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ADVANCES IN CLINICAL NEUROSCIENCE & REHABILITATION

In this issue

MUST NOT BE USED IN GIRLS OR WOMEN OF CHILDBEARING POTENTIAL

Valproate must not be prescribed to female children, female adolescents, women of childbearing potential or pregnant women.[1,2]

Children exposed in utero to valproate are at high risk of serious developmental disorders (in up to 30–40% of cases) and/or congenital malformations (in approximately 10% of cases).[1,2]

Epilim® (sodium valproate) Prescribing Information
Presentations ***Epilim 200/500 Gastro-resistant tablets:*** containing 200 mg and 500 mg sodium valproate, respectively. ***Epilim Crushable tablets:*** containing 100 mg sodium valproate. ***Epilim Chrono 200/300/500 Controlled Release:*** tablets containing a mixture of sodium valproate and valproic acid equivalent to 200 mg, 300 mg and 500 mg sodium valproate respectively. ***Epilim Chronosphere MR 50mg/100mg/250mg/500mg/750mg/1000mg modified release granules:*** sachets of microgranules containing a mixture of sodium valproate and valproic acid equivalent to 50mg, 100mg, 250mg, 500 mg, 750mg and 1000 mg of sodium valproate respectively. ***Epilim Syrup and Epilim Liquid (sugar free):*** both containing 200 mg sodium valproate per 5 ml. ***Epilim 400mg Powder and Solvent for solution for injection/infusion:*** freeze-dried powder containing 400mg of sodium valproate, with solvent for reconstitution. **Indications** All presentations: the treatment of generalised, partial and other epilepsy. Epilim Powder and Solvent for solution for injection/infusion: the treatment of epileptic patients who would normally be maintained on oral sodium valproate, when oral therapy is temporarily not possible. **Dosage and administration** ***Adults:*** Dosage should start at 600mg/day increasing by 200mg/day at three-day intervals until seizure control is achieved, usually within the range 1,000mg-2,000mg, to a maximum dose of 2500mg/day. ***Children over 20 kg:*** Dosage should start at 400mg/day (irrespective of weight) with spaced increases until control is achieved, usually within the range 20-30mg/kg body weight per day. Where adequate control is not achieved within this range the dose may be increased to 35mg/kg body weight per day. Above 40mg/kg/day, clinical chemistry and haematological parameters should be monitored. ***Children under 20 kg:*** Dosage 20mg/kg of body weight per day (to the nearest 50mg sachet); in severe cases this may be increased but only in patients in whom plasma valproic acid levels can be monitored. Above 40mg/kg/day, clinical chemistry and haematological parameters should be monitored. Epilim Chrono should not be used in this group of patients due to the tablet size and need for dose titration. ***Combination therapy:*** When starting Epilim in patients already on other anticonvulsants, these should be tapered slowly; initiation of Epilim therapy should then be gradual, with target dose being reached after about 2 weeks. It may be necessary to increase the dose by 5-10mg/kg/day when used with hepatic enzyme-inducing anticonvulsants; the dose may be reduced when these are withdrawn. ***Dose Frequency:*** Epilim Chrono and Chronosphere may be given once or twice daily. All other formulations should be given twice daily. ***Epilim Chronosphere Modified Release Granules*** should be sprinkled on a small amount of soft food or into a drink, which should be cold or at room temperature. Warm or hot food/drink must not be used. If preferred the granules can be poured directly into the mouth and washed down with a cold drink. If taken in a drink, once finished rinse the glass with a small amount of water and take this as well, as some granules may stick to the glass. Food/drink containing granules should be swallowed immediately; the granules should not be crushed or chewed; the mixture should not be stored for future use. Granules should not be given in babies' bottles as they can block the nipple. ***Epilim Solution for Injection/Infusion:*** Patients already treated with Epilim may continue at their current daily dose using continuous or repeated infusion in normal saline, 5% dextrose or dextrose saline. Other patients may be given a slow intravenous injection over 3-5 minutes, usually 400-800mg (up to 10mg/kg) followed by continuous or repeated infusion up to a maximum of 2500mg/day. Using the solvent provided, the concentration of reconstituted sodium valproate solution is 95mg/ml. Each vial is for single use only, should be reconstituted immediately prior to use and infusion solutions used within 24 hours. Any unused portion should be discarded. Injection or infusion should not be through the same IV line as other IV additives. The solution is suitable for infusion by PVC, polyethylene or glass containers. Epilim Intravenous should be replaced by oral Epilim therapy as soon as practicable. ***Renal insufficiency:*** It may be necessary to decrease the dosage; monitoring should be clinical as plasma concentrations may be misleading. In severe renal insufficiency it may be necessary to adjust dosage in accordance with free plasma valproic acid levels. **Please refer to the Summaries of Product Characteristics for full information about adverse effects**
Common Undesirable effects **Congenital malformations and developmental disorders:** 10.73% (95% CI: 8.16-13.29%) of children exposed to valproate monotherapy in utero suffer from congenital malformations, most commonly neural tube defects, facial dysmorphism, cleft lip and palate, craniostenosis, cardiac, renal and urogenital defects, limb defects and anomalies of multiple body systems. Studies in preschool children exposed to valproate in utero show up to 30-40% experience delays in their early development such as talking/walking later, lower intellect, poor language skills and memory problems. At age 6, IQ was 7-10 points lower than children exposed to other anticonvulsants in utero. There are limited data on long term outcomes. Children exposed in utero are at increased risk of autistic spectrum disorder (approximately three-fold) and childhood autism (approximately five-fold) compared with the general population. **Hepato-biliary disorders:** liver injury and increased liver enzymes. **Gastrointestinal disorders.** Nausea, gastralgia and diarrhoea, especially at the start of treatment. **Nervous system disorders.** Tremor, extrapyramidal disorder, stupor, somnolence, convulsion, memory impairment, headache, nystagmus. **Psychiatric disorders:** Confusional state, aggression*, agitation*, disturbance in attention* (*principally observed in the paediatric population). **Metabolic disorders:** hyponatraemia. **Blood and lymphatic system disorders:** Anaemia, thrombocytopenia. **Skin and subcutaneous tissue disorders:** hypersensitivity, transient and/or dose related alopecia. **Reproductive system and breast disorders:** Dysmenorrhoea. **Vascular disorders:** haemorrhage. **Ear and labyrinth disorders:** deafness (a cause and effect relationship has not been established). **Investigations:** Weight gain. **Serious adverse reactions, special warnings and precautions** ***Liver dysfunction:*** Severe liver damage, including hepatic failure, sometimes fatal, has been very rarely reported. Most at risk, especially with multiple anticonvulsant drugs, are infants and young children under the age of 3 years and those with severe seizure disorders, organic brain disease, and/or congenital metabolic or degenerative disease associated with mental retardation. Concomitant use of salicylates should be avoided in children under 16 years. Monotherapy is recommended in children under the age of 3 years; potential benefit should be weighed against the risk of liver damage or pancreatitis. Liver function should be measured before therapy and then periodically monitored during the first 6 months of treatment, especially in those who seem most at risk and those with a prior history of liver disease. Epilim should be withdrawn if early symptoms of liver dysfunction develop (which may precede jaundice), especially if accompanied by vomiting or abdominal pain: loss of seizure control, aesthenia, malaise, anorexia, lethargy, oedema and drowsiness. In cases of elevated hepatic enzymes (common, particularly at the beginning of therapy), a reduction in dosage may be considered and appropriate and tests should be repeated as necessary. ***Pancreatitis:*** Pancreatitis, which may be severe and sometimes fatal, has been very rarely reported. Patients with nausea, vomiting or acute abdominal pain should have a prompt medical evaluation (including measurement of serum amylase). If pancreatitis is confirmed Epilim should be discontinued. Hepatic failure with pancreatitis increases the risk of fatal outcome. ***Aggravated convulsions:*** Some patients may experience a reversible worsening of convulsion frequency and severity, or the onset of new types of convulsions when treated with Epilim. Patients should be advised to consult their physician immediately should this occur. ***Suicidal ideation and behaviour:*** Suicidal ideation and behaviour have been reported in patients treated with anti-epileptic agents in several indications. Patients should be monitored for and patients/caregivers advised to watch for signs of suicidal ideation and behaviours; medical care should be sought immediately and appropriate treatment should be considered. ***Carbapenem agents:*** The concomitant use of Epilim and carbapenem agents is not recommended. ***Patients with known or suspected mitochondrial disease:*** Epilim may trigger or worsen underlying mitochondrial diseases caused by mutations of mitochondrial DNA as well as the nuclear-encoded POLG gene. Valproate-induced acute liver failure

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The MHRA has worked with industry, healthcare professionals and patient groups on a toolkit to ensure female patients are better informed about the risks of taking valproate medicines during pregnancy.

The toolkit can be accessed from the following website: **https://www.gov.uk/government/publications/toolkit-on-the-risks-of-valproate-medicines-in-female-patients**

Hard copies may be ordered via your Sanofi representative or contact Sanofi medical information on:
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- is preferred over immediate-release valproate by people with epilepsy.[4]

Valproate – still a valuable treatment option 50 years after its introduction.[5]

Valproate must not be prescribed to female children, female adolescents, women of childbearing potential or pregnant women.[1,2]

and liver-related deaths have been reported at a higher rate in patients with hereditary neurometabolic syndromes caused by mutations in the mitochondrial enzyme polymerase γ (POLG) gene. In patients with a family history or suggestive symptoms, POLG mutation testing should be performed. ***Haematological:*** Blood cell count, bleeding time and coagulation tests are recommended prior to initiation of therapy or before surgery, and in the case of spontaneous bruising or bleeding. ***Renal insufficiency:*** See "Dosing and Administration" above. ***Systemic lupus erythematosus:*** The potential benefit should be weighed against potential risk in patients with systemic lupus erythematosus. ***Pregnancy:*** see "Female children ... pregnant women" below. **Lactation:** Valproate is excreted in human milk at a concentration of 1% to 10% of maternal serum levels; haematological disorders have occured in breastfed infants of treated women. The decision to abstain from Epilim or stop breastfeeding must balance the benefits of treatment for the mother and breastfeeding for the child. ***Hyperammonaemia:*** When a urea cycle enzymatic deficiency is suspected, metabolic investigations should be performed prior to treatment because of the risk of hyperammonaemia. ***Weight gain:*** Epilim very commonly causes weight gain, which may be marked and progressive. Patients should be warned of the risk of weight gain at the initiation of therapy and appropriate strategies should be adopted to minimise it. ***Diabetic patients:*** Epilim is eliminated mainly through the kidneys, partly in the form of ketone bodies; this may give false positives in urinary ketone testing. ***Alcohol:*** intake not recommended during treatment with Epilim. ***Interactions which decrease sodium valproate levels:*** Anticonvulsants with enzyme inducing effect (including phenytoin, phenobarbital, carbamazepine, lamotrigine), mefloquine, chloroquine, rifampicin, cholestyramine: clinical monitoring should be performed and dose increase considered if necessary. Carbapenem antibiotics (such as imipenem, panipenem and meropenem): use should be avoided, but if unavoidable close monitoring of valproic acid levels and dose adjustment must be performed. ***Interactions which increase sodium valproate levels:*** Highly protein bound agents (e.g. aspirin), felbamate, cimetidine or erythromycin: Epilim dose should be monitored. ***Storage:*** Epilim is hygroscopic - keep tablets in blister pack until use and avoid cutting blister strips. Epilim Liquid should not be diluted. ***Female children and adolescents, women of childbearing potential and pregnant women.*** Epilim should not be used unless alternative treatments are ineffective or not tolerated because of its high teratogenic potential and risk of developmental disorders in infants exposed in utero. The benefit and risk should be carefully reconsidered at regular treatment reviews, at puberty and urgently when a woman treated with Epilim plans a pregnancy or becomes pregnant. Women of childbearing potential must use effective contraception during treatment and be informed of the risks of use of Epilim during pregnancy, through provision of comprehensive information on the risks alongside relevant materials to support her understanding of the risks. The prescriber must ensure the patient understands: the nature and the magnitude of the risks of exposure during pregnancy, in particular the teratogenic risks and the risks of developmental disorders; the need to use effective contraception; the need for regular review of treatment; the need to rapidly consult her physician if she is thinking of becoming pregnant or there is a possibility of pregnancy. In women planning to become pregnant all efforts should be made to switch to an appropriate alternative treatment prior to conception. Therapy should only be continued after a reassessment of the benefits and risks of treatment with Epilim by a physician experienced in the management of epilepsy. If Epilim treatment is continued during the pregnancy, it is recommended to use the lowest effective dose and divide the daily dose Epilim into several small doses to be taken throughout the day. Prolonged release formulation may be preferable in order to avoid high peak plasma concentrations. Folate supplementation before the pregnancy may decrease the risk of neural tube defects common to all pregnancies. However the available evidence does not suggest it prevents the birth defects or malformations due to valproate exposure. **Contraindications** Active liver disease; family or personal history of severe liver dysfunction, especially drug related; patients with urea cycle disorders; porphyria, hypersensitivity to sodium valproate. Patients with known mitochondrial disorders caused by mutations in the nuclear gene encoding the mitochondrial enzyme polymerase γ (POLG), or children under age 2 suspected of having a POLG-related disorder. **Legal category:** POM

Adverse events should be reported. Reporting forms and information can be found at www.yellowcard.mhra.gov.uk Adverse events should also be reported to the Sanofi drug safety department on 0800 0902314.

Further information is available on request from the Marketing Authorisation Holder: Sanofi, One Onslow Street, Guildford, Surrey, GU1 4YS

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Date of Revision of Prescribing Information: February 2017

	Product Licence Number	NHS Cost	
Epilim 200 Gastro-resistant	04425/0302	100 tablets	£7.70
Epilim 500 Gastro-resistant	04425/0303	100 tablets	£19.25
Epilim 100mg Crushable Tablets	04425/0317	100 tablets	£5.60
Epilim Syrup	04425/0301	300ml	£9.33
Epilim Liquid	11723/0024	300ml	£7.78
Epilim Chrono 200	04425/0307	100 tablets	£11.65
Epilim Chrono 300	04425/0308	100 tablets	£17.47
Epilim Chrono 500	04425/0309	100 tablets	£29.10
Epilim Chronosphere MR 50mg	04425/0310	30 sachets	£30.00
Epilim Chronosphere MR 100mg	04425/0312	30 sachets	£30.00
Epilim Chronosphere MR 250mg	04425/0313	30 sachets	£30.00
Epilim Chronosphere MR 500mg	04425/0314	30 sachets	£30.00
Epilim Chronosphere MR 750mg	04425/0315	30 sachets	£30.00
Epilim Chronosphere MR 1000mg	04425/0316	30 sachets	£30.00
Epilim Powder and Solvent for solution for injection/infusion 400mg	11723/0022	1 vial	£11.58

References: **1**. Epilim Chrono (200 mg, 300 mg, 500 mg) Summary of Product Characteristics. **2.** Epilim Chronosphere (50 mg, 100 mg, 250 mg, 500 mg, 750 mg, 1000 mg) Summary of Product Characteristics. **3.** Trinka E, *et al.* J Neurol Neurosurg Psychiatry 2013;84:1138–47. **4.** Doughty J, *et al.* Epilepsy Behav 2003;4:710–16. **5.** Perucca E. Epilepsies 2015;56:1175–6.

Vikram Thakur and Steven Smithies from Cambridge propose a schematic model to explain how disrupted functional connectivity between the prefrontal cortex and angular gyrus might be the neurobiological substrate for alterations in the sense of agency seen in patients with schizophrenia.

Regular contributor JMS Pearce from Hull writes this issue's interesting history of neurology article about Frederick Batten, a former doyen of Edwardian era Queen Square who made major contributions to the literature on subacute combined degeneration of the cord, myotonic dystrophy, and who described the fatal paediatric onset disease, neuronal ceroid lipofuscinosis, now known as Batten's disease.

Also in this issue, Charles Wade from London writes a synthesis of four recently published large case series in the rapidly evolving field of MOG antibody-induced demyelination. Stacey Fawcett writes a moving, personal perspective on watching her mother engulfed by Parkinson's disease.

ACNR's conference editor Angela Zarkali, together with Sam Shribman, and ABN honorary secretary, Jon Sussman all preview the 2018 ABN meeting in Birmingham. ACNR's consulting and founding editor, Roger Barker previews the Fifth World Parkinson Congress in Kyoto, and there are previews of Pain Therapeutics in London, and Neurology 2018: Leading Edge Neurology for the Practising Clinician in London.

Conference reports are from Tom Balchin, Claire Williams, Peter Sandercock, Georgios Korres, and Mehran Manoosi. Book reviews are from Alison Murdoch and Ranjith Manon.

We hope you enjoy this edition of ACNR.

Todd Hardy, Co-Editor
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Todd Hardy, Co-Editor.

CONTENTS

FEBRUARY-APRIL 2018

REVIEW ARTICLES

SPECIAL FEATURES

ABNT

2018 ABN Annual Conference

REGULARS

PUBLISHED ON-LINE

Encephalitis Conference 2017

EAN/WSO/AAN/IBRO/WFN/EHF/LINF 9th Regional Teaching Course (RTC) on Neurology

Cambridge Dementia Course 2017

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Predicting Parkinson's Disease

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is a Core Medical Trainee at University College London Hospital and the National Hospital for Neurology and Neurosurgery. She graduated from the University of Cambridge with a first-class degree, and University College London (UCL) with distinction. Her interest in neurology began with a research project at the John van Geest Centre for Brain Repair, where she investigated the role of reactive astrocytes in promoting neuronal survival and synaptic plasticity after injury. Since then she has assisted Alastair Noyce with his study 'PREDICT-PD', which aims to identify individuals at high risk of developing Parkinson's disease. She is also involved in medical education, having completed a Postgraduate Certificate at the Royal College of Physicians and UCL while working as a clinical teaching fellow at Charing Cross Hospital.

