

ABN National Meeting

Conference details: 4-7th October 2011; The Sage in Gateshead, UK. Reviewed by: Catherine Pennington and Boyd Ghosh.



Professor Martin Rossor (centre) chairing the debate 'This house believes the ABN should be a college of clinical neuroscience'.



Professor Compston presenting a gift to Professor Eva Feldman after she gave the 17th Gordon Holmes Lecture.

The ABN meeting took place at the impressive Sage Gateshead venue. There was a wide mix of subjects covered, achieving a balance between practical clinical teaching, scientific developments and case presentations.

The meeting opened on the Tuesday with parallel sessions for medical students and registrars. The registrar teaching topics ranged from the familiar territory of Parkinson's disease to a cognitive examination master-class with Martin Rossor, and ended with the rather neglected arena of oratory and rhetoric. We all speak in public (and indeed to the public) on a regular basis yet often give a less than polished performance. Dr Mumford's talk covered both basic and advanced speechifying with tips on eye contact, correct use of the microphone, and insights into the speech writing tricks of Churchill and Martin Luther King. However the high point of the day had to be the quiz, which tested our ability to identify heavily moustached Victorian neurology heavyweights and MR images of a variety of fruit and veg. These subjects are clearly not adequately covered by the neurology curriculum as the scores were universally low!

There were further clinical talks on the Wednesday, with teaching from the DGH on neurological issues in pregnancy, a cardiologist's outlook on funny turns and a geriatrician's view of falls. The take home messages were to counsel early on and often on reproductive issues in epilepsy, be more worried about cardiac disease in older patients with new collapses with loss of consciousness (and to ditch the 24 hour tape in favour of more prolonged monitoring), and to involve physiotherapy and occupational therapy more in frequent fallers.

We were then taken back to the days of Hughlings Jackson in the history lectures, an era when clinical acumen was king and the West Riding Lunatic Asylum in Wakefield an

epicentre of neurological research. The neuropsychiatry session provided an insight into the world of theoretical modelling of brain pathways and how such models may contribute to our understanding of diseases such as Schizophrenia, which according to Professor Bullmore of Cambridge University, may actually result in more robust brain networks in close relatives, possibly providing an evolutionary explanation for the relatively high prevalence of such a debilitating disorder. This was followed by a stimulating debate on the issue 'This house believes that the ABN should be a college of clinical neuroscience'. On the 'for' side was an argument that the current college system fails to adequately serve the needs of neurologists, and that a joint college of neuroscience involving neurology, neurosurgery and neuroradiology would be better placed to meet our professional development needs and to represent neurology in the political world. 'Against' the motion was the practical issue that would arise from removing ourselves further from general medicine, the disparate requirements of neurology, neurosurgery and neuroradiology trainees, and the logistical advantages of being part of a larger body, such as the Royal College of Physicians, when raising issues at a national level. Overall the feeling was that the way forward is for neurologists to be more involved with the existing colleges, both to try raise the standard of service they provide to us and to improve the neurology training provided to non-neurologists. The day closed with the trainee dinner at RASA restaurant for curry and Cobra beer, for which there was an excellent turnout.

The following day the organisation of neurology services in the DGH was considered, stemming from the recent publication of a working party report into the matter. Whilst more neurologists are needed, how to organise services is a matter for debate, partic-

ularly in light of the looming NHS re-organisation in England and Wales, and the UK's straitened financial circumstances. Various models of DGH services are in use across the country, reflecting the fact that one DGH may serve a very different population to another, with variation in population size, demographics and distribution. What works for a metropolitan centre will not suit a rural region, let alone areas such as the Western Isles. There is a tendency to try to decentralise neurology services from regional centres out to the DGH, but smaller hospitals are unlikely to be willing or able to sustain a full neurology department with consultants, registrars, nurse specialists, neurophysiology and neuroradiology. Suggested ways to deal with the problem included greater involvement from GPs with a special interest in neurology in the long-term follow up of those with chronic conditions, and the use of telemedicine for outlying regions. Dr Dunn from Leeds gave an account of his experiences of being a liaison neurologist. On the plus side of spending a lot of time in the acute medical unit is the ability to improve the speed and accuracy of the diagnosis of patients as they present, reducing the length of their stay and (potentially) saving the NHS money. There are also opportunities to teach colleagues in medicine along the way. However getting the funding in the first place for such a post is challenging, and only likely to get more difficult in the future.

Dame Barbara Hakin from the Department of Health spoke on the pending reorganisation of the NHS in England and Wales. Details remain thin as to how the new clinical commissioning groups will be organised, and in particular no mention was made of how much involvement from the private sector will be permitted. She acknowledged that a regional commissioning group operating in isolation would not be well placed to organise many neurological services, in particular for

those with rare conditions. She expressed the opinion that the GPs' current role in deciding when to refer patients to specialists and when to delegate care to nurses gives them the expertise to be commissioners. Given the number of inappropriate referrals to neurology clinics this may not be the case. Dame Hakin made it clear that there will be no new Neurologists unless the money is saved elsewhere first.

