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JOINT MEETING OF 27th MALAYSIAN SOCIETY OF NEUROSCIENCES (MSN) & 17th NEUROSURGICAL ASSOCIATION OF MALAYSIA (NAM)

IN CONJUNCTION WITH

PAEDIATRIC NEUROLOGY UPDATE 2017 & 4th FEDERATION OF ASIAN-OCEANIAN NEUROSCIENCE SOCIETIES (FAONS) SYMPOSIUM
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1. Yogheswaran et al. Stroke. 2014;45:00-00.
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ON BEHALF OF THE ORGANISING COMMITTEE, AND TOGETHER WITH THE CHAIR OF THE LOCAL ORGANISING COMMITTEE, we wish you a warm welcome to the conjoint neuroscience fraternity meeting, MyNEURO2017 in Kuala Lumpur, Malaysia from Aug 11-13, 2017. MyNEURO2017 is a joint meeting of 27th Malaysian Society of Neurosciences (MSN) and 17th Neurosurgical Association of Malaysia (NAM), and in conjunction with Paediatric Neurology Update 2017 & 4th Federation of Asian-Oceanian Neuroscience Societies (FAONS) Symposium that is co-sponsored by the International Brain Research Organisation (IBRO).

Enriched by several exciting pre-conference teaching workshops held at numerous leading institutions in the country, MyNEURO2017 scientific programme has attracted over 900 participants, our largest figure in record. As the host, we are excited with the opportunities that this platform would foster, with sharing and exchange of evidence-based practices and scientific endeavours’ from the main plenary sessions to the diverse and interesting focused symposia involving neurologists, neurosurgeons, paediatric neurologists, general physicians, rehabilitation medicine specialists, neuroscientists and allied health professionals – that truly embodies MyNEURO2017 Conference theme – ‘Reconnecting the Synapses’. The best submitted abstracts are defended during oral presentation session and similarly for over 100 poster presentations with top prizes awaiting the winners. Come and support them!

Lastly, in unison with the Conference Co-Chairs, we truly have reconnected synapses @ MyNEURO2017.
INVITED SPEAKERS
BIO DATA & ABSTRACT
INTERNATIONAL FACULTY
**SPEAKER’S BIODATA**

**PRE-CONFERENCE WORKSHOP FOR ADULT NEUROLOGY**

“NEUROLOGY MASTERCLASS – MEET THE EXPERTS” & MAIN CONFERENCE – PLENARY & NEUROLOGY-NEUROSURGERY RECONNECTED – MDS EBM UPDATE ON PARKINSON’S DISEASE

**FULL NAME** : PROFESSOR DR. CAROLYN SUE, MBBS, PhD (Sydney, Australia)

**POSITION / AFFILIATION** : Head of the Department of Neurogenetics at Royal North Shore Hospital, University of Sydney

**TITLE OF TALK** : Plenary 2: The spectrum of mitochondrial diseases – from the bedside to the bench

**MDS-EBM** : Update on Treatments for Parkinson’s Disease: Grand Rounds with PD Experts

**SHORT BIOGRAPHY** :
Carolyn Sue is currently appointed as Head of the Department of Neurogenetics at Royal North Shore Hospital, University of Sydney. She was the first female adult neurologist to be promoted to Professor in Australia and is the inaugural Professor in Neurology at Royal North Shore Hospital. Dr Sue trained in the study of movement disorders with Professor John Morris and continued her post-doctoral studies at Columbia University, New York, USA. Dr Sue’s research interests are focused on two main areas: the role of mitochondrial function in neurodegenerative disease and the genetics of movement disorders. Dr Sue founded the Familial Parkinson’s Disease Research Clinic at Royal North Shore Hospital, and has coordinated national collaborative genetic studies in Parkinson’s disease. Most recently, her research group has established the use of patient derived stem cell models to investigate the pathophysiology underlying Parkinson’s disease.

Dr Sue is a Founding Director of the Australian Mitochondrial Disease Foundation and is currently appointed as Treasurer of the International Parkinson and Movement Disorder Society (Asian Oceanic Section), to the International Parkinson and Movement Disorder Society’s Task Force on Genetic Nomenclature in Movement Disorders, the Scientific Advisory Committee of Parkinson’s NSW and the Chair of the Clinical Trials and Research Group for the Movement Disorder Society of Australia and New Zealand.

**PRE-CONFERENCE WORKSHOP FOR ADULT NEUROLOGY – “NEUROLOGY MASTERCLASS – MEET THE EXPERTS” & MAIN CONFERENCE – PLENARY**

**FULL NAME** : ASSOCIATE PROFESSOR DR. OWEN B WHITE

**POSITION / AFFILIATION** : Director Neuro-ophthalmology and the Ocular Motor Research Laboratory, Royal Melbourne Hospital and Melbourne Brain Centre, University of Melbourne.

**TITLE OF TALK** : Plenary 3: Neuro-ophthalmology for Neurologists and Neurosurgeons

**SHORT BIOGRAPHY** :
A/Prof White completed his medical training in Melbourne and then moved to Toronto Canada to pursue Neurology as part of a University Exchange Programme. While there he undertook research into ocular motor abnormalities in Parkinson’s disease, sparking a career long interest in higher control of ocular motor function.

He subsequently moved to London, working at St Thomas’ Hospital in the Medical Eye Unit, as well as at Moorfield’s Eye Hospital.

He then returned to Australia and completed a PhD at ANU in Canberra before returning to Melbourne and the Monash Medical Centre, where he set up the Ocular Motor Research Laboratory, moving to Royal Melbourne and Melbourne University, where he remains, in 2002.

His major interest is the investigation of cognitive processing in the ocular motor system and the clinical utility of such measures in evaluating brain function in pathological states. The laboratory has defined the use of studies in cognitive processing in the oculomotor system as a means of quantifying progression in multiple sclerosis and is continuing to investigate both the basic mechanisms of oculomotor cognitive processing and the applicability of such studies in a range of cerebral disease.
SPEAKER’S BIODATA

MAIN CONFERENCE – FRONTIER IN BASIC NEUROSCIENCE & FAONS SYMPOSIUM

FULL NAME : PROFESSOR DR. TAN ENG KING
POSITION / AFFILIATION : Senior Consultant Neurologist, National Neuroscience Institute, Singapore
TITLE OF TALK : Translating Genetic discoveries in Parkinson’s disease
SHORT BIOGRAPHY :
Dr Tan is a senior consultant neurologist and research director at the National Neuroscience Institute, a Professor at Duke-NUS medical school and Yong Loo Lin School of Medicine, and a honorary Professor at Lee Kong Chian school of medicine. He chairs the Ministry of Health research accreditation panel and is an associate institutional official of Graduate Medical Education, Singhealth Residency.

Dr Tan is an editor of European Journal of Neurology, Parkinsonism Related Disorders and Journal of Parkinson’s disease, and has served in several key committees in the International Movement Disorders Society and International Association of Parkinsonism and Related Disorders. He has received several international and national awards and accolades for his contributions to academia and education.

Dr Tan’s primary research interests are in clinical and functional genomics and experimental therapeutics in Movement Disorders.

PRE-CONFERENCE WORKSHOP FOR ADULT NEUROLOGY – “NEUROLOGY MASTERCLASS – MEET THE EXPERTS” & MAIN CONFERENCE – PLENARY

FULL NAME : PROFESSOR YUKIKO GODA
POSITION / AFFILIATION : Team Leader and Acting Director / RIKEN Brain Science Institute
TITLE OF TALK : Controlling synapse variability and plasticity in hippocampal neurons
SHORT BIOGRAPHY :
(1) 2017-present Acting Director, RIKEN Brain Science Institute (2) 2015-present Deputy Director, RIKEN Brain Science Institute (3) 2014-present Adjunct Professor, Department of Life Sciences, Graduate School of Arts and Sciences, University of Tokyo (4) 2014-present Adjunct Professor, Saitama University Brain Science Institute (5) 2011-present Senior Team Leader, RIKEN Brain Science Institute (6) 2002-2011 Senior Group Leader, MRC Cell Biology Unit, University College London (8) 1997-2002 Assistant Professor, Division of Biology, University of California, San Diego (9) 1991-1997 Postdoctoral Fellow, The Salk Institute (10) 1985-1991 Stanford University, PhD in Biochemistry (11) 1981-1985 University of Toronto, BSc in Biochemistry and Chemistry
ASSOCIATE PROFESSOR S. THAMEEM DHEEN

Associate Professor, Head, Department of Anatomy, Yong Loo Lin School of Medicine, National University of Singapore

Title of Talk: Signaling molecules involved in synaptic plasticity are epigenetically regulated in rodent microglia

SHORT BIOGRAPHY:

Associate Professor Dheen is currently the HoD of Department of Anatomy, NUS Medicine. Prior to joining his alma mater as a Faculty member in 1999, he had obtained his PhD in Neuroscience from the Faculty of Medicine, NUS, in 1995 and completed his postdoctoral training at the University of Manitoba, Canada. He is currently the elected President of Singapore Neuroscience Association since 2009, Governing Council member of International Brain Research Organization (IBRO), the Council Member of Federation of Asian-Oceanian Neuroscience Societies (FAONS) and the National Coordinator of International Brain Bee Challenge. He also served as the President of Microscopy Society Singapore from 2003-2008. From 2013-2016, he served as the Assistant Dean (Graduate Studies) at NUS Medicine.

He has been actively involved in teaching gross anatomy and neuroscience to medical, pharmacy students, and training graduate students pursuing their MSc and PhD degrees.

A/Prof Dheen has carved a niche area in microglia research especially on the key roles these cells play in neuroinflammation in neurodegenerative diseases and neurological disorders, and is extending his research to the translational aspects of this glial type. The ultimate goal of this research is to promote development of gene-based therapeutics for neurological disorders.

PROFESSOR ANDREW J LAWRENCE

Associate Director, Florey Institute of Neuroscience & Mental Health, University of Melbourne, Victoria, Australia

Title of Talk: Stress, peptides & relapse

SHORT BIOGRAPHY:

Professor Andrew Lawrence is an NHMRC Principal Research Fellow & Associate Director at the Florey Institute of Neuroscience & Mental Health where he is Head of the Division of Behavioural Neuroscience and runs the Addiction Neuroscience laboratory. Andrew has published over 200 original articles & reviews, and been cited >7500 times (H index 47). Andrew was Treasurer of the Australian Neuroscience Society (2002-2008) and is a Fellow of the British Pharmacological Society. He was Senior Editor of The British Journal of Pharmacology (2007-2014) and is currently a reviews editor with The British Journal of Pharmacology. He is Deputy Editor in Chief of Pharmacology Research & Perspectives, Associate Editor of both Neurochemical Research and the Journal of Pharmacological Sciences. He sits on the editorial board of Addiction Biology. Andrew was recently President of the Asian-Pacific Society for Neurochemistry (2014-16) & is currently a Council member of the International Society for Neurochemistry.
**FULL NAME**: PROFESSOR DAMDINDORJ BOLDBAATAR

**POSITION / AFFILIATION**: Professor and Chair of the Department of Physiology, Mongolian National University of Medical Sciences, Mongolia

**TITLE OF TALK**: Thermosensation and interoception: Limbic system is involved in thermoregulatory behaviours

**SHORT BIOGRAPHY**:

**Education**: (1) MD in 2003 from Health Sciences University, Mongolia. (2) MPH in 2005 from Health Sciences University, Mongolia. (3) PhD in 2012 from Jichi Medical University, Japan

**Employment**: (1) 2004 – 2007: Lecturer, Department of Physiology, Health Sciences University. (2) Since 2013: Chair, Department of Physiology, Health Sciences University


**NOTE**: He is represented by PROFESSOR BATTUVSHIN LKHAGVASUREN

---

**FULL NAME**: PROFESSOR EDWARD JAMES CUPLER

**POSITION / AFFILIATION**: Head Section, Neurophysiology Director, Neurology Residency Training Program, King Faisal Specialist Hospital and Research Center- Jeddah (Jeddah, Saudi Arabia)

**TITLE OF TALK**: Infantile-onset versus Late-onset Pompe disease: what should clinicians know

**SHORT BIOGRAPHY**:

Prof Cupler is currently the Head Section, Neurophysiology Director, Neurology Residency Training Program with areas of consultancy that include: Neurology, Neuroimmunology, Neuromuscular Disorders and Sports Neurology. He is based at the King Faisal Specialist Hospital and Research Center- Jeddah, Saudi Arabia. Prior to this, he was the Director at the Neuromuscular Diseases Center, OHSU MDA Clinic and Co-Director at the ALS Center of Oregon and Associate Professor of Neurology, Department of Neurology, Oregon Health and Science University (OHSU), Portland, Oregon USA. He hold Bachelor of Science in Biochemistry and Biology, and subsequently obtained Doctor of Medicine (MD) at the Ohio State University College of Medicine with subsequent residential training at Loyola University College of Medicine, Illinois and Baylor College of Medicine, Houston, Texas, USA. He is a fellow at the American Academy of Neurology, and a member for the Academy’s section of Neuromuscular Medicine and Sports Neurology.

His other professional memberships include in the American Association of Neuromuscular Diseases and Electrodagnostic Medicine, European Federation of Neurology, International Brain Research Organization, Mediterranean Muscle Society, Muscle Study Group, Pan Arab Society of Neurosciences, Saudi Multiple Sclerosis Society (Member, Executive Board), Saudi Neurology Society (Secretary, Executive Board) and World Muscle Society. He had also served in as a member in the Selection Committee, King Faisal International Prize for Medicine (2000).
SPEAKER’S BIODATA

MAIN CONFERENCE – FRONTIER IN BASIC NEUROSCIENCE & FAONS SYMPOSIUM

FULL NAME : PROFESSOR HITOSHI OKAMOTO

POSITION / AFFILIATION : Deputy Director of RIKEN., Brain Science Institute, Japan

TITLE OF TALK : The sedative effect of the cholinergic transmission in the habenulo-interpeduncular pathway in social conflict


PRE-CONFERENCE WORKSHOP FOR ADULT NEUROLOGY – “NEUROLOGY MASTERCLASS – MEET THE EXPERTS” & MAIN CONFERENCE - NEUROLOGY-NEUROSURGERY RECONNECTED – MDS EBM UPDATE ON PARKINSON’S DISEASE

FULL NAME : PROFESSOR DR. REGINA KATZENSCHLAGER

POSITION / AFFILIATION : Head of the Department of Neurology and Karl Landsteiner Institute for Neuro-immunological and Neuro-degenerative Disorders, Danube Hospital, Vienna, Austria


SHORT BIOGRAPHY : Regina Katzenschlager, MD, is the head of the Department of Neurology and Karl Landsteiner Institute for Neuro-immunological and Neuro-degenerative Disorders at Danube Hospital, Vienna, Austria, and a Guest Professor at Vienna Medical University. She trained in neurology and psychiatry in Vienna and as a research fellow in movement disorders at Queen Square, University College London, UK. Her research focus is on clinical trials in Parkinson’s disease and Evidence Based Medicine. She is a past president of the Austrian Neurological Society and has served on editorial boards and committees, including for the International Parkinson and Movement Disorder Society.

MAIN CONFERENCE – PAEDIATRIC NEUROLOGY UPDATE

FULL NAME : DR. VIJeya GANESAN

POSITION / AFFILIATION : Senior Lecturer Paediatric Neurolgy UCL Great Ormond Street Institute of Child Health, London


SHORT BIOGRAPHY : Vijeya Ganesan is Senior Lecturer in Paediatric Neurology at UCL Great Ormond Street Institute of Child Health and leads the Paediatric Neurovascular Service at Great Ormond Street Hospital London. Her research interests are focussed on elucidating the causes and consequences of cerebrovascular disease in children.
FINNEN’S BIODATA

MAIN CONFERENCE – PAEDIATRIC NEUROLOGY UPDATE

FULL NAME : PROFESSOR DR. ANGUS ARTHUR WILFONG
POSITION / AFFILIATION : Chief of Paediatric Neurology, Phoenix Children’s Hospital, & Professor of Child Health, University of Arizona College of Medicine, Phoenix, USA
TITLE OF TALK : Latest clinical indications of Vagal Nerve Stimulator therapy and effectives for Paediatric epilepsy

SHORT BIOGRAPHY :
Since September 2016, Angus A Wilfong, MD has been Professor and Chief of Pediatric Neurology at the Barrow Neurological Institute at Phoenix Children’s Hospital and Professor of Child Health at University of Arizona College of Medicine, Phoenix. He was previously Professor of Pediatrics, Neurology, and Developmental Neuroscience at Baylor College of Medicine and Director of the Comprehensive Epilepsy Program at Texas Children’s Hospital, Houston, Texas.

Dr. Wilfong earned his medical degree and completed a residency in Pediatrics at the University of Saskatchewan in Canada. He then completed a residency in Pediatric Neurology and Fellowships in Epilepsy and Clinical Neurophysiology at Baylor College of Medicine, Houston.

Dr. Wilfong’s clinical interests include medical and surgical epilepsy and neonatal and childhood electroencephalography. He has been active in clinical and translational research and introduced MRI-guided stereotactic laser surgery for epilepsy. Dr. Wilfong has received a number of national and international recognitions and honors and has been a strong advocate for improving healthcare for children with Neurologic Disorders.

MAIN CONFERENCE – FRONTIER IN BASIC NEUROSCIENCE & FAONS SYMPOSIUM

FULL NAME : PROFESSOR HITOSHI OKAZAWA
POSITION / AFFILIATION : Professor and Chair, Director / Dept Neuropathology, Center for Brain Integration Research, Tokyo Medical and Dental University
TITLE OF TALK : Common pathologies across multiple neurodegenerative diseases revealed from unbiased approaches

SHORT BIOGRAPHY :
Hitoshi Okazawa graduated from Medical School The University of Tokyo in 1984 and received license of medical doctor. After clinical training as a resident in The University of Tokyo Hospital and other major hospitals in Tokyo, he became a staff member of Department of Neurology The University of Tokyo in 1986. He started research of molecular biology in 1988 at Department of Biochemistry The University of Tokyo and received Ph.D. by discovering Oct-3/Oct-4 in 1991 (Cell 1990; EMBO J 1991), which was later shown to be the most important factor for ES cell differentiation and iPS cell generation. He has been Professor and Chair of Neuropathology TMDU from 2003, Director of Center for Brain Integration Research TMDU from 2012, a director of Japanese Neuroscience Society from 2014, a trustee of Japanese Society of Neurology, Japanese Society of Neuropathology, Japanese Society of Dementia and many others. Main foci in his research are the pathomechanism and therapeutics development of neurodegenerative diseases including Alzheimer’s disease, Huntington’s disease and polyglutamine diseases.
SPEAKER’S BIODATA

MAIN CONFERENCE – FRONTIER IN BASIC NEUROSCIENCE & FAONS SYMPOSIUM

ASSOCIATE PROFESSOR THIRUMA VALAVAN ARUMUGAM

FULL NAME : ASSOCIATE PROFESSOR THIRUMA VALAVAN ARUMUGAM
POSITION / AFFILIATION
Affiliation
Department of Physiology
National University of Singapore, Singapore

TITLE OF TALK: Intermittent Fasting, Epigenetics and Stroke
SHORT BIOGRAPHY:
Thiruma V. Arumugam is an Associate Professor of Neuroscience at the Department of Physiology, YLLSOM, NUS. Dr. Arumugam’s major research focuses on unravelling neuronal cell death mechanisms in stroke. Dr. Arumugam’s research into novel targets for stroke therapy has the very real prospect of both transforming the field, as well as providing an intellectual platform for new drug development for stroke therapy. A/Prof Arumugam has over 120 publications and he is a lead, first or senior author on the majority of his publications, which have been collectively cited >8,300 times.