Alastair J Noyce, MRCP MSc (Epi) PhD

is a Clinical Senior Lecturer in the new Preventive Neurology Unit at the Wolfson Institute of Preventive Medicine, QMUL. His main interest is Parkinson's disease and related movement disorders, particularly early identification and epidemiology, including environmental, clinical and genetic determinants. His other interests include objective measurement of motor and non-motor features of Parkinson's. Over the last 7 years he has led a study called PREDICT-PD, which aims to identify those in the earliest stages of Parkinson's, who may one day benefit from drugs that could slow or even halt the disease.

Alastair graduated from Barts and the London School of Medicine and Dentistry in 2007 with Distinction and then pursued general medical postgraduate training. Since 2011 he has been a Specialist Registrar in Neurology at Barts Health NHS Trust. In August 2012 he left clinical training to pursue a PhD in Neuroscience at UCL, funded by Parkinson's UK, which he was awarded in February 2016. Between 2014-2016 he undertook an MSc in Epidemiology at the London School of Hygiene and Tropical Medicine, for which he was awarded distinction.

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Abstract

The diagnosis of Parkinson's disease is often not made until the pathology is advanced. The existence of prodromes prior to diagnosis are now well recognised. In this review, we focus on the research attempting to characterise prodromal disease with the ultimate aim of identifying individuals that would benefit from early initiation of neuroprotective therapies.

Why should we predict Parkinson's disease?

Parkinson's disease (PD) is the second most common neurodegenerative condition after Alzheimer's disease, and is associated with increasing age. As population demographics change worldwide, the prevalence and societal burden of PD will grow.[1] Currently the diagnosis is made once key motor features of rigidity, tremor and bradykinesia are established, correlating with an approximate loss of half of the neurons within the substantia nigra.[2] Thus, in terms of pathology, PD is not diagnosed until an advanced stage of the disease; limiting the potential benefits that might be obtained from neuroprotective therapies.

Over the last decade, the existence of a prodromal (or pre-diagnostic) phase of PD has become evident. This may extend up to 20 years prior to diagnosis,[3] during which time a variety of non-motor symptoms may emerge. These features include autonomic symptoms such as orthostatic hypotension, bowel, bladder and sexual dysfunction; olfactory dysfunction; sleep disorders such as REM-sleep behaviour disorder (RBD); excessive daytime somnolence; and cognitive and mood changes. This phase is unlikely to be exclusively non-motor, and increasing evidence suggests subtle motor dysfunction is also present at this time.[4]

Up to 2% of people aged between 65 and 69 years are likely to be in the prodromal phase of PD, with higher proportions at increasing ages.[5] A method to identify those at high risk of PD is a vital pre-requisite to enrolment in clinical trials, and subsequently to screen the population and select those likely to gain benefit from preventive or disease-modifying treatments.

How should we predict PD?

Prediction in high-risk cohorts

Several groups have adopted an 'enrichment' approach by identifying individuals with a single strong risk factor such as non-manifesting *GBA* or *LRRK2* gene mutation carriers. Here we use an alternative example of patients with RBD confirmed using polysomnography (PSG-RBD). The lifetime risk of individuals with PSG-RBD developing a synucleinopathy (PD, multi-systems atrophy (MSA) or dementia with lewy bodies (DLB)) exceeds 70%.[6] Such a high magnitude of risk may justify enrolment into clinical trials without further selection because the proportion that develop parkinsonism is approximately 10% per year.[7] However, the application of a second-stage test could decrease the length of trial follow-up required. For example, stratifying an RBD cohort according to the presence of additional prodromal symptoms, such as mild motor dysfunction and impaired olfaction, has been shown to identify subpopulations with a greater than 60% risk of PD development at three years.[7] One problem is that patients with idiopathic RBD can be difficult to identify; the disorder is not common and the diagnosis requires an overnight sleep study. PSG is expensive and time-consuming, and may be of limited value in identifying very large cohorts of individuals at risk of PD. It is also likely that RBD-associated parkinsonism represents a variant of the disease with greater cognitive impairment and more autonomic dysfunction, giving rise to a 'diffuse/malignant' subtype of PD; characterised by an accelerated decline in motor and non-motor functions.[8] If disease-modifying therapeutic success were achieved in these patients, it may not necessarily be replicated in a wider prodromal PD population.

An 'enriched' population may also be identified through the use of a multi-stage screening process: the primary stage would involve the application of a high-sensitivity 'test' to a general elderly population, followed by a second stage test, such as imaging, to achieve greater specificity for prodromal disease detection. Jennings et al. (2017)[9] used this strategy to screen a general population cohort for hyposmia with the widely used University of Pennsylvania Smell Identification Test, and hyposmic individuals subsequently underwent (^{123}I)ß-CIT SPECT scans. This method yielded promising results with a high specificity for prodromal PD detection (98%), and relatively good sensitivity (74%) and positive predictive value (PPV, 67%).

Prediction models in the wider population

An alternative method is to apply a 'risk algorithm' to an unselected elderly population. Such algorithms use a Bayesian naïve classifier approach to add or subtract 'likelihood ratios' associated with the presence or absence of multiple risk or protective factors, imaging abnormalities, and/or prodromal symptoms. Several groups have adopted such a method and the results are outlined in Table 1.

Interest in prediction models has increased in recent years, with the recognition that they hold certain advantages over the enrichment

Table 1 – Prediction models and their application

Prediction model			Application of model to a longitudinal cohort				
Name	Model type	Prediction strategy	Participants	PSG, imaging or genetics included?	Outcome	Duration of follow-up	Results*
PREDICT-PD[12]	Bayesian naïve classifier combining age-related risk with RRs of risk factors / prodromal markers	Online approach – questionnaire to examine risk factors and prodromal symptoms	PREDICT-PD cohort: 1323 subjects >60 years	Genotyping	Clinical PD	3 years	HR 4.39 (95% CI 1.03 – 18.68)
			Rotterdam study cohort: 6492 subjects >55 years[13]	No	Clinical PD	16 years (median)	HR 1.3 (95% CI 1.06 – 1.59)
MDS task force[5]	Bayesian naïve classifier combining age-related risk with LRs of risk factors / prodromal markers	Any combination of risk / protective factors and prodromal symptoms can be combined if LRs known	Bruneck study cohort: 539 subjects >55 years[14]	TCS	Clinical PD	5 years	Sensitivity 55%, Specificity 99%, PPV 60%
			PRIPS cohort – Tübingen subsample: 715 subjects >50 years[15]	TCS	Clinical PD	5 years	>50% post-test probability: Sensitivity 14%, Specificity 100%, PPV 50%, NPV 99%
			TREND: 650 subjects >50 years, reporting at least one of: depression, hyposmia or RBD[15]	TCS	Clinical PD	6 years	Sensitivity 20%, Specificity 100%, PPV 40%, NPV 99%
			121 subjects with PSG-confirmed RBD, mean age 66 years[11]	PSG	Clinical PD	4 years	Sensitivity 67%, Specificity 68%, PPV 64%, NPV 70%
Genetic Risk Score[16]	Bayesian naïve classifier combining weighted genetic risk scores	Combined age, gender, smoking, FH, and common genetic mutations (NB G2019S mutation in LRRK2 not included, and only the p.E326K variant in GBA included)	Rotterdam study cohort: 7167 subjects >55 years old	Genotyping	Clinical PD	12 years (median)	HR 1.25 (95% CI 1.02 – 1.55)

Table 1 – Studies that have developed and/or applied a Bayesian naïve classifier prediction model to a longitudinal cohort
*figures quoted apply to a test with ›80% post-test probability of PD, unless otherwise stated

Key: CI = confidence interval; FH = family history; HR = hazard ratio; LR = likelihood ratio ; MDS = Movement Disorder Society ; PD = Parkinson's disease; PPV = positive predictive value; PRIPS = prospective validation of risk factors for the development of Parkinson syndromes; PSG = polysomnography; RR = relative risk; TCS = transcranial sonography.

approach. One benefit of the algorithmic method is that it individualises risk, so that the high-risk cohort includes a range of people with different combinations of prodromal features and risk factors, with or without additional genetic risk markers. The resulting cohort is more likely to be representative of the true prodromes of PD, when compared to a population enriched by the presence of one relatively uncommon high-risk prodromal marker (such as PSG-RBD), or by a fixed combination of prodromal symptoms. Additionally, the flexibility of this approach enables application of the algorithm in a variety of ways, depending upon the information available. This is evidenced by the diversity of cohorts to which the MDS research criteria for prodromal PD have already been applied (see Table 1).

Despite such benefits, the prediction model strategy is not without disadvantages. Essentially a 'test' is applied to a population, with a predefined outcome (for instance >80% likelihood of prodromal PD) stating whether an individual is 'test positive' or 'test negative' for prodromal PD. Applying such a test to an unselected population, with a low background prevalence of PD, naturally leads to lower PPVs than it would if applied to an enriched population. Consequently, use of this approach to enrol people into clinical trials means a high number of trial participants will not go on to develop PD, potentially exposing a substantial number to unnecessary risk. Thus far, only Mahlknecht et al (2016),[10] have achieved a relatively high PPV (60%) using this method, by applying the MDS Task Force criteria to the Bruneck study cohort (see Table 1).

Is a combined approach the best way forward?

The two broad strategies described are not mutually exclusive, and indeed have already been combined in one recent study where the MDS criteria were applied to a PSG-RBD cohort.[11] As expected, the application of a prediction model to an enriched population, with a high pre-test probability of PD, led to a relatively high PPV of 64% at four years (see Table 1), which increased to 100% when follow-up duration was extended to ≥10 years. Though this approach is hindered by the aforementioned limitations of using a PSG-RBD cohort, it emphasises the importance of the

duration of follow-up when making an accurate determination of the sensitivity, specificity, PPV and NPV of a prodromal disease 'test'.

Perhaps the most promising strategy for the future is to use a two-stage process which combines both approaches: use of an algorithm to screen for high-risk individuals in the general population as the first step (with or without a genetic risk score), before applying a second-stage test using quantitative, objective assessments such as smell tests, motor assessments and/or imaging, such as DAT-deficit on (^{123}I) ß-CIT SPECT or substantia nigra hyperechogenicity on transcranial sonography. This is the approach adopted by the PREDICT-PD study, which uses an online strategy to screen for those at high-risk, before inviting selected participants for further investigation.[12]

Conclusion

The field of prodromal PD research has advanced considerably over the last decade, and we are now at the stage where high-risk cohorts are being assembled for clinical trial enrolment. The development of prediction models offers the advantage of greater flexibility and generalisability than alternative approaches. However, utility is dependent upon the information available, and higher positive predictive values may come at the cost of reduced feasibility. Work remains in order to refine prediction methods, in parallel with identifying robust disease biomarkers.

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A Delusion of Control:
What happens to a sense of Agency in Schizophrenic patients?

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Agency is the feeling of control over your own actions and their effect on the external world. This gives us a sense of power and freedom to act to achieve some motivated goal and explains our movements and actions as our own decisions. This sense of agency is one of the first cognitive processes to develop in Paget's Neoconstuctivism model of development. This theory suggests infants first know that they have agency before they recognise others do and even believe objects exist only when they act on them. Research suggests that such an innate part of our sense of self may be impaired in schizophrenia. A loss[1,2,3] or gain[4] of agency is a characteristic feature of psychosis and a first rank symptom of schizophrenia. However, this does not appear in DSM-5 as a diagnostic criterion for schizophrenia.

A possible model for the sense of agency was first used to describe the control of motor systems and then also used for the sense of agency. The comparator model involves the comparison between the predicted sensory feedback of an action and the actual sensory feedback of doing the action.[5] A goal or desired state produces a motor command and an efference copy that feeds into an internal prediction or forward model. The internal prediction model uses this efference copy of the motor command to predict the sensory feedback that would ensue after doing the action. A controller system or inverse model produces the motor command that achieves the desired state or goal given the context of the environment. This leads to a motor output or action, which leads to an actual state and subsequent sensory feedback of the actual state. The comparator model suggests that the predicted sensory feedback based on the efference copy of the motor command and the actual sensory feedback are compared. This produces an error signal that can be used to improve the internal predictions or the controllers that determine the appropriate motor command to achieve a goal. In terms of agency, no error signal would lead to a sense of agency since the actual sensory feedback matches the predicted sensory feedback based on the representation of the motor command, therefore the action is generated by the self. If there is an error signal due to a mismatch in content or the temporal aspect of predicted and actual sensory feedback, it would lead to a diminished sense of agency or none at all according to this model. This describes a retrospective sense of agency since it occurs after the action and is affected by retrospective external cues such as sensory feedback and its comparison with internally predicted sensory feedback from the efference copy of the motor command (the output of the comparator model).

The comparator model is good at explaining a sense of non-agency when there is such a mismatch and is useful in suggesting a mechanism for the loss of agency seen in schizophrenia. However, it does not seem adequate in accounting for the increased sense of agency seen in schizophrenia,[4] or the fact that a sense of agency may not be dependent on the predictability of outcomes.[6] Furthermore, it has also been shown that a sense of agency may be felt at the time of action selection rather than retrospectively after the action has been carried out.[7] This suggests that a prospective sense of agency exists and it can be affected by external prospective cues that occur before the action, such as subliminal priming, which affects the fluency of action selection, and internal predictions based on efference copies of motor commands. The comparator model is difficult to falsify,[8] however, it seems to need some modification to account for these points. This led to the development of Synofzik and colleague's 2-step model.[9] In this model, the sense of agency is divided into a low-level feeling that you have control over your actions (feeling of agency) and high-level conscious interpretation or judgment of being in control of your actions (judgement of agency). In this model, the feeling of agency involves a multifactorial weighting of cues involved in the comparator model, such as efference copies and sensory feedback and the congruence of cues of many modalities, as well as prospective cues. The weighting and integration of these cues, that gives a low-level feeling of agency or non-agency, may differ based on context, the individual as well as between disease groups. Both retrospective and prospective cues are used to deliver a reliable sense of agency.[10] If there is a deficit in either prospective or retrospective agency, there will be an over-reliance on the other. The second step of the 2-step model involves taking the feeling of agency and interpreting it based on belief stance, intentions, and social or contextual cues.

It has been suggested that in patients who suffer from schizophrenia, this integration of cues is altered. There seems to be an over-reliance on external sensory cues, such as visual or auditory perception, for a sense of agency and a deficit in internal monitoring process, such as action selection or parietal internal monitoring.[11-14] This may lead to an over-reliance on retrospective agency. Internal predictions and cues may be unreliable in schizophrenic patients, which leads to a greater weighting of external cues. This may cause the sense of agency of a schizophrenic patient to be altered by the events after their actions, invading beliefs, and resulting emotions. This shares features with some of the common symptoms of schizophrenia, for example, patients associating external events as an effect of their actions, due to an aberrant sense of agency, can explain delusions of reference. Patients may over-emphasise the salience of an external event unrelated to their actions and associate it to their agency. However, a schizophrenic patient may also fail to attribute sensory feedback of their actions

with a sense of agency due to unattended or unavailable internal cues, which may reduce their sense of agency for self-produced actions. Patients may understand this as external forces controlling their actions. This could partially explain delusions of influence.[15,16]

In the most recent study of agency in patients with schizophrenia by M. Voss et al. in 2017,[17] 16 schizophrenic patients and 16 healthy volunteers were taken and used in cued and free priming trials. They were matched for handedness, age and sex, and the patient's symptoms were evaluated with SANS (μ=23.42) and SAPS (μ=21.6) scores.[18] An ego disturbance score was also calculated by summing up aspects of the SAPS score. This has been shown to be particularly relevant to a disturbance of control over one's actions.[19,20] It is worth noting here however, that there was a large variation in the SANS and SAPS scores (σ=14.08 and 19.9 respectively). A possible extension to this study could be to make healthy volunteers take SANS and SAPS tests as well. This could be used to make a comparison between the healthy volunteers and schizophrenic patients or even to see if there is a correlation between a sense of agency and SANS or SAPS scores.

In the experiment, they differentiate between the effect of prospective and retrospective cues on a sense of agency.[21] Both of these are examples of external cues.[22] A prospective cue refers to an external stimulus that occurs before action selection, which also influences action selection. In this study, they used subliminal primes, which have already been shown to influence response time.[23] Subliminal primes have been shown to influence a sense of agency[24] and compatible primes have also been shown to induce a stronger feeling of control over external action than incompatible ones.[7] A retrospective cue on the other hand, is an external stimulus that occurs after the action selection, which relates to the outcome of the action. It therefore cannot have an effect on the action selection but can still influence the feeling of control over that action.[21] In this study, they used the appearance of coloured dots on a screen (the 'action effect') as a retrospective cue.

The trials used were carried out, on a screen, in the following way:

1. A priming arrow was shown for one frame, pointing either right or left. The participant is not consciously aware of the prime as was later shown in a prime visibility test. The prime is followed by a delay of two frames.
2. A target/mask was then shown. The target/mask randomly pointed in one direction in cued trials, either left or right, and the participants were instructed to follow this in their response. In free trials, the target/mask pointed in both directions and the participant was instructed to choose their response.
3. The participant responded, pressing a button (the action) for either left or right with their left or right hands respectively.
4. An action effect occurred consisting of four coloured dots (two for each hand). A different pattern of coloured dots was shown depending on whether the prime was compatible or incompatible with the response. These dots appeared after intervals of either 100, 400 or 700ms, randomly. The interval between the action and the action effect is the action effect interval (AEI). This variation in the AEIs increases the range of judgements of control.[7,25]
5. The participant was then asked to judge their feeling of their level of control over the coloured dots shown on a scale from 1-8.