Later in the day Dr Huw Morris reported breaking news from Wales with the finding of a new mutation on chromosome 9 which may be responsible for a significant proportion of cases of both fronto-temporal dementia and motor neurone disease. Further details are published in *Neuron*. The medallist lecture was given by David Neary on the neurology of dementia, with added reminiscences of his time in Boston in the 1970s living at the YMCA on \$3 a day. The evening ended with the Gala dinner at the Discovery museum, with entertainment provided by a barber shop quartet of Neurologists.

On the last morning, one of the parallel sessions was the case presentation competition. Given the early hour, there was a good turn out with plenty of interesting cases, including two with camptocormia (!), transverse myelitis post malaria, rapid cognitive decline due to subacute sclerosing panencephalitis, Chronic lymphocytic inflammation with pontine perivascular enhancement responsive to steroids (CLIPPERS) and micturition induced epilepsy which took twelve years to capture on telemetry! The winner was Dr Sean Slaght from Southampton, describing a reversible camptocormic syndrome due to Lyme disease.

The 17th Gordon Holmes lecture was given by Professor Eva Feldman on ground-breaking human safety trials of the use of stem cells in motor neurone disease, with a fascinating video of the injection of cells into human subjects. In the afternoon, Dr Kevin Talbot toyed with us in the clinic-pathological conference before pulling the correct diagnosis out of the hat. The Neuroradiologists joined us for

the last part of the meeting, discussing screening for aneurysms, where the consensus was that we should screen those with two close family members involved; GPs' access to CT scans, where we decided that they shouldn't have direct access; and the use of CT or MRI for acute stroke, where it was decided that CT was adequate currently.

Overall there was a high standard of poster and case presentations, and an excellent attendance of neurologists, trainees and students from across the UK. Dr Kathryn Peall won the Charles Symonds prize for the best platform presentation, Dr Nils Muhlert won the Charles Symonds prize for the best poster and as already mentioned Dr Sean Slaght won the ACNR prize for best case presentation. The feeling amongst trainees we spoke to was that having a single annual UK meeting raised the quality of the material presented, made it easier to attend and created greater opportunity to catch up with colleagues from around the country. We look forward to Brighton 2012! ♦

Fourth Practical Cognition Course

Conference details: 20-21 October 2011; Newcastle upon Tyne, UK. **Reviewed by:** Dr Colin Mumford, Consultant Neurologist, Edinburgh, UK.

Most jobbing neurologists have a somewhat restricted concept of the classification of dementia. Many of us would be able to separate typical Alzheimer's disease from fronto-temporal dementia. Others might even be able to make a tentative diagnosis of Pick's disease or, where appropriate, be sensitive to the possibility of Creutzfeldt-Jakob disease in a given patient. However, very few of us have the near encyclopaedic knowledge displayed by the panel of experts who convened in Newcastle during mid October to host, and to contribute to, the annual "Practical Cognition Course".

This excellent course is now in its fourth year. Organised by Professor Tim Griffiths from Newcastle and Dr Chris Butler from Oxford, the course is eminently suitable for trainees in neurology and established consultants alike. Moreover, and perhaps unusually, it is also suitable for clinical psychologists, psychiatrists both at consultant and registrar level, and this year was also attended by at least one specialist in ophthalmology.

The course follows a successful format: first, the different scientific components of the course are closely aligned to presentation and discussion of illustrative cases, the majority of these being admirably exemplified by the use of high quality video recordings. Secondly, the course timetable builds in a great deal of time for discussion, with the mixed professional backgrounds of the delegates making for interesting debate between specialists. Thirdly, the relatively small number of delegates means that nobody is left out, with substantial interac-

tion taking place between individuals in the audience, as well as between delegates and presenters.

This year, much of the early part of the course was practical in its focus. Delegates were introduced to a suggested format for running a cognitive neurological clinic, and then were shown typical cognitive screening instruments, some familiar, and some less so, used in different units around the country. The indispensable role of the clinical neuropsychologist was then very colourfully illustrated by Tom Kelly, one of the local Newcastle experts.

The afternoon of the first day of this two-day programme brought in sections introducing disorders of language and also disorders of consciousness. It was fascinating to see videos of patients with primary progressive aphasia, and also to see – and debate – the rather dubious entity of "foreign accent syndrome". The language disorders component was greatly assisted by a splendid lecture given by Dr Jason Warren from the Institute of Neurology in London. Meanwhile the seemingly complex field of consciousness was tackled sensitively and comprehensively by Professor Adam Zeman from the Peninsula Medical School. His unassailable grasp of this area was manifest in a lecture that moved between the differentiation of the "minimally conscious state" from the "persistent vegetative state", and on into a consideration of the history of our understanding of consciousness, and delved yet further into the very philosophy of consciousness.