PROFESSOR TAKESHI IWATSUBO

FULL NAME : PROFESSOR TAKESHI IWATSUBO
POSITION / AFFILIATION
Affiliation
Professor, Department of Neuropathology, School of Medicine,
The University of Tokyo

TITLE OF TALK: Alzheimer’s disease: from molecular pathology to prevention
SHORT BIOGRAPHY:
Dr. Iwatsubo is currently Professor of Neuropathology at the School of Medicine, University of Tokyo. After graduating from the Univ of Tokyo in 1984 and trained in neurology and neuropathology, Dr. Iwatsubo has contributed to the studies of human neurodegenerative disorders, especially Alzheimer’s and Parkinson disease, using multidisciplinary approaches. He demonstrated that Aβ42 is the initially deposited species in senile plaque amyloid, and elucidated the process of β-secretase complex formation. He has identified β-synuclein, especially a hyperphosphorylated form, is a component of Lewy bodies. On the clinical front, Dr. Iwatsubo has been serving as the PI of Japanese AD Neuroimaging Initiative (J-ADNI) project, aiming at establishing standard surrogate markers for clinical trials of disease-modifying therapies for AD.
MAIN CONFERENCE – FRONTIER IN BASIC NEUROSCIENCE & FAONS SYMPOSIUM

FULL NAME : PROFESSOR TADASHI ISA
POSITION / AFFILIATION : Professor, Department of Neuroscience, Graduate School of Medicine, Kyoto University
TITLE OF TALK : Viral-vector based pathway-selective and reversible manipulation for causal neuroscience studies
SHORT BIOGRAPHY :

My research basically addresses the structure and function of neural systems controlling dexterous motor repertoires such as fractionated digit movements and saccades, which specifically developed in higher primates. Especially, we have been analyzing the corticospinal system in the hand movement control and superior colliculus in the control of saccadic eye movements. During the last decade, these lines of studies further developed to the reorganization of the circuits for functional recovery after the brain and spinal cord injury, and mechanism of blindsight for visuo-motor behaviors using nonhuman primate models. For such studies, we combine multidisciplinary approaches such as electrophysiology, behavioral analysis, neuroimaging (PET), pharmacological inactivation, gene expression analysis with microarray, pathway-selective and reversible manipulation with viral vectors, large-scaled ECoG recording, big-data analysis, and large-scaled spiking neuron network modeling etc. Especially, we developed, first time in the world, the pathway-selective and reversible transmission blocking technique using double viral vector infection and succeeded in inducing behavioral effects in macaque monkeys (Kinoshita et al. Nature, 2012). We are successively improving the technique and applying it to different neural circuits in the monkey brain.

MAIN CONFERENCE – FRONTIER IN BASIC NEUROSCIENCE & FAONS SYMPOSIUM

FULL NAME : PROFESSOR KEN-ICHIRO TSUTSUI
POSITION / AFFILIATION : Tohoku University Graduate School of Life Sciences
TITLE OF TALK : Use of trans-cranial magnetic stimulation (TMS) as a tool for basic neuroscience research: the role of medial frontal cortex tested by the inhibitory repetitive TMS in monkeys
SHORT BIOGRAPHY :

Ken-Ichiro Tsutsui graduated, and received his Ph.D. in Experimental Psychology, from the University of Tokyo. Since then he has been studying the neural mechanisms of higher cognitive functions, first as a JSPS Fellow in the Department of Physiology, Nihon University School of Medicine, next as a Research Associate in the Department of Anatomy, University of Cambridge, and then as an Associate Professor and later as a Professor in the Tohoku University Graduate School of Life Sciences.
Owen B White, Dept of Medicine, University of Melbourne, Vic, Australia

Neuro-ophthalmology permits evaluation of neurological function, in the cerebrum and the brainstem. A thorough understanding of anatomy and physiology of the system facilitates the evaluation of brain.

Clinical evaluation of neurological function is hampered by the difficulties matching input with responses, and quantitatively measuring the effect of pathology. The visual and oculomotor systems are closely integrated at multiple levels and, together, constitute the first closed loop system to mature in humans. This closed loop system is relatively free of the complexities added by multiple degrees of freedom of movement in the periphery, and is almost free of inertia, permitting close analysis of the effects of central processing. By manipulating input, and by closely monitoring stimulus-response relationships, we gain insights into systems degenerations as well as lesion pathologies of the cerebral hemispheres and cerebellum. The evaluation of visual fields, pupil responses and visual acuity, provide ancillary information regarding anatomical and systems integrity.

Beyond hemispheric and system disease, the oculomotor nuclei, their internuclear connections and infranuclear projections, ramify widely throughout the brainstem, producing characteristic patterns of deficit (eg, internuclear ophthalmoplegia, skew deviation, hemi-seesaw nystagmus, Parinaud’s syndrome, gaze palsies), permitting anatomical diagnosis.

Finally, the extra-axial projections of the various nerves, their relationships to each other as well as the 5th and optic nerves, provide extra-axial anatomical data.

Diagnosis in Neurology is dependent on pattern recognition. The visual and oculomotor systems combined provide a wide variety of diagnostic patterns that facilitate evaluation and subsequently management of patients.

Regina Katzenschlager
Department of Neurology, Vienna, Austria

The cardinal motor features of PD, bradykinesia, tremor and rigidity, typically respond very well to dopaminergic replacement therapy. Over the disease course, the responsiveness usually persists, but in most patients, motor complications (fluctuations and dyskinesias) and non-dopaminergic motor problems emerge, such as balance impairment and freezing during ON states, which may lead to falls.

Initial treatment of motor symptoms should be started at the time of diagnosis to improve patients’ quality of life. The substance is chosen based on the relative importance of improving motor function versus delaying motor complications (more relevant in younger patients who are more likely to develop motor complications): While L-dopa is the most effective oral antiparkinsonian drug, motor complications can be delayed by L-dopa sparing strategies involving dopamine agonists and MAO-B-inhibitors. However, dopamine agonists carry a risk of impulse control disorders and sleepiness.

Dose increases are necessary over the disease course due to the neurodegenerative process. Once motor fluctuations have emerged, intervals between and doses of L-dopa can be adjusted and its effect can be prolonged by blocking the enzymes MAO-B and COMT. Dopamine agonists also improve fluctuations but all of these measures may increase dyskinesias. Amantadine is the only oral drug which may improve both parkinsonism and dyskinesias.

Motor fluctuations that have become refractory to oral adjustments may improve on the continuous administration of intestinal L-dopa or subcutaneous apomorphine (a dopamine agonist) via pump systems, usually during daytime.
NON-PHARMACOLOGICAL TREATMENTS FOR PD MOTOR SYMPTOMS

Regina Katzenschlager
Department of Neurology, Vienna, Austria

The mainstay of treatment for PD is pharmacological. However, the evidence for an important additional role of non-pharmacological approaches has become relatively robust over recent years. The Evidence Based Medicine Review of the International Parkinson and Movement Disorder Society (MDS), which is regularly updated and published on the MDS website, has now been able to include over 100 randomised controlled studies of training and exercise therapy fulfilling inclusion criteria. Despite limitations compared to clinical trials of medical treatments, e.g. with respect to sample size, treatment duration, lack of blinding and lack of longer-term follow-up, the overall classification of physical therapy in a broad sense is now likely efficacious and clinically useful.

Methods included in the MDS EBM Review were physiotherapy in a strict sense (including e.g. treadmill training, aerobic exercise and progressive resistance training), movement strategy training with cueing or focused attention (often targeting balance and fall prevention, e.g. robotic gait training, mental practice, Nintendo Wii® and other technology assisted training, augmented visual feedback, and the “BIG” methodology), and formalized patterned exercises such as tai chi, qi gong, Argentine tango, Irish dance and other types of dancing.

Occupational therapy could also be classified as likely efficacious and clinically useful. Speech therapy (mostly Lee Silverman Voice training) was classified as being possibly useful. 

PAEDIATRIC STROKE

Dr Vijeya Ganesan
Great Ormond Street Hospital, London, UK

Imaging:
In this session we will consider the approach to diagnostic imaging, lesion characterisation and follow-up of ischaemic and haemorrhagic stroke in children. Consideration will be given to choice of imaging modalities (ultrasound CT, MRI, catheter angiography), timing, sensitivity and specificity and diagnostic pitfalls. These will be illustrated by consideration of clinical cases.

Therapeutic approach:
In this talk we will consider the 2017 RCPCH paediatric stroke guidelines for acute diagnosis and management of ischaemic and haemorrhagic stroke in children. This will include discussion of the recommendations for hyperacute recanalization therapies for childhood ischaemic stroke.

Diagnostical approach:
This talk will consider diagnostic algorithms for ischaemic and haemorrhagic stroke in children. I will also cover the recent international literature on risk factors and the recommendations from the 2017 RCPCH stroke guidelines.

TRANSLATING GENETIC DISCOVERIES IN PARKINSON’S DISEASE

Tan Eng King
Duke-NUS Medical School, Singapore

Parkinson’s disease (PD), a common neurodegenerative condition is due to dopamine deficiency in the pars compacta in the substantia nigra. The role of genes and environmental factors in PD has been debated for decades. The discovery of several genes and loci provide an opportunity to decipher the underlying pathophysiologic mechanism in both invitro and invivo genetic models. While these models are far from perfect, they do recapitulate some of the features observed in human disease. Identification of specific targets encoded by proteins of disease causing genes can lead to development of novel therapeutic targets. In addition, identification of disease causing genes facilitates development of genetic testing programmes in clinical practice. This lecture will provide a concise summary of some of the genetic discoveries that can potentially lead to clinical translation in the clinics.
Intermittent fasting (IF) is a dietary protocol where energy restriction is induced by alternate periods of ad libitum feeding and fasting. Prophylactic intermittent fasting has been shown to extend lifespan and attenuate the progress and severity of age-related diseases such as cardiovascular, neurodegenerative and cancerous diseases in animal models. Stroke is the second leading cause of death, and lifestyle risk factors such as obesity and physical inactivity have been associated with elevated risks of stroke in humans. Recent studies have shown that prophylactic IF may mitigate tissue damage and neurological deficit following ischemic stroke. The efficacy of IF to protect brain against neurodegenerative diseases and ischemic injury involved the coordinate upregulation of multiple neuroprotective proteins including neurotrophic factors, such as BDNF and bFGF; protein chaperones, including Hsp70 and GRP78; antioxidant enzymes, such as SOD and HO-1, down regulation of pro-inflammatory cytokines (TNF, IL-1β and IL-6) and suppression of inflammasome activation at the site of injury. In this talk, I will summarize the data supporting the mechanisms of IF in ischemic stroke and plasticity.

THE SEDATIVE EFFECT OF THE CHOLINERGIC TRANSMISSION IN THE HABENOULO-INTERPEDUNCULAR PATHWAY IN SOCIAL CONFLICT

Hitoshi Okamoto
RIKEN Brain Science Institute, Japan

Nicotine stabilizes emotion. Although nicotine activates brain acetylcholine (ACh) systems, little is known about the mechanisms how to stabilize emotions. We previously identified two subregions of the dorsal habenula (dHb) in zebrafish that antagonistically regulate the outcome of conflict. Silencing of the dHbl or medial subregion of dHb (dHBM) caused a stronger predisposition to lose or win a fight, respectively. In mouse, the dorsal and ventral subregions of the medial habenula (dMHb and vMHb) are the direct evolutionary homolog of the dHbl and dHBM in zebrafish. The neurons in the vMHb projecting to the IPN use both glutamate and acetylcholine as co-neurotransmitters. Here we show that a loss of cholinergic neurotransmission from the ventral part of the medial habenula (vMHb) to the interpeduncular nucleus (IPN) prevented surrender and allowed mice to overcome physically stronger opponents in instantaneous social conflicts. Conversely, mice in which the vMHb-IPN pathway was optogenetically activated tended to stop the fight and yield against even gentler opponents. These results demonstrate that the vMHb-IPN pathway is essential for animals to determine when they cease aggressive behavior during the social conflicts and may contribute to emotional stabilizing effect of nicotine via its receptor. We are now analyzing how the cholinergic transmission affects the Hb-IPN pathway pharmacologically both in mouse and zebrafish.

CONTROLLING SYNAPSE VARIABILITY AND PLASTICITY IN HIPPOCAMPAL NEURONS

P. Chipman1, M. Letellier1,2, Y. Park1, T. Chater1, A. Sawant1, S. Gautum1, Y. Goda1
1RIKEN Brain Science Institute, 2-1 Hirosawa, Wako, Saitama 351-0198, JAPAN
2Université Bordeaux, Institut Interdisciplinaire de Neurosciences, UMR5297, Bordeaux, FRANCE

Synapses are the fundamental nodes of information transmission in the brain, and the diversity and variability of synaptic connections are crucial for neural circuit operations underlying brain functions. However, the basis by which synaptic strength is set and regulated across individual synapses in a population remains to be clarified. We have addressed this question by examining the interaction between multiple presynaptic terminals that converge onto single hippocampal pyramidal neurons. Presynaptic strengths of two independent Schaffer collateral inputs were highly heterogeneous and uncorrelated. However, upon bath applying NMDA receptor antagonists or ablating the expression of GluN1 NMDA receptor subunit from GFAP-positive astrocytes, presynaptic strengths became more similar between the two sets of convergent inputs. Interestingly, the reduced variability did not involve a change in the mean presynaptic strength and appeared to be specific to the Schaffer collateral connection. Our study highlights the existence of an astrocyte-dependent cellular mechanism that serves to create the heterogeneity of basal synaptic strengths in hippocampal neurons. Moreover, this astrocyte-dependent mechanism plays a role in the expression of heterosynaptic presynaptic plasticity that involves counterbalancing of synaptic strengths between stimulated and non-stimulated synapses.
**SPEAKER’S ABSTRACT**

**AN INTRODUCTION AND RECENT ADVANCES IN: DIFFUSION MRI IMAGING AND ANALYSIS AS POTENTIAL BIOMARKERS FOR NEURONAL DISEASES AND NEURO SURGICAL GUIDANCE**

Mandava Rajeswari  
*School of Computer Sciences, Universiti Sains Malaysia, Penang, Malaysia*

Diffusion weighted magnetic resonance imaging (dMRI) produces in vivo maps of microscopic structural information of biological tissues such as brain white matter, heart, muscle etc. It is increasingly becoming an important imaging biomarker for neurodegeneration with its ability to characterize the tissue pathophysiology at micro structural level before it can become apparent with gross anatomical changes. From the diffusion image signal, a wide range of quantitative indices that represent tissue morphology and compartmentalization are being developed to assess axonal and myelin damage in neurological disorders. dMRI has also enabled the visualization of white matter fiber tracts in the brain, emerging as a potentially valuable tool for pre-surgical planning where knowledge of the exact location of the lesion with respect to eloquent white matter pathways is of great importance; and also in post-operative follow up. The popular initial diffusion model, DTI – diffusion tensor imaging, is a rather simple model that assumes linearity of diffusion within a voxel. Therefore, it is inadequate to resolve nonlinear diffusion that results from crossing and kissing of multiple fibers. To overcome these limitations, the recent focus has shifted to the advanced image acquisition methods and their related analytical approaches. This presentation introduces diffusion imaging and its use as a biomarker for neurodegeneration and its applications in neurosurgery. It also presents some recent trends in imaging, modelling and tractography techniques.

**SIGNALLING MOLECULES INVOLVED IN SYNAPTIC PLASTICITY ARE EPIGENETICALLY REGULATED IN RODENT MICROGLIA**

S.T. Dheen¹, G. Saw¹, N. Gupta¹ and M. Karthik²

¹Department of Anatomy, ²Department of Physiology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore.

