the Charles Dent Metabolic Unit at the National Hospital for Neurology and Neurosurgery, where more than 1,500 adult patients with a wide range of inherited metabolic diseases are cared for. He trained in internal medicine and metabolic medicine. He did his PhD research on herpes simplex virus-mediated gene delivery to the brain and post-doctoral work on glycosphingolipid lysosomal storage disorders.

Dr Lachmann is Chair of the Metabolic Disorders Clinical Reference Group, and sits on Council of the Royal College of Physicians (London).

Selected background reading:

How do I interpret these neuro-psychometric tests

by Professor Jason Warren
Consultant Neurologist
Professor of Clinical Neurology
UCL Institute of Neurology
Jason Warren completed general neurology training as the Australasian Fellow to the National Hospital, Queen Square (FRACP 2000) and subsequently trained in cognitive neurology and dementia in the Dementia Research Centre at the UCL Institute of Neurology. Following completion of a PhD in the functional imaging of the human auditory brain at the Wellcome Department of Cognitive Neurology (2005) he was awarded a Wellcome Intermediate Clinical Fellowship (2006) and subsequently a Wellcome Senior Clinical Fellowship (2010) based at the Dementia Research Centre.

He is currently Professor of Neurology at UCL and jointly runs the Specialist Cognitive Disorders Clinic at the National Hospital.

His research group uses complex sound as a paradigm to understand disordered information processing in neurodegenerative disease. Special interests include the progressive aphasias, auditory and emotional cognition in dementia and functional imaging of neurodegenerative diseases.

Selected background reading:


How do I interpret these nerve conduction studies & EMG

by Professor Martin Koltzenburg
Consultant Neurologist
Professor of Clinical Neurophysiology
UCL Institute of Neurology
Professor Martin Koltzenburg is a neurologist and the Head of the Department of Clinical Neurophysiology at The National Hospital for Neurology and Neurosurgery at Queen Square. He studied medicine at the University of Kiel, Germany and UCL. During this time he earned a doctorate with research into the neurophysiological mechanisms of pain. This was followed by postdoctoral research and clinical specialist training at the Department of Physiology of the University of Erlangen, the Department of Neurology and the Department of Psychiatry of the University of Würzburg, Germany and the Department of Clinical Neurophysiology of the University of Uppsala, Sweden.

His work won him several prizes including the Research Prize of the International Association for the Study of Pain, and the Patrick Wall Medal of the British Pain Society. He is regularly lecturing internationally and was the Bjorn Lind Lecturer at the Nobel Forum, Karolinska Institute, Stockholm, the Traveling Speaker of the Canadian Pain Consortium and the Michael Cousins Foundation Visitor’s Lecturer of the Australian and New Zealand College of Anaesthetists.

Martin shares his time between the clinic and research laboratory. His clinical work focuses on neurophysiological techniques in the assessments of neuromuscular disorders including neuropathic pain and translational methods in drug discovery. His basic science research investigates the properties of sensory neurons on a cellular and system level, particularly the mechanisms that lead to acute and chronic pain.

Selected Background Reading:
A. Gechev; N.M. Kane; M. Koltzenburg et al. Potential risks of iatrogenic complications of nerve conduction studies (NCS) and electromyography (EMG) Clinical Neurophysiology Practice 1 (2016) 62–66

S.B. Park; D. Goldstein; A.V. Krishnan; M.Koltzenburg; et al. Chemotherapy-Induced peripheral neurotoxicity: A critical analysis CA: A Cancer Journal for Clinicians 63 (2013) 419-437

Diagnosis of Coma

by Dr Robin Howard
Consultant Neurologist
Senior Lecturer
UCL Institute of Neurology
Dr Howard is Consultant Neurologist at the National Hospital, Queen Square and St. Thomas’ Hospital, and Senior Lecturer at The Institute of Neurology, University College and King’s College.

He qualified from Cambridge University and the Middlesex Hospital in 1980, undertook training in Oxford and London and was appointed to his present post in 1992. He is Head of Service for a large general neurological practice at St. Thomas’ and neurologist to 3 intensive care units. His major specialty interests are intensive care neurology and neuromuscular diseases including myasthenia gravis, motor neurone disease, post-polio syndrome and sleep disorders.