The second day began with an analysis of parietal lobe disorders, and continued with a

consideration of problems relating to emotion and social cognition. Many of us recall reading about, but never actually seeing, a case of the Gerstmann syndrome, so how nice it was to have a video of a patient exemplifying the key facets of the condition, all elegantly drawn out by the interviewer. A further highlight on the second day was an exceptional lecture on "The Inattentive Brain" by Prof Masud Husain, from the Institute of Cognitive Neuroscience in London.

Professor Griffiths led the final section of the course, presenting a number of case based discussions relating to emotional disturbance and problems with social cognition, including frontotemporal dementia and Huntington's disease. This was then rounded off with a well-crafted lecture addressing the complexity of social cognitive problems given by Dr Roland Zahn, from the University of Manchester.

Courses such as this one are extremely relevant both to established neurologists and also to trainees in neurology who wish to further their knowledge in this area, so often neglected by many other general neurological postgraduate updates. The course is well put-together, efficiently administered, and even offers a first-class course dinner at the "Baltic" arts centre adjacent to the River Tyne. It is a fine way to ensure continuing professional development. The organisers are to be congratulated on an extremely informative teaching course which appears to be going from strength to strength. Let us hope they reproduce this offering for many years to come. ♦

When Stable PD Patients Begin to Fluctuate

Conference details: Report from a satellite symposium at the 2011 Annual Meeting of the Association of British Neurologists (ABN), Newcastle UK, 6th October 2011. Satellite symposium and report supported by an educational grant from Teva Pharmaceuticals Ltd and Lundbeck Ltd.

Chair: Professor David Burn IAH Director & Professor of Movement Disorder Neurology, Newcastle University, Newcastle upon Tyne, UK.

Speakers: Dr Nin Bajaj, University of Nottingham Medical School, Queen's Medical Centre, Nottingham, UK.

Dr Paul Worth, Norfolk and Norwich University Hospital NHS Trust, Norwich, UK.

Dr Malcolm Steiger, The Walton Centre for Neurology and Neurosurgery, Fazakerley, Liverpool, UK.

It is well known that patients with early idiopathic Parkinson's disease (PD) who are initiated on dopaminergic (levodopa or a dopamine agonist) therapy initially respond very well. Indeed, the first few years of pharmacotherapy are often referred to as the 'honeymoon period' because most patients enjoy sustained symptomatic relief with few side-effects. However, it is equally well established that within a few years of starting dopaminergic therapy, the majority of patients will begin to notice a decline in the duration of benefit of each dose. This phenomenon is commonly referred to as 'wearing-off'.

Opening the meeting, Professor David Burn emphasised that the early and effective management of wearing-off is vital for patients with PD, as numerous studies have shown that the emergence of wearing-off has significant impact on patients' daily activities and overall quality of life¹ and it also significantly increases the costs of care.² In recent years, there has been a move to recognising and treating wearing-off earlier in the course of PD,³ and the four presentations in this symposium were designed to review and discuss current thinking in how to best manage this important motor fluctuation.

From stable response to fluctuation response

In order to optimise treatments it is important to understand the mechanisms that underlie the change from a patients' stable response to levodopa to a fluctuating response, said Professor David Burn. The ELLDOPA study provided very important insights into this. It was the first study to clearly demonstrate higher dosages of levodopa are a key factor in both the development of dyskinesia and motor fluctuations. By the end of the 9-month study, almost a third (29.7%) of patients receiving the highest daily dose of levodopa (600 mg/day) experienced 'wearing-off' compared with <20% in the lower dose (150 and 300 mg/day) groups.⁴

Professor Burn reminded the audience that the response to levodopa is comprised of two components. The short-duration response (SDR), which provides an improvement in motor function that lasts a few hours after a levodopa dose, and the long-duration response (LDR), which is a sustained effect derived from chronic levodopa treatment that lasts for several days after stopping levodopa therapy.⁵ For many years, most medical students have been taught that the



development of wearing-off is due to the progressive loss of nigrostriatal neurons, resulting in a lack of dopamine synthesis and storage and the consequent inability of the brain to 'buffer' short-term changes in the supply of dopamine made from levodopa. Although most would agree that this presynaptic 'storage hypothesis' (reflecting changes in the SDR) does contribute to the development of wearing-off, elegant studies have since shown that changes in the LDR during the course of PD also have a critical role.⁶ These studies have shown that while the magnitude of the SDR progressively increases with disease duration, the LDR declines; and that the rate of LDR decline is dependent on disease severity and duration of therapy. Importantly, it has been shown that the decline in the LDR determines the magnitude of the SDR.⁶ These observations have significant clinical implications. They suggest that the presence of the LDR in early disease 'masks' changes in the SDR and so patients appear to be stable even though changes to their motor response are already occurring (i.e. the development of wearing-off has already begun).³