In this session we will consider the approach to diagnostic imaging, lesion characterisation and follow-up of Microglia, the resident macrophages of the brain, have been shown to be involved in the plasticity of neuronal synapses. Phosphatidylinositol 3-kinase (PI3K), which mediates synaptic plasticity in neurons, is expressed in microglia. However, the role of microglial PI3K has been mainly studied in the context of inflammation. Further, downstream effectors of microglial PI3K such as protein kinase B (Akt), CREB and BDNF have been shown to influence synaptic plasticity. Hence it is hypothesised that the microglial PI3K regulates the synaptic plasticity by altering the BDNF production. The present study showed that the microglial PI3K is regulated epigenetically through histone modification and sumoylation. Sodium butyrate, a HDAC inhibitor, upregulated PI3K expression and the phosphorylation of Akt and CREB in microglia, suggesting that BDNF secretion from microglia may be altered via epigenetic regulation of PI3K. In addition, ChIP results show a significant increase in H3K9ac enrichment at the Pik3ca promoter region which is highly correlated with PI3K gene expression in BV2 microglia treated with HDACi, further implying that PI3K is epigenetically regulated. Knockdown of SUMO1 in stable BV2 microglia resulted in a decrease in the phosphorylation of Akt and CREB as well as the expression of BDNF. These results suggest that microglial PI3K is epigenetically regulated by histone modifications and post-translationally modified by sumoylation. Understanding the mechanisms by which microglial PI3K influences synapses may give us an insight into the ways by which it can modulate synaptic transmission and subsequently synaptic plasticity in learning and memory. Support: NUS Strategic Research Grant (R185-000-271-646).
Cognitive outcomes following mild traumatic brain injury (mTBI) are varied in nature despite similarity in general injury patterns and severity. Polymorphism of neural repair and plasticity genes are postulated as one of the reasons for this heterogeneity. We therefore analysed the role of brain derived neurotropic factor (BDNF) genetic polymorphism (Val66Met) on cerebral white matter integrity using diffusion tensor imaging (DTI), and examined its effect on longitudinal cognitive outcomes of patients with mTBI over a 6-month period. A detailed neuropsychological assessment and magnetic resonance imaging (MRI) including diffusion tensor imaging (DTI) were performed for all patients (n=66) at admission, and the same protocols were repeated again at six months post-trauma. Serum blood samples were collected at admission for genotyping purposes (n=48). Significant differences of the Δ were found in the domains of attention \( \text{F}(2,49)= 8.60, p=0.001 \), memory \( \text{F}(2,49)= 6.11, p=0.004 \) and executive function \( \text{F}(2,49)= 4.01, p=0.024 \) amongst the groups over time. Met carriers had significantly lower SS in memory \( \text{M}=86.2, \text{SD}=12.5 \) than the Val/Val \( \text{M}=102, \text{SD}=12.5 \). Acutely, the Met carriers had significantly increased FA in the PCR-Rt \( \text{t}(44)= -2.78, p=0.01 \), PCR-Lt \( \text{t}(44)= -2.95, p=0.01 \), CGC-Lt \( \text{t}(44)= -2.33, p=0.02 \), right superior longitudinal fasciculus (SLF-Rt; \( \text{r}(44)= -1.98, p=0.05 \)) and SLF-Lt \( \text{r}(44)= -3.02, p=0.00 \), with a trend of lower MD and RD. Reduced FA values at 6 months among Met carriers were linked with increased MD and RD values. Findings suggest that the observed effects could be due to a down-regulation of BDNF expression in Met carriers, thus possibly reducing neuronal survival and repair, affecting neurocognitive performance detrimentally. Taken together, the combination of DTI metrics and BDNF (Val66Met) polymorphism provides a clearer prognostic picture for patients with mTBI and useful in terms early targeted rehabilitative intervention.
THERMOSENSATION AND INTEROCEPTION: LIMBIC SYSTEM IS INVOLVED IN THERMOREGULATORY BEHAVIOURS

D. Boldbaatar¹, J. Corrigan², B. Lkhagvasuren¹³

¹Science and Technology Center, Mongolian National University of Medical Sciences, Ulaanbaatar, Mongolia
²Department of Biological Engineering, Massachusetts Institute of Technology, Boston, Massachusetts, USA
³Systemic Inflammation laboratory, St. Joseph’s Hospital and Medical Center, Phoenix, Arizona, USA

Behavioral thermoregulatory responses are associated with neural circuits of sensory systems, stress responses, autonomic nervous system, and endocrine system. Interestingly, not the brain lesions in the preoptic area, the hypothalamic center for thermoregulation, or in the thalamic ventroposterior nucleus, the relay center of the ascending anterolateral system, but the brain lesions in the bed nucleus of stria terminalis (BNST) which is one of the main limbic system structures responsible for anxiety, emotion, and stress responses, disrupts the thermoregulatory behaviors. In an isothermal condition, both BNST lesioned and sham lesioned rats injected with a vehicle exhibited transient explorative behavior, followed by a persistent positive thigmotactic behavior (i.e., stayed close to either corner). In a heterothermal condition, sham lesioned rats injected with vehicle exhibited the exploratory behavior but then moved to the middle portion of the apparatus (~26°C; the thermoneutral environment) and remained there until the end of the observation period. In contrast, BNST lesioned rats could not find the thermoneutral environment and kept preferring corners showing the thigmotactic behavior, similar to that observed in an isothermal condition. Furthermore, autonomic thermoregulatory responses including body core temperature, skin temperature, and heat loss index were not altered in BNST lesioned rats, and anxiety, thermal pain, and spatial memory were intact. These findings indicate that the BNST plays a critical role in behavioral thermoregulation and support the interoception approach by identifying a limbic system structure, BNST, as a brain site that drives behavioral responses to thermal stimuli in freely moving, conscious rats.

USE OF TRANS-CRANIAL MAGNETIC STIMULATION (TMS) AS A TOOL FOR BASIC NEUROSCIENCE RESEARCH: THE ROLE OF MEDIAL FRONTAL CORTEX TESTED BY THE INHIBITORY REPETITIVE TMS IN MONKEYS

K.I. Tsutsui

Laboratory of Systems Neuroscience, Tohoku University Graduate School of Life Sciences, Sendai, Japan

TMS is expected to be a powerful tool in manipulating the brain activity. In order to investigate its working mechanisms, we recorded electrocorticogram (ECoG) before and after repetitive trans-cranial magnetic stimulation (rTMS). We also recorded motor evoked potential (MEP) induced by single-pulse TMS before and after rTMS. When the MEP amplitude was suppressed after low-frequency (1 Hz) rTMS, we observed the decrease of beta-band power in ECoG; when the MEP amplitude was enhanced after high-frequency (10 Hz) rTMS, we observed the increase of gamma-band power in ECoG. These result indicate the systematic change of cortical neural activity induced by low-frequency and high-frequency rTMS. We then explored the function of the medial cortical surface by applying low-frequency rTMS inhibiting the local neural activity (intensity: 120% of the MI motor threshold, duration of stimulation: 20 minutes, total number of pulses: 1200). In addition to the figure-of-eight coil, double cone coil was used to stimulate deeper regions on the medial cortical surface. We observed clear and profound impact on behaviour only when the low-frequency rTMS was targeted on the anterior part of the medial prefrontal cortex with a double-cone coil. After the stimulation, the monkey exhibited changes in physiological and behavioural measures that indicated sustained depression of mood and emotion, such as elevated cortisol level in the blood, decreased within-cage spontaneous activity, social withdrawal (unwillingness to interact with research staffs taking care of them), and decreased motivation for performing tasks to acquire food. These results indicate the critical involvement of the medial frontal cortex in the regulation of mood and emotion.
In modern neuroscience studies, to clarify the function of particular elements of neural circuits, it is required not only to show their temporal correlation, but also to demonstrate their causal relationship, to behaviour. Development of molecular genetics enabled us to selectively manipulate the function of particular neurons with specific promotors using transgenic techniques in model animals such as mouse, nematode, zebrafish and drosophila. However, such cell specific promotors are not identified in all the cell types in the CNS and such technique is not available in other non-transgenic animals such as primates including humans. In this lecture, I will talk about the recent development of viral vector technologies which enabled pathway-selective and reversible manipulation in the animals including non-human primates. In this technique, we inject viral vectors which are retrogradely transmitted from the nerve terminals to cell bodies of the neurons projecting to the injection site (A). In addition, we inject the second vector into the location of their cell bodies (B). By doing this, the neurons projecting from the area B to the area A are double infected. In one way, we use tetracycline transactivator system to selectively express tetanus neurotoxin light chain in the double-infected neurons by administration of doxycycline. In another way, we combine Cre-double flox system to selectively express channelrhodopsin (ChR2), which enabled pathway-selective optogenetic activation. I show successful examples of these anatomy-based selective manipulation of neural circuit elements as very general techniques applicable to a variety of animal species and cell types.
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VNS Therapy has demonstrated long-term efficacy independent of AED use.

No medication changes were allowed across multiple studies.

Patients with a 50% seizure frequency reduction:
- **57%** Responder rate
  - **12 MONTHS** mean follow-up
    - (N=210): Letters
  - **No AED changes were allowed**

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Significant improvements in quality of life, independent of seizure control in adults:

Quality of life improvements can lead to improved wellness.
Improvement was defined as patient being "better" or "much better" at 12 months (N=2,229):

- **30%** for **Achievements**
- **34%** for **Memory**
- **41%** for **Verbal Skills**
- **44%** for **Seizure Clusters**
- **45%** for **Mood**
- **55%** for **Productive Period**
- **62%** for **Alertness**

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Significant improvements in quality of life in pediatric patients:

Quality of life improvements can lead to improved wellness.
Improvement was defined as patient being "better" or "much better" at 12 & 24 months (N=109):

- **16%** for **Memory**
- **23%** for **Development**
- **36%** for **Progress**
- **54%** for **Verbal**
- **41%** for **Mood**
- **39%** for **Energy**
- **43%** for **Concentration**
- **42%** for **Alertness**

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Clinicians' assessment of Quality of Life:
Improvement was defined as patient being "better" or "much better" at 12 & 24 months (N=109):

- **55%** for **Memory**
- **65%** for **Development**
- **66%** for **Progress**
- **64%** for **Verbal**
- **54%** for **Mood**
- **42%** for **Energy**
- **43%** for **Concentration**
- **66%** for **Alertness**
Confidence in Your Multi Morbid Patients

Well-Established Efficacy and Safety Profile Proven in Multi-Morbid NVAF Patients

- Non-inferior protection against stroke and systemic embolism in the intention-to-treat analysis (p=0.12) *1

Study powered for non-inferiority for primary endpoint of stroke or systemic embolism vs warfarin*1

ITT population: 12% RRR; P=0.12

Noninferiority of Xarelto® vs warfarin in primary prophylaxis of stroke and systemic embolism in non-valvular atrial fibrillation (NVAF) in the ENGAGE AF-TIMI 48 study (NCT01301889). The study was designed to demonstrate non-inferiority of Xarelto® to warfarin in reducing the risk of stroke and systemic embolism in patients with NVAF. The primary endpoint was the composite of stroke and systemic embolism. The study enrolled patients with NVAF and randomized them to either Xarelto® (2.5 mg twice daily) or warfarin (INR 2-3). The study demonstrated non-inferiority of Xarelto® to warfarin in reducing the risk of stroke and systemic embolism. The primary endpoint was met with a non-inferiority margin of 1.25. The study was conducted in two parts: Part A and Part B. In Part A, the study enrolled patients from February 2012 to October 2013 and in Part B, the study enrolled patients from November 2013 to March 2014. The study was sponsored by Bayer HealthCare and was conducted under the guidance of the ENGAGE AF-TIMI 48 investigators. The study was designed to be non-inferior if the upper limit of the confidence interval for the risk difference between Xarelto® and warfarin was less than 1.25.

Stroke or Systemic Embolism

Study population: 16,143 patients with NVAF

- Primary endpoint: Composite of stroke and systemic embolism
- Secondary endpoints: All-cause mortality, major bleeding, serious adverse events

Safety analysis: 16,143 patients

- Mean CHADS2 score: 3.5

Intracranial Hemorrhage

- Primary endpoint: Composite of stroke and systemic embolism
- Secondary endpoints: All-cause mortality, major bleeding, serious adverse events

Safety analysis: 16,143 patients

- Mean CHA2DS2-VASc score: 3.5

Focal Bleeding

- Primary endpoint: Composite of stroke and systemic embolism
- Secondary endpoints: All-cause mortality, major bleeding, serious adverse events

Safety analysis: 16,143 patients

- Mean CHA2DS2-VASc score: 3.5

No significant difference in primary safety endpoint of major or clinically relevant non-major bleeding vs warfarin

NVAF, non-valvular atrial fibrillation; AF, atrial fibrillation; RRR, relative risk reduction; ARR, absolute risk reduction; YR, year; HR, hazard ratio. The RRR was calculated as 1 - ARR by Bayer. Critical organ bleeding HR 0.67, fatal bleeding HR 0.50, p-value for superiority.
INVITED SPEAKERS BIODATA & ABSTRACT LOCAL FACULTY
**FULL NAME** : PROFESSOR DR. LIM KHENG SEANG  
**POSITION / AFFILIATION** : Faculty of Medicine, University of Malaya and Consultant Neurologist specialized in epilepsy in University of Malaya Medical Centre, Kuala Lumpur, Malaysia  
**TITLE OF TALK** : Plenary 1: Understanding brain network via epilepsy research, beyond the era of Brodmann's cortical area concept  

**SHORT BIOGRAPHY**:
Professor Lim is a University of Malaya (Malaysia) graduate, is a Professor in Faculty of Medicine, University of Malaya and Consultant Neurologist specialized in epilepsy in University of Malaya Medical Centre, Malaysia. He has been trained in the University of Malaya for his neurology subspecialty training, followed by fellowship training in Melbourne for epilepsy. He is currently the member of Malaysian Epilepsy Council and the president of the Malaysian Epilepsy Society, and a member of Commission of Asian and Oceanian Affairs, International League Against Epilepsy. He has published numerous original papers in epilepsy, especially on the psychosocial aspects of epilepsy, pharmacogenomics, and pharmacokinetics of antiepileptic drugs, and currently involved in various research in neurology and epilepsy. He has involved in many trials of newer treatment (e.g., newer drugs and transcranial magnetic stimulation) in epilepsy. He is also specialized in noninvasive and invasive epilepsy surgery assessment, including long-term video-EEG monitoring, intracranial monitoring with subdural and depth electrodes, electrocorticography and cortical stimulation. Other areas of expertise included vagal nerve stimulation and callosotomy evaluation and monitoring.

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**FULL NAME** : ASSOCIATE PROFESSOR DR. VAIRAVAN NARAYANAN  
**POSITION / AFFILIATION** : Consultant Neurosurgeon, University Malaya Medical Centre, Kuala Lumpur, Malaysia  
**TITLE OF TALK** : Current and Future Paradigms of Epilepsy Surgery in the Management of intractable Epilepsy  

**SHORT BIOGRAPHY**:
Dr Narayanan is an Associate Professor of Neurosurgery in the Faculty of Medicine of University Malaya and Consultant Neurosurgeon in University Malaya Medical Centre, Kuala Lumpur. His clinical interest lies in Neuro Oncology, Epilepsy and Skull Base Surgery. He works closely with the adult and paediatric Neurologists and has built up a successful Epilepsy Surgery Program. With his fellow neurosurgeons and neuro-oncologists, he also runs a dedicated Neuro Oncology Unit which provides the highest standards of care for brain tumour patients. He has extensive research interests and is well published in many neurosurgical fields. He heads the University Malaya Head Injury Research Group which primarily works on Traumatic Brain Injury, specifically mild head injury and neuropsychological sequela; advanced imaging and white matter changes; genetic modulation of neural recovery in head injured patients and rehabilitative assessment and intervention. Dr Vairavan is also involved in other research activities including Surgical Education and Simulation; genetic polymorphisms and mechanisms of brain metastases and advanced imaging in primary brain tumors. Dr Vairavan’s primary interest is to be a clinician scientist, contributing to the growing medical knowledge as well as to share this knowledge with both his students and the general medical fraternity at large.
SPEAKER’S BIODATA

**FULL NAME :** ERIC HO TATT WEI

**POSITION / AFFILIATION :**
- Senior Lecturer, Dept of Electrical & Electronics Engineering
- Center for Intelligent Signal & Imaging Research
- Universiti Teknologi PETRONAS
- Malaysia Node Coordinator,
  International Neuroinformatics Coordinating Facility

**TITLE OF TALK :** Advances in Quantitative Neuroimaging Analysis for Epilepsy and Beyond

**SHORT BIOGRAPHY :**

Dr. Eric Tatt Wei Ho is a senior lecturer at Universiti Teknologi PETRONAS, Malaysia in the Department of Electrical & Electronics Engineering. He received his MSc and PhD degrees in Electrical Engineering from Stanford University, USA. His M.Sc specialization was in Computer Hardware & VLSI Systems. His PhD research resulted in a portable robotics systems with real-time machine vision for high content and high throughput basic neuroscience experiments, which was published in Nature Methods and received press coverage from the New York Times in 2015. He was also a co-inventor of a 2g miniature integrated microscope for live wide-field brain imaging in freely behaving rodents and holds joint authorship of a US and UK patent for this technology which has been commercialized by Ins copix, USA.

As a young investigator, his research interests are in applying advanced big data analytics and machine learning techniques to brain analysis to characterize the effect of addictions, disease and wellness on the brain as well as in the monitoring and manipulation of blood cells for immunotherapy using microfluidics devices. He hopes to apply these tools as means to monitor and assess health and the efficacy of interventions. In 2015, he established the Malaysia Node of the International Neuroinformatics Coordinating Facility with Prof Ahmad Fadzil and is currently the Malaysia Node Coordinator. He is an active member in the Malaysian Society for Neuroscience and in the international neuroinformatics community.

**FULL NAME :** DR. TAN CHENG YIN

**POSITION / AFFILIATION :**
- Consultant Neurologist and Senior Lecturer University Malaya Medical Centre, The Faculty Of Medicine, University Malaya (UM)

**TITLE OF TALK :** Differential Diagnosis of Cranial Facial Pain

**SHORT BIOGRAPHY :**

Dr. Tan Cheng Yin is a consultant neurologist and a senior lecturer at the University Malaya Medical Centre and the Faculty of Medicine, University Malaya (UM). He is a life member of the Malaysian Society of Neuroscience. He obtained his Bachelor of Medicine and Bachelor of Surgery (MD) from the National University of Malaysia (UKM) in 2003 and Membership of the Royal Colleges of Physicians of the United Kingdom (MRCP) in 2010. He graduated with the Master of Internal Medicine (MintMed) from the University of Malaya (UM) in 2012. He served as a clinical specialist in University Malaya Medical Centre and completed his training in Neurology from 2012 to 2015. He was awarded the Certificate of Completion of Training in Neurology (Malaysia) in 2015. His areas of interest are Neuromuscular disorders and Neurophysiology. Besides clinical work, Dr. Tan is active in teaching and research in the University of Malaya and has published several papers in local and international journals in the field of Neurology.
ASSOC. PROF. DATO’ DR. HARI CHANDRAN
Consultant Neurosurgeon,
University Of Malaya Medical Centre
The Equilibration of Surgical Options in the Management of Trigeminal Neuralgia-Percutaneous Rhizotomy, Microvascular Decompression and Stereotactic Radiosurgery
Hari Chandran is a Consultant Neurosurgeon & Associate Professor with the University of Malaya.
His clinical interests lie in Neuro-Oncology & Stereotactic Radiosurgery, Craniofacial Pain Syndromes and Spinal Surgery. He works closely with his fellow Neurosurgeons and Neuro-Oncologists in providing a dedicated Neuro-Oncology Service which prescribes to the highest standards of care for brain tumour patients.
His current research interests include trauma, translation & application of biomaterials in clinical utility and stereotactic radiation therapy for cerebello-pontine angle tumours.
He was appointed and currently serves in the Specialty Subcommittee of Neurosurgery of the NSR. He is also the Vice-President of the Neurosurgical Association of Malaysia.

DR. LAW WAN CHUNG
Neurologist, Sarawak General Hospital
Acute Treatment of Stroke: A Malaysian Experience
Dr Law Wan Chung is neurologist in Sarawak General Hospital. I graduated from University Malaya, Kuala Lumpur in 2001 and attained membership for Royal College of Physician, United Kingdom in 2008. I completed my Neurology training in Hospital Kuala Lumpur in 2013 and return to Sarawak in 2014. I am life member of Malaysia Society of Neuroscience and adjunct lecturer for medical faculty of University Malaysia Sarawak ( UNIMAS ). I am actively involve in research. In 2014, Sarawak General Hospital became the first public hospital under Ministry of Health in Malaysia to provide 24/7 acute thrombolysis for Acute ischemic stroke.
PRE-CONFERENCE WORKSHOP FOR PAEDIATRIC NEUROLOGY – “CHILD NEUROLOGY & DEVELOPMENTAL PAEDIATRICS MASTERCLASS” & MAIN CONFERENCE – PAEDIATRIC NEUROLOGY UPDATE

FULL NAME : Dr. Mohd Feizel Alsiddiq Bin Mohd Fakharuddin
POSITION / AFFILIATION : Consultant Paediatric Neurologist, Prince Court Medical Centre, Kuala Lumpur
TITLE OF TALK : Evaluation and management of paediatric headache
SHORT BIOGRAPHY :

Mohd Feizel Alsiddiq is a Consultant Paediatrician and Paediatric Neurologist at Prince Court Medical Centre Kuala Lumpur since 2014. He graduated from National University of Ireland, Galway, Republic of Ireland in 1997. Following an exciting 2.5-year clinical posting in a rural district hospital in Sabah, he underwent his paediatric residency training in University Malaya Medical Centre (UMMC), Kuala Lumpur and graduated with Master in Paediatrics as well as obtaining his membership to Royal College of Paediatrics and Child Health (MRCPCH), United Kingdom.