The participants undertook this study in functional and structural MRI. The fMRI measured the BOLD response in areas of the brain such as the prefrontal cortex and the angular gyrus in the action selection phase, which was the time from the prime onset to the participant's response, and the control judgement phase. Functional connectivity was judged by correlating activation in different regions.

It is worth noting however, that due to natural constraints, this study was undertaken on relatively small and varied samples. The sample sizes were reduced further as some participants had to be excluded for excessive movement in the scanners or being able to notice the subliminal primes. The study is also measuring subjective responses, which may require large sample sizes to be meaningful. In fact, not only is a sense of agency subjective but it is also difficult to define as it is, by nature, a quale. This, again, may call into question the validity of the judgements of control made by the participants. It would be worth repeating this study to see if the results are reproducible.

The results for the trials showed multiple correlations. In the cued trials, the response time was faster with compatible primes, where the prime matched the response, than incompatible primes, for both groups. The responses were faster on cued trials than free trials. On free trials, both groups were more likely to select a response compatible with the primes than incompatible. The control group experienced higher levels of control over action effects following compatible prime-target associations than the patients (P=0.005). These results are all as was expected and show that the primes worked in terms of influencing response and control judgement. Since the priming occurs before the action, but it is influencing the participant's feelings of control over the action effect, it must be an example of a prospective cue for sense of agency. This shows that a sense of agency can depend on premotor processing before the action.

AEI occurs after the action and so is an example of a retrospective cue. Both groups reported higher experienced levels of control for shorter AEIs. However, the patients felt more control than the controls for shorter AEIs, and less for longer AEIs. In other words, they experienced greater variation depending on the AEI. Since AEI is a retrospective cue for sense of agency, this may reflect a schizophrenic's greater reliance on retrospective, external cues for a sense of agency. This effect in Schizophrenia has been shown by other studies.[17,26]

With regards to the fMRI results, in cued trials, the dorsolateral prefrontal cortex (dlPFC) and right inferior occipital cortex were more active if the prime and response were compatible. If the prime and response were incompatible, there was instead activation in the insular and fusiform gyrus bilaterally, however the activation in the fusiform gyrus did not survive correction for multiple testing. Note that these are not the same areas used in explicit, conscious conflict, where the anterior cingulate cortex is active.[6,27] In free trials, there was strong activation in the rostral/medial PFC if they were compatible, and activation in the inferior orbitofrontal cortex if they were incompatible. Since the dlPFC and rostral/medial PFC were more active on compatibility, their activity reflects the ease of action selection. Hence, they were more active with fluent primes. These results are comparable with the classic routes for internally and externally triggered routes of action. Namely, that externally driven responses, as in the cued trials, are dependent on a lateral route, via the dorsolateral PFC and then the lateral premotor area. Internally driven responses are dependent on a medial route, via the rostral/medial PFC and then the supplementary motor area (SMA). The primes still had the same effect on response in both cued and free trials, however. It appears that the prime enters frontal action selection areas but can then influence either the medial or lateral route. The schizophrenic patients showed the same pattern of activity in these areas and showed the same influence of the prime on their responses, suggesting that their frontal action selection areas and, by extension, their motor performance is normal. In this way, we can dissociate the subjective feeling of control from motor performance.

When correlating with the judgements of control, in cued trials, the left angular gyrus was more active at low levels of feelings of control in incompatible trials. In free choice trials, it was the right angular gyrus that was activated on incompatibility, so there seems to be some hemisphere specificity. The angular gyrus is known to be crucial for a sense of agency.[6,28,29,30] It is also involved in agency via both prospective and retrospective cues.[28,29] Since it is more active at low reported levels of control, it appears that activity codes for non-agency rather than agency. As is seen with very young infants in the sensorimotor phase of Paget's model, they initially believe objects only exist when they act upon them, and only have a comprehension of their own agency, and not of anyone else's or any other causes for action. The brain then later develops enough to be able to inhibit sense of agency. Therefore, it may be that the brain works by first assuming the action was caused by the being in question, and then coding for non-agency if there is a mismatch. Crucially, this modulation of activity in the angular gyrus by the sense of control occurred in healthy volunteers but not in patients, and so may be the cause of their reduced reported feelings of control in compatible trials.

In cued, incompatible trials, there was increased frontoparietal connectivity between the dlPFC and the angular gyrus bilaterally in controls. The relationship was such that increased activation in the dlPFC reduced activity in the angular gyrus. The same relationship was found in free choice trials but between the medial PFC and the angular gyrus. This is likely to be the method by which a prospective cue codes for later agency over an action. This change in connectivity did not occur in the patients, however, and may explain their lessened sense of control in response to prospective cues. It is important to remember that the patients still reported the same variation in levels of feelings of control, however this variation was not as correlated to prime compatibility to the response. After statistical analysis it was found that the increase in variation of feelings of control depending on AEI roughly balanced this. Therefore, in schizophrenia, patients may not monitor prospective cues as well due to a lack of coding in the angular gyrus and a disrupted functional connectivity with the frontal action selection areas, and so to compensate, they rely more heavily on retrospective cues. The connection from the frontal action selection areas to the angular gyrus seems to form part of a monitoring circuit of the action taking place, with the angular gyrus acting as a metacognitive monitoring hub for many processes, including coding a sense of agency. A simplified schematic for how this might work can be seen in Figure 1.

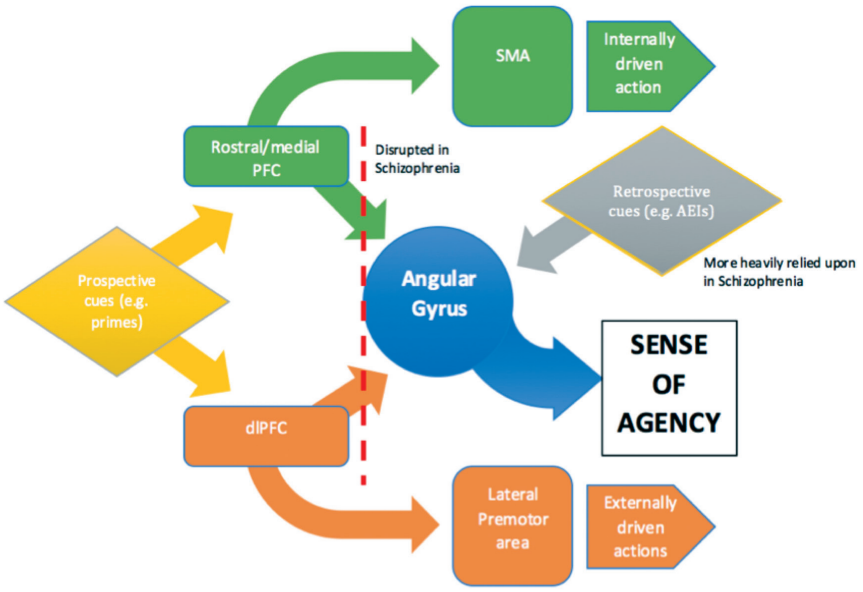

Figure 1: A simplified proposal schematic of how a sense of agency may be elicited, and how it is disrupted in schizophrenia.

This experiment design is a useful way of investigating the difference in sense of agency between patients and healthy volunteers, however it may be difficult to scale this up to explain delusions seen in schizophrenia, because delusions are far more complex than the experimental design. Also, our ability to infer conclusions about the hypothesis that the sense of agency is affected in schizophrenia, is limited due to the small sample size and the subjective measure of the sense of agency. The results of this study are especially pertinent as we can start to elucidate a cognitive and neurobiological model for the loss of agency and possibly some of the positive symptoms of schizophrenia. This may lead to useful diagnostic tools and therapy for schizophrenic patients. Giving a schizophrenic patient back their control over their actions, emotions and perceptions is the ultimate goal in their therapy.

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Frederick Batten (1865-1918): father of paediatric neurology

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Abstract
Frederick Batten made many major contributions to neurology and rehabilitation. He was one of a group of eminent physicians at Queen Square in the Edwardian period and devoted his energies to paediatric neurology. Amongst many published works his papers on familial 'Cerebral degeneration with symmetrical changes in the maculae' (Batten's disease), subacute combined degeneration of the cord, and dystrophia myotonica are highlighted and summarised.

Key words
Paediatric neurology; Batten's disease; Neuronal Ceroid Lipofuscinoses; Subacute Combined Degeneration Of The Cord; Dystrophia Myotonica.

If you had passed through the portals of Queen Square in the Edwardian period spanning World War 1, you would have been confronted if not greeted by a group of eminent physicians. One such, often called the "father of paediatric neurology" was Frederick Batten*, who made many major contributions to neurology and rehabilitation.


Figure 1: Frederick Eustace Batten

He was born in Plymouth, son of JW Batten, Q.C, and his wife Sarah. He attended Westminster School and Trinity College, Cambridge, and graduated in medicine in 1891 from St Bartholomew's Hospital. He obtained his MD in 1895, and became FRCP in 1901. He was appointed Physician to the National Hospital for the Paralysed and Epileptic (pathologist, 1899; physician, 1900–1918; dean, 1908–1918) and to the Children's Hospital, Great Ormond Street. Both he served until his early death.

Amongst 106 published papers three are of particular interest: 1. Family cerebral degeneration with macular change: Batten's disease; 2. Subacute combined degeneration of the cord (SACD); and 3. Myotonia atrophica (Dystrophia myotonica).

Batten's disease

Batten described two cases in 1903,[1,2] from the Hospital for Sick Children. The original description has been attributed to Otto Christian Stengel (1794-1890), who in 1826 described from Røros in Norway, a "singular illness" affecting four children of a local family.[3] Interestingly Batten cited an earlier 1897 study[4] on familial macula degeneration by his brother Rayner D Batten, but with hindsight there was no mental defect and no cerebral involvement. Frederick Batten described symmetrical changes in the maculae in two members of a family (see pedigree below) with cerebral degeneration starting about the age of six, now known as Batten's disease.

Batten's disease is a group of rare inherited autosomal recessive disorders that present in childhood with retinal and cerebral degeneration and terminate fatally. It is characterised by the intracellular accumulation of autofluorescent lipopigment storage material with different ultrastructural patterns. He described clinical features including visual impairment resulting in blindness; epilepsy; myoclonic jerks; impaired speech, language and swallowing; and a deterioration of motor skills that result in immobility. The afflicted child becomes totally dependent and death occurs in childhood or early adult life.

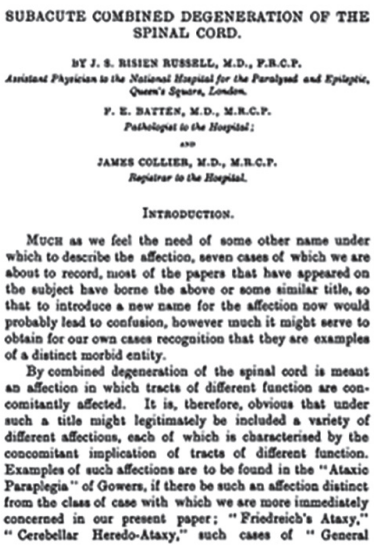
It is the most common form of the Neuronal Ceroid Lipofuscinoses (NCLs), linked to the CLN3 gene.[5] Historically, the NCLs were classified by age of onset as infantile, late infantile, juvenile or adult NCL. Juvenile NCL has also been called: Vogt-Spielmeyer disease, and Spielmeyer-Sjogren disease, but Batten's disease is often used generically. Each variant has differences in the rate of progression and clinical features. Treatment is of no avail save for cerliponase alfa (Brineura) which may slow progression of children with CLN2, the late infantile variant.

Batten's principal contribution was his recognition of the recently described neuronal storage diseases, and to realise his syndrome differed from Waren Tay-Sach's disease:

> The difference lies in (1) the absence of race proclivity; (2) the absence of the characteristic macular change; (3) the difference of age. What the nature of the poison may be … is a problem yet to be solved.[6]

Subacute combined degeneration of the cord (SACD)

Though described first by Leichtenstern in 1884,[7] and by Putnam[8] and Dana[9] in 1891 the most comprehensive account was in a 70-page paper written by Batten with Risien Russell and Collier (Figure 2.).[10]


SUBACUTE COMBINED DEGENERATION OF THE SPINAL CORD.

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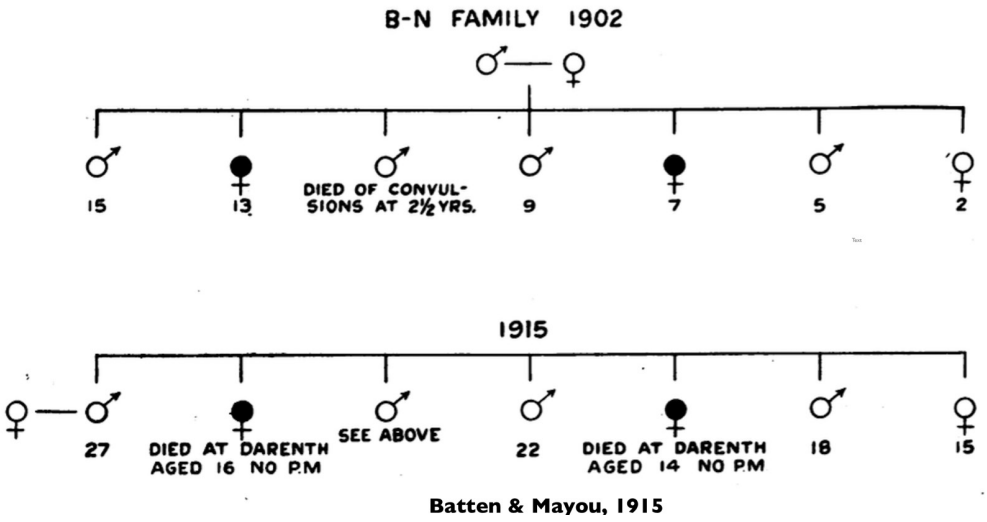
Registrar to the Hospital.

INTRODUCTION.

MUCH as we feel the need of some other name under which to describe the affection, seven cases of which we are about to record, most of the papers that have appeared on the subject have borne the above or some similar title, so that to introduce a new name for the affection now would probably lead to confusion, however much it might serve to obtain for our own cases recognition that they are examples of a distinct morbid entity.

By combined degeneration of the spinal cord is meant an affection in which tracts of different function are concomitantly affected. It is, therefore, obvious that under such a title might legitimately be included a variety of different affections, each of which is characterised by the concomitant implication of tracts of different function. Examples of such affections are to be found in the "Ataxic Paraplegia" of Gowers, if there be such an affection distinct from the class of case with which we are more immediately concerned in our present paper; "Friedreich's Ataxy," "Cerebellar Heredo-Ataxy," such cases of "General

Figure 2. Russell JSR, Batten FE, Collier J. Subacute Combined Degeneration of the Spinal Cord. Brain 1900.



Batten & Mayou, 1915

They described nine patients with autopsies in seven. The illness was in three stages of progressive paraplegia with ataxy and sensory loss in the lower limbs culminating in complete paraplegia; absent knee jerks; anaesthesia; wasting, and double incontinence. In respect of the recognised association with pernicious anaemia they noted:

> '... Some of the most typical cases presented no anaemia throughout the course ... others only late in the disease, while in other cases anaemia was an obtrusive symptom from the first and preceded the nervous symptoms by many months.'

They also observed that nomenclature was a problem:

> 'A name other than ''combined degeneration'' would undoubtedly do much to establish the affection as a distinct morbid entity, ... in consequence of the fact that so many different diseases of the spinal cord are characterised by combined degeneration of tracts of different function.'

Leichtenstern, Putnam and Dana had all noted an association with anaemia, and Lichtheim specified pernicious anaemia.[11] Many years later were shown the causal cobalamin Vitamin B12 deficiency present in raw liver (Whipple Minot, Murphy, 1926, Nobel prize 1934[12]) and the associated deficiency of intrinsic factor needed for cobalamin absorption.

Dystrophia myotonica

Batten and Gibbs also provided one of the earliest detailed accounts of Dystrophia myotonica under the title of myotonia atrophica, published in 1909, the same year as Steinert's paper.[13] Charles Dana had described the syndrome in 1888.[14] The salient features that Batten and Gibbs observed were:

> …A group of cases which present the rare association of muscular atrophy with a slow relaxation of muscles after voluntary contraction. The muscular atrophy has a distribution which is peculiar and corresponds to none of the well known types of myopathy.[15]

They recognised the disease as an entity distinct from Thomsen's myotonia congenita and their paper includes the first photograph unmistakably portraying the disease. The association with cataracts was not noted until Greenfield's accounts of 1911 and 1923.[16,17] It is now recognised as autosomal dominant DM1, with Cytogenetic locations: 19q13.32., typically showing: myotonia, myopathy, cataracts, hypogonadism, frontal balding, and ECG changes.

As a children's physician, Batten 'was in the first rank.'[18] In 1913, with Sir Archibald Garrod and Thursfield he published a well-known textbook on Diseases of Children. In his Lumleian lectures at the Royal College of Physicians and re-published in Brain, June 1916, Batten detailed the features of poliomyelitis.[19] His research was both clinical and pathological. He published several papers on progressive spinal muscular atrophy of infants (Werdnig-Hoffmann type) and on poliomyelitis (infantile paralysis); he devised corrective celluloid splints.[20,21] Fittingly, in 1952 the intensive care unit for patients with respiratory paralysis at the National Hospital was named the Batten Unit in his honour.