It is also clear that the simple storage hypothesis cannot account for these observations and other mechanisms must also play a part. Indeed, post-synaptic changes are now being investigated and changes in signal

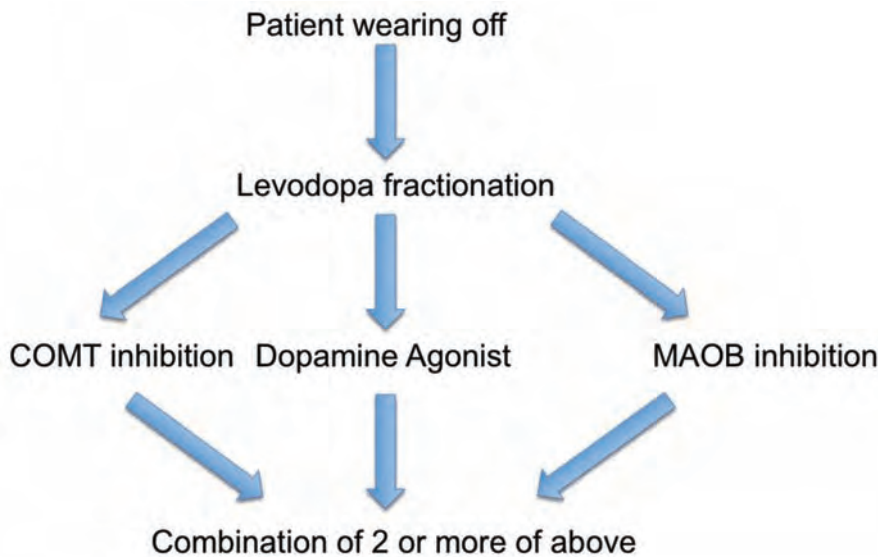
transduction, cellular transport, transcription and translation seem to play an important role.⁷

Wearing-off is more than a motor fluctuation

Professor Burn closed his presentation by emphasising that the signs and symptoms of wearing-off can be non-motor as well as motor. Whilst many physicians recognise wearing-off when it is associated with the return of obvious motor symptoms, it is less easy to identify when manifested through non-motor symptoms, such as pain, mood disturbances, fatigue, akathisia, sweating and increased salivation.⁸ Indeed, the emergence of non-motor wearing-off has been suggested to precede motor symptoms.³ Since non-motor symptoms can be very subtle in the beginning, they may often go unrecognised by physicians and, therefore, remain untreated before becoming prominent and disabling. One way to help recognise the full range of symptoms is to use wearing-off questionnaires such as those available on the EPDA website (<http://epda.eu.com/medinfo/wearing-off/#>).^{9,10}

Can wearing-off be prevented?

Dr Paul Worth continued the theme by looking at how best the currently available treatments can be used to manage wearing-off and whether the emergence of wearing-off can be



prevented or at least delayed. As noted earlier, the ELLDOPA study clearly showed that higher doses of levodopa are associated with an increased incidence of wearing-off and dyskinesia.⁴ Since this study, most physicians have stopped increasing levodopa doses above a certain level, and now consider introducing other adjunct therapies instead.

Importantly, the ELLDOPA study also showed that some patients can develop the signs of wearing-off within the first year of levodopa therapy – much earlier than originally recognised. The early development of these so-called motor complications was the major impetus for the development of dopamine agonists, and a number of studies have shown a lower incidence of dyskinesia and wearing-off in patients with early PD who were initiated on a dopamine agonist versus those who were initiated to levodopa treatment.¹¹⁻¹³ These observations led to the popular suggestion that providing a continuous stimulation of dopamine receptors through dopamine agonists (vs. the pulsatile stimulation provided by levodopa) may be helpful in avoiding motor complications.¹⁴ This may be the case, but most patients will eventually require levodopa and will therefore develop complications. Moreover, because the risk of developing motor complications is closely associated with disease severity, those patients who have delayed taking levodopa until they are much more severe may develop wearing-off quite rapidly once they start. Attempts to provide continuous stimulation with levodopa have not so far been successful and the recent STRIDE-PD study found that

while Stalevo (levodopa/ carbidopa/ entacapone) did reduce the emergence of wearing-off, this was at the expense of a shorter time to the appearance of dyskinesia.¹⁵

How should wearing-off be treated?