He is a senior editor and contributor to ‘Neurology – A Queen Square Textbook’ and has been author of 150 papers and a contributed to 25 textbooks of Neurology.
Acute Neurology

What should our service look like?

by Dr Chris Turner
Consultant Neurologist
UCL Institute of Neurology
Dr Chris Turner graduated from Oxford University and undertook his clinical training in Oxford, Hammersmith Hospitals, the Whittington, St George's, Chelsea and Westminster and the National Hospital for Neurology and Neurosurgery. He was awarded a Wellcome Clinical Research Training Fellowship in 2000 and completed a PhD in the Molecular Pathogenesis of Huntington's Disease.

In 2007 he became a consultant at the National Hospital for Neurology and Neurosurgery at the MRC Centre for Neuromuscular Diseases. Dr Turner runs general neurology clinics at UCLH and neuromuscular clinics at Queen Square. Dr Turner is the Lead in the Undergraduate Clinical Neurosciences Module at UCL. Dr Turner has a specialist interest in myotonic dystrophy and leads the myotonic dystrophy clinic at Queen Square in conjunction with a Clinical Nurse Specialist, Georgie Mewing. Dr Turner is involved in developing the Myotonic Dystrophy National Registry and Standards of Care Document as well as a research programme.

Selected background reading:
http://www.londonscn.nhs.uk/publication/london-acute-neurology-services-a-case-for-change/
Update on Treatment of Acute Stroke

by Professor David Werring

Consultant Neurologist
Professor of Clinical Neurology

UCL Institute of Neurology
David Werring is Professor of Clinical Neurology and Honorary Consultant Neurologist at the Stroke Research Centre, UCL Institute of Neurology, Queen Square, and the National Hospital for Neurology and Neurosurgery (NHNN), University College Hospitals (UCH) NHS Foundation Trust. Professor Werring contributes to delivering hyperacute and acute stroke care, and runs a specialist clinical service and research program in intracerebral haemorrhage and cerebral small vessel disease.

His projects include observational and neuroimaging studies of cardioembolic stroke, cerebral microbleeds, intracerebral haemorrhage, subarachnoid haemorrhage, and cerebral amyloid angiopathy. He is Head of the Research Department of Brain Repair and Rehabilitation at the Institute of Neurology, Queen Square. David is a member of the Association of British Neurologists Stroke Advisory Group, Stroke Specialty Lead for the NIHR North Thames Clinical Research Network, Chair of the European Stroke Organization Education Committee, Member of the Board of Directors of the European Stroke Organisation, and member of the Editorial Board of the European Journal of Stroke.

Selected background reading:


Improving Care for people with neurological conditions - commissioners viewpoint

by Dr Nicholas Losseff
Consultant Neurologist
University College London Hospitals
Dr Nick Losseff is consultant in neurology at the National Hospital and London Clinical Director of Neuroscience for NHS England. He qualified from St Thomas’ Hospital and trained in neurology at Kings, St Thomas, UCH and The National Hospital for Neurology and Neurosurgery. He was previously awarded the Queen Square Prize in Neurology, The European Neurology Society Prize and The MS Society Grant Holders Prize for his work examining the pathophysiology of disability.

He has a sub-specialist interest in stroke medicine and is best known for his work improving stroke services in London. After developing the first 24/7 thrombolysis service for stroke in North London from UCH, he led the London Stroke Strategy for NHS London though its decision making phase. This team were later awarded the BMJ “Improving Patient Safety” prize and the Health Service Journal “Secondary Care Reorganisation” prize. As medical director of NHS North Central London he led several other large health service improvements including the highly political “BEH Clinical Strategy” which delivered the first major A+E reorganisation in London.

As clinical director for Neuroscience he has worked to raise the profile of neurologic conditions with CCG’s and NHS England. The London Neuroscience board have developed a strategy aimed at modernisation of service delivery for patients with neurologic conditions, including new models of delivering hyperacute care, managing common conditions and integrating care for long term neurologic conditions. The lecture will focus on a commissioner centric view of neurologic services and discuss the disconnect arising from the low priority of neurologic conditions in today’s NHS.

Selected background reading:

Dr Nick Losseff
For more information visit: www.tiny.cc/nlosseff
n.losseff@ucl.ac.uk
Dr Indran Davagnanam is a consultant neuroradiologist based at two of the country's premier specialist centres: the National Hospital for Neurology and Neurosurgery (Queen Square) and Moorfields Eye Hospital. He is proficient in the interpretation of diagnostic imaging of a wide variety of orbital, neurological and neurosurgical conditions, as well as minimally invasive diagnostic procedures such as dacryocystography (DCG), digitally subtracted cerebral catheter angiography and cisterno-myelography.