His last communication was on epidemic stupor, jointly with his friend and renowned paediatrician, Sir George Frederick Still (1868-1941).[22] Sir Gordon Holmes (1876–1965) recalled:

> 'Batten's approach was scientific...interpret[ing] symptoms as disturbances of function and determin[ing] the changes in structure . . . to which they were due. His honesty, simplicity and directness impressed all who came in contact with him'.[19]

His students knew him as 'Freddie'. He was described by TT Higgins as:

> 'a brisk, lithe figure with a conspicuous domed head and lively eye, quick, tumbling speech … and an intense interest in current affairs, but first and foremost concerned with the well-being of his patients and the parents, relatives, nurses and doctors who administered to them.'[23]

Known as a perfectionist, disliking sloppiness and indecision, he nonetheless was considered lovable, modest, genial, and tolerant. Batten died aged only 52 from haemorrhage following surgery for prostatic obstruction.

**Amongst his colleagues were: T Buzzard, H Charlton Bastian, Sir David Ferrier, Sir WR Gowers,* JA Ormerod. Howard H Tooth, Tames Taylor, JS Risien Russell, W Aldren Turner, JS Collier, E Farquhar Buzzard, T Grainger Stewart, Gordon M Holmes, CM Hinds Howell, and SA Kinnier Wilson.

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Parkinson's Disease: My family's perspective

Stacey Fawcett

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Invited and internally reviewed.

Conflict of interest statement:
None declared

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The inspiration for this article is my Nan who is currently fighting Parkinson's disease and Lewy Body Dementia. This article will discuss how my family have been affected throughout her disease progression.

Early Stages (Years 1-6 of Parkinson's disease)

My Nan did aerobics until she was 75, retired at 78 and kept the house cleaner than a show home. She was independent, strong-willed, courageous, honest and kind, the type of woman you would aspire to be. The only concern in the family at this point was the microwaved frozen Battenberg she used to feed my Dad when we would visit her. This was until she was diagnosed with Parkinson's disease. Nan had previously confided in a neighbour, who was a nurse, of her annoyance at a trapped nerve in her hand which was causing it to tremble. Her neighbour advised her to visit the GP, who then referred her to the hospital.

The diagnosis was a huge shock as Nan had always been fit and well. This was unknown, upsetting territory but we were confident Nan could self-manage the illness with our help, as our understanding of the disease at this time was limited to the tremors. Nan was 79, not a spring chicken but a very strong independent woman who would certainly put up a fight.

Everything seemed normal for the first couple of months. The first challenge was her medication.

The prescribed dosage on the bottle was 5.0mg per dose. The following evening my Nan was frantically calling my parent's house at 2:00 am, crying so hard she could barely explain what was happening. She said that there were bugs and creatures coming out of her walls everywhere she looked. I remember my Dad's panic as we had no idea what was happening. Could there be an infestation in her house or was this something else? When my Dad got there Nan was distraught, the doctor arrived shortly after and explained this was a hallucination due to the medication dosage being transcribed incorrectly. It should have been 0.5mg per dose. We were furious, upset, confused and concerned about any long term and lasting effects. We simply felt helpless – all we could do was wait for it to wear off. This experience frightened us – it was the first time we saw her vulnerability; here was something we had never seen before. Fear was something we would experience more of over the next few years.

The following two events in particular stand out for me.

Nan started to complain that her house smelt of smoke. At first we thought it was genuine and had someone check all heat sources; we even taped up gaps in the skirting board. After a few months of this had passed, Nan was still smelling smoke which we tried to link to her new central heating having been installed and its 'new' smell. We couldn't smell anything or find any dust and this is when alarm bells started to ring. We were concerned as she seemed so sure and was adamant it was happening and we still believed her somewhat as there was no reason for her to fabricate this. At this point she was sleeping downstairs in a dust mask and had called the Fire Brigade out a couple of times during the night which we hadn't always known about. They kindly fitted some alarms to ease her anxiety. After a quick Google search we were sure she was experiencing 'Phantosmia' (phantom smell). This explained a lot. Unfortunately, Nan's next hospital appointment wasn't for a while and a Parkinson's Nurse was yet to be assigned, leaving us with few people to contact for advice. When we eventually spoke to her Consultant the reaction we received was "it's part and parcel of Parkinson's". Maybe there was more to Parkinson's disease than just tremors. She still smelt the smoke for another couple of years.

The second event was a few years later. At this point we were used to Nan hallucinating as it became clear that she was very sensitive to her medication changes and experienced these 'events' at a slight dosage increase. She was found in the middle of the street at 1:00am by a neighbour, next to a main road in the middle of winter, talking to cars with her teddy bear as they were going to a wedding. It was a threefold horror call for my Dad to receive: winter, main road and hallucinations. Every outcome that night rushed through our heads. Nan was back at home a few days later and we were told again, "it's part and parcel of Parkinson's". She had no recollection of this, her main concern was her teddy bear and if it had been left in the house alone.

'Teddy' was a bear that Nan bought from a charity shop. She clothed it and told of his harrowing backstory of abuse and operations against his will. The stitches were down the bears back and curiously it didn't have a sound box in its stomach. We treated this as a pacifier for her as it was doing no harm, although it made us feel uneasy. The attachment to the bear was also, "part and parcel of Parkinson's". We were getting very familiar with this phrase by now.

For Nan to show improvement her consultant had to keep adjusting her medication. The hallucinations she had varied from hilarious (a Mexican dancing rat party) to outright horror (people in her house trying to kill her). This in itself caused emotional conflict, as the person you've admired and looked up to was suddenly tainted by this condition, although she was coherent and everything she experienced was real to her. She wasn't aware these experiences were hallucinations. This was a very tiring process. We started to see the person we knew disappear.

Years 6-8 (The stage of denial)

Nan progressively started to get worse: more tremors, more hallucinations, phone calls of terror in the middle of the night, preparing meals for family members that had passed. It felt like her condition was out of control and nothing that we did could ease it. We felt completely helpless, frustrated and angry. This is when we started to normalise her behaviour and appearance. Nan was getting frail and weaker which we were putting down to old age, and as it was winter

her paleness 'usual'. The odd memory lapse she may have had was also old age. In hindsight this is because we didn't want to see what was happening or think about it getting worse. The odd stay in hospital became more normal, as did the quick discharge and "It's still just Parkinson's" phrase.

As her disease progressed she went for memory tests via the psychiatric route, but was never referred to a memory clinic. She passed the tests easily as she memorised the answers, which usually would be a positive thing, but her 'non-rehearsed' response was overlooked. She could not have told you the colour of her jumper or the date. This was not helpful for us as we could see something was going wrong and getting worse. But there was nothing we could do.

Although I am unsure what effect it would have had, I wish there had been more advice, more in-depth explanation available on the illness. I feel this may have offered us an insight of what to expect as the disease progressed. "It's just Parkinson's disease" isn't very helpful although it may be true. There must be more information or warning signs that families can be made aware of, and future potential developments of Parkinsons' such as dementia. Advisory information on legal aspects such as Power of Attorney would be valuable as this is something we struggled with, being unaware there are two different types. Information leaflets in hospitals or easier access to online support would have been useful. It is difficult as a family member to think rationally as you are emotional; you want an answer, a cure, something.

Years 8 – the present day (Advanced Parkinson's and Lewy Body Dementia diagnosis)

At the beginning of her 8th year with Parkinson's disease she had been in hospital and quickly discharged. This was via the social worker who visited her twice as she was now deemed mobile due to having the ability to walk up two stairs. We had tried to argue against this point as we were frightened something was going to happen to her when she was at home, because we could not watch her 24 hours a day, 7 days a week. Nor would she have allowed this.

A month later, after many falls due to mobility issues, the last fall hospitalised her. My sister had found my Nan on the sofa with her hair matted with blood. She noticed a pool of blood on the floor at the side of her radiator at the bottom of stairs which were also blood-stained. It is clear what had happened – she had fallen down the stairs and hit her head. Nan had no idea she'd done this. It seemed now that the carer arranged by social services to come and visit her three times a day to make sure she was eating, drinking and taking her medication, wasn't enough. Heartbreaking.

This was the steepest decline we saw. Nan's face became more deadpan, she was either immobile or could run and became violent in hospital. Nan's aggression must have been horrifying as there have been accounts of her punching nurses, trying to escape from the hospital and refusing food. It was clear she would be going into a care home, which was the next difficult step.

Nan would have never wanted any of this; she always said she'd rather be dead than in a home. The decision my Dad and Uncle had to make that day was probably the hardest choice they'd had to make in their lives. We went through moments over the last few years where we thought she was possibly dying and preparing for that moment, and then she was diagnosed with Lewy Body Dementia on top of her Parkinson's.

The care home is perfectly fine, we have had a few funding applications rejected for her care but you hear about this across the board, as generally care homes are underfunded. We are grateful for the care they provide as she is not an easy patient at all. The violence she shows, but the bruising from the falls is hard to see and surprisingly she's never broken anything – but with each fall you do think, 'is this it?'

The constant emotion you feel is that you want them to die, because you want them to go with dignity intact and still be that family member you know. This hasn't happened.

As I live in London I try to visit her when I can but it is emotional and just horrible every time, as you go in there and look at a shell of the woman you once looked up to. I have started to feel selfish about her visits, as I want every moment I can with her and have bought her presents so I'm doing the right thing, although she has no idea. Deep down this is all for me and not her, which is a very confusing feeling.

My Nan that I love dearly is now just her condition and no longer my Nan.

Thank you for reading this article

ACKNOWLEDGEMENTS

1. My beautiful Nan as without her strength I certainly would not be able to write an article like this, although she will never read or understand it.
2. My family – thank you for your support throughout writing this article in what is an incredibly challenging time. We will continue fighting the fight, as they say, and in time I do hope that other family members do not have to experience this or feel more prepared for it if it does happen.
3. My colleagues (Neuroimmunology & CSF Laboratory, UCLH London) – I presented this topic to my team and the support and gratitude I received from them was humbling. (https://www.uclh.nhs.uk/OurServices/ServiceA-Z/Neuro/NEURI/Pages/Home.aspx)

Please note that due to my Nan's mental capacity I have obtained consent from my Dad who has fully approved this article and hopes that it reaches out to others in a similar situation and assures them that they are not alone in their struggles with coping with such a condition.

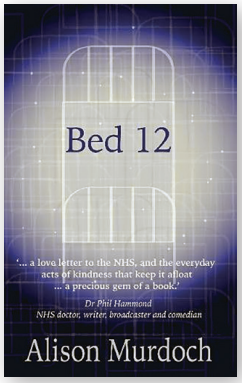
Bed 12

From the unassuming title describing the intensive care unit (ICU) location of the author's husband over one entire summer, to the religious references, I found Bed 12 to be an informative yet rewarding and heart-warming read. Bed 12 is not a neurological textbook but a first-hand poignant experience of dealing with a loved one with life threatening suspected viral encephalitis. This enriches the book greatly and I would recommend it to all, since it offers an additional perspective to medical students and others learning about neurology. The book is an affirmation to all the busy hospital staff that relatives and patients are deeply thankful and grateful to for the unrelenting intensive care and attention given in our wonderful NHS hospitals. The book is well written, humorous at times, and accessible, even to those not medically trained.

Simon had firstly become unwell with a headache. He subsequently arrived home from work unsteady on his feet, eyes half closed and very quickly deteriorated, unable to speak, agitated and almost unconscious. The strength and calmness of the author Alison Murdoch during the acute illness leading to her husband's coma and long stay in ICU is uplifting and reassuring and should I find myself in the same boat I will be re-reading this book. Further chapters detail the gravity and realities of over a month's stay in ICU when the outcome was less than certain and the impact this had on the author who maintained an almost constant vigil. The uncertainty that surrounds the outcome shows there is still much to be learnt about this devastating illness.

The breakthrough chapter documents the awakening from the coma, the fast exit from ICU and the differences in intensity of hospital care. Aftermath details the move home, the continuing impact of the illness on the wider network and the long recovery. The Epilogue is written from the patient's (Simon's) perspective of his illness. He has no recollection of his time in ICU, a reminder that it is loved ones that bear the deepest memories of this time. It is notable that it took over a year for him to recover some functions despite a 'miraculous recovery' from encephalitis.

As a scientist directing a laboratory helping to diagnose autoimmune encephalitis, the grittier detail of this illness is not spared in this book and this is a welcome reminder. The mark of encephalitis is deep and longstanding, affecting a much wider group of people than just the patient and for a much longer time period than the hospital stay.



Author: Alison Murdoch
Publisher: Hikari Press; New edition (25 May 2017)
Price: £9.99
Paperback: 178 pages
ISBN-13: 978-0995647800

Reviewed by: Melanie Hart. Principal Clinical Scientist and Laboratory Director, Neuroimmunology and CSF Laboratory, Institute of Neurology, University College Hospitals NHS Foundation Trust, London, UK. I can confirm I have no conflicts of interest.

Alison Murdoch has had a varied career as a writer, contributor to BBC Radio and also works for a charity based in a London Tibetan Centre.

The Oxford Textbook of Neurocritical Care

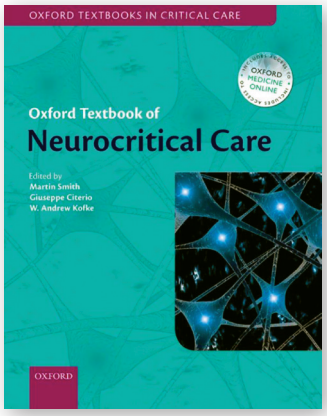
"The Oxford Textbook of Neurocritical Care" is edited by Martin Smith, Giuseppe Citerio and W. Andrew Kofke with contributions by several international authorities from the disciplines of general and neuro critical care. Indeed, most chapters benefit from more than one author.

This volume will be most appreciated by physicians with neurocritical duties and neurologists or neurosurgeons who subspecialise in traumatic and vascular brain diseases.

The book is laid down in three parts. The first part provides a thorough description of essential neurophysiology, neuropathology, and neuropharmacology. The in-depth details in this section cater especially to critical care physicians. Likewise, the second part which details different monitoring techniques and neuroimaging.

For me, the third part of the textbook was most useful. This section includes chapters devoted to specific brain conditions – different forms of stroke, traumatic brain injury, status epilepticus and several others. The schematic illustrations which complement the expansive text on each topic are especially good.

I would recommend this book to anyone involved in caring for patients with acute neurological disease.



Edited by: Martin Smith, Giuseppe Citerio and W. Andrew Kofke. **Published by:** Oxford University Press. **Price:** £116.69. **Pages:** 438
ISBN: 978-0-19-873955-5. **Reviewed by:** Dr Ranjith K Menon, MD, FRCP(Edin), MD(Res), MRCP(Neuro), Fellowship Stroke Neurology (Univ Toronto).

Chris Bryant MP to speak at Acquired Brain Injury conference in March

Chair of the All Party Parliamentary Group for Acquired Brain Injury (ABI), Chris Bryant MP, will formally open the Acquired Brain Injury conference, hosted by Chroma, the UK's only national provider of arts therapies services.

The conference takes place on 15 March 2018 at BMA House in London. 'Arts Therapies and Brain Injury: Optimising Outcomes Across Assessment, Treatment and Care' is set to host seminars and workshops based on Arts Therapies and its use within brain injury rehab.

The Conference brings together some of the leading authorities and influencers in this field, to deliver the latest research and scientific evidence on how arts therapies are improving outcomes for patients recovering from acquired brain injuries.

Clearing the fog: MOG-antibody associated disease – an emerging clinical picture

Review by: Dr Charles Wade, Neurology Junior Clinical Fellow at Royal Free Hospital, London.

Conflict of interest statement: Dr Wade has received no support from any organisation for the submitted work. He has no financial relationships with any organisations that might have an interest in the submitted work and has no other relationships or activities that could appear to have influenced the submitted work.

Myelin oligodendrocyte glycoprotein (MOG) is a membrane protein expressed on oligodendrocytes and on the outermost surface of the myelin sheath. Anti-MOG antibodies (MOG-Ab) recently emerged as potential biomarkers in a phenotypically-distinct group of patients with inflammatory demyelinating diseases (IDD). More described and defined forms of IDD include multiple sclerosis (MS) and aquaporin-4 (AQP4)-Ab associated neuromyelitis optica spectrum disorders (NMOSD), but a separate MOG-Ab-specific disease profile is now emerging.

Accurate diagnosis of IDD aetiology is essential as disease course and treatment options vary. Immunomodulatory therapies that work for MS have been shown not to benefit or have a detrimental impact in NMOSD, which is more effectively treated with immunosuppressant therapy.

Within the past month, four large case-series have been published detailing MOG-Ab disease. A clinical picture is now emerging that includes a female predominance and an average onset in the early to mid-thirties. Ramanathan et al published a retrospective case series of 59 (33 paediatric and 26 adult) patients with relapsing demyelination (≥2 episodes) and MOG-Ab seropositivity. Bilateral optic neuritis was the most common initial presentation and unilateral optic neuritis was the most frequent phenotype throughout disease. ADEM was prominent in children, while transverse myelitis was more common in adults. Demyelinating episodes in almost half the patients were preceded by an infectious prodrome, a finding shared by Mariotto et al, who published a cases series of 22 seropositive MOG-Ab patients, suggesting the potential role for an uknown pathogen acting as a self-mimic agent leading to direct damage and further activation of the immune system.

Both papers emphasise the vast diversity in phenotypes associated with MOG-Ab demyelination, and the overlap that may be present between patients with clinically definite MS and NMOSD. Possibly refining the picture slightly, Hamid et al published a retrospective case series of 34 MOG-Ab patients, comparing them with 100 patients with AQP4-Ab NMOSD in a tertiary neurological centre. Interestingly, five of the 34 patients with MOG-Ab (14.7%) had seizures compared with just 1 patient with AQP4-Ab (2-sided P<.008, Fisher test). All MOG-Ab with seizures had inflammatory cortical brain lesions on MRI, and 3 out of 5 presented with seizure as part of their index event.