Thus at present, most approaches to the management of wearing-off are currently reactive rather than preventative – many physicians are, however, trying to manage wearing-off in its earliest stages in the hope that it will improve the long-term management of these symptoms. Therapeutic options include modifications to the levodopa regimen and the introduction of adjunct therapies. However, there is little head-to-head evidence comparing all the modalities and NICE guidelines state that “it is not possible to recommend a universal first-choice drug therapy” either for early PD or for adjuvant drug therapy for later PD.¹⁶

Levodopa-modification strategies, such as increasing the total dose or frequency of levodopa or introducing a night-time dose of controlled release levodopa have classically been the first-line approach taken in the management of wearing-off. The main benefits of these strategies are their low cost and patient familiarity with the drug. Indeed, optimising the levodopa regimen is a good first step in the management of wearing-off. However, since it is now recommended to keep the levodopa dose as low as possible,¹⁶ and patients often find the introduction of extra doses throughout the day difficult to adhere to, other approaches are also often needed.

The use of adjunctive therapies to manage wearing-off is now common practice. There are three main classes of drug to consider; the dopamine agonists, COMT inhibitors and MAO-B inhibitors, and all of these options have good evidence of efficacy in reducing OFF time.¹⁷ The dopamine agonists (pramipexole, ropinirole, rotigotine etc) have also been shown to allow a reduction in the levodopa dose, and recent studies have indicated that there may be some benefits of the newer prolonged-release formulations than with the old immediate-release formulations.¹⁸ However, the benefits of dopamine agonists need to be weighed against their side-effects and costs (higher with prolonged release formulations). In today’s clinical practice, most patients who can tolerate a dopamine agonist would already be receiving one before levodopa. Those patients who do not receive early dopamine agonist therapy usually cannot tolerate dopamine agonists due to cognitive and/or neuropsychiatric issues – and the same considerations apply in later disease. Moreover, there is ever increasing awareness of impulse control disorders including excessive gambling and hypersexuality, which may occur even at low dosage but are more prevalent in higher dose ranges.¹⁹

COMT inhibition with entacapone is a popular option for patients with wearing-off and studies with levodopa plus adjunct entacapone have demonstrated a reduction in OFF time of approximately one hour compared with levodopa plus placebo.²⁰ Similarly, in a large randomised study for wearing-off (LARGO), adjunct treatment with the MAO-B inhibitor rasagiline was shown to have similar efficacy to entacapone in reducing OFF time.²¹ The choice of which adjunct therapies to use necessarily depends on the needs of the individual, however Dr Worth noted that whereas entacapone had a slightly higher adverse event rate, rasagiline had an adverse event rate similar to placebo in this trial,²¹ and was generally well tolerated in the elderly.²² Other options include the COMT inhibitor tolcapone, which due to its potential for hepatotoxicity must only be used when treatment with entacapone fails, and the MAO-B inhibitor selegiline, which (compared to other treatments) has only limited RCT evidence of efficacy as adjunct therapy.

Closing his presentation, Dr Worth noted that many patients are on more than one adjunct therapy and that using combinations of therapies may allow better tailoring of the medication regimen to the needs of the individual.

Current approaches to the treatment of wearing-off are reactive rather than preventative, but by the time a patient’s symptoms are fully apparent many maladaptive changes will have already occurred in the basal ganglia. It is therefore of interest to manage wearing-off in its earliest stages in the hope of improving the long-term management of these debilitating symptoms.

What is the future for wearing-off?

Closing the symposium, Dr Steiger looked at products that are in development. Many researchers continue to look at how to optimise levodopa delivery. The best-known of these products is the levodopa intestinal gel – Duodopa. Dr Steiger noted that preliminary evidence from ongoing open-label studies indicate that Duodopa can be very effective, offering 4.6 hours of increased ON time in patients with very severe fluctuations.²³ However, it is an invasive therapy and technical problems are reported to be commonplace.²⁴ Therefore duodenal levodopa infusion seems to be an effective last-line therapy for motor complications in Parkinson’s disease and should be considered as a good alternative to deep brain stimulation (DBS). Like DBS, there are strict criteria that a patient should meet to be suitable for Duodopa. Suitable patients are those with severe “ON-OFF” motor fluctuations who have something to gain from improved motor control (i.e not severely demented, or suffering from other severe chronic disease). Other levodopa therapies in development include a new levodopa ‘accordion pill’ which has both immediate release and extended release components and which preliminary reports at the Toronto MDS symposium indicate offers significant benefits over classic immediate release levodopa.²⁵ Finally, Dr Steiger highlighted the numerous non-dopaminergic therapies, which are also in development and include adenosine antagonists,²⁶ neurotrophic factors and gene therapy.²⁷ ♦

Case studies

Dr Nin Bajaj used case studies to interact with the audience and gain insights into current practice in general neurology clinics. The case studies were designed to discuss the various ways treatment can be tailored to meet the needs of patients with wearing-off.

Issues discussed included the utility of fractionating levodopa – most of the audience agreed that increasing the dosing frequency from three times to four times a day can often be very helpful and physicians should always try to optimise the levodopa regimen as a first step in the management of wearing-off. While many agreed that Sinemet CR has its place in helping control nocturnal symptoms, Dr Bajaj noted that it can lead to increased end-of-day dyskinesia if used throughout the day. Balancing the need to treat motor fluctuations with the potential to induce dyskinesia was another topic of discussion; many patients say that they prefer to be dyskinetic than suffer OFF periods. Dr Bajaj discussed that the introduction of entacapone (or Stalevo) can induce quite severe dyskinesia in some patients and that a levodopa dose reduction is often needed.