His subspecialty interests include specialist imaging of spinal and spinal cord pathology, stroke, central and peripheral nerves, as well as orbital and neuro-ophthalmological pathologies. He has been invited to give lectures in his areas of interest as well as being published in medical textbooks and scientific journals. Dr Davagnanam is an Honorary Senior Lecturer at the Institute of Neurology, and has received grants from the Clinical Biomedical Research Centre (CBRC) and Parkinson’s Disease UK with several local and international research collaborations. He is the current lead of the Clinical Audit and Quality Improvement Committee (CAQIC) for the Queen Square division as well as a member of the UCH Trust CAQIC central committee and the Clinical Governance committee, Queen Square division.

He established and leads the neuro-ophthalmology multi-disciplinary meeting as well as serving as member of the Radiation Protection Committee at Moorfields Eye Hospital. He also serves as a committee member, tutor and research supervisor for the advanced neuroimaging MSc programme at the Institute of Neurology, and a deanery recognised clinical supervisor for the fellows on the Pan-London Neuroradiology rotation.

He leads on research projects with an emphasis on the development and application of quantitative advanced and novel imaging techniques to develop neuro-ophthalmological and neurovascular biomarkers.

He has published over 70 articles in scientific peer-reviewed journals including high impact clinical neurosciences research journals and has been invited to lecture on specialised areas of neuroimaging.
Clinical Pathological Conference

by Professor Mary Reilly
Consultant Neurologist
Professor of Clinical Neurology
UCL Institute of Neurology
Professor Mary M. Reilly graduated from University College Dublin in 1986, received her MD in 1996, FRCP in 2002 and her FRCPI in 2003. She was appointed a consultant neurologist at Queen Square in 1998 and a Professor of Clinical Neurology at UCL in 2010. Since 1998, she is head of the peripheral nerve services in the National Hospital for Neurology and Neurosurgery and has an active research program in genetic neuropathies.

She is co-director of the MRC Centre for Neuromuscular Diseases in Queen Square, a past president of the British Peripheral Nerve Society, president elect of the international Peripheral Nerve Society and President Elect of the Association of British Neurologist (ABN) due to take up the Presidency in 2017.

Professor Reilly leads the peripheral nerve clinical service in the National Hospital for Neurology and Neurosurgery, leads a research group in the MRC centre for Neuromuscular Diseases in the Institute of Neurology (ION) and is head of the Division of Clinical Neurology in ION. She has a longstanding interest in the clinical management and research in the inherited peripheral neuropathies and runs a research program encompassing gene identification, pathogenetic studies, natural history studies, development of outcome measures and conducting clinical trials in inherited neuropathies.
Clinical Pathological Conference Overview
Clinicopathological conference (CPC)

Presented by: Professor Mary M Reilly, Dr Zane Jaunmuktane and others

Discussant: Dr Jeremy Chataway

History

- 51 year old woman was referred for a second opinion with a 3 year history of sensory symptoms. In October 2009, she had flu like symptoms followed by numbness in both hands (fingers 2/3/4), both feet and left side of face.
- This remained stable over 6 months but her GP noted her ESR was 75 and CRP 42.
- In April 2010 her hands began to get weak and her GP gave a medication for 5 days which she had marked improvement from.
- She was then referred to a local neurologist who extensively investigated her but no diagnosis was established. She was given a further trial of an intravenous treatment followed by oral treatment. Over the next 6 months she remained well as long as her oral treatment dose was not reduced below a certain level.
- Following this she began to deteriorate with increasing sensory symptoms and was referred for a second opinion.

Examination

- Reduced pinprick right Vth cranial nerve.
- Distal weakness upper limbs (wrist extension 4 right, 5 left; 1ST DIO and ADM 4 bilaterally; APB 3 right and 4 left).
- Distal weakness lower limbs (ankle dorsiflexion and plantarflexion weakness 4 bilaterally).
- Lower limb reflexes absent, plantars flexor.

Sensation:

- Reduced pinprick to wrist and patchily distally lower limbs. Reduced vibration to right wrist, left elbow, right ankle and normal in left foot. Reduced proprioception to wrist but normal in feet.