Not only distinct at onset, Jurynczyk et al, who have published the largest case-series of MOG-Ab seropositive patients yet (252 patients acors at least 16 months), suggest MOG-Ab disease also runs a different disease course. Their paper suggests MOG-Ab prognosis is generally favourable; recovery from onset attack was full or good in 78%, and relapse rate at 16-months was 36%. After median disease duration of 28 months, the paper found that permanent disability occurred in about half of patients and more often involved bladder/bowel sphincter (28% and 20% respectively) and erectile function (21%) than vision (16%) or mobility (7%). When compared to previous work, NMOSD appears far more disabling – after 25 months from onset, disability (as defined by an Expanded Disability Status Scale score >6) occurred in 4% on MOG-Ab compared to 25% of those with AQP4-Ab disease.

All four papers comment on MRI appearance. The MRI Brain of MOG-Ab positive cases show nil abnormality, unspecific findings, optic nerve involvement, or other abnormalities resembling those observed in NMOSD and MS (though only a small percentage fulfill revised McDonald Criteria). Supporting previous data, Mariotto et al and Ramanathan et al note the prevalence of fewer brain lesions (< 2) in patients with MOG-Ab compared to seronegative ones. Both further agree that optic neuritis (unilateral/bilateral/both) and/or radiological involvement of the optic nerve appears to be the predominant finding in MOG-Ab cases. Spinal lesions, if present, were usually short. Further refining the diagnostic process, Mariotto et al analysed seropositive cases for MOG-IgG subtype. IgG1 was the most predominant subtype and results suggested that both anti-total IgG and IgG1 based assays could give comparable results. Due to the high sensitivity of IgG subclass test, IgG1 assay could even identify also patients below the cut-off for total IgG. MOG-Ab titres decrease in non-relapsing cases, regardless of level of recovery, and could fall below the cut-off, highlighting the importance of testing patients during the acute phase.

Regarding treatment, Jurynczyk et al showed that immunosuppression with steroids longer than 3 months following the onset attack was associated with a lower risk of a second relapse. Ramanathan et al suggest that patients with relapsing MOG-Ab disease are also steroid responsive, but frequently relapse with low doses or with rapid taper. Interestingly, some patients on maintenance low-dose prednisone alone had a relapse-free course, suggesting this may be effective in sustaining remission. A subgroup of MOG-Ab patients remained relapse free on no immunotherapy for a long time after initial steroid treatment with steroids, and had a relapse many years later.

Ramanthan et al. Clinical course, therapeutic responses and outcomes in relapsing MOG antibody-associated demyelination.
J Neurol Neurosurg Psychiatry. 2018 Feb;89(2):127-37.

Marrioto et al. Clinical spectrum and IgG subclass analysis of anti-myelin oligodendrocyte glycoprotein antibody-associated syndromes: a multicenter study. Journal of Neurology. 2017 Dec;264(12):2420-30.

Hamid et al. Seizures and Encephalitis in Myelin Oligodendrocyte Glycoprotein IgG Disease vs Aquaporin 4 IgG Disease. JAMA Neurol. 2018 Jan;75(1):65-71.

Jurynczyk et al. Clinical presentation and prognosis in MOG-antibody disease: a UK study. Brain. 2017;140(12):3128-38.

A packed programme to ensure attendees, including social care staff, NHS workers, students, charities and anyone involved in rehabilitation get the most out of the day will include a client's story of their rehab experience with arts therapies.

Dr Jeanette Tamplin of the University of Melbourne will provide an introduction to the evolving field of the creative arts therapies within brain injury rehabilitation, covering current research and practice. Sarah O'Doherty and Rebecca O'Conner of the National Rehabilitation Hospital will present their Music Therapy Neuropsychology Assessment Model.

The day will also provide practical hands-on workshops, which allows delegates to experience, engage with and understand an art therapy process from a client's/patient's point of view. A special workshop brings together physiotherapy and music therapy approaches to introduce the neuro-scientific framework for motor symptoms in neurology and movement stimulation by music and rhythm.

Dr Wendy Magee from the US will showcase the MATADOC assessment for patients with prolonged disorders of consciousness (PDOC) that she and her colleagues pioneered.

The completion session will be a commissioner 'insight' piece about using the neurologic music therapy within a leading paediatric neuro rehab hospital.

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ABN Trainees' Preview of the Birmingham 2018 ABN Meeting

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Ever since the Midlands enlightenment and subsequent Industrial revolution in the 18th century, Birmingham has been at the forefront of worldwide advances in science, technology, industry and economic development. Home of many inventions, including the steam engine and Xrays, Birmingham has become a large and diverse metropolis, earning the title of "the first manufacturing town in world" as early as 1791. Inspired by the industrious past and present of the city, the ABN returns to Birmingham's ICC, winner of the 2017 UK Best Conference Venue, for its 2018 ABN Annual Meeting with an innovative programme.

We start on the 8th of May with the ABN Trainees' Day which has been established as a major teaching and meeting day for neurology trainees across the UK. This year, we will address the topics that neurology trainees described as most difficult, starting with Referrals and Triage; four small group sessions will teach us how to better respond to A&E, ward and ITU referrals. We continue with a review of Idiopathic Intracranial Hypertension by local expert Dr Alex Sinclair and a masterclass on How to approach the unconscious patient by Dr Robin Howard, an expert in neurocritical care. The day will finish with the Clinical skills laboratory: Keeping out of trouble with the clinical and managerial confessions of Prof Adrian Williams, chair of the National Neurological Advisory Group.

In parallel with the SpR session, medical students, foundation doctors and core medical trainees interested in neurology will have the opportunity to attend an excellent series of talks and case studies chaired by Chinar Osman, regional ABN Trainee representative. There will be insight into what neurologists do and where we fit in the wider neuro family, case studies on acute neurology, stroke and from the outpatient clinic as well as plenty of advice on how to pursue a career in neurology - encourage your junior colleagues to come along!

The pre-meeting day will finish with an evening Research workshop where great speakers will share their insight on combining academic and clinical interests during and after neurology training. The main ABN meeting, running from 9th to 11th of May 2018, will have an equally interesting and full programme. The meeting will focus on areas of innovation in neurology including neuroinflammation, acute neurology, vascular neurology and genetics. Dr John Trojanowski of the University of Pennsylvania and Dr Bastiaan Bloem of Radboud University will deliver the Gordon Holmes and Practical Neurology Lectures respectively. With several parallel sessions, Special interest groups and posters covering the width and breadth of neurology, this year's ABN Annual Meeting will be one of the most industrious yet!

And after the first day of the meeting, time to relax and catch up with friends at the annual Trainees' Dinner; this year at the Bank restaurant, in the cosmopolitan Brindleyplace.

About Birmingham

The second largest city in the UK after London, Birmingham is a booming metropolis. Known for its industry and innovation, Birmingham is home to many attractions for those who have time to wander in between parallel sessions, lectures and posters.

Major tourist attractions include Back to Backs, a restored courtyard of 19th century working people's houses, the Birmingham library, the National Motorcycle Museum, the Barber Institute of Fine Arts and the Birmingham Museum and Art Gallery. Within walking distance from the conference venue, you can find the Symphony Hall, Victoria Square with one of the largest fountains in Europe known as "The River", the Gas street basin and Bingley Hall, the world's first purpose-built exhibition hall.

With such an excellent programme and venue, this year's meeting is promising to be one to remember; we would love to welcome everyone there.

New video guide to diagnosing Parkinson's disease

The Parkinson's Academy is working with Dr Frank Phelan, the 2017 MasterClass Project Award winner, to turn his video guide to diagnosis project into an interactive tool for clinicians. The MasterClass project is an integral part of the Parkinson's MasterClass which attendees undertake on a subject of interest within their own work setting. Frank decided to use his MasterClass project as an opportunity to create a resource which gives a description of the core features of Parkinson's disease and all of its mimics side by side, all supported by video clips demonstrating particular features. Not only is this an aid for the diagnosis of Parkinson's disease, but also helps with the subtle differentiation between the other possible mimics such as multisystem atrophy, progressive supranuclear palsy, dementia with Lewy bodies, corticobasilar degeneration and essential tremor.

Putting together a library of video clips was no mean feat, and Frank found it quite a challenge to source videos with the necessary permissions (from both the publishers and patients). However, Dr Neil Archibald has kindly volunteered his own video material and now the plans to take Frank's project to the next stage are going ahead. The Parkinson's Academy team is working on developing the video guide to diagnosis into a user friendly interactive tool, which clinicians can easily explore.

Read more about Frank Phelan's video guide to diagnosis project at http://bit.ly/2DxWbLa
See http://parkinsonsacademy.co for more information about the Parkinson's Academy.

PREVIEW: ABN annual conference 2018

Conference details: ABN annual conference 2018, 8-11 May, 2017; Birmingham, UK.


Jon Sussman

Birmingham, the first manufacturing town in the world contributed to advances in science, technology, and economic development that laid many of the foundations of modern industrial society, as well as being the home of a broad-based political radicalism which had a pivotal role in the creation of British democracy. Birmingham looks to the future but always with an eye to the past. In this spirit, we will enjoy many facets of this heritage, historic, academic, cultural and culinary.

The conference opens on Tuesday 8 May with the Foundation Doctor Session and the ABNT Registrar Training Session, including the research workshop, now in its 5th year. We are also holding another 'Need to Know Neurology' session for GPs.

We are delighted to announce that Chris Kennard is the 2018 ABN Medallist. On Wednesday 9 May, John Trojanowski, from the University of Pennsylvania School of Medicine will deliver the 24th Gordon Holmes lecture. In addition, Bastiaan Bloem, Nijmegen will deliver the Practical Neurology lecture on Friday morning.

On Thursday morning our AGM will be extended to include a business session featuring models of acute neurology care delivery. The Special Interest Groups will run sessions on Thursday and Friday mornings. This meeting's SIGs include, Muscle diseases, Cognitive Disorders, Functional disorders, Multiple Sclerosis & Neuroinflammation, Movement Disorders, Peripheral Nerve and Neuro-opthalmology. The SIG meetings offer an opportunity to hear updates in the field, to discuss interesting cases and meet with friends and future clinical and research collaborators.

The plenary sessions this year features Neuroinflammation, including an update on vasculitis, Sjögren's disease and new treatments for MS. From genes to the environment will showcase up to the moment data on new therapy for Huntington's chorea, Nutritional deficiencies - from famine to feast, and on the 100th anniversary of the First World War we'll hear about the significant contribution of war to neurology. The Acute Neurology session will look at our contribution to care on the obstetric unit and the ITU. With exciting new developments in vascular neurology, we'll hear about the role of thrombectomy as well as the diagnostic dilemmas of embolic stroke of unknown origin and strokes in the young. In addition there will be video sessions with fascinating contributions on Sleep, Epilepsy, Neuro-ophthalmology and Movement disorders. Once again there'll be a CPC in which you can compare your analytic skills with David McKee, though unlike him, you can keep your diagnosis to yourself...if required.

2018 has seen another record number of abstracts submitted, assisted by the early career researcher abstract bursary, and we will have six parallel platform sessions and two guided poster sessions in addition to the ever popular case presentations competition. The Annual General Meeting will be held on Thursday 10 May at 1145. The Gala dinner will be held in the beautiful historic Birmingham City Council House. In addition we have a fun run and a historic walking tour of Birmingham. We hope you enjoy the meeting in the multifaceted heart of the Black Country.

Pre-Meeting Training and Development Day – Trainee Doctors – 8 May 2018

Chair: Sam Shribman, Angeliki Zarkali		
1300	**Small group teaching** 4 x 20-minute interactive small group sessions (plus change-over time) covering:	**Referrals and triage – how to manage them:** - **A+E** - **Wards** - **ITU** Alex Foulkes, Tom Hayton, Ben Wright, Naz Sharaf
1445	**Idiopathic intracranial hypertension**	Alex Sinclair
1515	Tea break	
1545	**Neurocritical care: Approaching the unconscious patient**	Robin Howard
1615	**Clinical skills laboratory:** 'Keeping out of trouble'	Adrian Williams
1700	Reception, light refreshments	

Research workshop: Pathways In Neurology Research ***Chair: Martin Turner***	
1720	Research workshop: My working life - Four short talks with Q&A with different academic focus in terms of their techniques and day-to-day • Mary Reilly • Jacqueline Palace • Kevin Talbot • Martin Turner Four talks from clinician scientists on pros and cons of research based in genetics, epidemiology and neuroimaging
1920	Close

Pre-Meeting Training and Development Day – Foundation Doctors – 8 May 2018

I want to be a neurologist! *(a meeting for Foundation doctors interested in neurology)* *Chair: Chinar Osman*		
1300	**What neurologists do and why**	David Nicholl
1330	**Who do neurologists work with** Relationships to neurophysiology, neurosurgery, neuropsychiatry, etc	Tom Warner
1350	**Case-based discussions** Part 1 (acute neurology and stroke)	Martin Punter
1435	**Case-based discussions** Part 2 (neurology in clinic)	Tabish Saifee
1515	Tea break	
1545	**Becoming a neurology trainee**	Chinar Osman ABNT Wessex Regional Trainee Representative
1615	**Clinical skills laboratory:** 'Keeping out of trouble'	Joint with trainee session Adrian Williams
1700	Reception, light refreshments	

Research workshop: Pathways In Neurology Research ***Chair: Martin Turner***	
1720	Research workshop: My working life - Four short talks with Q&A with different academic focus in terms of their techniques and day-to-day • Mary Reilly • Jacqueline Palace • Kevin Talbot • Martin Turner Four talks from clinician scientists on pros and cons of research based in genetics, epidemiology and neuroimaging
1920	Close

	Wednesday 9 May			
09:00	**Opening and Welcome:**			
09:15	**Plenary session 1: Neuroinflammation** • CNS Vasculitis: Neil Scolding, Bristol • What's the next drug for MS?: Emma Tallantyre, Cardiff • Connective Tissue Disease/Sjogren's: Aleksandar Radunovic, London			
10:45	Coffee & Exhibition 1			
11:15	Parallel session 1		Parallel session 2	
12:30	Lunch, Exhibition **Novartis (MS)** Combining 'Magnetic' Forces; streamlining communication between neuro-radiologists and neurologists in MS		**Biogen (Alzheimers)** Early & accurate diagnosis of Alzheimers	
14:00	**Gordon Holmes Lecture:** Neurodegeneration: John Trojanowski, Pennsylvania			
14:45	**Video session: 4x15 minutes** • Sleep: Paul Reading, Middlesbrough • Epilepsy: Markus Reuber, Sheffield, • Neuro-ophthalmology: Gordon Plant, London • Movement disorders: Chris Kobylecki, Manchester			
15:45	Coffee & Exhibition 2			
16:15	Parallel Session 3		Parallel session 4	
17:30	Poster session with discussants 1			
18:45	Drinks reception + posters			

	Thursday 10 May			
07:45	SIG 1: Cognitive disorders	SIG 2: Movement disorders	SIG 3: Neuro-ophthalmology	SIG 4: Peripheral nerve
09:00	**Plenary session 2**: **From Genes to Environment** • Gene silencing therapy development for Huntington's Disease: Sarah Tabrizi, London • Nutritional deficiencies - from famine to feast: Lionel Ginsberg, London • Contribution of war to neurology: Matthew Craner, Oxford			
10:30	Coffee and Exhibition 3			
11:00	Poster session with discussants 2			
11:45	**AGM + business session including models of acute neurology care delivery**			
13:15	Lunch, Exhibition **Roche (MS)** MS: Beyond the relapse		**Teva (Migraine)** Entering a new era for migraine management	
14:45	Parallel Session 5		Parallel session 6	
16:00	Coffee and Exhibition 4			
16:30	**ABN Medallist Lecture:** Chris Kennard, Oxford			
17:15	**Late breaking news**			
17:35	ABNT Forum			
19:00	Gala Dinner			

	Friday 11 May		
07:45	SIG 5 Myology	SIG 6 Functional disorders	SIG 7 MS and neuroinflammation
09:00	Case presentation competition		
10:15	Practical Neurology lecture: Bastiaan Bloem, Nijmegen NL		
11:00	Coffee and Exhibition 5		
11:30	**Plenary session 3 – Acute Neurology** Chair: Derek Bell • Acute medicine: Derek Bell, RCPE • Neurology of Obstetrics: Dominic Heaney, London • Neurological consults on the ITU: Max Damian: Cambridge		
13:00	Lunch, Exhibition **Merck (MS)** DMT Sequencing Algorithms in MS: How does MAVENCLAD (cladribine tablets) contribute?		**ABN top 6 posters**
14:30	**Plenary session 4-Vascular neurology** • What's new in large vessel disease/genetics of stroke/ESUS and anticoagulation for stroke tbc: Hugh Markus, Cambridge • Stroke in the young: Tom Hughes, Cardiff • Thrombectomy – what can we do and how can we implement it?: Jeremy Madigan, London		
16:00	**CPC** Tom Hayton/Saiju Jacob		
16:45	Prize presentations and close		
17:15			

Recovery after Brain Injury - State of the Art: A Report

Conference details: October 13th, 2017, London, UK. ***Report by:*** Dr Tom Balchin, Director, the ARNI Institute & Senior Research Fellow, Oxford Brookes University. ***Conflict of interest statement:*** None declared.