Another key topic was the need to help patients first thing in the morning – before they take their first dose of antiparkinsonian medication. The audience discussed that using dispersible levodopa is sometimes useful for a faster ON effect and that long acting dopamine agonists used last thing at night often help manage nocturnal OFF problems. The audience discussed that the new once daily dopamine agonist formulations should help with controlling over night symptoms. Similarly, it has recently been reported that adjunct rasagiline (also given once daily) also improves motor symptoms in the practically defined OFF state.²⁸

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The BIRT Conference 2011

Inspiring Learning and Innovation in Brain Injury Rehabilitation



Conference details: 21st-22nd September 2011; Marriott Hotel, Bristol, UK. **Reviewed by:** Professor Mike Oddy.



The Brain Injury Rehabilitation Trust (BIRT) Conference 2011 invited national and international delegates to enjoy this two day event. Delegates were presented with engaging discussions on the latest developments in brain injury rehabilitation. The conference also marked BIRT's 20th anniversary year, which included a photographic exhibition 'One Piece at a Time' compiled by BIRT service users for delegates to view. The conference was sponsored by Irwin Mitchell Solicitors and the gala dinner, with after dinner speaker Hardeep Singh Kohli, by Barclays Corporate.

Emotional and social aspects of recovery were the common theme for the five plenary sessions on day one. Professor Rodger Wood, Clinical Neuropsychologist from Swansea University and BIRT's first clinical director, gave a talk that highlighted the neurobehavioural correlates between injuries to the frontal lobe and the alterations of personality that arise as a result. He reviewed recent research suggesting that difficulties in recognising and expressing emotions (alexithymia) are highly prevalent in individuals with acquired brain injury, and discussed the impact that these characteristics have in social functioning.

Professor Jeffery Kreutzer, the Director of Neuropsychology and Rehabilitation Psychology at Virginia Commonwealth University (USA), focused on the clinical and family issues associated with personality changes resulting from acquired brain injury. He argued that one of the key challenges in rehabilitation is dealing with the ambiguous loss experienced by family members of having a loved one physically present but psychologically absent due to the personality changes resulting from brain injury. Close family members of people with brain injury often report feeling they are living with a stranger. This talk gave practical suggestions for addressing this important part of the rehabilitation process.

Simple steps to help recognise and learn to deal with this change involve focusing on what is liked about the 'new' individual, encouraging the person to speak in ways that are appreciated, praising and reinforcing social behaviour, and communicating and getting to know the 'new' person better.

Charles Bombardier, Professor and Head of the Division of Clinical and Neuropsychology at the University of Washington (USA), presented a thorough review of the prevalence, risk factors, diagnostic issues and treatment efficacy of depression following TBI. His research shows that about half of the people who have suffered a TBI will have major depressive disorder. Within the TBI population, depression is associated with poor outcomes. Age, history of psychiatric disorders and excessive alcohol intake are risk factors for depression after brain injury. Screening for depression after TBI is often complicated by transdiagnostic symptoms, but psychometric tools are available that can effectively guide decisions. There has also been progress in the treatment front, with research suggesting that pharmacotherapy, telephone counselling, Cognitive Behavioural Therapy (CBT) and a combination of approaches can all have positive effects in treating depression in TBI.



Huw Williams, Associate Professor of Clinical Neuropsychology at the University of Exeter, reported a number of case studies illustrating adaptations of CBT to neurorehabilitation of social and emotional dimensions, and the potential of this approach for helping individuals with TBI, and their families.

In the closing session, Professor George Prigatano gave an inspirational and comprehensive discussion of past developments and present day challenges and opportunities in neuropsychological rehabilitation. He argued that whilst there had been few 'advances' in brain injury rehabilitation over the last 20 years there had been important 'refinements'. The refinements he emphasised were closer working with families, more emphasis on psychotherapy and more focus on systematic efforts at cognitive retraining and the correlates of this with changes in chemical and electrical activity in the brain. However, he went on to delineate 10 challenges the field of brain injury rehabilitation continues to face into the current decade. One of these was the absence of a good developmental perspective on neuropsychological rehabilitation which can help us to meet the needs of brain injured children.

Day two offered a number of symposiums and workshops covering a wide range of themes. Following the issues introduced on day one, Prof Kreutzer discussed the importance of the therapeutic alliance in working with brain injury patients and their families, and offered practical approaches for evaluating and developing more effective alliances. Prof Bombardier focused on the issues associated with substance abuse in brain injury. He discussed screening procedures and treatment approaches, including approaches that can be provided to those who refuse treatment.