He pursued his interest and training in paediatric neurology at UKM Medical Centre (UKMMC), Kuala Lumpur followed by a fellowship in epilepsy and neurophysiology with the Division of Neurology, Children’s Hospital of Philadelphia (CHOP), Philadelphia PA, United States of America in 2010. Upon his return, he started the paediatric neurology service at Hospital Serdang, Selangor which is the main teaching hospital of the UPM Medical school where he was working as a senior medical lecturer. He was appointed as the Head of Department, Department of Paediatrics, Faculty of Medicine, University Putra Malaysia (UPM) in May 2011. He is currently the Chairperson of the Chapter of Child Neurology and Paediatric Neurology (CCNDP) of the Malaysian Society of Neurosciences (MSN) and Adjunct Medical Lecturer with the Faculty of Medicine, UPM.
SPEAKER’S BIODATA

MAIN CONFERENCE – PAEDIATRIC NEUROLOGY UPDATE

FULL NAME : WONG SAU WEI
POSITION / AFFILIATION : Associate Professor
Department of Paediatrics
Universiti Kebangsaan Malaysia, Kuala Lumpur
TITLE OF TALK : Schematic approach to the hypotonic infant

SHORT BIOGRAPHY :
MBBS (UM), MRCP (Edin), MRCPCH (UK)

A/Prof Dr Wong Sau Wei is a lecturer and consultant paediatric neurologist in UKM Medical Centre. He is an active member of the Malaysian Society of Neurosciences and the Asian and Oceanian Child Neurology Association. His research interests include epilepsy, cerebral palsy and transition care in children with neurological disorders.

PRE-CONFERENCE WORKSHOP FOR PAEDIATRIC NEUROLOGY – “CHILD NEUROLOGY & DEVELOPMENTAL PAEDIATRICS MASTERCLASS” & MAIN CONFERENCE – PAEDIATRIC NEUROLOGY UPDATE

FULL NAME : ASSOCIATE PROFESSOR FONG CHOONG YI
POSITION / AFFILIATION : Associate Professor and Consultant Paediatric Neurologist,
Department of Paediatrics, Faculty of Medicine, University Malaya, Kuala Lumpur
TITLE OF TALK : Principles and Evaluation of Paediatric Ataxia

SHORT BIOGRAPHY :

Dr Fong Choong Yi is a medical graduate from University of Nottingham, UK. He trained in Paediatrics and Paediatric Neurology in UK. His UK Paediatric Neurology specialty training include working in tertiary Neurology units at Great Ormond Street Hospital London, Evelina Children’s Hospital London and Bristol Royal Children’s Hospital. He then had further subspecialty dual-fellowship training in Paediatric Epilepsy and Paediatric Electroencephalography at Brisbane, Australia (Mater & Royal Children’s Hospital Brisbane) and Melbourne, Australia (Royal Children’s Hospital Melbourne). He is currently an Associate Professor and Consultant Paediatrician and Paediatric Neurologist at the Faculty of Medicine, University Malaya. He developed and oversees the Comprehensive Paediatric Epilepsy evaluation service in University Malaya. He is an executive committee member of the Malaysian Society of Neurosciences, Malaysian Chapter of Child Neurology and Developmental Paediatrics, and the Malaysian Epilepsy Council. He is also a life member of the International Child Neurology Association.
FULL NAME : PROFESSOR. DATO’ DR. JAFRI MALIN ABDULLAH

POSITION / AFFILIATION : Director, Center For Neuroscience Service & Research, Universiti Sains Malaysia, Health Campus, 16150 Kubang Kerian, Kelantan

TITLE OF TALK : TBA How Neurotechnology helps us with transdisciplinary management of Traumatic Brain Injury patients

SHORT BIOGRAPHY :
Professor Dr. Jafri Malin Abdullah studied in Sekolah Menengah Sains Bukit Mertajam and SMS Kelantan, Pengkalan Chepa and Leederville Technical College, Perth, Western Australia and the University of Western Australia.

He graduated later with an MD from the School of Medical Sciences, University Sains Malaysia in 1986. In 1994, he was awarded the Diplomate Certification of Specialization in Neurosurgery from the University of Ghent, Belgium. He later obtained a Ph.D (Magna Cum Laude) from the same university in 1995. Professor Dr. Jafri is a Fellow of the Academy Science Malaysia, American College of Surgeons, the Royal College of Surgeons of Edinburgh and the Royal Society of Medicine(UK).

He is currently Professor of Neurosciences and the Director of P3Neuro; The Center for Neuroscience Services and Research, University Sains Malaysia. He was awarded the prestigious Young National Malaysian Scientist Award in 1999 and Top Research Scientist Award, Academy Science Malaysia in 2013 both by the Prime Minister of that period. Part of his cluster’s research are focused on new treatments in the field of neurooncology, medicinal chemistry in the field of biodegradable wafer antibiotics, drugs for movement disorders, CNS tuberculosis, epilepsy and pain as well as ethnopharmacology.

Together with the Transcranial Magnetic stimulation facilities and complete behaviour lab his other cluster concentrates on comparative as well as neuropsychology and behavioral neurosciences. Besides being responsible in setting up labs for functional magnetic resonance imaging, magnetoencephalography, high density electroencephalography, neurogenetics, rodent animal behavior, electrophysiology, stem cell culture and primary cell laboratories his most recently research activity is in the field neuroinformatics. Professor Dr. Jafri has 174 publications in national/international peer-reviewed journals and has a H-Index of 18.

He is the Editor of the Malaysian Journal of Medical Sciences and is editorial board member/International editor of 6 international neuroscience/neurosurgical journals in Europe, USA, Australia, Japan, India and China. Professor Dr. Jafri has authored 10 textbooks and written 14 textbooks chapters. He graduated more than 64 neurosurgeons, neurologists & neuroscientists via the Masters of Surgery (Neurology), Advance Master Internal Medicine (Neurology), Master of Science (Neuroscience) and PhD Neuroscience and recently initiated Asia’s first Integrated Doctor of Neuroscience Program as well as the first joint Psychology and Cognitive Neuroscience’s programme.

Professor Dr. Jafri has established more than 20 neuroscience clubs in secondary and primary schools in Malaysia and is the Malaysian International Brain Bee coordinator. Professor Dr Jafri has been the member of the board of Society for Brain Mapping and Therapeutics, Member of the G20+ World Brain Mapping and Therapeutics Initiative (G20+ WBMTI) Committee (representing Malaysia) and the Vice Chairman of the Malaysian- SBMT and co-founder of Malaysian Brain Mapping Initiative as part of the G20+ WBMTI.
Dr. Lim Thien Thien is currently a Consultant Neurologist working in Island Hospital, Penang. He graduated from University Malaysia Sarawak (UNIMAS) in 2002. Subsequently, he obtained his Membership Royal College of Physician (MRCP) from the United Kingdom (UK) in 2007. From Jan 2008 till May 2009 he underwent his gazettement as a physician in Hospital Seberang Jaya. After that, he furthered his training in neurology in Penang General Hospital, University Kebangsaan Malaysia (UKM) and Kuala Lumpur General Hospital before doing his subspecialty in Parkinson’s disease and movement disorders. He was awarded the Fellowship in Parkinson disease and Movement disorders from Cleveland Clinic, United States of America in 2012 after his training in the United States of America. He has done numerous researches and has written many articles in journals and book chapters in Movement Disorders. Dr. Lim is currently the Secretary of the Movement Disorder Council of Malaysia.

Professor and Head of Department of Medicine, Faculty of Medicine, UKM. She was the First Chair of the Movement Disorders Council of Malaysia. Completed one year Fellowship with Prof Niall Quinn and Prof Kailash Bhatia at the Institute of Neurology, Queen Square, London in 2007. Recipient of High Impact Research Grant 2012 and Dana Lonjakan Penerbitan 2011. Recipient of Researcher of the year award for Faculty of medicine 2016 and Anugerah Bitara UKM (Journal Publications 2016). Committee member for Lancet Commission Steering Committee for Stroke in Low to Middle Income Countries since 2016. Head of Internal Medicine in National Professors Council of Malaysia.
SPEAKER’S BIODATA

PRE-CONFERENCE WORKSHOP FOR ADULT NEUROLOGY – “NEUROLOGY MASTERCLASS – MEET THE EXPERTS” & MAIN CONFERENCE - NEUROLOGY-NEUROSURGERY RECONNECTED – MDS EBM UPDATE ON PARKINSON’S DISEASE

FULL NAME : PROFESSOR DR. LIM SHEN-YANG
POSITION / AFFILIATION : Consultant Neurologist
University of Malaya Medical Centre

TITLE OF TALK : 1. DBS in PD
2. Grand Rounds with PD Experts

SHORT BIOGRAPHY :

Biosketch of Professor Dr. LIM Shen-Yang
MBBS (Melb) MD (Melb) FRACP FASc (Malaysia)

Professor Lim is a Neurologist at the University of Malaya, where he runs a very busy clinical practice specializing in Parkinson’s and related disorders.

He is the current Chair of the Malaysian Movement Disorders Council and a Medical Advisor to the Malaysian PD Association.

Internationally, he is the Secretary of the International Parkinson & Movement Disorder Society (MDS), Asian-Oceanian Section. He is an active member of the MDS Evidence-Based Medicine Task Force for PD treatments, having served on this expert panel since 2009.

MAIN CONFERENCE - NEUROLOGY-NEUROSURGERY RECONNECTED – MDS EBM UPDATE ON PARKINSON’S DISEASE

FULL NAME : ALBERT SII HIENG, WONG
POSITION / AFFILIATION : Head Department of Neurosurgery

TITLE OF TALK : Advances in the utility of Image Guidance and Intraoperative Imaging in the surgical placement of Auditory Brainstem Implants.

SHORT BIOGRAPHY :

MBBS, FRCS(Edin), FRACS (Australaia), Spine Fellowship (Canada)
FULL NAME : PROFESSOR DR. ZAMZURI IDRIS
POSITION / AFFILIATION : Head of Neuroscience Department, School of Medical Sciences, Universiti Sains Malaysia, Kubang Kerian, Kota Bharu, 16150 Kelantan, Malaysia
TITLE OF TALK : Brain Mapping in Vascular Neurosurgery
SHORT BIOGRAPHY :
Prof Dr Zamzuri Idris had graduated from University of Wales College of Medicine Cardiff UK (1994), then pursued his postgraduate career in Neurosurgery locally at USM (2005). In 2007, he completed his fellowship programme in Gent Belgium under Prof J. Caemert for Neuroendoscopy and Prof D. Van Roost for Functional Neurosurgery. He is the Head of Neuroscience Department. His major interests are in Minimally Invasive Neurosurgery (Neuroendoscopy), Precision Radiation Therapy, Brain Trauma, Epilepsy, Brain Mapping and Brain Stimulation. He published papers locally and internationally and wrote 8 chapters in the international books. His recent chapters are on Neurointensive Care Monitoring for Severe Traumatic Brain Injury; Brain Tumorigenesis; Functional MRI, Diffusion Tensor Imaging, Magnetic Source Imaging, Intraoperative Neuromonitoring Guided Brain Tumour Resection in Awake and under GA; Future Applications of EEG; Neurosurgery Notes for the Graduate Students; and Human Brain Anatomy: Prospective, Microgravity, Hemispheric Brain Specialisation and Death of a Person.

FULL NAME : ASSOCIATE PROFESSOR DATO’ DR. JEGAN THANABALAN
POSITION / AFFILIATION : Associate Professor/ Senior Consultant Neurosurgeon National University of Malaysia Medical Center University Kebangsaan Malaysia Medical Center
TITLE OF TALK : Anterior Circulation Aneurysm: Clipping Vs Coiling, has the paradigm shifted?
SHORT BIOGRAPHY :
I have been a neurosurgeon in UKMMC since 2002. I completed my Fellowship in Functional Neurosurgery in Oxford UK in 2008. I have a special interest in Minimally invasive and endoscopic skull base surgery for which I trained in Naples Italy in 2011 and University of Pittsburgh USA in 2012.

My publications are in local and international journals. I am currently a Senior Consultant Neurosurgeon In the faculty of medicine UKMMC, involved with local collaborative reaserch and involved with International multicenter trial. I am also involved with undergraduate and postgraduate teaching programes.
**SPEAKER’S BIODATA**

**PRE-CONFERENCE WORKSHOP FOR ADULT NEUROLOGY – “NEUROLOGY MASTERCLASS – MEET THE EXPERTS” & MAIN CONFERENCE - NEUROLOGY-NEUROSURGERY RECONNECTED – MDS EBM UPDATE ON PARKINSON’S DISEASE**

**FULL NAME** : DR PARTHIBAN NAVOO

**POSITION / AFFILIATION** : Director and Senior Consultant Neurosurgeon Mahkota Brain & Spine Centre, Mahkota Medical Centre, Malacca, Malaysia

**TITLE OF TALK** : A novel approach in management of lumbar degenerative stenosis. A single Centre’s Experience

**SHORT BIOGRAPHY** :

MBBS (Mal), AM (Mal), FRCS (Edinburgh ), FRCS (Ireland ), FRCS Neurosurgery (UK), FICS Neurosurgery (USA)

Since founded in 2005, Dr Parthiban has been serving as Director and Senior Consultant Neurosurgeon at Mahkota Brain & Spine Centre. His main areas of interest are spine disorder and surgery, craniocervical anomalies, skull base tumors, aneurysm and minimally invasive spinal pain procedures.


**PRE-CONFERENCE WORKSHOP FOR NEUROSURGERY & MAIN CONFERENCE – NEUROSURGERY UPDATE**

**FULL NAME** : DR MOHD RAFFIZ MOHD ALI

**POSITION / AFFILIATION** : Neurosurgeon Hospital Kuala Lumpur

**TITLE OF TALK** : The Young Neurosurgeon in Malaysia: Prospects and Challenges

**SHORT BIOGRAPHY** :

MBChB (Scotland,UK), MS Neurosurgery (USM, Malaysia)

Dr Raffiz currently serves as a resident neurosurgeon in the Department of Neurosurgery, Hospital Kuala Lumpur. He is actively involved in the Neurosurgical Association of Malaysia(NAM) and was the Assistant to the Secretary in the year 2016. He was later entrusted to lead and represent the young neurosurgeons in Malaysia as the Young Neurosurgeon Coordinator of NAM. Prior to completing his neurosurgical training, he was also the President of the Neurosurgical Trainee Association of Malaysia (NEUTRAC).

Being a young neurosurgeon himself, Dr Raffiz is passionate on the future and prospects of young neurosurgeons in Malaysia, and their role in the expending neurosurgical services in Malaysia. As one of the NAM Education subcommittee, he is always fond to contribute and lend a helping hand in the continuous education of neurosurgical trainees and young neurosurgeons alike.
SPEAKER’S BIODATA

PRE-CONFERENCE WORKSHOP FOR NEUROSURGERY & MAIN CONFERENCE – NEUROSURGERY UPDATE

FULL NAME: DR. SHARON CASILDA THEOPHILUS
POSITION / AFFILIATION: Consultant Neurosurgeon
Hospital Sultanah Aminah Johor Bahru

TITLE OF TALK: History, Challenges And Future Of Woman In Neurosurgery

SHORT BIOGRAPHY:
Received her Master Of Surgery (Neurosurgery) from USM in 2008, worked as a neurosurgeon in Hospital Kuala Lumpur from 2008 -2009 and presently in Hospital Sultanah Aminah. She is a sessional lecturer for Monash Medical University Malaysia since 2010. She is also active in training neurosurgical residents in her centre. Currently she is the representative for women neurosurgeons in the Neurosurgical Association Of Malaysia (NAM).

PRE-CONFERENCE WORKSHOP FOR NEUROSURGERY & MAIN CONFERENCE – NEUROSURGERY UPDATE

FULL NAME: ASSOCIATE PROFESSOR DATO’ DR. AB. RAHMAN IZAINI GHANI
POSITION / AFFILIATION: Assoc Professor, Consultant Neurosurgeon
Dept of Neurosciences, School of Medical Sciences, University Science Malaysia, Kubang Kerian, 15100, Kota Bharu, Kelantan.

TITLE OF TALK: Microscopic Transphenoidal Surgery Revisited: Institutional Experience

SHORT BIOGRAPHY:
Completed neurosurgical training from USM 2006. Special interest in transphenoidal surgery and movement disorders.

MAIN CONFERENCE – NEUROSURGERY UPDATE

FULL NAME: MR NASSER ABDUL WAHAB
POSITION / AFFILIATION: Consultant Neurosurgeon, Hospital Pulau Pinang
MBBS (Bangalore, India); Sarjana Surgeri (Neurosurgery) (USM)
Dr. Teh Chee Ming is currently working as consultant paediatrician and paediatric neurologist in Hospital Pulau Pinang. He is also the honorary paediatric lecturer for Penang Medical College. He studied medicine in University of Malaya, granted with the scholarship from Kuok Foundation. He graduated in 2001 as the best student, receiving multiple awards. In 2005, he obtained the membership from Royal College of Paediatrics and Child Health, United Kingdom. Subsequently, he ventured into the fellowship training of paediatric neurology from 2008-2011 in Hospital Pulau Pinang, Hospital Kuala Lumpur and The Hospital for Sick Children, University of Toronto, Canada. He currently involves as co-investigator (Malaysia site) for International Paediatric Stroke Study. He has previously published in journal and presented either via oral / poster presentation for studies in the field of paediatric neurology.

Dr Ahmad Rithauddin obtained his medical degree from University College London in 1997 and membership of Royal College of Paediatrics and Child Health (UK) in 2003. He joined the paediatric neurology fellowship in 2006 at the Paediatric Institute, Hospital Kuala Lumpur, under the tutelage of Dato’ Dr Hussain Imam and Dr Khoo Teik Beng. He then trained further at the Royal Children’s Hospital, Melbourne, where he completed paediatric epilepsy and neuromuscular fellowships, followed by a research work on epilepsy surgery in children with tuberous sclerosis. He is currently practising at the Paediatric Institute Hospital Kuala Lumpur, where he is leading the paediatric epilepsy surgery programme. He is an active member of the Malaysian Child Neurology society and recently has been involved in teaching of epilepsy and EEG in the Asia-Pacific region.
Dr. Ching is currently worked as developmental paediatrician in Paediatric Department, Sultan Ismail Hospital, Johor Bahru. She qualified with a basic medical degree from the University of Malaya, in 2004, and obtained her membership from Royal College of Paediatrics and Child Health, United Kingdom in 2010. Subsequently she pursued her interest in Developmental Paediatrics in Paediatric Institute, Kuala Lumpur Hospital in 2013 and Child Development Center, National University of Malaysia in 2014. She was awarded the Best Poster Award at Paediatric Neurology Update 2013 and 2014 respectively, as well as Young Investigator Award at 15th ASEAN Paediatrics Federation Congress 2014. Finally, she completed her fellowship in Development and Behavioural Paediatrics at Child Development Unit, National University Hospital, Singapore in 2016. She returned to Malaysia in July 2016 and has set up child development services in Sultan Ismail Hospital since then.