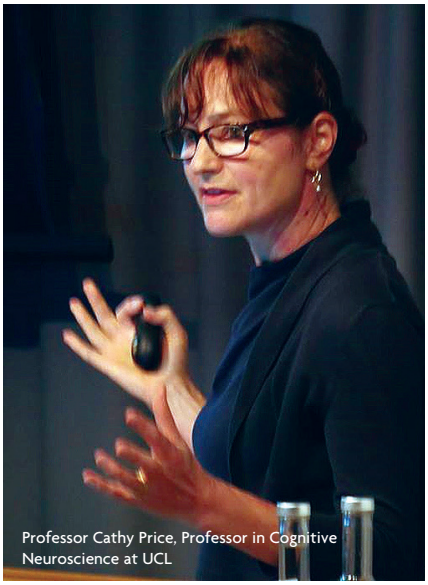
On October 13th 2017, the ARNI Institute for Stroke Rehabilitation and the Institute for Sport, Exercise and Health combined forces to run the 'Recovery after Brain Injury – State of the Art' Conference at the Royal Society of Medicine. Chaired by Professor Alan Roberts OBE, Professor Hugh Montgomery, Professor Helen Dawes and Dr Tom Balchin, the Formal Welcome was given by the Rt Hon, the Lord Lingfield, DL, Kt., and the Address was given by HRH Princess Katerina of Yugoslavia. The theme was recovery from acquired brain injury: stroke in particular.

Professor of Stroke Medicine at the University of Leicester, Thompson Robinson, noted the many strides forward in acute ischaemic and haemorrhagic stroke treatment over the past 10 years, which has contributed to a reduction in mortality from 25% to 12%. He stated that the most significant factor leading to better patient survival rates is the rapid access hyper acute stroke units. He warned that with the number of people registered as hypertensive consistently increasing since 2005, that there could be up to another 6.8 million people in the UK with undiagnosed high blood pressure.

Professor of Stroke Medicine at Keele University, Christine Roffe, reported that early treatment with aspirin following the IST study has undoubtedly been a significant factor. Pneumonia, caused by aspiration of saliva and vomit, remains the most common cause of death after stroke, and there is good evidence that early screening for swallowing problems lowers the risk. Maintenance of normal physiological parameters, such as blood pressure, body temperature, oxygen levels, and blood sugar have also been shown to be important for better outcomes.

Professor of Clinical Neurology and Neurorehabilitation at UCL, Nick Ward, noted that stroke appears to induce the critical period plasticity that supports recovery. Further, that we should seek evidence of this in humans to justify early and intensive therapy/training. He stated that the evidence shows that the window for plasticity may return to 'normal' levels after a few months, but it does not shut. Importantly, drugs (e.g. fluoxetine) are available to increase the potential for plasticity right now, but in order to know who and when to treat, he highlights the need for biomarkers of plasticity mechanisms in humans.

Professor of Cognitive Neuroscience at Oxford University, Heidi Johansen-Berg, confirmed how non-invasive brain imaging techniques can be used to detect systems-level structural and functional plasticity in


Professor Cathy Price, Professor in Cognitive Neuroscience at UCL

the human brain. She stressed that although imaging is useful to detect such adaptations, many imaging measures are non-specific and do not allow us to pinpoint the underlying cellular changes that are driving observed effects. She predicted that in the future, imaging could be used to guide individually targeted brain stimulation to enhance adaptive brain plasticity.

Professor of Neurorehabilitation at the University of East Anglia, Val Pomeroy, reported on the creation of a free app called 'Viatherapy'. This is designed to enhance the ability of clinicians to be current in their use of evidence-based stroke rehabilitation interventions for the upper limb. Through answering a series of questions that the app poses, the therapist is guided to the current best treatment options based on the motor impairment characteristics of each individual after stroke. These options can then be refined by considering other aspects of the individual's clinical presentation such time after stroke and whether apraxia is present.

Professor in Cognitive Neuroscience at UCL, Cathy Price, (pictured) spoke about how people recover the power of speech after stroke. She confirmed that not being able to speak to family and friends is one of the most devastating consequences of stroke. Patients desperately want to know if they will recover but currently, clinicians can't provide accurate predictions. Cathy and her PLORAS team are predicting recovery based on which parts of the brain have been damaged by the stroke. The results are proving to be much more useful than previous methods. The goal is to improve the quality of life for as many stroke patients as possible.

Consultant in Stroke Medicine at Imperial College Healthcare NHS Trust, Soma Banerjee, informed Conference about a stroke therapy using stem cells extracted from patients' bone marrow which has shown promising results in the first trial of its kind in humans. She noted that the study showed that the treatment appears to be safe and that it is feasible to treat patients early when they might be more likely to benefit. She noted that it is currently too early to draw definitive conclusions about the effectiveness of the therapy.

Associate Professor in Psychology Applied to Rehabilitation and Health at Exeter University, Sarah Dean, spoke about the clinical effectiveness and cost effectiveness of the ARNI Programme (the ReTrain Trial). ARNI (Action for Rehabilitation from Neurological Injury) Institute Charity was set up in 2001 by Dr Tom Balchin. It provides a community-integration and support network for survivors by matching them with its therapists and instructors. These specialists teach its intensive and creative programme which features innovative techniques such as a rotational technique to get off the floor without assistance, and the use of implement-challenge boards to train the reach, grasp and release components of the upper limb.

Professor of Restorative Neuroscience & Rehabilitation at the University of East London, Duncan Turner, presented the results from some patients who had taken part in the RATULS (Robotic Assisted Training for the Upper Limb after Stroke) Trial so far. He charted the improvement in fine movement control in these patients before and after the intervention and noted that robots, which can carry out 1,000 repetitions an hour, can dramatically augment the therapist's power to deliver clinically-meaningful input volume.

Key emergent themes from the event were that early intervention, repetitive practice, meaningful tasks and intensity are primary drivers for successful recoveries after stroke. Our grateful thanks to guest speaker Michael Lynagh, and ACNR Publisher Rachael Hansford, who donated a box of the latest issues.

Swansea University & Elysium Neurological 'Neurobehavioural Disability after Acquired Brain Injury: Advances in the Management of Social Handicap' conference

Conference Details: 27 November 2017, Swansea, UK. ***Report By:*** Dr Claire Williams, Senior Lecturer, Department of Psychology, College of Human and Health Sciences, Swansea University. ***Conflict of interest statement:*** None declared.

The conference brought together some of the leading experts to present the latest developments in the management of challenging behaviour and social handicap after acquired brain injury (ABI). In addition to an impressive ensemble of speakers, the conference attracted a range of exhibitors and over 100 delegates involved in the care of individuals with ABI. The conference provided an excellent learning environment for delegates to share knowledge and there were plenty of opportunities for questions and discussions, enabling further insights and debates to be aired. The whole event was full of energy and enthusiasm.

Professor Nick Alderman (Clinical Director, Neuropsychological Rehabilitation Services, Elysium Healthcare) commenced proceedings by delivering an authoritative account of the conceptualisation and assessment of neurobehavioural disability. He presented an overview of the St Andrew's Swansea Neurobehavioural Outcome Scale (SASNOS; sasnos@swansea.ac.uk), covering information related to its initial development, its core features and benefits, as well as information about recent SASNOS developments. With the latter, he explained how ratings of NBD concerning patients in residential rehabilitation programmes reflect the prevalence of behaviours and functional abilities in the context of rehabilitation, acknowledging that we cannot assume that results obtained will be generalisable to other settings. Sometimes ratings on various tools can be comparable with neurologically healthy people and could prompt discharge to a less restrictive environment. However, whilst rehabilitation ideally results in long-lasting change, some improvements require ongoing support which standardised scores in the 'normal' range do not indicate by themselves. The risk is that some people may be discharged from services prematurely without the support needed to maintain autonomy. To mitigate this risk, he highlighted how a supplementary SASNOS scoring system[1] can be used to recalibrate standard scores to estimate the effect on ratings without support.

Professor Alderman concluded his talk by explaining that the conference programme had been structured to address how social handicap could be minimised in the five major domains of NBD captured by the SASNOS – interpersonal relationships, neurocognitive function, inhibition, aggression, and communication.

With the contextual back-drop to the conference set, Dr Giles Yeates (Principal Clinical Psychologist, Community Head Injury Service, Buckinghamshire Healthcare NHS Trust) and Eachelle Khan (Assistant Psychologist) took to the stage next to focus on how we can support interpersonal relationships following ABI. Dr Yeates explained how brain injury represents a simultaneous attack on relationships and self, representing an eroding ripple that passes through all relationships in a survivor's social network, proceeding over time through closer relationships. He explored the usefulness of emotionally-focussed couple's therapy after ABI, the therapeutic working alliance in neurorehabilitation, and emphasised how rehabilitation goals for supporting inter-dependence and connection with others should be a routine priority.

Professor Barbara Wilson OBE (Clinical Neuropsychologist, The Oliver Zangwill Centre and The Raphael Medical Centre) discussed the rehabilitation of everyday cognitive deficits with a particular focus on memory. At the start of her talk she reminded us that rehabilitation is NOT synonymous with recovery OR treatment, and that rehabilitation IS a two way interactive process. In relation to neuropsychological rehabilitation, the main purpose is to enable people to achieve their own optimum level of wellbeing, to reduce the impact of their problems on everyday life, and to help them return to their own most appropriate environments. She outlines a multitude of helpful strategies and rehabilitation approaches. Having published 23 books during her impressive career, I suspect that many who attended will have had a few of her books on our Christmas 2017 'Wish Lists'!

The next speaker was Professor Andrew Worthington (Clinical Director, Headwise) who presented 'An Uninhibited Guide to Disinhibition' – a title that had grabbed many delegates' interest for months prior to the conference. Never one to disappoint, he started "as disinhibited as he dare!" and continued to present an informative guide on the assessment and management of disinhibition. He concluded with a look towards managing disinhibition in the next 10-20 years, providing delegates with much food for thought.

After lunch, Professor Alderman returned to discuss neurobehavioural rehabilitation approaches to the management of post-ABI aggressive behaviour disorders. After opening with a game of 'Bruce Forsyth's Play Your Cards Right' to outline the prevalence of aggression in neurorehabilitation services, he proceeded to explore neurobehavioural rehabilitation in practice whilst emphasising the importance of the transdisciplinary team. With the focus on multicomponent interventions to manage post-ABI aggression, delegates received a whole host of helpful suggestions and approaches for future consideration.

Drawing towards the end of the conference, Dr Jennifer Brooks (Consultant Clinical Psychologist, Elysium Healthcare) concentrated on the rehabilitation of the neurobehavioural manifestations of communications disorders. With a particular focus on tangentiality, she proceeded to outline the impact of cognitive communication disorders and detailed strategies to reduce tangents. Owing to its practical significance and usefulness, the talk was very well received by delegates.

The final speaker of the conference was Dr Zoe Fisher (Clinical Psychologist in Neuropsychology, Community Brain Injury Team, Abertawe Bro Morgannwg University Health Board) who presented an incredibly interesting and inspiring overview of her team's revised approach to community based neurorehabilitation. She explained how their programmes make use of co-production, positive psychology and task shifting principles to improve resilience, wellbeing and facilitate community and social integration.

1. Alderman N, Williams C & Wood R. (2017). *When normal scores don't equate to independence: Recalibrating ratings of neurobehavioural disability from the 'St Andrew's – Swansea Neurobehavioural Outcome Scale' to reflect context-dependent support.* Brain Injury, 1-12. doi: 10.1080/02699052.2017.1406989.

Save the Date:
Next year's conference will take place on 26 November 2018, Swansea UK. Further details will be announced early 2018.

World Stroke Day Congress

Conference details: October 25-27, 2017, Moscow, Russia. ***Report by:*** Peter Sandercock, DM, FRCPE, FESO, Emeritus Professor of Neurology, University of Edinburgh. ***Conflict of interest statement:*** None declared.

More than 2800 neurologists and other physicians involved in stroke care from Moscow and more than 60 regions of Russia and 10 other countries, mostly Eastern European, as well as representatives of stroke support groups, attended the Congress. The meeting was held in the iconic Ukraina Radisson Royal Hotel Conference centre, in central Moscow. The Conference was organised by Professor Eugene Gusev, President of the All-Russian Society of Neurologists, and Professor Alla Guekht, Secretary of the All-Russian Society of Neurologists and the World Stroke Organization, with the support of the Ministry of Health of the Russian Federation, the Russian Academy Of Sciences, Moscow Healthcare Department, Pirogov Russian National Research Medical University, All-Russian Society of Neurologists, and the Moscow Research And Clinical Center For Neuropsychiatry.

In the spirit of international collaboration and scientific exchange of ideas and solutions to tackle the global burden of stroke, the conference was supported by representatives from major international stroke and neurological organisations:, World Federation of Neurology, European Academy of Neurology, American Academy of Neurology, European Stroke Organisation, International League against epilepsy.

The Congress focused on the latest developments in stroke prevention, acute management and restorative care after stroke, as well as on raising awareness about stroke and the need for better resources, sharing experiences in dealing with problems resulting from stroke, providing relevant information to stroke survivors and their caregivers.

The Congress book containing extended abstracts of all the talks was published in English and Russian, and the participants of the Congress received it for free. As many doctors in the former Soviet Union know English poorly, these books are extremely valuable for them.

Day 1 Education sessions and symposia

The congress got off to a great start, with the programme for the day including sessions on stroke in the young, rehabilitation after stroke, chronic cerebrovascular disease, clinical pharmacology and pharmacotherapy of stroke, current technologies in endovascular treatment of acute ischaemic stroke, management of stroke: challenges and solutions, organisation of stroke care, and a master class on multiple organ failure in severe stroke. The WSO members on the faculty who gave talks on Day 1 were Geoff Donnan on 'Thrombolysis, modern state and perspectives' and Peter Sandercock on 'Personalised Medicine: can it be applied in Stroke and can it be tested in trials?' and Wolfgang Grisold (from WFN) on 'Stroke and Cancer'.

Day 2 main scientific sessions

The scientific congress was formally opened by a Praesidium of Representatives of all the key organisations in contributing to the congress, with welcoming words from Parliament of the RF, Russian Academy of Sciences, Local organisers A Guekht and E Gusev and from W Hacke (representing WSO). ESO was represented by V Caso, EAN by D Leys, WFN by W Grisold, ILAE by E Perucca. It was followed by a series of expert talks from Russian colleagues, covering a wide variety of issues on current stroke care in the region. The afternoon sessions included updates on current standards in stroke diagnosis, role of neuropsychiatry in stroke, novel opportunities in stroke recovery, thrombolysis and a masterclass in chromotherapy. There was an important session on Cerebrovascular disease in ICD 11 with talks by S Murasev and E Salakhov (reresentatives of the MoH) on ' Role of the Russian Federation in international programme against brain diseases', B Norrving [WSO] on 'stroke as a brain disease in ICD 11 – what does it mean?', R Sacco [AAN) on 'Stroke prevention and Brain Health support' & V Caso [ESO] on 'Gender differences in people with ischaemic stroke). There was also a key session on post-stroke epilepsy with talks by A Hauser and S Moshe from USA, Professor A Guekht and E Perucca (Italy).

Prof Guekht and Immediate Past President of WSO, Prof S Davies discuss stroke rehabilitation

Day 3 Scientific sessions

The main plenary session was opened by Professor Veronika Skvortsova, the Minister of Health, and was followed by the Award of Diploma of the Foreign Members of the Russian Academy of Sciences. This was followed by a series of talks on major stroke topics: 'Intravenous thrombolysis – is still the most important and specific method of acute stroke therapy', W Hacke, 'Cognitive impairment after stroke is a heavy burden for patients, their families and society.' M Brainin, 'Reperfusion therapy and ischemic penumbra' S. Davis, 'Arterial hypertension and stroke' E. Chazov, I. Chasova, 'Approaches to lowering cardiovascular disease mortality in Russia' S Boitsov, 'Surgical treatment of stroke in Russia' V Krylov and 'Spinal Cord circulation disorders' A Skomorets. This session outlined the great progress that has been made in reducing the burden of stroke and vascular disease over the past decade, but also highlighted the priority actions for the future. Other interesting contributions in the day included sessions on stroke in childhood, ultrasound in diagnosis, 'Eye as a mirror of the brain' N Bornstein and a session on Post-Stroke cognitive impairment.

Visit to Moscow Research and Clinical Center For Neuropsychiatry

Prof Guekht arranged a fascinating and most enjoyable visit for the international faculty to her institution, at which research fellows presented their work on various aspects of cognition, neuroimaging, neuropsychiatry and rehabilitation. She invited her colleagues and collaborators to attend this meeting and present their institutions, so there was a possibility to get acquainted with the best University Hospitals/ Clinical Centers in Moscow: the Clinical Medical Center of the Moscow University of Medicine & Dentistry, Buyanov Moscow City Hospital of the Healthcare Department of Moscow and others. This was an excellent opportunity for scientific exchange and discussion. The significant achievements in the Moscow medical system – modern equipment, new technologies, well-trained doctors – were very impressive; the Buyanov Moscow City Hospital and the Moscow Research and Clinical Center of Neuropsychiatry were the perfect examples. The grounds of the Center include new buildings as well as some beautiful historic ones which have been renovated and preserved as monuments to the long scientific heritage of the unit.

Acute Dizziness and Balance workshop 2017

Conference details: November 20th, 2017, London, UK.
Report by: Dr Georgios Korres, BSc (Hons) CMB, MD, PhD, Clinical Fellow in Audiovestibular Medicine, Royal National Throat, Nose and Ear Hospital, University College London Hospitals NHS Trust.
Conflict of interest statement: Dr Korres used to work as a Clinical Fellow in Audiovestibular Medicine at the Royal National Throat, Nose and Ear Hospital where Dr Kaski runs weekly Neuro-Otology clinics.

An original attempt for a one-day workshop by one of the prestigious Consultants of the National Hospital of Neurology and Neurosurgery, Dr Diego Kaski, proved a great success in the heart of Central London, at the British Transport Museum.

Following the heavy legacy and continuous success of Queen Square's Dizzy course, this workshop – focussing on acute vertigo – was heavily subscribed by a large variety of professionals including Emergency Department clinicians, Physiotherapists, Audiologists, Scientists and GP practitioners. Its main aim was to introduce the audience to the basics of acute peripheral and central vestibular disorders, through a series of lectures delivered by worldwide leaders of the subject.