The influence of emotional and motivational factors on brain injury rehabilitation was, again,

a key topic on the second day. Prof Nick Alderman and Dr Caroline Knight, of the National Brain Injury Centre, St Andrews Hospital and Dr Andrew James, Consultant Neuropsychologist at BIRT Daniel Yorath House, Leeds discussed the assessment and rehabilitation of aggression and sexual disinhibition following brain injury. Dr Camilla Herbert and Dr Siobhan Palmer, of BIRT, described a model considering the interplay of emotional, cognitive factors, and curiosity in working with those who lack awareness of their deficits.

A number of workshops and symposiums addressed the usefulness of new technologies in rehabilitation. Prof Michael Oddy, the Director

of Clinical Services at BIRT, Dr Nigel Harris of the Bath Institute of Medical Engineering and Dr Anna Kuppuswamy of the University of Bath, gave an overview of smart technologies available for promoting independence, and described a new easy to use system, based on the International Classification of Functioning, Disability and Health, for assessing and identifying the most suitable technology for specific functional impairments. Dr Brian O'Neill from BIRT Graham Anderson House Glasgow and Dr Alex Gillespie from the London School of Economics, described the rehabilitation principles underlying the use of a new prompting system for guiding individuals with planning and monitoring difficulties through daily activi-

ties such as washing clothes. Jon Graham overviewed the latest technologies available for physical rehabilitation.

Jon Graham challenged the notion that rehabilitation is ineffective if delivered long after a brain injury and Liz Parish presented evidence of successful response to rehabilitation more than 10 years post injury. Professor Tom McMillan presented evidence to dispel the myth that disabilities following brain injury stabilise after two years or so and that older adults recover less well than younger adults. The prevalence of traumatic brain injury amongst the homeless and amongst prisoners and the effects of neurological impairment on musical processing were also discussed. ♦

Many people attend conferences simply to satisfy their continued professional development requirements, however the BIRT conference is different. It offers so much more; it's a great networking opportunity, meeting with others in the brain injury neuro-rehabilitation world. You learn a great deal more from respected professionals in a well organised environment such as this

Lee Hart – Clarke Willmott, Bristol.

Dietary Treatments for Epilepsy

Dietary treatments for epilepsy date back ninety years, following reports that a high fat, low carbohydrate, ketone-generating diet brought about similar benefits in seizure control as did the fasting state.¹ This classical ketogenic diet (KD), although still used widely today, has been modified over the years, one version incorporating the higher-ketone yielding medium chain triglycerides (MCT). Other more flexible KD variants are the modified Atkins diet (MAD) and low glycaemic index treatment (LGIT). Efficacy of the KD has been demonstrated in many retrospective and prospective observational studies and a randomised controlled trial² which found responder rates similar to those of the newer antiepileptic medications. The MAD has also been shown to be successful in a rapidly growing evidence base. Reported benefits of KD therapy extend beyond seizure control to medication reduction and improvements in behaviour, cognition and quality of life.

KD therapies, although differing in macronutrient proportions and liberality of approach, all employ the similar principle of carbohydrate restriction with fat the main source of dietary energy. The restriction of glucose supply will lead to the ketone bodies acetoacetate and β -hydroxybutyrate becoming the primary brain energy source; high levels in both

blood and urine are usually detected, and encouraged, while on a KD therapy. The mechanistic role of ketone bodies in seizure modulation is subject to extensive research; a number of mechanisms are likely to work together related to the changes in metabolism associated with a ketotic state.³

Although primarily used to treat childhood epilepsy, KD therapy is gaining popularity for adolescents and adults with refractory seizures. Generally used after failure of two appropriate anticonvulsant medications, it may be first line treatment in syndromes such as GLUT-1 or pyruvate dehydrogenase deficiencies. It should not be used in children who have enzyme deficiencies of organic acid metabolism or disorders requiring high carbohydrate treatment.⁴ Emerging evidence suggests KD therapy may also be of benefit in conditions beyond epilepsy, such as neurodegenerative disorders and cancer.⁵ Full nutritional supplementation is required with any KD therapy, monitoring is essential, and the risk of side effects should be considered before initiation; most commonly constipation, short-term acidosis, raised serum lipids, growth faltering and kidney stones.⁶ Management by an experienced multi-disciplinary team is recommended; unfortunately UK availability is both limited and variable. ♦



Elizabeth Neal,

MSc, PhD, RD,
Research Dietitian,
Matthew's Friends Charity and
Clinics, Honorary Research
Associate, UCL-Institute of Child
Health, London, UK.

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Meningitis Research Foundation Conference 2011: The prevention of meningitis and septicaemia in adults and children.

Conference details: 8-9th November 2011; Royal Society of Medicine, London, UK. **Reviewed by:** Claire Wright, Medical Information Officer, MRF.