Dr. Jayanath is a member of the Early Career Committee of the International Society for Autism Research (INSAR). She is also a member of the Neurodevelopmental and Behavioural Paediatrics Society of Australasia (NBPSA).

She is a life member of the Malaysian Society of Neurosciences (MSN) and the Malaysian Paediatric Association (MPA). She was previously the Treasurer of the Chapter of Child Neurology and Developmental Paediatrics of MSN (2012 - 2014). She was awarded a Chapter of Child Neurology and Developmental Paediatrics - Malaysian Society of Neurosciences (CCNDP-MSN) Education Travel Grant in 2014, to present a poster at the 5th Congress of the European Academy of Paediatric Societies (EAPS) 2014 in Barcelona. Dr. Jayanath was the chairperson of the organising committee for the Developmental Paediatrics Course 2017: Autism and Learning Issues, organised by the Department of Paediatrics, UM (May 2017). Her areas of interest are autism spectrum disorder, developmental delay and attention-deficit hyperactivity disorder. Her undergraduate training was at Universiti Putra Malaysia, Serdang. She completed a combined Bachelor of Science (BSc) in Medical Science and Doctor of Medicine (MD) degree course. She later joined the Academic Training Scheme of University Malaya as a trainee lecturer while undertaking her MPaeds degree. Dr. Jayanath went on to do her sub-specialty training in the field of developmental-behavioural paediatrics. This was at UMMC, followed by the National University of Malaysia Medical Centre and then at the Royal Children’s Hospital (RCH), Melbourne. She worked as an Honourary Supernumerary Fellow at the Centre for Community Child Health (CCCH) and the Department of Developmental Medicine at RCH in 2015. Dr. Jayanath has academic, research and clinical duties as a tenure staff at University of Malaya and as a consultant developmental paediatrician.
Dr. Cindy Chan Su Huay

**Title of Talk:** Identifying young children at risk for dyslexia

**Short Biography:**
Dr. Cindy Chan has practiced paediatrics in both urban and district hospitals and health settings in Peninsula Malaysia, and has a keen interest in early childhood intervention and lifelong development.

Her special interests are in communication disorders, learning differences and behavioural problems in children and young persons. Dr Cindy takes a practical and collaborative approach when working with families, emphasizing the importance of empowering children and their caregivers.

Dr. Rajini Sarvananthan

**Title of Talk:** Screen Time And The Developing Brain

**Short Biography:**
Dr. Rajini embarked on her career in Paediatrics in 1994, having completed her MBBS in the University of Newcastle upon Tyne.

She further subspecialised in Developmental Paediatrics and Neurodisability in the UK before returning to Malaysia at the end of 2003. Together with a team of Developmental Paediatricians, Clinical Psychologists and other Allied Health Professionals, she was involved in starting the first local Child Development Centre at UKM Medical Centre. In the last 8 years, Rajini has been actively working in the community in multidisciplinary settings. Currently, she is part of the Child Development Centre at Parkcity Medical Centre. She is also a visiting Consultant at the University Malaya Medical Centre.
FULL NAME : DR VIGNESWARAN VEERAMUTHU
POSITION / AFFILIATION : Consultant Clinical Neuropsychologist (Adult and Pediatrics),
Brain and Cognition Recovery Centre, Gleneagles Medini Hospital, Johor
TITLE OF TALK : Brain Derived Neurotrophic Factor and Diffusion Tension Imaging
as Reliable Biomarkers in Predicting Structural and Cognitive Alterations in Mild Traumatic Brain Injury
SHORT BIOGRAPHY :
Dr Vigneswaran Veeramuthu is currently a Consultant Clinical Neuropsychologist (Adult and Pediatrics) at Gleneagles Medini Hospital, Johor and also serves as Sessional Lecturer in Neuropsychology at UoRM.

He completed a BSc degree in 2003, MEd Psychology in 2008 and a Fellowship in Clinical Neuropsychology at Hawaii Pacific Neuroscience Institute, Hawaii, USA in 2013. He completed his PhD in Clinical Neuropsychology (Neurosurgery) in July, 2016 at University of Malaya. He has also completed various professional training programs and courses through the American Psychological Association’s (APA) Continuing Education programs and US Department of Defense in relation to neuropsychological assessment, diagnosis, and neurocognitive rehabilitation. He specialised in diagnostic neurocognitive and neurobehavioral assessments, multisensory stimulation and neurocognitive rehabilitation/ interventions for aging-related cognitive disorders, acquired brain injury, epilepsy and disorders of consciousness. Besides that, he is also one of the very few clinicians in the region trained in intra-operative brain mapping, neuropsychological monitoring and advanced functional neuroimaging (Diffusion Tensor Imaging, FMRI). To date he has published a number of publication in high impact journals including Journal of Neurotrauma, World Neurosurgery, PLOS One, Neurology Asia, to name a few.

SHORT BIOGRAPHY :
Prof Ir Dr Ahmad Fadzil is a Senior Professor at the Department of Electrical & Electronics Engineering, Universiti Teknologi PETRONAS. He was recently appointed as the President and Group Chief Executive of SIRIM Bhd.

He founded the Centre for Intelligent Signal & Imaging Research (CISIR) in 2008 at UTP and the centre is now a Higher Institution Centre of Excellence (HICOE) of the Ministry of Higher Education. He is an elected Fellow of the Academy of Sciences Malaysia and a Fellow of the Institution of Engineers Malaysia, a member of National Professors Council, Malaysia, a registered Professional Engineer with Board of Engineers Malaysia and a Senior Member of IEEE.

He is a Governing Board Member of the International Neuroinformatics Coordinating Facility (INCF) based in Karolinska Institute.

In industry, he sits on the Board of Directors of ViTrox Corporation Bhd., a vision inspection R&D and public-listed company. He is also on the Board of Prince Court Medical Centre Kuala Lumpur. He has recently joined the Board of SIRIM Bhd and boards of SIRIM’s subsidiaries.

He specialises in image processing and computer vision. His research activities range from fundamental pattern recognition to developing vision and imaging applications in the biomedical area. His current research challenges are developing new analysis techniques for early osteoarthritis, neuroimaging of brain reward pathways for analysis of drug addiction, workplace stress and neuro-ergonomics using magnetic resonance imaging and spectroscopy techniques. He has authored Surface Imaging for Biomedical Applications CRC Press, over 200 research articles and holds several patents (Malaysia, U.S. and India). His latest book on Optical Imaging for Biomedical Application and Clinical Applications is expected to be available November 2017 by CRC Press.
SPEAKER’S BIODATA

MAIN CONFERENCE – FRONTIER IN BASIC NEUROSCIENCE & FAONS SYMPOSIUM

FULL NAME : PROFESSOR MANDAVA RAJESWARI
POSITION / AFFILIATION : Professor at the School of Computer Science, Universiti Sains Malaysia (USM), Penang
TITLE OF TALK : Diffusion MRI imaging and analysis as potential biomarkers for neuronal diseases and neurosurgical guidance
SHORT BIOGRAPHY:
Mandava Rajeswari (Universiti Sains Malaysia) is a Professor at the School of Computer Science, Universiti Sains Malaysia (USM), Penang. She leads a large group of researchers including Computer Scientists and Medical Specialists in developing IT solutions, systems and computer assisted diagnosis related to medical images.

Her research interests include medical image analysis (multispectral image segmentation and analysis, image annotation and knowledge guided segmentation), more specifically neuroimage analysis (diffusion weighted imaging, tractography, biomarkers for neurodegeneration). She has delivered several lectures at various forums in these areas.

MAIN CONFERENCE – CLINICIAN-SCIENTIST NEUROSCIENCE CROSS TALK

FULL NAME : DR. AKHMAL YUSOF
POSITION / AFFILIATION : Chief Executive Officer
TITLE OF TALK : Paving Malaysia as Industry Sponsored Research (ISR)
SHORT BIOGRAPHY:
Dr Akhmal Yusof is an experienced leader from a global research based biopharmaceutical company. He graduated from the Royal College of Surgeons in Ireland in 1992 and practiced medicine in the public and private hospital for almost 10 years.

He later venture into the medical insurance industry as Medical Manager in one of the biggest medical insurance provider in Malaysia. He was later head hunted to lead the Medical Department in the global research-based biopharmaceutical for over 12 years. His main forte in the industry is clinical research management & regulatory, medical and government affairs. He now leads Clinical Research Malaysia (CRM) as their Chief Executive Officer. CRM is a non-profit Malaysia Ministry of Health owned-company to promote Industry Sponsored Studies as a one stop center.

MAIN CONFERENCE – WORKSHOP FOR NURSES AND ALLIED HEALTH PROFESSIONALS

FULL NAME : DR. NUJAIMIN UDIN
POSITION / AFFILIATION : Consultant Neurosurgeon
TITLE OF TALK : Neurological assessment in a trauma setting
SHORT BIOGRAPHY:
Graduated from Cairo University and Universiti Sains Malaysia and currently Head of Terengganu state neurosurgical service and Resident Neurosurgeon in Hospital Sultanah Nur Zahirah, Visiting Consultant Neurosurgeon National Cancer Institute and Kuala Terengganu Specialist Hospital, Visiting Medical Lecturer in medical faculty of University Sultan Zainal Abidin and University College Sedaya International.
SPEAKER’S BIODATA

MAIN CONFERENCE – WORKSHOP FOR NURSES AND ALLIED HEALTH PROFESSIONALS

**FULL NAME** : DR. NG WEI PING  
**POSITION / AFFILIATION** : Consultant Neurosurgeon, Hospital Sungai Buloh, Selangor  
**TITLE OF TALK** : Care of Critically ill Patient in Neuro-icu  
**SHORT BIOGRAPHY** :  
Young neurosurgeon Hospital Sungai Buloh  
- Interested in doing research beside doing surgery  
- Publication: Case report and research in IMJM, ANN, MJMS  
- Presentation (poster): awarded 1st runner up in Hospital Sungai Buloh research day and Selangor research day 2016

**FULL NAME** : DR. KHAIRUL AZMI BIN IBRAHIM  
**POSITION / AFFILIATION** : Neurologist And General Physician, Hospital Sultanah Nur Zahirah, Kuala Terengganu  
**TITLE OF TALK** : Assessment Of Stroke Patient In The Emergency Unit  
**SHORT BIOGRAPHY** :  
Basic Medical Degree: MB. BCh. BAO. National Univ of Ireland 1999  
Post Graduate Qualification: MMED (Internal Medicine) Univ of Science, Malaysia 2009  
Neurology Subspecialty Training:  
- MOH Neurology Subspecialty Training June 2010 – Sep 2015  
- Fellowship in Stroke Medicine at Plymouth Hospitals NHS Trust UK June 2013 – May 2014

**FULL NAME** : DR MOHAMAD IMRAN IDRIS  
**POSITION / AFFILIATION** : Neurology Trainee in University Malaya Medical Centre  
**TITLE OF TALK** : Workshop for Nurses and Allied Health Professionals : Cranial Nerves and Brainstem reflexes  
**SHORT BIOGRAPHY** :  
Dr Mohamad Imran Idris is currently a Neurology trainee at the University Malaya Medical Center (UMMC) in Kuala Lumpur. He graduated from the University of Cambridge in 2010 and worked as a House Officer at UMMC from 2010-2012, before moving on to become a Medical Officer at the Hospital Tengku Ampuan Afzan in Pahang from 2012-2015. He obtained his MRCP in 2014 and moved back to UMMC in 2015 to continue his sub-specialty training in Neurology. His research interests include cognitive neurology, stroke, and dementia.
Dr. Teh Pei ChieK
Neurology Registrar, Neurology Department, Kuala Lumpur Hospital
Workshop for Nurses and Allied Health Professionals: Upper Limb Examination

Pei ChieK is currently working as neurology registrar in Neurology Department, Kuala Lumpur Hospital. He qualified with a basic medical degree from the University Putra Malaysia in 2008, and obtained his membership from Royal College of Physician, United Kingdom in 2013. Subsequently he pursued his interest in neurology in Kuala Lumpur Hospital, since 2016 and National University of Malaysia in 2017. Dr Teh is a member of Malaysian Society of Neurosciences, and The International Society for Parkinson’s Disease and other Movement Disorders, since 2016.

Dr. Wan Aliaa Wan Sulaiman
Physician and Clinical Lecturer of Internal Medicine and Neurology, University Putra Malaysia
Workshop for Nurses and Allied Health Professionals: Lower Limb Examination

Wan Aliaa Wan Sulaiman is a physician and clinical lecturer of internal medicine and neurology at University Putra Malaysia. She received a MB BCh BAO degree in Medicine from Royal College of Surgeons in Ireland, MRCP from Royal College of Physicians in UK and MRes in Clinical Sciences from the University of Liverpool, UK. She has been active in the area of medical research and has published papers on diabetes, hypertension, stroke, neurological infections, dengue, neuromuscular diseases as well as mental health.

Dr. Low Soon Chai
Neurology Registrar in University Malaya Medical Centre
Workshop for Nurses and Allied Health Professionals: Cerebellar Examination

Dr Low Soon Chai is a neurology registrar in University Malaya Medical Centre. He received his medical degree from University of Malaya in 2009. He is a member of the Royal College of Physician London, UK since 2013. He starts his neurology training in University of Malaya since 2014. Dr Low’s special interests include Parkinson’s disease, movement disorder, familial amyloid neuropathy and neuroimmunology. He has publication in topics including Parkinson’s disease, progressive supranuclear palsy, catatonia and neuromelioidosis. He is principal investigator in clinical trials of familial amyloid polyneuropathy. Currently, he is a committee member is Neuroimmunology and Neuroinfection Council, Malaysia.
MAIN CONFERENCE – WORKSHOP FOR NURSES AND ALLIED HEALTH PROFESSIONALS

FULL NAME : DR. RUBAN KANESALINGAM

POSITION / AFFILIATION : Neurologist, Head of Department, Department of Neurology, Hospital Sultanah Aminah, Johor Bahru

TITLE OF TALK : Mental State and Speech Assessment

SHORT BIOGRAPHY :
Graduated IMU 2003, obtained MRCP (UK) 2008, trained in Neurology in Penang, HKL and UMMC and NNI, Singapore. Currently Neurologist and Head of Neurology, Hospital Sultanah Aminah, JB

MAIN CONFERENCE – EPILEPSY RESEARCH CROSS TALK

FULL NAME : PROFESSOR DR. TAN HUI JAN

POSITION / AFFILIATION : Consultant Neurologist
Universiti Kebangsaan Malaysia Medical Centre

TITLE OF TALK : Epilepsy Research UKMMC

SHORT BIOGRAPHY :
Currently appointed as head of neurology unit, UKMMC and has a keen interest in epilepsy research. Supervises neurology trainees in clinical and laboratory work.

MAIN CONFERENCE – EPILEPSY RESEARCH CROSS TALK

FULL NAME : ASSOCIATE PROFESSOR NG CHING CHING

POSITION / AFFILIATION : Associate Professor/ Genetics and Molecular Biology, Institute of Biological Sciences, Faculty of Science, University of Malaya, Kuala Lumpur, Malaysia

TITLE OF TALK : Epilepsy Genetic Research in University of Malaya

SHORT BIOGRAPHY :
Ng Ching Ching obtained her PhD from Osaka University in 2003. She is an Associate Professor and Programme Coordinator for the Genetics and Molecular Biology Unit, Institute of Biological Sciences, University of Malaya. Her research interests include human genetics and molecular medicine.
MAIN CONFERENCE – EPILEPSY RESEARCH CROSS TALK

FULL NAME : PROFESSOR LUA PEI LIN
POSITION / AFFILIATION : Faculty of Pharmacy c/o Faculty of Health Sciences, Universiti Sultan Zainal Abidin (UniSZA), Terengganu, Malaysia
TITLE OF TALK : Non-clinical Epilepsy Research

SHORT BIOGRAPHY :
Prof Dr Lua Pei Lin is a Professor at Faculty of Pharmacy C/O Faculty of Health Sciences, Universiti Sultan Zainal Abidin (UniSZA). She received her PhD and B.Pharm both from Cardiff University, United Kingdom. Her fields of specialization include Health-Related Quality of Life (HRQoL), Pharmacy Practice, Behavioural Health, Health Education / Promotion.

MAIN CONFERENCE – EPILEPSY RESEARCH CROSS TALK

FULL NAME : DR. IRENE LOOI
POSITION / AFFILIATION : Consultant Neurologist, Hospital Seberang Jaya, Penang
TITLE OF TALK : Research Opportunity in KKM

SHORT BIOGRAPHY :
MBBS (UM), FRCP (Edin), Fellowship of Neurology (M’sia), Clinical Fellowship in Stroke (S’pore)

Dr Irene Looi serves as the Head of Clinical Research Centre in Seberang Jaya Hospital, Penang, Malaysia. She is also the resident senior consultant neurologist in Seberang Jaya Hospital and visiting neurologist to several district hospitals in Penang and Perak.

Her research interest spans wide on stroke, white matter lesion and vascular dementia. She is currently the co-principal investigator driving trials examining the neuroprotective effects of tocotrienols for diabetic peripheral neuropathy (VENUS) and acute ischaemic stroke (SATURN). The VENUS trial has won the first runner-up for Minister of Health Innovation and Research Award 2016.

She is also an active trainer for evidence-based medicine workshops. She co-founded the National Stroke Registry and currently serves as Vice President in Malaysian Society of Neurosciences. She is a strong advocate for international collaborations for clinical trials and an active member in REACTA (Regional Asian Clinical Trial Association) Forum.
MAIN CONFERENCE – EPILEPSY RESEARCH CROSS TALK

FULL NAME : DR. MOHD. FAROOQ SHAikh
POSITION / AFFILIATION : Lecturer in Pharmacology, Jeffrey Cheah School of Medicine and Health Sciences, MOANSH University Malaysia,
TITLE OF TALK : Bandar Sunway, Selangor, Malaysia.

Epilepsy and associated cognitive dysfunction

SHORT BIOGRAPHY :
Dr Mohd. Farooq Shaikh completed his PhD in Pharmacology from the Institute of Chemical Technology, University of Mumbai, India, in 2012. During his PhD (2011), he was also selected by the International Brain Research Organization (IBRO) to be part of the prestigious Young Scientist Training Program for his research work in epilepsy.

In 2012, he was awarded the IBRO-APRC fellowship to continue his post-doctoral studies at School of Biomedical Sciences, University of Queensland, Australia, where he worked with Dr. Karin Borges on epilepsy therapy research.

Dr Farooq joined Monash University Malaysia in March 2013, where he is actively involved in experimental epilepsy and the discovery of anti-epileptic drugs from diverse sources including medicinal plants. He also developed a zebrafish model of epilepsy induced cognitive dysfunction to screen potential drugs.