The hands-on sessions and interactive lectures were very fruitful, as they presented the audience with the opportunity to express all kinds of thoughts and questions, from basics up to more tortuous subjects. Given the ethnic and cultural diversity of the conference, the opinions and problems arising in different clinical environments certainly added experience to the understanding and treatment of vertigo and dizziness.

The conference opened with Professor Linda Luxon, who gave us a memorable lecture on the characteristics of central vertigo, comparing studies while adding her own professional experience. Dr Amanda Male, a Vestibular Physiotherapist at RNTNEH then followed with an update on the advances in physiotherapy and how it can be helpful to specific individuals suffering from disequilibrium.

Dr Diego Kaski, Consultant Neurologist and Chairman took the stand and introduced us to the practical sessions of the conference. By asking the delegates not only to observe but also to perform manoeuvres, such as the Semont and Epley repositioning manoeuvres for treatment of BPPV, he gave the audience the chance to practice their skills under the supervision of experienced Consultants.

Professor Adolfo Bronstein, Consultant Neurologist at the National Hospital of Neurology and Neurosurgery, gave a fascinating lecture on how to differentiate central from peripheral vertigo in acute settings, also providing specific examples and case reports.

Professor Doris Bamiou, Consultant in Audiovestibular Medicine at the Royal National Throat, Nose and Ear Hospital, gave an intriguing lecture on how the inner ear is vulnerable to stroke, introducing us to cortical agnosia and explaining auditory processing and auditory functions in stroke.

The afternoon sessions included a useful and informative discussion of the differences between vestibular neuritis and labyrinthitis, as well as a clear and practical overview of vestibular migraine by Dr Louisa Murdin. The workshop ended with a video-based case discussion focussing on the diagnosis and management of a variety of gait disorders that de-mystified and simplified such a complex and common neurological dysfunction.

The workshop has rightfully earned its place in the diary of Dizziness conferences in the UK.

The next meeting will be held at the Transport Museum on the 20th November 2018.

To list your event in this diary email Rachael@acnr.co.uk by 6th April, 2018

MARCH

Association of the European Pediatric Cardiologists (AEPC) Working Group Bi-Annual Conference "Neurodevelopment and Psychosocial Care from Fetus to Adult"
7-9 March, 2018; Leicester, U.K.
E. Wendy.Miller@uhl-tr.nhs.uk

Arts Therapies and Brain Injury: Optimising Outcomes Across Assessment, Treatment and Care
15 March, 2018; BMA House, London, UK
Book form at www.wearechroma.com

From Holmes to House – 500 years of the diagnostic neurologist
20 March, 2018; London, UK.
www.rcplondon.ac.uk/Holmes-to-House

APRIL

2018 Neuromodulation Society of Australia and New Zealand 13th Annual Scientific Meeting
6-8 April 2018; International Convention Centre Sydney, NSW, Australia
www.dcconferences.com.au/nsanz2018

2018 Australian Pain Society 38th and New Zealand Pain Society Conjoint Annual Scientific Meeting
8-11 April 2018; International Convention Centre Sydney, NSW, Australia
www.dcconferences.com.au/apsnzps2018/

Complex Epilepsy Study Day
13 April, 2018, Manchester, UK
T. Jacqui McAleer 07836 650782.
jmassociates1@me.com

MAY

Padovan Method of Neuro Functional Reorganisation Course
3-6 May, 2018; Brighton, UK
E. Lorena Salerno
info.uk.nfrpadovan@gmail.com

Specialist Rehabilitation Medicine Event
17-18 May, 2018; Derbyshire, UK
Contact NCORE for further details:
dhft.ncore@nhs.net
T. 01332 254679 – www.ncore.org.uk

Manchester Neuroimmunology Study Day: Making sense Of POTS and PANS
18th May, 2018; Manchester, UK
E. paediatricneurologyrmch@gmail.com
www.paediatric-neurology.com/neuroimmunology-study-day-.html

JUNE

European Neuro Convention
6-7 June, 2018; London, UK. FREE tickets at www.neuroconvention.com

Parkinson's Advanced MasterClass – Parkinson's Academy
12-14 June, 2018; Halifax Hall, Sheffield
http://parkinsonsacademy.co/courses/advanced-masterclass-course/

Rehabilitation Medicine Society of Australia and New Zealand Snapshots Workshop 2018 (RSMANZ Snapshots 2018)
Saturday 16 - Sunday 17 June 2018; Melbourne, Australia
www.dcconferences.com.au/snapshots2018

The Rubik's Cube of Childhood Brain Injury – The Children's Trust National Paediatric Brain Injury Conference
Wednesday 20 June, 2018; The Royal Society of Medicine, London, UK
www.thechildrenstrust.org.uk/conference

MS Non-specialist MasterClass – MS Academy
26-28 June, 2018; Halifax Hall, Sheffield, UK
http://multiplesclerosisacademy.org/courses/general-ms-masterclass

JULY

British Society of Neuro-Oncology Annual Meeting
4-6 July, 2018; Winchester, UK
https://www.bnos.org.uk/events/bnos-conference/

Frontiers in Traumatic Brain Injury
5-6 July, 2018; London, UK
https://frontiersintbi.com

Short Course: The Comorbidities of Epilepsy
Friday, 6th July 2018
St George's University Hospital, Tooting, London, UK
https://www.sgul.ac.uk/study/professional/short-courses

SEPTEMBER

Parkinson's Foundation MasterClass – Parkinson's Academy
4&5 September, 2018; Halifax Hall, Sheffield, UK
http://parkinsonsacademy.co/courses/foundation-masterclass-course/

ILAE British Chapter Annual Scientific Meeting
26th-28 September, 2018; Birmingham, UK
Early Bird Rate available until the 30th July 2018
www.ilaebritishconference.org.uk/

NOVEMBER

MS Specialist MasterClass – MS Academy
21-23 November, 2018; Halifax Hall, Sheffield, UK
http://multiplesclerosisacademy.org/courses/specialist-ms-masterclass/

DECEMBER

UK Stroke Forum Conference
4 -6 December; 2018; Telford, UK
https://www.stroke.org.uk/professionals

4th European Congress of Neuro Rehabilitation

Conference details: October 25-28, 2017, Lausanne, Switzerland.
Report by: Dr Mehran Maanoosi, MRCP (UK), Consultant Physician in Rehabilitation Medicine and Stroke, St Mary's Hospital, Isle of Wight NHS Trust. ***Conflict of interest statement:*** None declared.

The beautiful city of Lausanne on Lake Geneva with surrounding mountains is home to the International Olympic Committee headquarters with Chaplin's world museum nearby the east of the city. Swiss Tech Convention Centre at EPFL, (École Polytechnique Fédérale de Lausanne) hosted 450 delegates from different countries to attend the 4th European congress of neurorehabilitation from 25th to 28th October 2017. It was an exciting time to be amongst the expertise in the field of neurorehabilitation and to get a chance to stroll in the EPFL campus or alongside Lake Geneva.

The congress objectives were the following topics:

- Acute neurorehabilitation
- Impairment vs compensation oriented approaches in stroke rehabilitation: How shall future rehabilitation be organised following our current neuroscientific knowledge
- Better epistemological and biometric strategies for clinical trials
- Use of high tech approaches such as intelligent training devices or virtual reality in neurorehabilitation
- New horizons in Neurobiology and Neuropharmacology
- New drugs against impairment in combination with rehabilitation procedures
- Better cognitive training strategies
- Nutritional aspects in neurorehabilitation

The congress parallel lectures, workshops and sessions were held in several halls (gardens) and a number of companies exhibited their latest technology in the field of neurorehabilitation.

Speakers of "newest in motor rehabilitation for upper and lower extremities" on the first day were the programme Chair, Volker Hömberg and congress President, Leopold Saltuari. The latter concluded his talk with the following summary:

- Early verticalisation seems to be beneficial to the patient, but should not be performed at least in the first 24 hours. There is no evidence that one physiotherapy technique is superior to another but intensive interaction between therapist and patient, motivation, repetition, and duration are critical.
- Robotic treatment of the lower limbs in combination with classical physiotherapy reduces the physical burden of the therapist, and allows for an increase in the number of therapeutic sessions.
- Pharmacological treatment can enhance recovery, but use of anti-spastic and antiepileptic medications at the wrong time and when patient uses the spasticity for better balance can also hamper clinical evolution.
- Cranioplasty in "SSF, sinking skin flap syndrome" should be considered early. Sinking skin flap syndrome is a rare complication after large craniectomy that may progress to paradoxical herniation as a consequence of atmospheric pressure exceeding intracranial pressure. Cranioplasty after post injury decompressive craniectomy (DC) is routinely performed with a three-month delay to avoid the risk of infection and other complications. Recent experience suggests that performing Cranioplasty surgery at shorter period than three months following DC not only may not cause more infections, but also has the advantage of easier dissection, less bleeding, and reduced costs.

At the end of the talk, there was a discussion about the role of FES (Functional Electrical Stimulation) in rehabilitation of lower limb;

some of the audience, including me, did not fully agree with dismissing FES without proper objective assessments like 6 metre walking speed or measuring energy expenditure. NICE suggests: current evidence on the safety and efficacy (in terms of improving gait) of FES for drop foot of central neurological origin appears adequate to support the use of this procedure provided that normal arrangements are in place for clinical governance, consent and audit.

Other interesting topics were the "role of neuropharmacology in stroke and neuro-rehabilitation" and the discussion around "drugs available to manipulate plasticity". Levodopa, SSRIs, memantine and amphetamine all have been tried. Most of the studies included small sample sizes and are not powered RCTs, whilst safety and efficacy still need to be further investigated. Neuroleptics could be harmful for neural plasticity and some agents (e.g. methylphenidate or amphetamines) are applicable just to a small minority of patients. Dopaminergic agents and selective serotonin-reuptake-inhibitors (SSRI) are promising candidates and out of SSRIs, Fluoxetine is probably the most promising. However, when a question was put to one of the speakers that "Shall we use fluoxetine for patients who suffer from post stroke depression to kill two birds with one stone" the answer was not fully in favour of fluoxetine and the advice was to use sertraline or citalopram, as we currently do in our clinical practice.

The most interesting experience for me was the "Mental Work" at the art-science exhibition which was not practically part of the conference programme. From a technical standpoint, thought is at the core of the *Mental Work* exhibit. Brain-computer interfaces (BCIs) are systems that measure brain activity, extract relevant features from that brain activity, and translate these features into messages or commands. BCIs entail research in several disciplines, including engineering, cognitive neuroscience, psychology, computer science, and mathematics. The main focus of BCI research is clinical application (e.g. BCI-based communication and prostheses for people with physical disabilities). It is gaining attention in games and human-computer interaction and is applied in various branches of experimental research, such as driving safety, neuro-usability, and neuro-ergonomics.

Embark on a cognitive revolution at EPFL

Use your brainwaves to control the workings of a machine and contribute to science at EPFL Art Lab's next art-science exhibition, "Mental Work" from October 27th – February 11th, 2018. (Visitors have the opportunity to experience what it's like to control machines using thought alone via brain-machine interfaces, and it requires a fair share of concentration).

More and more studies have shown the beneficial effect of rich environment on neurorehabilitation and post-stroke recovery. In (VR) Virtual Reality technology, various rich environments can be simulated for patients with software. Also, a real and safe training environment will provide subjects task-specific training and accurate sensory feedback, in which key elements such as repetitive practice feedback and motivation maintenance should be included. The Rehabilitation physician should develop an individualised rehabilitation programme based on different dysfunctions to keep patients' interest and active participation and such programmes can go far beyond traditional therapies. VR technology used to focus more on upper limb rehabilitation but one of the companies demonstrated its product for gait retraining and balance rehabilitation. There has also been some research to claim that virtual reality could potentially reduce pain in paraplegic patients and creates the illusion that they can feel their paralysed legs being touched again. The results could one day translate into therapies to reduce chronic pain in paraplegic patients.

Functional disorder in neurorehabilitation was another interesting topic. *Is Functional Neurological Disorder (FND) a good description of this condition?* One of the speakers believed that it is probably the least bad description! Epigenetic factors, methylation of O2 receptors and higher amygdala activity as well as sense of agency (refers to the experience that we cause our own actions) and right temporal-parietal dysfunction were discussed in the neurobiology of FND. This condition is also common in children and particularly girls between 10-14 years old. In treatment of this condition in children, long term medications and invasive procedures should be avoided. Motor action abnormalities, emotion-action interactions, higher order processes and hypo-activation of the dorsolateral prefrontal cortex were focused on the neuroimaging in FND. These sessions were presented by S Bayek from Bern, K Muller from Germany and I Sinanaj from Geneva in order.

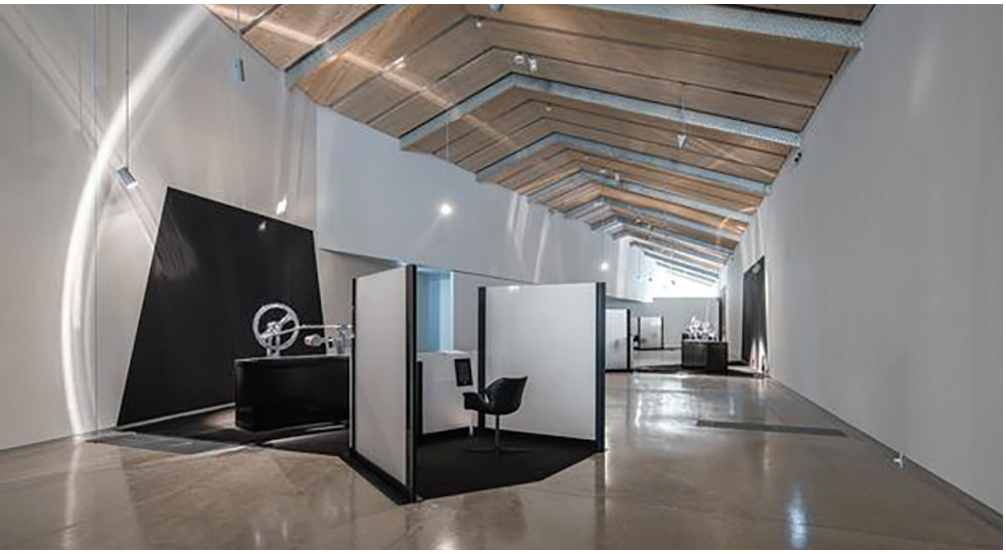
Education, lifestyle modification, energy conservation and pacing strategies, work simplification and environmental modifications were the main focuses of management of fatigue in Multiple Sclerosis. Behavioural changes post-stroke can be summarised as sadness, passivity, aggressiveness, indifference and disinhibition. There was an interesting session about ethical issues in end-of-life decision making in acute neurorehabilitation by Dr Borasio from Lausanne. The speaker gave an interesting example of his parents and the different views they have towards disease and death. Delicate balance exists between emotional discharge of family and patient's best interest and ethics of dialogue should be reflected in expression of caring.

In recent years, robotic devices have been utilised to replace the manpower and physical needs of therapists in the field of neurological rehabilitation. Robotic rehabilitation devices can be divided based on the driven principles: exoskeleton robot (e.g. Lokomat, AutoAmbulator) and end-effector robot (e.g. G-EO-systems, Gait Trainer, Gait Master). A number of pieces of research on exoskeleton robot and end-effector robot have been studied and there was an interesting round table discussion on rehabilitation technology about these methods. However, no method has shown to be superior to another.

Vagus Nerve Stimulation (VNS) has been used in thousands of patients with epilepsy. Using a system named Serenity, one of the exhibitors told us how pairing sounds with VNS can decrease brain hyperactivity in treating tinnitus. Using another system, named Vivistim, VNS may also have a useful role in the rehabilitative movements of stroke patients in the future.

What is the definition of natural recovery? An interesting question from one of the audience! Is it when there is absolutely no input or any form of therapy in someone who had a stroke for example in one of the most under-developed countries and any minimal intervention excludes natural recovery?

Many e-posters were also presented at the conference and the event attracted very good feedback. I enjoyed the conference, exhibitions, workshops as well as the beauties of Lausanne!



PREVIEW: Fifth World Parkinson Congress

Conference details: 4-7 June 2019, Kyoto, Japan. ***Report by:*** Roger Barker – WPC 2019 Programme Chair

The Fifth World Parkinson Congress, also known as the WPC 2019, will once more unite the global Parkinson's community in June 2019 in Kyoto, Japan. The four-day long programme will offer a unique experience for researchers, clinicians, rehabilitation professionals, people with Parkinson's, care partners, and others. Unlike any other meeting it brings patients and the clinical and scientific community together. Under the leadership of Co-Chairs Dr Jon Stoessl and Dr Marie-Francoise Chesselet, more than 100 Congress committee members from 25 countries are helping the WPC 2019 take shape.

The WPC 2019 follows the success of the first four WPCs, the last of which took place in 2016 in Portland, Oregon. Based on the success of that meeting, along with the feedback we are receiving, we expect up to 4,000 delegates from over 50 countries to participate in this highly informative and wide ranging meeting.

The conference embraces a range of presentations from plenary talks to roundtable discussions and everything in between – parallel sessions and interactive workshops. Indeed, some of the most popular parts of each WPC are the workshops and Roundtable discussions where topics get discussed from a range of different perspectives given the varied backgrounds of the audience.

Programme

The programme has been carefully put together over the past year by a committee representing academia, clinicians, researchers, and those who experience the reality of living with this condition. The aim has been to profile and highlight the latest and most germane issues in Parkinson's today. Topics on gene and cellular therapy will run alongside sessions on neuroprotection, clinical trials, rehab therapies, and best care delivery models as well as sessions devoted to 'fake news'. The provisional programme can be viewed and downloaded on the WPC website at www.WPC2019.org. Speakers will be confirmed by July 2018.