Over 250 clinicians, researchers, public health professionals and industry leaders gathered to discuss the latest issues in the burden, detection, treatment and prevention of meningitis and septicaemia at Meningitis Research Foundation's (MRF's) 8th biannual conference.

During the conference the burden of disease was highlighted in a series of lectures. Dr Mary Ramsay of the Health Protection Agency (HPA) presented the epidemiology of meningococcal disease in the UK and Europe. Dr Peta Sharples of the University of Bristol discussed the neurological impact of meningitis and explained why some children, who were considered to have made a full recovery at the time of discharge, may go on to experience problems when they reach school age. This concept was further touched upon by Professor Russell Viner who presented results from the MOSAIC study and Dr Liam Dorris who discussed the psychosocial impacts of meningococcal disease.

In a Novartis led satellite session, Mr Fergal Monsell, a consultant paediatric orthopaedic surgeon, emphasised how the skeletal consequences of septicaemia often go unrecognised, and Dr Stuart Clarke examined the public health impact of meningococcal disease. Further discussion on the burden of disease included a moving account from MRF member Scottie Kern, whose son tragically died from pneumococcal meningitis in 2009. A presentation on MRF's 'Counting the Cost of Meningitis' campaign examined the types of disabilities that survivors of severe cases of disease can be left with and the extensive life-long costs associated with this.

From the burden of disease, the sessions went on to explore cost effectiveness analysis and how decisions are made about the introduction of new meningococcal vaccines to the childhood schedule. Dr Hannah Christensen presented her model of the potential impact of MenB vaccines in England. Discussion on prevention included a talk from Professor Andrew Pollard who suggested the implementation of a teenage booster may soon be required to maintain population protection against meningococcal group C disease. Moving the discussion specifically to MenB prevention, Dr Peter Dull from Novartis spoke about prospects for use of the 4CMenB vaccine and Dr Katherine Jansen from Pfizer discussed the bivalent factor H binding protein vaccine which is in the late stages of development.

Both days included interactive sessions where audience members questioned a panel of experts in the fields of vaccine develop-



Q&A with panel of experts.



Dr Nelly Ninis of St Mary's Hospital.

ment, epidemiology, cost-benefit analysis, clinical management, public health, vaccine production and research. These popular sessions covered topics such as purchasing decisions regarding meningococcal vaccines and the issues surrounding the introduction of a MenB vaccine into the UK immunisation schedule.

Some of the latest advances from MRF funded research and their implications were presented throughout the two days. Professor Robert Heyderman discussed findings from studies which aim to address the high mortality in adult meningitis in Africa. Professor Michael Levin discussed findings from the Genome Wide study which has identified genetic variation in the Factor H gene and Factor H related genes which control for meningococcal disease susceptibility. Professor Paul Heath presented findings from his study on the burden of bacterial meningitis in infants and discussed how findings from the study may eventually be used to improve current practice with the potential for better outcomes.

The prevention of pneumococcal disease was featured in a talk from Pauline Kaye from the HPA, who discussed the impact of the pneumococcal conjugate vaccines (PCV) and touched upon issues such as serotype replacement and herd immunity. This was followed with a talk from Dr William Hausdorff who discussed the need for and current progress in the development of protein based pneumococcal vaccines. A satellite session from Pfizer

vaccines, who manufacture PCV, concluded this group of lectures.

Tackling meningitis in Africa was covered by a series of talks related to the Meningitis Vaccine Project (MVP). Dr Marc Laforce, (Director of MVP) discussed the successful introduction of meningococcal serogroup A vaccine (MenAfriVac) in Burkino Faso and how this success bodes well for the further roll out of the vaccine across other countries in the African meningitis belt. Dr Caroline Trotter then discussed preliminary carriage study results from the MenAfriCar project (a global research effort to study how meningococci are spread in Africa and to document the impact of the meningitis vaccine MenAfriVac on reducing transmission). Professor Richard Adegbola of the Bill and Melinda Gates Foundation concluded the session with a discussion on the evolution and vision of the MVP.

Back in the UK setting, a series of talks on the current issues in recognition and treatment of disease from Dr Nelly Ninis of St Mary's Hospital, Dr Mark Peters of the Institute of Child Health and Professor Mervyn Singer of University College London emphasised the need for getting resuscitation and intensive care management right.

Poster presentations on display throughout the conference covered a range of topics including: host-pathogen interactions; epidemiology and surveillance; diagnosis, treatment and sequelae; public health management; and vaccine discovery and vaccinology and poster presenters were on hand to answer any questions during breaks. The prize for best poster was awarded to Paul Kristiansen's work on the impact of MenAfriVac on carriage of serogroup A *Neisseria meningitidis*.

Comments from those who regularly attend included "the best to date" and "remarkable how much genuinely new and important work gets presented". Whilst one new comer commented: "well organised, informative and enjoyable. I would certainly say that the MRF is punching above its weight!" ♦