PRE-CONFERENCE WORKSHOP FOR ADULT NEUROLOGY – “NEUROLOGY MASTERCLASS – MEET THE EXPERTS”

FULL NAME : PROFESSOR DATO’ DR. TAN CHONG TIN
POSITION / AFFILIATION : Senior Consultant, Division of Neurology, University of Malaya.
TITLE OF TALK : Pre-Conference Workshop for Adult Neurology – “Neurology Masterclass – Meet the Experts”: Approach to speech examination

SHORT BIOGRAPHY :
Professor Tan is the senior consultant, Division of Neurology, University of Malaya. He graduated from the University of Melbourne. His training in Neurology includes Institute of Neurology, Queen Square, London, UK. Prof. Tan is deeply interested in the Neurology education.

He has helped to train many neurologists in Malaysia and in the neighbouring countries. He also helped to build many Neurology institutions, including as past President of the Malaysian Society of Neurosciences, past Chairman of the ASEAN Neurological Association, and past Vice-President of ILAE. Presently he is the Editor-in-Chief of Neurology Asia. Among the recognitions received is the Merdeka Award for Health, Science, and Technology and Mahathir Science Award, as Leader of the Nipah encephalitis Investigating Team, University of Malaya.
FULL NAME : DR. SHANTHI VISWANATHAN
POSITION / AFFILIATION : Consultant Neurologist with interests in Movement disorders and Demyelinating diseases
TITLE OF TALK : Pre-Conference Workshop for Adult Neurology – “Neurology Masterclass – Meet the Experts” : Approach to lower limb examination

SHORT BIOGRAPHY :
Dr Shanthi graduated from Manipal, India with MBBS and MRCP from the Royal College of Physicians of Ireland. She did a one year fellowship at Queen Elizabeth Hospital, Birmingham, United Kingdom, spending most of her time in Movement disorders and Demyelinating diseases.

Currently, she is a Consultant Neurologist at the Department of Neurology, Kuala Lumpur Hospital and Deputy Head of Department where she is responsible for the setting up the Demyelinating diseases database, Demyelinating diseases clinic (am clinic now) and plasmapheresis suite. Dr Shanthi is the chairperson for the recently published Malaysian Clinical Practice Guidelines (CPG’s) on Management of Multiple Sclerosis and member of several other CPG’s/consensus guidelines including Dementia, Parkinsons disease and reviewer for the recently launched Infective Endocarditis CPG.

In addition she is also involved in Parkinson’s patients care through the Advanced Parkinson’s disease clinic at Kuala Lumpur Hospital. She is an examiner for undergraduates and postgraduate candidates with the Royal College of Physicians of Ireland and honorary lecturer for students from RCSI (Perdana University). Internationally, she is a member of PACTRIMS and the Movement disorder Society. She has given talks both locally and internationally on demyelinating diseases and has been and is currently actively involved in several multinational multicenter ongoing trials in MS and NMO. She has published both locally and internationally in several peer reviewed journals and is an adhoc reviewer for Multiple Sclerosis Journal, Journal of Archives of Preventive Medicine, Journal of Clinical Case reports and Journal of Clinical studies and Medical Case reports, Ophthalmology Research: An International Journal and International Ophthalmology.

FULL NAME : DR. HIEW FU LIONG
POSITION / AFFILIATION : Hospital Kuala Lumpur
TITLE OF TALK : Pre-Conference Workshop for Adult Neurology – “Neurology Masterclass – Meet the Experts” : Approach to upper limb examination

SHORT BIOGRAPHY :
Dr Hiew Fu Liong completed his undergraduate education at International Medical University (IMU), Malaysia. He subsequently completed his post graduate study in Internal medicine in 2009 [MRCP (UK), MMed (S’pore)] and obtained his Fellowship in Neurology from Ministry of Health, Malaysia in 2016.
SPEAKER’S BIODATA / ABSTRACT

PRE-CONFERENCE WORKSHOP FOR ADULT NEUROLOGY – “NEUROLOGY MASTERCLASS – MEET THE EXPERTS”

FULL NAME : Dr. HOO FAN KEE
POSITION / AFFILIATION : Neurologist and Lecturer, University Putra Malaysia
TITLE OF TALK : Pre-Conference Workshop for Adult Neurology – “Neurology Masterclass – Meet the Experts” : Pearls in making bedside neurological diagnosis

SHORT BIOGRAPHY :
Dr. Hoo Fan Kee is a neurologist and lecturer at the University Putra Malaysia. He earned his medical degree from University Sains Malaysia. Hoo has numerous publications in medical journals. He is also Honorary Treasurer of Malaysian Society of Neuroscience (MSN), and a council member of Malaysian Stroke Council.

UNDERSTANDING BRAIN NETWORK VIA EPILEPSY RESEARCH, BEYOND THE ERA OF BRODMANN’S CORTICAL AREA CONCEPT

Prof. Dr. Lim Kheng Seang
Division of Neurology, Department of Medicine, Faculty of Medicine, University of Malaya

Epilepsy networks are the brain regions involved in the production and propagation of epileptic activities. Previous epilepsy research emphasized the understanding of epileptogenic zone, which is the area generating epileptic seizure. This zone overlaps with Brodmann’s cortical area. Brodmann’s cortical area was described by Korbinian Brodmann, based on the cytoarchitectural organization of neurons, published in 1909. However, since the establishment of stereo-encephalography (SEEG), the understanding of epileptogenicity expands beyond cortical area, leading towards a network concept. This lecture will focus the research on brain network, via structural and functional studies. Structural connectivity was determined using animal studies through isotope injection, and imaging such as MR tractography and whole brain connectivity. Major long and short association fiber tracts were identified. These tracts connect both hemispheres, different lobes of the brain, as well as various gyri within the same lobe. Recent human connectome project was initiated to understand whole brain connectivity. Functional connectivity studies were divided broadly into neurophysiological studies (e.g. cortico-cortical evoked potential) and functional imaging studies (e.g. functional MRI). Functional MRI connectivity study was first performed during resting state, describing the brain default mode network. Subsequent active networks during various activities were reported. Besides improving the understanding of epileptogenicity, apprehension of the brain network helps understanding of brain function as a whole.

ADVANCES IN QUANTITATIVE NEUROIMAGING ANALYSIS FOR EPILEPSY AND BEYOND

Eric T.W. Ho1, K.S. Lim2

1Department of Electrical & Electronics Engineering, Center for Intelligent Signal & Imaging Research, Universiti Teknologi PETRONAS, Perak, Malaysia
2Faculty of Medicine, University of Malaya, Petaling Jaya, Malaysia

Recent advances in structural and functional neuroimaging have enabled investigations into a new paradigm of the brain as a system with a network of interacting parcels. In this talk, I will review advances in structural and functional network analysis of neuroimages and early findings which show that disease and degeneration lead to significant changes in the network behaviour of the brain. First, I will introduce the concepts behind functional and structural network connectivity. Using epilepsy as an example, I will motivate the use of these network concepts for clinical neuroimaging and subsequently discuss recent findings emerging from network analysis in various neurological & neuropsychiatric diseases. Finally, I will review preliminary advances in the joint analysis of structural, functional and genomic network analysis and briefly introduce the concept and major components of neuroinformatics, which a big data analysis approach to analysing multiscale and multidimensional neuroimaging data.
SPEAKER’S ABSTRACT

THE EQUILIBRATION OF SURGICAL OPTIONS IN THE MANAGEMENT OF TRIGEMINAL NEURALGIA—PERCUTANEOUS RHIZOTOMY, MICROVASCULAR DECOMPRESSION AND STEREOTACTIC RADIOSURGERY

Hari Chandran FRCS (Neuro.Surg)

Division of Neurosurgery, Department of Surgery, Faculty of Medicine, University of Malaya

Trigeminal neuralgia (TGN) is a chronic neuropathic facial pain, classically characterised by severe, unilateral paroxysmal pains in the distribution of one or more branches of the fifth cranial nerve. The surgical options accessible for the management of TGN, opens debate on the modality of choice, necessitating patient and pathophysiological factors, and treatment failures in determining the indications for the option of choice. The varying and conflicting results of the various lesioning techniques of percutaneous rhizotomy (PTR), microvascular decompression (MVD), and stereotactic radiosurgery (SRS) with the Gamma Knife and Linac based systems, suggests that each modality of treatment for TGN has its merits and limitations. While MVD provides the lowest rate of pain recurrence, it may not be the right modality for everyone. Decisions on the modality of choice must be made after careful consideration of benefits and risks of treatment.

SCHEMATIC APPROACH TO THE HYPOTONIC INFANT

SW Wong

Department of Paediatrics, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur

Hypotonia is a common and non-specific clinical sign in infancy. It is observed in disorders affecting all level of the nervous system – brain, brain stem, spinal cord, peripheral nerves, neuromuscular junction and muscle. After obtaining the relevant history, the first approach is to classify the hypotonia as central or peripheral. In infants with neuromuscular disorders, the diagnostic work up is usually straightforward. However in other cases, the subsequent evaluation is often complex due to the many rare genetic and metabolic causes of hypotonia. Recent advances in genetics have lead to newer diagnostic entities and rapid molecular diagnosis is now possible for several conditions. The investigative work up and schematic evaluation of infants with hypotonia will be outlined.

PRINCIPLES AND EVALUATION OF ACUTE PAEDIATRIC ATAXIA

Choong Yi Fong

1Division of Paediatric Neurology, Department of Paediatrics, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia

Ataxia can be defined as a pathological abnormality in the smooth and accurate coordination of movements which is usually due to cerebellar dysfunction. Ataxia is broadly divided into acute, subacute / episodic and chronic ataxia. Although the majority causes of ataxia are benign, a careful history, physical examination and targeted investigations are recommended to quickly identify the potentially serious and life-threatening causes of ataxia.

My lecture will cover:

• A clinical approach to paediatric ataxia
• Brief review of the cerebellar anatomy
• Suggest a recommended algorithmic approach and investigation work-up for paediatric ataxia with an emphasis on acute ataxia.
THE ADVENT AND UTILITY OF IMAGE GUIDANCE & INTRA-OPERATIVE IMAGING IN THE MANAGEMENT OF PAEDIATRIC BRAIN TUMOURS

Dharmendra Ganesan

Division of Neurosurgery, Department of Surgery, University of Malaya, Kuala Lumpur

Stereotactic surgery a term first adopted in 1973 by the International Society for Research in Stereoecephalotomy in Tokyo. It is based on the principles of the Cartesian coordinate system. It has evolved leaps and bounds over the years from frame based systems to current frameless systems.

The use of navigation systems have become an integral part of modern neurosurgery both for cranial and spinal work. The further refinement of the frameless navigation systems that use electromagnetic waves in the tracking device enables navigation to be performed without clamping the child’s head. Such devices have made the use of navigation in the neonatal and infancy a reality. The use of navigation systems has enable more precise localisation of lesions hence minimising collateral damage in the pursuit of removing the lesion within the brain. It has made biopsies of deep seated brain lesions such as at the thalamus and brainstem possible with a much safer profile as well as accuracy of hitting the target lesion. The software application allows for fusion of various images (CT scan, CT angiogram, MRI images etc) to furnish the surgeon with all the relevant imaging information as he/she treads through the structures of the brain. Navigation is typically performed using a probe which is touched on the brain surface, further advancement allow the microscope to be navigated allowing the surgeon the view a structure within the brain which will be projected on the MRI/ CT image on the screen. The drawback navigation is that it is reliant on the pre-operative MRI /CT brain image hence it is not real time. Once the cranial cap is opened; the brain retracted and CSF released, there would be movement of the structures and the accuracy diminishes to certain extent.

The use of ultrasound which is co registered with the MRI/ CT images could help alleviate the some of the issues pertaining to the brain shift during navigation. The use of intra operative MRI (iMRI) is one of the methods to obtain a more accurate navigation by having periodic updated images particularly when dissecting eloquent part of the brain. The use of iMRI in the management of paediatric tumour has enabled the surgeon to obtain a better resection of tumour in the first sitting, lesser morbidity, preclude the need for another anaesthetic for post op MRI on another day to assess the extent of resection and able to start adjuvant treatment faster.

HOW NEUROTECHNOLOGY CAN ASSIST US WITH TRANSDISCIPLINARY MANAGEMENT OF TRAUMATIC BRAIN INJURY PATIENTS

Prof Dato Dr Hj Jafri Malin Datuk Hj Abdullah
FASc,MD(USM),PhD(Ghent),FRCS(Ed),FACS(USA),FRSM(UK),FAANS,DSCN(Belgium)

Center for Neuroscience Services and Research,Universiti Sains Malaysia and Department of Neurosciences,School of Medical Sciences,Universiti Sains Malaysia,

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Managing the primary and secondary effects of traumatic brain injury(TBI) just seconds after injury hidden under a 12 mm skull bone can be daunting especially when trillion of neurons, astrocytes, microgial and numerous other cells are affected synchronously without a single unified technology available to measure them without errors in temporal or spatial measurements.

The importance of the usage of neurotechnology gadgets using neurophysiology as the basis of measurements has to be imparted to the current generation of Malaysian neurosurgical scientist,neurosurgeons,neuroanesthesiologist and neuro - critical care specialist,neurorehabilitation specialists,clinical psychologists and neuropsychiatrists. They will need to work together to manage TBI right up to the level when the patient returns to the Malaysian society in a transdisciplinary and translational manner.

Though expensive the investment of using neurotechnology is the only way known to monitor the process of healing of an injured brain and as such the whole teaching syllabus will need to inculcate this so as to improve the care of traumatic brain injury.
BRAIN DERIVED NEUROTROPHIC FACTOR AND DIFFUSION TENSION IMAGING AS RELIABLE BIOMARKERS IN PREDICTING STRUCTURAL AND COGNITIVE ALTERATIONS IN TRAUMATIC BRAIN INJURY

Veeramuthu V.,1,2 Ahmad-Anuar, A.,3 Ramli, N.,4 Bondi, M.W.,5 Delano-Wood, L.,5 Ganesan, D.,5 Narayanan, V.5
1Brain and Cognition Recovery Centre, Centre of Excellence and Research in Neuroscience, Gleneagles Medini Hospital, Johor, Malaysia
2Department of Psychology, University of Reading Malaysia, Educity, Nusajaya, Johor, Malaysia
3Department of Biomedical Science, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia
4University Malaya Research Imaging Centre, University of Malaya, 50603 Kuala Lumpur, Malaysia
5Department of Psychiatry, University of California San Diego, SD, United States of America
6Division of Neurosurgery, Department of Surgery, Faculty of Medicine, University of Malaya, Kuala Lumpur, Wilayah Persekutuan, Malaysia

Cognitive outcomes following mild traumatic brain injury (mTBI) are varied in nature despite similarity in general injury patterns and severity. Polymorphism of neural repair and plasticity genes are postulated as one of the reasons for this heterogeneity. We therefore analysed the role of brain derived neurotropic factor (BDNF) genetic polymorphism (Val66Met) on cerebral white matter integrity using diffusion tensor imaging (DTI), and examined its effect on longitudinal cognitive outcomes of patients with mTBI over a 6-month period. A detailed neuropsychological assessment and magnetic resonance imaging (MRI) including diffusion tensor imaging (DTI) were performed for all patients (n=66) at admission, and the same protocols were repeated again at six months post-trauma. Serum blood samples were collected at admission for genotyping purposes (n=48).

Significant differences of the Δ were found in the domains of attention [F(2,49)= 8.60, p=0.001], memory [F(2,49)= 6.11, p=0.004] and executive function [F(2,49)= 4.01, p=0.024] amongst the groups over time. Met carriers had significantly lower SS in memory (M=86.2, SD= 19.2) than the Val/Val (M=102, SD=12.5). Acutely, the Met carriers had significantly increased FA in the PCR-Rt (t(44)= -2.78 p= 0.01), PCR-Lt (t(44)= -2.95 p= 0.01), CGC-Lt (t(44)= -2.33 p= 0.02), right superior longitudinal fasciculus (SLF-Rt; t(44)= -1.98 p= 0.05) and SLF-Lt (t(44)= -3.02 p= 0.00), with a trend of lower MD and RD. Reduced FA values at 6 months among Met carriers were linked with increased MD and RD values.

Findings suggest that the observed effects could be due to a down-regulation of BDNF expression in Met carriers, thus possibly reducing neuronal survival and repair, affecting neurocognitive performance detrimentally. Taken together, the combination of DTI metrics and BDNF (Val66Met) polymorphism provides a clearer prognostic picture for patients with mTBI and useful in terms early targeted rehabilitative intervention.

ANTERIOR CIRCULATION ANEURYSM: CLIPPING VS COILING, HAS THE PARADIGM SHIFTED?

A/Prof. Dato’ Dr. Jegan Thanabal

1Department of Neurosurgery, Department of Surgery, University Kebangsaan Malaysia.

Being the more common and accessibly sites for aneurysm, the anterior circulation aneurysms has been subject of on going discussion on the best mode of treatment. Here we discuss the options available and the impact of technology on the outcome of these aneurysms.

There has been advancement in both microsurgical and interventional methods. Deciding the best mode of treatment might be more complex than just quoting a journal. We discuss the options.
Stereotactic surgery a term first adopted in 1973 by the International Society for Research in Stereoencephalotomy in Tokyo. It is based on the principles of the Cartesian coordinate system. It has evolved leaps and bounds over the years from frame based systems to current frameless systems.

Paediatric stroke occurs in 2-8 per 100,000 children / year. Despite few published articles on the characteristics of childhood stroke, none is from the South East Asian Region with its unique population.

We prospectively recruited paediatric stroke cohort in Paediatric Institute, Kuala Lumpur (2007-2009) and Hospital Pulau Pinang (2010-2015). A total of 50 patients (65% male) were identified. The peak age of stroke was < 1 year (38%) but only 12% during neonatal period. Majority of them were diagnosed with arterial ischaemic stroke (AIS) (94%) but only 10% with cerebral sinovenous thrombosis (CVST). The commonest presentation was hemiparesis (86%).

For aetiologies, 38%, 28%, 24%, 10% of them were caused by acute illness, cardiogenic, vasculopathy and chronic illness respectively. Around 60% received anti-thrombotic therapy (most commonly aspirin). Two third of them sustained some neurological deficits. However, the mortality rate was low (~5%). In comparison to data of International Paediatric Stroke Study (IPSS), our cohort had unusually low incidence of neonatal stroke and CVST. The postulated reason was under-diagnosis due to lack of awareness among healthcare workers and insufficient / incomplete neuro-imaging. Acute illness was the commonest aetiology in our cohort, contradictory to chronic illness in IPSS.

Besides, a local study found that 22% out of 72 children with acute focal neurological deficits actually had AIS. The important differentials of AIS included acquired demyelinating disorder, CNS infection and peripheral nervous system disorder. Children with sudden onset (within minutes / hours) of focal weakness and normal mental status had higher likelihood of AIS.
Higher cognitive brain functions such as language, planning and problem solving require the working memory (WM), a temporary buffer that stores limited amount of information for immediate manipulation. Studies have shown that negative mood states impair WM functions that are related to activations at the prefrontal cortex (PFC) region while performing various WM tasks. Optical Topography (OT) is a non-invasive neuroimaging modality that is able to measure the haemodynamic responses in the brain grey matter based on functional near-infrared spectroscopy (fNIRS) technology. It imposes less physical constraint on subjects during the experiment thus allowing psychological and behavioural experiments, which difficult to perform in functional magnetic resonance imaging (fMRI).