The World Parkinson Coalition® has lead the neurological world in innovative meetings by bringing the full range of people touched by Parkinson's together under one roof. This has been done not through scheduling separate tracks of talks, but by bringing together everyone to maximise the understanding of the disease and the impact it has on those who live with it. This allows researchers to actually meet patients and see the condition they are trying to treat and cure, while allowing patients and their carers to interact with those trying to help them. This provides a unique opportunity for a global exchange of ideas between all the stakeholders and is one of the reasons why the WPC was awarded the globally prestigious Incredible Impacts Award in 2017 by the International Congress and Conventions Association.

As the programme chair, I feel that we have created a one of a kind programme that will offer not only excellent talks, and thought-provoking ideas, but in a setting that really encourages innovation and opportunity to explore new ideas.

Community

The WPC 2019 works closely with the Parkinson's community, starting with more than 100 Organisational Partners from 30 countries, 16 WPC 2019 Ambassadors who all live with Parkinson's disease, and 16 Blogger partners who blog about their WPC experience and why the community needs to attend this unique Congress.

Organisational partners represent professional and patient organisations and within the UK alone, WPC OPs include such groups as: Parkinson's UK, European Parkinson's Disease Association, The Cure Parkinson's Trust, and the British Association of Neuroscience Nurses.

Two WPC 2019 Ambassadors are based in the UK, David Sangster and Emma Lawton. David and Emma are both leading patient advocates who are available to meet with community members to speak about their experiences and to help people think through their plans for attending the WPC 2019.

I can also attest to the fact that this meeting is the most inspirational and accessible of all major PD meetings that I attend. Unlike any other meeting, it has a palpable buzz of excitement and discovery and leaves you with a sense of privilege and admiration for those who work and live with this condition.

Exhibit

The exhibit hall will offer a chance to meet representatives of companies and patient voluntary organisations from around the world. The poster display will highlight the science and treatment of Parkinson's with an array of basic and clinical science topics covered. The posters will also include a section from those who experience life with Parkinson's to illustrate the ways they have improved their lives. These "Living with Parkinson's" posters will be a way of making some truly inspiring initiatives more conspicuous so that they can be used by others.

Patient Engagement

The WPC has also led in terms of patient engagement and involvement. People with Parkinson's are incredibly important resources for those of us working in the Parkinson's space. The WPC recognised this early on and it's what makes the WPC experience so memorable for the delegates. People with Parkinson's are not only helping others live with the condition, they are contributing to the research agenda by helping set priorities for our scientific research. After they help us set the research agenda, many go on to help advance the science by signing up for clinical trials, something I am eternally grateful for as a researcher.

A selected number of outstanding poster presenters will be invited to speak about their work as Hot Topics presenters each morning to a large audience. One of these lucky presenters will be awarded the Stanley Fahn Young Investigator Award. This opportunity will open the door for upcoming researchers to take centre stage in front of some of the most influential neuroscientists and renowned Parkinson's authorities on the planet. Submission deadline for abstracts is Friday 23 November 2018.

Wellness Way

The WPC Wellness Way area includes four rooms: Renewal Room, Care Partner Lounge, Massage Room, Quiet Room. Each of these areas gives the participants a chance to try something new and the Congress is designed to demonstrate activities that can be done to help alleviate the challenges of living with Parkinson's and will include short programmes on yoga, dance, laughter therapy, voice and singing therapy and more. The WPC is a high-level meeting with a programme that can exhaust even the most experienced conference attendee. We aim to keep everyone healthy and fit while they are learning about Parkinson's!

The aim of WPC 2019 is to bring the world of Parkinson's together in one place to hear about some of the most interesting things happening in Parkinson's science and care today. What better way to kick-start dialogue, innovation, and partnership than to do it together? And what more attractive city than Kyoto?!

The WPC occurs just once every three years. Add this Congress to your 2019 calendar, and learn about some of the most exciting things happening in the Parkinson's world today. I hope to see you Kyoto from June 4 – 7, 2019.

Key Dates for WPC 2019
9 July 2018
Abstract submission opens
10 Sept 2018
Registration & Housing Opens
23 Nov 2018
Abstract submission closes

PREVIEW: Pain Therapeutics

Conference details: 21–22 May 2018, Holiday Inn Kensington Forum, London, UK. ***Web:*** www.pain-therapeutics.co.uk/ACNR

SMi is pleased to present the return of the 18th annual Pain Therapeutics Conference taking place on 21st–22nd May 2018, London, UK. Each year SMi brings together decision makers and creative thinkers to unite and collectively shape and discuss the new breakthrough discoveries, innovations fuelling the future development of the Pain Therapeutics landscape.

We have worked hard to bring together an elite speaker panel to educate and inspire our delegates through the exploration of innovative approaches and novel targets in analgesic medicine. Attendees will be able to network with industry experts from leading pharma companies, biotech and academics to name but a few. If you want to discover the future of pain therapeutics and be a part of the conversation, visit www.pain-therapeutics.co.uk/ACNR

2018 Highlights

- Explore the possibilities of DNA-based, disease modifying treatments for painful diabetic neuropathy with ViroMed
- Overcome the challenges of patient recruitment and the placebo response with Novartis
- Learn how AstraZeneca and Eli Lilly are targeting ion channels to reduce pain
- Get involved in round table discussions on chronic pain and depression, the opioid crisis, and alternatives to animal models
- Listen to Centrexion, Amgen, Janssen, Nektar Therapeutics and Grunenthal discuss the current industry outlook

The upcoming Pain Therapeutics conference moves away from well discussed topics such as opioid dependence and animal models and focuses on the most exciting current research, opinions, novel targets and mechanisms and advances in the field of analgesic medicine.

Chairs for 2018:

- Joseph Stauffer, Chief Medical Officer, Cara Therapeutics
- Randall Stevens, Chief Medical Officer, Centrexion Therapeutics
- Kerrie Brady, Founder and Chief Business Officer, Centrexion Therapeutics

Featured speakers include:

- Daniel Mikol, Executive Medical Director Global Development Neuroscience, Amgen
- Torsten Madsen, CMO, Aptinyx
- Iain Chessell, Head of Neuroscience, AstraZeneca
- Gordon Munro, Senior Scientist, Danish Headache Centre
- Eric Nisenbaum, Head of Neurophysiology, Eli Lilly
- Mark Field, SVP, Head Global Clinical Development, Grunenthal
- Jean, Deregnaucourt, Scientific Director, Innopain
- Neil Singla, Founder & Chief Scientific Officer, Lotus Clinical Research
- Yanina Flossbach, Associate Medical Director Neuroscience, Novartis
- Joanne Taylor, VP, Head of Neuroscience, Prescient Healthcare Group

PREVIEW: Neurology 2018: leading edge neurology for the practising clinician

Conference details: 12-13 April, 2018, London, UK.

This course is an annual event run by the UCL Institute of Neurology. Its purpose is to provide an update on the practical hospital management of neurological diseases, emphasising new developments, but nonetheless firmly oriented in day-to-day clinical practice. Importantly too, the meeting aims to be convivial, relaxed and entertaining.

It is designed for Consultants and trainees in the various neuroscience specialties as well as GPs and other clinicians with a special interest. As in past years, it is held in the informal and comfortable surroundings of the well-equipped conference suite in the UCL Institute of Education which is 5 minutes walk from Queen Square.

This year we have a fantastic programme. The annual Prize lecture is given by Professor Linda Greensmith, head of the Graeme Watts laboratory at UCL Institute of Neurology. We also have the ever popular CPC session (and those who have attended previous years will know what fun these are) and an MRI quiz. The lecture programme too has been chosen to be in cutting edge areas but to be very practical. As in previous years, we also have arranged a pre-course symposium aimed primarily at trainees to help preparation for the Specialty Certificate Examination (the exit exam) but also of great value to consultants keen to refresh their knowledge in multiple sub-specialties of Neurology.

This year, we will have a section of clinical case discussions in the early evening on Thursday after the drinks reception, with a panel and five cases – which we hope will be interesting and engaging. As always too we will provide a detailed course book, to accompany the lectures.

All are welcome to register for the meeting, and we hope to see you at what should be an absorbing, informative and very enjoyable few days. At the end of day one we will have Clinical case discussions. We would like to invite non-consultant grade clinicians to present (video or clinical photos and definitive diagnosis required). There will be a 10 minute discussion after the presentation and a prize awarded to the person who presents the best case. All selected cases will attract free registration to the course. Please submit a 100 word abstract of the case you will present via e-mail to ion.educationunit@ucl.ac.uk by the 9th March 2018.

After the success of the Royal College of Physicians' (RCP's) 'Neurology of systemic disease' conference in 2017, Professor David Nicholl has put together a programme for the 'From Holmes to House – 500 years of the diagnostic neurologist' conference on Tuesday 20 March 2018 (co-badged with the Association of British Neurologists (ABN)).

Commenting on the 'From Holmes to House' event, Professor Nicholl said:

'I am genuinely excited about this contribution by the ABN to the RCP's 500th anniversary, which takes place on the birthday of the physician that (many consider) was the founder of British neurology, William Gowers. This is a great opportunity to both reflect back and look forward to pioneering physicians and to hear and discuss the findings of world-class speakers on clinical reasoning, imaging, genetics and overdiagnosis. This conference will be of interest to a very broad range of physicians and (not just) neurologists as we look forward to the next 500 years of the specialty.'

Dr Nicholl is clinical lead for neurology at City Hospital Birmingham and an RCP tutor at University Hospitals Birmingham NHS Foundation Trust. He is the honorary secretary of the ABN and he is on the Board of Trustees and Council at the RCP. Dr Nicholl is passionate about clinical reasoning, medical education and clinical neurology.

Find more about his research by following @TOSStudyGroup on Twitter, and join the discussion about the conference on Twitter via #HolmesToHouse.

IQoro – A new neuromuscular rehabilitation approach to dysphagia after stroke

IQoro is a neuromuscular training device and regime designed to treat the causes of dysphagia – especially after stroke, Hiatus hernia and its associated symptoms of reflux, LPR and GERD, and snoring and sleep apnoea.

It is successfully used by about 4500 patients, predominantly in its country of origin, Sweden, but relatively new to the UK. It is a CE marked class I medical device and has a growing number of private users in the UK who have purchased via the company's website www.iqoro.com

The company is starting a series of service evaluations in UK NHS hospitals to provide evidence of its applicability in the UK Healthcare system. The device is small, simple and usually self-administered allowing easy deployment amongst patients in their own homes or in residential care as well as in the in-patient setting. Clinical studies available on the company's website show that a training period of 5 to 13 weeks can improve swallowing in 97% of patients and restore normal swallowing in 63%.

The company is seeking to start limited service evaluations in other NHS institutions and welcomes enquiries.

Cognitive Impairment in Trigeminal Neuralgia

Following a Learning Day for members of the Trigeminal Neuralgia Association UK held at The University of Leeds last year, the hosts from the Cognitive Psychology Department, together with colleagues from Sheffield University and UCLH, set up a project to determine the cognitive and motor effects on patients taking drugs prescribed for TN.

It is well known and documented that there are severe side-effects from such drugs as carbamazepine, oxcarbazepine and others which result in patients being unable to think clearly or, as one sufferer put it, being 'zombified'. Several volunteers from TNA UK have agreed to take part in a study using a series of tests which are displayed on a tablet computer coupled with oral questioning by the researcher. Over the period of the study, the researcher will also spend some time at UCLH with Professor Zakrzewska reviewing the results of her findings with regard to her own patients. Patients will do these tests when on a high dosage of these drugs and then again after they have stopped them – either because surgery has been successful or because they have gone into a remission period. This will improve understanding of the effects of these drugs and highlight the need for potentially newer drugs that result in fewer cognitive side effects.

www.tna.org.uk

Neurokinex launches charitable trust

Neurokinex - provider of neurological activity-based rehabilitation – has launched the Neurokinex Charitable Trust to provide specialised neurological rehabilitation for various forms of paralysis.

Established in 2013, Neurokinex is the first and only European affiliate of the Christopher & Dana Reeve Foundation's Neuro Recovery Network. It sets out to 'redefine possibilities' for people with a spinal cord injury: its programmes stimulate and load the entire nervous and musculoskeletal systems through carefully crafted, task-specific exercises with the assistance of skilled therapists.

"I believe that everyone living with a neurological impairment resulting from paralysis deserves access to high quality rehabilitation and wellness programmes based on the latest breakthroughs in neuroscience and neuro-restorative research," says Harvey Sihota, Neurokinex CEO and founder. "My hope is that by raising funds for initiatives such as a dedicated paediatric capability, individual bursaries and an innovation fund to support continuous improvement, more and more people with spinal cord injury can access our groundbreaking programmes and maximise their rehabilitation and recovery."

http://neurokinex.org/charity

The Complete Solution for Neurological Gait Rehabilitation

With the THERA-Trainer Complete Solution for gait rehabilitation, medica Medizintechnik GmbH is bringing a complete device-based concept for neurological rehabilitation onto the market. The company is addressing the challenge of offering scientifically established and effective therapies despite the lack of resources, cost pressures and time constraints. "With our Complete Solution, we are successfully implementing an evidence-based, clinically proven treatment concept for the rehabilitation of the lower extremities", says Jacob Tiebel, head of product management at medica.

The THERA-Trainer Complete Solution for gait rehabilitation is developed individually with each customer and is tailored to the current operating reality of each hospital. An in-depth analysis of the initial situation and a customised design of the solution ensure that space issues are taken into account and that the training and therapy devices are properly utilised. The Complete Solution is not a substitute for therapists, but instead facilitates and supports their work. In addition, it enables a single therapist to treat several patients at the same time.

With the Complete Solution concept, THERA-Trainer primarily addresses the organisational and process weaknesses in hospitals. With this approach, the company intends to harness previously untapped economic potential in hospitals, while at the same time working sustainably towards better treatment outcomes. The focus is not on the individual products, but on an optimised therapy process and the full set of devices as a complete solution. Last year, medica acquired an end-effector gait trainer through its merger with the Swiss company ability. "With the THERA-Trainer lyra, we now offer the full range of products for gait rehabilitation. The real innovation lies in integrating these products intelligently into a high-efficiency setting", said medica owner and managing director Peter Kopf.

www.thera-trainer.de/en

Published data show that once-daily Zebinix® (eslicarbazepine acetate) monotherapy is non-inferior to current standard of care

Positive results from a pivotal Phase III monotherapy study of once-daily Zebinix® (eslicarbazepine acetate) in newly diagnosed focal epilepsy patients have recently been published in the journal Epilepsia. The study of 815 patients showed that treatment with eslicarbazepine acetate monotherapy was non-inferior to twice-daily controlled-release carbamazepine, the current standard of care. Eslicarbazepine acetate was also shown to be well-tolerated.

"For this patient population in particular, it is important that the physician takes into consideration individual factors and tailors treatment to the individual. We therefore welcome the news that another treatment has been shown to be effective for these patients, especially one with an easy to use once-daily formulation that has the potential to improve adherence," comments Eugen Trinka, lead author of the study, Professor and Chair, Department of Neurology, and Medical Director Christian Doppler Klinik, Paracelsus Medical University, Salzburg, Austria.

More details can be found at http://bit.ly/2s0iojp

ExorLive - Exercise software helping to prevent falls

Falling is one of the main challenges for the elderly, relatives and health care services. Regular physical activity is an important source of energy, self-reliance in everyday life and overall good health. To maintain physical function like strength and balance, we must be active. As we grow older, we lose muscle strength and our balance is reduced. The best way to limit this loss of function is to be active and spend as much time as possible in a weight-bearing, standing position. ExorLive provides easy to use exercise software for rehabilitation and sports therapists and fitness experts. Inspire your clients with quality-assured exercises. Send exercise programmes straight to an app for the client, or simply print or email.

New in ExorLive: SeniorLive

SeniorLive is a series of instructional exercise videos with music. It consists of functional strength and balance training for seniors. The exercises should be performed standing with the support of a chair or walker. The programme is suited for people with reduced balance and walking function. It is also well suited as a group exercise for the elderly.

www.exorlive.com | 0208 819 6750 | sales@exorlive.com

New handbook for teenagers living with brain injury

A new handbook for teenagers living with brain injury has been launched by The Children's Trust. Me and My Brain gives advice and guidance on topics such as independence, bullying, driving and education. It also includes real life experiences of young people living with the condition.

Created by The Children's Trust's team of medical professionals and teenagers affected by brain injury, Me and My Brain helps explain the lifelong condition, providing tips and strategies on some of the challenges such as fatigue and memory loss.The resource is recommended for family members, teachers and carers, emphasising brain injury as a hidden disability, which can be very difficult for those affected to explain.

Order free from www.thechildrenstrust.org.uk/books

KYOTO INTERNATIONAL CONFERENCE CENTER

5th World PARKINSON Congress

Kyoto, Japan

June 4–7, 2019

The 5th World Parkinson Congress offers a unique, international, interdisciplinary forum for all who are researching, treating, or living with Parkinson's disease.

www.WPC2019.org

ATTENDEES WILL INCLUDE

- Neuroscientists, clinicians & geriatricians
- Nurses, rehabilitation specialists, social workers & other health professionals
- People with Parkinson's disease
- Care partners/caregivers/family
- Nonprofit organization staff
- Pharmaceutical industry leaders
- Government and policy representatives

IMPORTANT DATES

JULY 9, 2018	Abstract Submission Opens
SEPT. 10, 2018	Registration & Housing Open
NOV. 23, 2018	Abstract Deadline
DEC. 7, 2018	Travel Grants Deadline
FEB. 27, 2019	Early Registration Deadline