Investigations

- NCS: SAPs (Right radial 11, left 26: right ulnar 8, left 7: right median 8, left 3: right sural (biopsied), left 4).
- Motor studies. Conduction block and variable slowing of motor conduction in several nerve segments. EMG shows denervation.
- Select bloods ESR=105; CRP=37
How do I manage my patient with difficult myasthenia gravis?

by Professor Dmitri Kullmann
Consultant Neurologist
Professor of Clinical Neurology
UCL Institute of Neurology
Dimitri Kullmann is a Consultant Neurologist at the National Hospital for Neurology and Neurosurgery, and Professor of Neurology at the UCL Institute of Neurology. He trained in Oxford and London, previously held an MRC Senior Clinical Fellowship, and is a Fellow of the Academy of Medical Sciences. He specialises in neurocritical care and myasthenia gravis. His research interests centre on the normal mechanisms underlying synaptic and neuronal signaling in the brain, as well as inherited and acquired disorders of ion channels (channelopathies) and circuit excitability (especially epilepsy).

Dimitri Kullmann has a research interest in fundamental mechanisms of synaptic transmission, circuit neuroscience and gene therapy for epilepsy. He specializes clinically in myasthenia and neuro-critical care at the National Hospital for Neurology and Neurosurgery. He established his own laboratory at the Institute of Neurology in 1992, and has held an MRC Senior Clinical Fellowship, was Head of the Department of Clinical and Experimental Epilepsy, and is a Fellow of the Academy of Medical Sciences. Since 2014 he has been the editor in chief of Brain.

Myasthenia gravis is an under-recognised cause of neuromuscular weakness, especially in the elderly. Seronegative myasthenia can present diagnostic challenges.

Although most cases of myasthenia can be managed with anticholinesterase medication and immunosuppression, some refractory cases require intravenous immunoglobulin, plasma exchange or monoclonal antibody treatment. This talk will also discuss the role of thymectomy, and the diagnosis and management of Lambert-Eaton myasthenic syndrome, botulism and congenital myasthenic disorders.

Selected background reading:
What do I Need to know about Deep Brain Stimulation?

by Professor Tom Foltynie

Consultant Neurologist
Professor of Clinical Neurology

UCL Institute of Neurology
Professor Thomas Foltynie trained in medicine at UCL, qualifying in 1995 then working in Addenbrooke's Hospital, in Cambridge. From 1999 to 2003, he undertook his PhD in Cambridge looking at the heterogeneity of Parkinson's disease, describing differences in cognitive abilities between patients under the influence of various genes including COMT and BDNF, and Tau. He finished his neurology training between Addenbrooke's Hospital and the National Hospital for Neurology and Neurosurgery in London. While working in London with Prof Limousin, he has developed his interest in Deep Brain Stimulation for Parkinson's disease and has developed collaboration between Parkinson's disease investigators in Cambridge and London.

He is responsible for Movement disorder patients, particularly PD patients undergoing advanced treatments such as DBS, Apomorphine and Duodopa. He is chief investigator for a trial of Exenatide- a potential neurorestorative treatment for PD, as well as the lead clinician at UCL for a multi-centre trial of fetal dopaminergic cell transplantation for PD, and a proposed trial of Deep Brain stimulation as a treatment for the cognitive problems associated with advanced PD.

Professor Foltynie is also leading a trial of Deep Brain Stimulation for the treatment of patients with severe Tourette syndrome. Aside from trial involvement, PD patients with and without DBS are being recruited to research looking at the influence of genetics on PD risk and clinical progression, and the use of functional imaging to explore the mechanism of action of DBS surgery.

Selected background reading:


NEUROLOGY 2017:
Leading-edge Neurology for the Practising Clinician

All articles included in the booklet have been reprinted with permission. The editors would like to thank all the journals for allowing us to reprint these articles for our booklet.
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*Allergan is a unique, global pharmaceutical company, focused on developing, manufacturing and commercializing innovative branded pharmaceuticals. We have a specialist focus on central nervous system, eye care, medical aesthetics, gastroenterology, women's health, and urology. With commercial operations in approximately 100 countries, Allergan is committed to working with our customers to deliver innovative and meaningful treatments that help people around the world live longer, healthier lives.

The sponsors have had no input on the scientific content of this meeting.