In our recent work, the relationship between induced mood states and the PFC activation is being investigated using verbal N-back WM task paradigm among subjects in Malaysia. OT is used to measure the PFC haemodynamic response, where the task performance by subjects who are under either neutral or negative mood states bias are monitored for 0-back, 1-back and 2-back tasks concurrently. Negative mood induced subjects showed a significantly (p<0.05) poor accuracy during 2-back task, as compared to the control (neutral mood) group. In addition, a smaller region of the PFC is found activated in all n-back tasks and a significantly lower Oxy-haemoglobin level is obtained around the Broca language region (p<0.05) during 2-back task. These findings suggest that the effect of negative mood on an individual’s cognitive function is significant when the brain neural resources are engaged with a higher working memory load. Therefore, the relationship of negative mood state and PFC activity is reproducible among Malaysia subjects with mixed ethnical and cultural background by using verbal n-back task paradigm.

These findings suggest that similar approach can be applied to neuroergonomics that demands for natural setting that is highly comparable with the real-life environment. For example, to investigate the brain’s haemodynamic responses toward mental stress in a field-specified workplace (e.g., oil and gas offshore platform, corporate offices etc.). Besides, the surrounding factors which may boost the cognitive performances and productivity of an employee (e.g., lightings, noise level, spaciousness etc.) can be identified through virtual reality technology. These efforts will contribute to an objective mental state assessment tool, in promoting high performance in the workplace and mental health, raising productivity and economic growth.

CARE OF CRITICALLY ILL PATIENT IN NEURO-ICU

WP Ng

Department of Neurosurgery, Hospital Sungai Buloh, Jalan Hospital, 47000 Sungai Buloh, Selangor, Malaysia

Care in neuro-icu focuses on critically ill patients with primary and secondary neurological problems as well as management of postoperative neurosurgical patient. Commonly encountered life threatening illnesses include traumatic brain injury, intracranial bleeding, ischemic stroke, brain tumor, seizure, brain infection, spinal cord disorders and systemic complications secondary to neurological illnesses.

The main aim of neuro-icu care are to resuscitate critically ill patients, provide comprehensive neurological support, maintain optimal cerebral perfusion to prevent secondary brain insult and facilitate patient’s transition to a recovery state. Allied health professionals are the key members in neuro-critical care in delivering high quality services to critically ill patients in neuro-icu.

A collaborative efforts between the nurses and treating doctors are important to provide multisystem care for critically ill patients. Early detection of neurological worsening, understanding the pathophysiology, applying care following standard practical guidelines and monitoring the side effect of treatment help to improve the neurological outcome of patients.
Auditory Brainstem Implant was first performed at the House Ear Institute by House and Hitselberger in 1979. In the Sarawak General we performed the first ABI implant in Malaysia on 28th June 2016. So far we have placed 3 ABIs in three patients who had total hearing loss. Two were for patients with NF2 and one was for a patient with meningitis.

The use of image guidance was very useful in the 3 cases because of the complexities of the first 2 cases where both had previous bilateral acoustic neuromas excisions and previous radiation treatments for their remnant tumours. The third case has right cochlear aplasia and left cochlear ossification. The ossifications at the temporal bone caused loss of the landmarks during the translabyrinthine approach. The Image Guidance system was able to guide that approach well.

However their use can be considered as adjunctive as the final placements over the cochlear nuclei at the brainstem were aided but direct microscopic inspection of the Foramen of Luschka, identification of the facial nerve using the facial nerve stimulator and the use of the EMG pattern of the testing electrode on the cochlear nuclei.

All the 3 patients regained hearing ability to at least 50 up to 8 month follow-up with PTA testing. The third case has excellent sound recognition. There was a wound infection, which resolved with antibiotics in the third case. There was no other morbidity and no mortality.

In conclusion image guidance has aided in the placement of ABIs but a combination of anatomical knowledge and electrophysiological monitorings were all needed to make the placement successful. Mental status had higher likelihood of AIS.

**EXAMINATION OF UPPER LIMBS**

**Teh Pei Chiek**

*Hospital Kuala Lumpur*

Auditory Brainstem Implant was first performed at the House Ear Institute by House and Hitselberger in 1979. Precise technique in examination skills increase the yield of detection of neurological signs. Nurses and allied health professionals are the arms and legs of neurology team and play the crucial role in management of patient. This is particularly true for medical assistant handling acute stroke in emergency department and electrophysiologist performing nerve conduction studies in electrodiagnostic lab.

Upper limb examination can be broadly divided into motor, sensory and cerebellar component. Each examination always begin with inspection of muscle wasting, abnormal movement and position. Secondly follow by examination of tone, power and reflexes as part of the motor examination, pinprick sensation, vibration and proprioception response as part of the sensory examination and cerebellar examination.

The main objective of this selected topic is to differentiate between upper motor neuron and lower motor neuron sign, to detect different sensory loss pattern and associated neurological signs. A complete examination is necessary for localization of lesion clinically, plan for subsequent investigations and management.
W.A Wan Sulaiman

Neurology Unit, Department of Medicine, Faculty of Medical and Health Science, Universiti Putra Malaysia, Serdang, 43400, Malaysia.

In an overview, neurological examination of the lower limbs should include both motor and sensory examinations in which left and right limbs should be directly compared at each step. There are several important preparations prior to examination. First, always wash your hands. Second, check the identity of the patient, introduce yourself to the patient and ask the patient’s permission to carry out the examination.

Third, give a brief explanation to the patient before you start. Further instructions and explanations can be given as you proceed for each step of examinations. Fourth, prepare the equipment namely cotton wool, neuro-tips, tendon hammer and tuning fork 128Hz.

Lastly, position the patient into a comfortable lying position as well exposing the limbs appropriately. Examination should start with general observations from the end of the bed. Note the resting posture, body asymmetry and the surrounding items such walking aid or callipers. Next, assess the gait and do the Rhomberg’s test because this would be give important initial findings to aid further examination. Motor examination includes inspection of the limbs, tone and clonus, power, reflexes and coordination. Sensation examination includes light touch, vibration and proprioception as well as pain and temperature. Knowledge on myotome and dermatome are necessary to interpret the findings. Upon completion of the examination, help patient to dress up again and always thank the patient. Consider other important neurological examination such as upper limbs and cranial nerve examination.

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Epilepsy surgery for children with intractable epilepsy in Malaysia commenced in 2001. This early series reported surgery for children with well localised lesions and a few palliative callosotomies (Selladurai 2007). The establishment of a comprehensive paediatric epilepsy surgery programme in 2012 resulted in a significant increase in the number surgeries. From June 2012, 96 children and young adults were operated at a median age of 11.3 years. Temporal lobectomy was the most common procedure (49%), followed by hemispherotomy (23%), focal resection (21%), TPO disconnection (5%) and corpus callosotomy (2%). After a median follow up of 2.4 years, 70% of the operated patients are seizure free. This talk will highlight the lessons learnt and future challenges of paediatric epilepsy surgery in Malaysia.
AN INTRODUCTION AND RECENT ADVANCES IN: DIFFUSION MRI IMAGING AND ANALYSIS AS POTENTIAL BIOMARKERS FOR NEURONAL DISEASES AND NEURO SURGICAL GUIDANCE

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Diffusion weighted magnetic resonance imaging (dMRI) produces in vivo maps of microscopic structural information of biological tissues such as brain white matter, heart, muscle etc. It is increasingly becoming an important imaging biomarker for neurodegeneration with its ability to characterize the tissue pathophysiology at micro structural level before it can become apparent with gross anatomical changes.

From the diffusion image signal, a wide range of quantitative indices that represent tissue morphology and compartmentalization are being developed to assess axonal and myelin damage in neurological disorders. dMRI has also enabled the visualization of white matter fiber tracts in the brain, emerging as a potentially valuable tool for pre-surgical planning where knowledge of the exact location of the lesion with respect to eloquent white matter pathways is of great importance; and also in post-operative follow up.

The popular initial diffusion model, DTI – diffusion tensor imaging, is a rather simple model that assumes linearity of diffusion within a voxel. Therefore, it is inadequate to resolve nonlinear diffusion that results from crossing and kissing of multiple fibers. To overcome these limitations, the recent focus has shifted to the advanced image acquisition methods and their related analytical approaches. This presentation introduces diffusion imaging and its use as a biomarker for neurodegeneration and its applications in neurosurgery. It also presents some recent trends in imaging, modelling and tractography techniques.

Mohd Raffiz

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Neurosurgical services in Malaysia started not too long ago, when the first neurosurgeon began to perform neurosurgical procedures in Hospital Kuala Lumpur in 1963. It started with a small unit and slowly increases its strength in terms of manpower, services offered and coverage area. Until recently, many would consider the neurosurgical services in Malaysia to still be in its infancy stage where its focus were mainly to provide emergency services especially but not exclusively traumatic patients.

As the number of neurosurgical centres and neurosurgeons grew, so do the variety of neurosurgical services offered. Although the focus remains to provide adequate neurosurgical emergencies to the public, we have expanded our services to include neuro-oncology, paediatric, vascular, spine and most recently functional neurosurgery.

The local neurosurgical programme in USM started in 2001 is to be credited for the growing numbers of young neurosurgeons in Malaysia. However, the increment of strength in terms of personnel and facilities should be parallel with increment of services, and the public should, rightfully so, demand an increase in quality of care. In developed countries such as Japan or the United States, quality of care was assured, among others, by having neurosurgeons further trained and focused on certain aspects of neurosurgical services only. In Malaysia, although our current neurosurgical set up and the facilities at the moment are still inadequate for such subspecialty services, it should not hinder the young neurosurgeons to develop special interest and pursue further training in selected areas, whilst at the same time strengthen the competency in performing all general neurosurgical procedures.
HISTORY, CHALLENGES AND FUTURE OF WOMEN IN NEUROSURGERY

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In an overview, neurological examination of the lower limbs should include both motor and sensory There was a time where women in the medical profession as physicians or surgeons was restricted. This scenario has evolved and today women are finding themselves in fields that was once male dominated. Diana Beck, MD, (UK) in 1939 became the first female neurosurgeon in the world. She apprenticed with Hugh Cairns who had trained with Harvey Cushing, Father of Neurosurgery and William Halstead.

In a country, as advanced as the United States, women only make up 5% of actively practicing, board-certified neurosurgeons even though 49% of medical graduates are women. In Malaysia, 9% of neurosurgeons are women. The number of women applying into the Master of Surgery (Neurosurgery) program has definitely increased. In 2016, 40% of the successful applicants were women. Interestingly, in the final year postgraduate exam May 2016 there was only 1 male candidate among 3 female candidates. It must be a first in the world where women actually outnumbered men in the neurosurgical board exam.

As a Malaysian woman in neurosurgery it should never be about being a woman instead we should strive to be an honest, dedicated and accomplished neurosurgeon. Never forgetting that neurosurgery is an inherently demanding field and we should not expect changes to attract or accommodate us unwilling to do the work to master and advance the field.

IDENTIFYING YOUNG CHILDREN AT RISK FOR DYSLEXIA

Chan C

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Dyslexia is a specific learning disorder causing poor reading and spelling, with severity ranging from mild to severe. It is one of the most common learning difficulties encountered in a typical classroom. Difficulties with phonological awareness is a characteristic feature of dyslexia but other developmental difficulties including problems with working memory, verbal processing speed and attentional issues often co-exist. Without evidence based interventions, many of these children go on to struggle academically throughout school, with lifelong implications in social and employment spheres.

Efforts to detect children with dyslexia in primary school are in place in many countries, including Malaysia. By the time children are identified in primary school however, many of them may have experienced years of academic failure with an ability gap between them and their peers that is too wide to close. Therefore, efforts are now shifting to identify children at risk for dyslexia at a younger age, so that interventions can begin much earlier or even before they start formal primary schooling.

SCREEN TIME AND THE DEVELOPING BRAIN

Dr Rajini Sarvananthan

Consultant Developmental Paediatrician
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Baby And Beyond Child Specialist Centre
Visiting Consultant University Malaya Medical Centre

Over the last 20 years or more, research has shown that screen time affects sleep and is associated with poorer developmental outcomes in children, leading to recommendations that it should be limited in children. Studies recently have shown that portable screen devices are increasingly used even amongst infants and toddlers. The evidence for structural as well as functional changes in the brain and its effects on development, cognition and sleep in the developing brain of infants and children will be discussed in this session.
Lua, P. L.

Faculty of Pharmacy, Universiti Sultan Zainal Abidin (UniSZA) Kuala Nerus, Terengganu

Epilepsy management consistently imposes tough challenges for patients and healthcare providers alike, as non-clinical issues require equally careful attention. As treatment strategies progress, studies concerning epilepsy education, psychosocial issues, e-health innovations and health-related quality of life (HRQoL) outcomes are becoming important. Recent selected studies are discussed here - which uniquely featured e-health educational innovations, non-clinical assessments and the participation of adults, children and family caregivers. A randomised, controlled community trial was conducted in public hospitals in Terengganu, Pahang and Kelantan enlisting 144 adult patients. The SMS-based Mobile Epilepsy Education System was the e-health intervention tool used to ascertain awareness, knowledge, attitude (AKA) and HRQoL outcomes. Significant AKA and HRQoL improvements were recorded over-time by the intervention group.

Receiving educational snippets proved a significant predictor for good HRQoL. A further pre- and post-study in 32 children utilising another Interactive Animated Epilepsy Education Programme showed significant AKA and HRQoL enhancements. These innovations were subsequently followed by creation of the Animated Epilepsy Educational Video - its effectiveness further evaluated via a randomised, controlled-parallel study among 126 patients and their respective carers (n=131). After direct intervention for carers, significantly higher awareness and more favourable HRQoL was detected. The corresponding patient group also reported better AKA and significantly improved HRQoL.

These combined outcomes signified clear non-clinical benefits of such investigations, while simultaneously demonstrating the positive impacts of innovative educational tools in complementing epilepsy management. Essentially, active participation from all parties should be emphasised in the provision of holistic epilepsy care.

Irene Looi

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The Ministry of Health Malaysia, realising the importance of Research and Development (R&D) in improving the medical care and human health of Malaysia, has set up various portals to improve the research culture among healthcare workers. Among others, some of the initiatives include the establishment of

- Clinical Research Centres (CRC) in every big hospital,
- Medical Research Malaysia (CRM), a not-for-profit NGO set up by the government to promote research,
- Medical Research Grant (MRG) for application by the MOH staffs who are interested to do research in the 10 focus disease areas identified as critical in the RM 11 (Rancangan Malaysia 11).

Suffice to say, a good research is a research which incorporates the talents from various fields and the best corporation would be a corporation of MOH and MOE/MOHE (universities). Our government is endeavouring to improve the medical care and the human health of Malaysian through quality research. Let us optimally utilise the resources that has been prepared by our government to do quality research that really matters to our patients.

Nasser Abdul Wahab

Department of Neurosurgery, Hospital Pulau Pinang, Malaysia

The treatment of craniofacial defects following trauma can present many challenges due to the variety of tissue-specific requirements and the complexity of anatomical structures in that particular region. 3D-printing technologies provide surgeon with the ability to create patient-specific solutions for craniofacial defects.
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The screening of BDNF Val66Met polymorphism among Malaysian diagnosed with major depressive disorder

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BDNF is a neurotrophin found in abundance in brain regions such as the hippocampus, cortex cerebellum and basal forebrain of the central nervous system. It plays a significant role in the survival, differentiation, and outgrowth of hippocampal and cortical neurons, cholinergic, striatal, nigral dopaminergic, and 5-HT neurons during adulthood and development. BDNF has been associated with the risk of susceptibility to memory impairment, obsessive compulsive disorder, Alzheimer’s disease, Parkinson’s disease, anorexia nervosa, bipolar disease, schizophrenia and major depressive disorder.

Inconsistent results have been reported on the association of BDNF Val66Met polymorphism with major depressive disorder. Significant association was reported between the mutant variant and MDD in the Caucasian population but not Japanese and Chinese population. There were no studies related to the BDNF variant in Malaysian MDD patients, therefore this study aims to screen for the prevalence and association of BDNF Val66Met variant with Malaysian MDD patients. High resolution melting analysis was used to screen for the variant among cases and controls recruited from local hospitals with matched age, sex and ethnicity.

The association of genotypes and allelic variants of BDNF was determined using chi-square test. Hardy-Weinberg equilibrium analysis was also conducted to study the distribution of the genotypes within the population. To date, our findings show no significant association or disequilibrium of the BDNF Val66Met genotypes/allelic variants with/among Malaysian MDD patients.
Cerebral hypoperfusion is a condition characterized by a net reduction in blood flow to the brain. Reduction in supply of blood to the brain leads to various brain damages including neuronal death, microglial activation and white matter lesion. The damaging effects of cerebral hypoperfusion on the blood-brain barrier (BBB) in vivo, however, have not been well documented.

The BBB is the brain’s first line of defence that forms a separation between the brain parenchyma and the circulating blood. It regulates the entry and exit of substances into and out of the brain thus maintaining the brain microenvironment homeostasis. In an attempt to investigate the pathological effects of cerebral hypoperfusion on the BBB, the two-vessel occlusion (2VO) model was adapted to mimic the condition of cerebral hypoperfusion in rats.

An exogenous tracer, Evans blue dye (EBD) was used to assess the spatiotemporal changes in the permeability of the BBB in the 2VO rat model. There was a marked extravasation of the EBD tracer in the brain regions i.e. frontal cortex, posterior cortex and thalamus-midbrain at day 1 following induction of cerebral hypoperfusion, indicating the vulnerability of these brain regions towards hypoxia insult during the acute phase. Ultrastructural analysis using transmission electron microscopy further reveals possible BBB endothelial cells and astrocytes damages during cerebral hypoperfusion.

In order to understand the mechanisms that may lead to BBB damages during cerebral hypoperfusion, two-dimensional (2D) gel electrophoresis coupled with LC-MS/MS method was employed to investigate the global changes in the expression of the total protein obtained from brain microvessels. It was found that 7 proteins was differently expressed (5 downregulated and 2 upregulated) which includes proteins that are involved in mitochondrial metabolism, transcription regulation and signalling pathways.

These observations provide useful insights into BBB damages during cerebral hypoperfusion that may assist future therapeutic strategies.


**Abstract ID: OP-03**

*Umbelliferae* family extract increases the potential of neural stem cell generation from rat full-term amniotic fluid (R3) and mouse embryonic (46C) stem cell lines

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Neural stem cell (NSCS) has gained much attention due to its potential therapeutic applications for neurological disorders. Several studies have shown that NSCs can be generated from certain type of stem cells in vitro. However, more efficient method or NSC inducer is essential to increase the NSC conversion from stem cells. Among the inducers, raw extract from a species of family *Umbelliferae*, known as CA, could be the potential candidate. Extract of this family has been used in Ayurvedic traditional system of medicine as brain tonic to improve memory and clarity of thinking.

Here, we aimed to disentangle the role of CA as an NSC inducer for rat full-term amniotic fluid (R3) and mouse embryonic (46C) stem cell lines to efficiently differentiate into neural stem cells. CA was treated on R3 and 46C at two concentrations (1 μg/ml and 10 μg/ml) on the day they were seeded for monolayer differentiation. Upon monolayer induction, the stem cells generally express Nestin, a marker for NSC and exhibit NSC-like morphology when cultured in neural selective medium. For this study, the CA-treated cells were cultured either in DMEM/F12, a serum-free media, or GMEM supplemented with FBS.

After 48 hours of treatment, the cells were checked for the expression of neural stem/progenitor cell protein markers namely Sox1, GFAP and Tuj1 by using flow cytometry analysis. For both stem cell lines, the expression of Sox1, Tuj1, and GFAP was observed to be higher in both of the treatment groups as compared to the untreated group (control). These results strongly suggest the property of this Umbelliferae family extract in enhancing the generation of neural stem cells from these stem cell lines. This finding clearly marks CA as the potential neural stem cells inducer, which could be useful to generate NSC from stems for future bedside applications.

**Abstract ID: OP-04**

Mangosteen Extract Reduces Apoptosis after Traumatic Brain injury

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Traumatic brain injury (TBI) is one of the most significant cause for mortality and morbidity in young population. After the primary injury, there is secondary injury that will aggravate the injury and lead to cell death. Apoptosis plays a crucial role in pathogenesis of head injury. Inhibition of apoptosis can potentially reverse the devastating effect and lead to better outcome. Inflammation is a powerful initiator of apoptosis. In this study, we used an experimental mouse model of TBI to examine the temporal profile of apoptosis, including apoptosis inducing factor (AIF), caspase 8, caspase 9, and apoptotic body. We also investigate the therapeutic potential of mangosteen extract that contain natural antiinflammation on apoptosis. We observed that expression of AIF, caspase 8, caspase 9, and apoptotic body were reduced in treatment group. These findings suggested that mangosteen extract might be a potential therapeutic agent for TBI.
MEG power spectral analysis and its relationship with the neurocognitive assessment among traumatic brain injury patients of different level of severity

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Traumatic brain injuries are very common in Malaysia which draws a great concern especially in the regards of the management for the patients who need recommence back to their daily life or adaptation to surrounding environment. The hypothesis of this study was to analyse the brain waves which are related to patient memory and attention after the traumatic brain injury (TBI). Hence, we investigated the potential of Magnetoencephalography (MEG) as a tool for early detection the disruption brain waves in these traumatic brain injury patient and their correlation to neuropsychological assessment. Our study consisted of twelve traumatic brain injury patients who in the age of 15-25 years old with a Glasgow Coma Scale (GCS) of 9-13 in the first twenty-four hours after motor-vehicle accidents. The neuropsychological test were measured from the patients before MEG recording. The MEG recording was done from these two groups of patients in a resting state of eye close and eye open conditions. MEG data were pre-processed and the power (amplitude squared) value was then extracted from different frequency band of Delta, Theta, Alpha, Beta and Gamma waves using BESA Research 6.1 software. Result showed that the power in Beta frequency band reduced and Theta/Beta ratio is increased significantly in moderately severe traumatic brain injury patients compared to mild brain injury patients; imply moderate brain injury patients have mental processing and attention deficit than mild injury patients. Thus, MEG plays an important role in detecting changes after brain injury objectively which may have great implication in prediction of cognitive sequelae of traumatic brain injuries in the neurological, neurosurgical and neurorehabilitation settings.

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Background: Chronic subdural collections (CSDCs) are pathological condition frequently occur in paediatric age, particularly in children less than two-year-old. It can present as chronic subdural effusion (CSDE) or chronic subdural hematoma (CSDH). CSDE usually occurs as a complication of bacterial meningitis whilst CSDHs are mostly due to non-accidental injury (NAI). Subdural drainage remains the main surgical method for symptomatic CSDC. We evaluate the clinical features, radiological findings and surgical outcome of CSDC.

Methods: We used retrospective cohort study to evaluate 55 children (less than 2 years old) diagnosed as symptomatic CSDCs and treated surgically with subdural drainage from Jan 2008 till October 2016. Patients were divided into 2 groups according to aetiology: 29 cases occur post-infection (CSDE group), while 26 cases were post-traumatic (CSDH group). All patients was monitored for re-surgery and shunt dependency at three and sixth months. Data concerning the patient’s clinical features, imaging findings and management are described.

Results: There were no significant differences in term of patient general characteristic, pre-operative symptoms and surgical outcome between groups. Children with CSDH presented with significant history of care by babysitter (p<0.001) and retinal haemorrhage (p<0.001). Fever, high white cell count, positive cerebrospinal fluid (CSF) polymorph and CSF culture were significantly associated with CSDE group (p<0.001). Thickness pre-operative subdural collection >1cm and positive CSF culture were identified as independent prognostic factors of resurgery. Good results were also obtained with subdural drainage as only 7% of patients require shunt. Conclusion: Our study concludes that burrhole drainage can be considered as a treatment of choice for managing symptomatic CSDC. The use of subdural drain in symptomatic CSDC help to reduce the shunt dependency although no significant risk factors was identified.
Semiological and electroencephalographic features of lateral temporal lobe epilepsy

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Introduction: Temporal lobe epilepsy is the commonest type of focal epilepsy; however lateral temporal epilepsy is distinctly different from medial temporal lobe epilepsy in terms of semiologies, and electroencephalographic (EEG) features. The aim of this study is to clarify semiological and scalp EEG features of patients with lateral temporal lobe epilepsy who were successfully treated surgically.

Methods: This is a retrospective study. This study includes 17 patients with lesional lateral temporal lobe epilepsy who satisfied the following: lateral temporal resection sparing mesial temporal structures was performed; followed for more than 2 years after surgery; and obtained favorable seizure outcome (Engel class I). There were ten females and seven males, with age ranged from 15 to 48 at the time of surgery (mean age 31.2 years). Auras, videotaped seizure semiology, interictal and ictal EEG were reviewed. Twenty patients with mesial temporal lobe epilepsy with hippocampal sclerosis who obtained favorable seizure outcome (Engel class I) were selected as control group.

Results: Ictal semiology showed epigastric ascending sensation in one patient (6% versus 40% in control group, p<0.05) oral automatisms in five (29% versus 80% in control group, p<0.01). None of the patient in LTLE presented with dystonic posturing manifestation (0% versus 40% in control group, p<0.05). Unitemporal rhythmic theta activity was seen in five patients (29% versus 75% in control, p<0.05). Conclusion: We found oral automatism and dystonic posturing is significantly infrequent in LTLE patients than those with MTLE. Unitemporal theta rhythm was also significantly infrequent in LTLE. This study showed notable difference of semiology and electrographic features between LTLE and MTLE. These findings may be useful for identifying epileptogenic zone.

Automated Epileptic Discharge Detection for EEG

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Epileptic discharge (ED) has been a marker for neurologist to diagnose a person if they have tendency to develop a seizure. Conventional method to detect epileptic discharge EEG by neurologist’s visual screening is tedious and operator dependent. We proposed automated epileptic discharge detection with adaptive segmentation method for EEG data to assist neurologist in detection of epileptic discharge. The new adaptive segmentation algorithm has been derived based on identification of amplitude outlier to ease the computational cost due to the length of EEG. The algorithm designed to avoid segmentation at possible epileptic discharge location, preserving the EEG data usability. A mimetic technique is implemented to extract features such as amplitude, width, and slope and phase reversal. Outlier values for these three features are selected as threshold. An improvement was made to able the algorithm to differentiate the type of seizure (spike or sharp) based on width. 16 EEG data was acquired from PPUKM database and their number of spike, sharp and phase reversal was determined by neurologist manually are use as reference to validate the performance of developed algorithm.
Bilateral Globus Pallidus Internus Deep Brain Stimulation for Dystonic Opisthotonus in Atypical Pantothenate Kinase-Associated Neurodegeneration Syndrome

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Introduction: Pantothenate kinase-associated neurodegeneration (PKAN) syndrome is an autosomal-recessive disorder characterised by neurodegeneration and brain iron accumulation due to pantothenate kinase 2 gene mutations (PANK2). It causes progressive generalised dystonia, which remains pharmacologically intractable. Globus pallidus internus (GPI) deep brain stimulation (DBS) has been successfully used in the classic forms of PKAN patients. Here, we report a case of a patient with atypical PKAN syndrome who obtained significant improvement of dystonic opisthotonus posturing following bilateral GPI stimulation.

Case Presentation: A 25-year-old Malay gentleman with PKAN syndrome who had homozygous c.332T>A mutation of the PANK2 gene was referred to our tertiary centre with medically refractory generalised dystonia, particularly affecting his upper trunk and cranio-cervical region. He initially presented at age 14 with upper limbs dystonia and dysarthria, which subsequently progressed over the years. On examination, there were prominent jaw-opening oromandibular dystonia, dystonic posturing of upper limbs and marked back-arching axial dystonia (dystonic opisthotonus) with retrocollic spasms especially upon standing and walking. MRI brain did not show the typical radiological hallmark of PKAN, the ‘eye of the tiger’ sign. He underwent surgery for bilateral internal globus pallidus deep brain stimulation. Post-operatively with the stimulator ON, there was a dramatic improvement in the opisthotonus posturing and retrocollic. He could sit, stand and walk independently. The oromandibular and upper limbs dystonias were also improved. Dysarthria persisted, but he was able to vocalise some words. Dystonia severity assessment by using Burke-Fahn-Marsden Dystonia Rating Scale (BFMDRS) demonstrated significant improvement in his score; from 80/120 to 56/120 and from 13/30 to 12/30 on the motor and disability sections respectively. The improvement remains clinically evident 8 months after the surgery.

Conclusion: Our experience supports further that GPI DBS is beneficial in severe secondary generalised dystonia, particularly those with marked axial dystonia such as this case.
Association of Vitamin D-related Gene Polymorphisms with Serum 25(OH)D and Vitamin D Status in Malaysian Children with Epilepsy

A. N. Kong, C. C. Ng, A. R. Mohamed, T. B. Khoo, T. Nadarajaw, L. C. Ong, C. Y. Fong
(Affiliations not provided)

Vitamin D deficiency is reported to be common in children with epilepsy (CWE) on long-term antiepileptic drugs (AEDs) treatment. Single nucleotide polymorphisms (SNPs), in the vitamin D pathway have been reported by previous studies to be as important as other risk factors for the serum 25-hydroxyvitamin D (25(OH)D) concentration. This cross-sectional study investigated vitamin D-related SNPs in relation to serum 25(OH)D concentrations in 239 CWEs on AEDs and healthy control group (N=280). Twelve SNPs in 7 genes (VDR, GC, CYP2R1, CYP24A1, CYP27B1, CYP27A1, CYP3A4) were genotyped using TaqMan assays, and serum 25(OH)D was measured using electrochemiluminescence immunoassay. Data regarding basic biochemical analyses, clinical history, anthropometry, physical activity and dietary intake history were also recorded. Linear and logistic regression models were used to assess associations between each SNP with serum 25(OH)D concentrations and presence of vitamin D deficiency, respectively, adjusted for covariates. Models were run separately by ethnicity, followed by fixed-effects meta-analysis to combine the results. Participants in the epilepsy group included 52.7% Malay, 24.3% Chinese and 23.0% Indian with mean serum 25(OH)D was 58.8 nmol/L (SD 25.7); the prevalence of vitamin D deficiency (≤37.5nmol/L) was 22.9%. In the epilepsy group, minor allele of GC-rs4588 was significantly associated with lower serum levels of 25(OH)D (β=-8.11, P<0.004) in the meta-analysis while VDR-rs7975232 was significantly associated with reduced odds of vitamin D deficiency in Malay subgroup (Odds Ratio, 0.14; 95% Confidence Interval, 0.04-0.42; P<0.004). In the control group, significance for the association of GC-rs4588T with lower serum 25(OH)D levels was shown in the meta-analysis (β=-5.08, P<0.004) and Indian subgroup (β=-7.57, P<0.004). Our findings were the first to suggest that GC-rs4588 may be genetic determinant of serum 25(OH)D concentration in CWE and healthy children in Malaysia, while VDR-rs7975232 is associated with lower risk of vitamin D deficiency in Malaysian CWE.
Prevalence of Low Bone Mineral Density and Its Risk Factors In Malaysian Children with Epilepsy

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Background: Children with epilepsy on long-term antiepileptic drugs (AEDs) are associated with the risk of low bone mineral density (BMD).

Objective: To assess prevalence of low bone mineral density among children with epilepsy on long-term AEDs and to assess potential risk factors of low bone mineral density in children with epilepsy on long-term AEDs.

Design: Cross sectional study in Paediatric Neurology Clinic, University Malaya Medical Centre (UMMC) Kuala Lumpur. Children aged between 4 to 18 years old with epilepsy who are on AEDs for more than 1 year were recruited from May 2014 to May 2015.

Methods: Detailed epilepsy history was evaluated using a data proforma. Detailed questionnaire assessments were performed on lifestyle factors including the physical activity, sun exposure behaviour and dietary nutrition intake. Blood were drawn to assess the biochemical parameters of the bone health (Vitamin D, Alkaline phosphatase, Parathyroid hormone, calcium, phosphate). A bone scan was done using dual energy x-ray densitometry (DXA scan) of the lumbar spine and the z-scores were calculated for each patient to assess the children’s bone density. Low lumbar BMD is defined as Lumbar Z-Score of ≤-2 SD.

Results: Ninety-seven patients were enrolled, which comprised of 62 male patients and 35 female patients. Mean age for the participants are 11.9 years (SD 3.5103) with age range of 4.5 years to 18.2 years. The prevalence of Low lumbar BMD in our cohort was 25.8% (25 patients). We identified 8 potential risk factors that are associated with low lumbar BMD in the bivariate analysis which include number of AEDs, duration of epilepsy, types of seizure, ambulatory state, cerebral palsy state, BMI status, wrist breadth and waist circumference (p<0.05). Analysis with multiple logistic regression identified intake of more than 2 AEDs and wrist breadth <15th centile has higher risk of getting poor lumbar BMD.
Quality of life and family functioning in Malaysian children with epilepsy

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Background: Children with epilepsy (CWE) are at risk of impaired health-related quality of life (HRQOL) and achieving good HRQOL is important among CWE.

Objectives: To investigate: i) HRQOL of multi-ethnic CWE in Malaysia as reported by both child and parent; ii) Potential correlates of sociodemographic, epilepsy characteristics and family functioning with HRQOL in CWE; iii) Level of agreement between child-self report and parent-proxy report HRQOL.

Methods: Children aged 8-18 years old with at least 6 months’ duration of epilepsy; minimum primary school education Year 1 and attending mainstream education were included. Exclusion criteria were children with learning difficulty/intellectual impairment, disability (physical, visual/hearing) or any chronic diseases that can independently affect QOL. Questionnaires were given (CHEQOL-25 for parent and child, GF-12 for parent).

Results: 115 participants were recruited. In general, Malaysian parents rated children’s HRQOL lower than the children themselves. Agreement between child-parent on CHEQOL-25 measure ranged from ICC 0.31-0.54, with greatest discordance for Epilepsy Secrecy (ICC=0.31, p=0.026). Malay ethnicity, focal seizure and high seizure frequency were associated with lower HRQOL. 47 (40.9%) reported family dysfunction. >2 anticonvulsant (p=0.030, OR 9.681, 95% CI: 1.244-75.31) and caregiver with primary educational degree (p=0.023, OR 7.903, 95% CI: 1.331-46.916) were significant predictors for family dysfunction. GF-12 has small correlation to CHEQOL-25 Total Score (PPR) (r=-0.186, p=0.046).

Conclusion: This is the first multi-ethnic Asian study comprehensively evaluating correlates of HRQOL among CWE (both parent and child) and the level of parent-child agreement in HRQOL. Malay ethnicity, focal epilepsy and high seizure frequency were associated with lower HRQOL. There was an overall moderate agreement between the parent and child reported HRQOL with parents underestimating their child’s HRQOL. It is important to have the child’s perspective. We recommend targeting psychosocial intervention to CWE especially among the Malays, those with focal seizure and high seizure frequency.
Choose the RIGHT antiepileptic drug......
POSTER ABSTRACTS
Common 4977 bp deletion and copy number alterations in mitochondrial DNA in brain tumor.

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Mitochondria are major cellular sources of reactive oxygen species (ROS) generation which can induce mitochondrial DNA (mtDNA) damage and lead to carcinogenesis. MtDNA 4,977-bp deletion as well as alteration in mtDNA copy number have been implicated in various types of human cancers. The aim of the present study was to find out the association of mtDNA 4,977-bp deletion and mtDNA content in brain tumor from the Malaysian patients. Brain tumor tissues and corresponding blood specimens were obtained from 50 patients. For comparison, 40 blood samples of healthy controls were also included in this study. The mtDNA 4,977-bp deletion was detected using the multiplex Polymerase chain reaction (PCR) analysis and later was confirmed by direct DNA sequencing. Furthermore, the mtDNA content was analyzed by using a quantitative real time PCR method. The mtDNA 4,977-bp deletion were observed in 24% (12 out of 50) of our patients. Moreover, we found that mtDNA copy number was significantly reduced in tumor tissues (13.49±9.32) compared to corresponding blood samples (36.65±9.32). For the first time, we have been able to describe the occurrence of mtDNA 4,977-bp deletion and decreased mtDNA content in a Malaysian brain tumor population. Deletion of mtDNA 4,977-bp could be classified as pathogenic mutation in connection with mutations in other mitochondrial or nuclear genes as well as environmental factors in the development of various diseases and cancers. We believe that mtDNA 4,977-bp deletion and mtDNA content determination may be considered as potential diagnostic and prognostic biomarker among Malaysian population particularly in those with brain tumors.

The Neurochemistry of Islamic Lifestyle

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Islamic lifestyle is a way of life that provides many benefits for mental, physical and spiritual health. Nevertheless, scientific research on the effects of neurochemicals resulting Islamic lifestyle is still on going concern and at the initial stage. The Islamic lifestyle consists of three main components; (i) routine ibadah (daily worship); (ii) the practice of sunnah (the way of the prophet Muhammad SAW); and (iii) tadabbur the alam (exposed to the nature). This review assesses the evidence that Islamic lifestyle is capable of improving health and well-being through the involvement of neurochemical systems for individual cognitive abilities and behaviors such as learning, memory, focus, emotion, decision making and reasoning. This paper also discusses the meaning of the verses in al-Quran by referring to the information obtained from various books of tafseer al-Quran. It also asserts that strong reasons are always consistent with the guidance of the al-Quran and the hadiths to avoid the misleading views of giving facts and analysis. Al-Quran and hadiths have emphasized the importance of the Islamic lifestyle and its benefits for the human beings.
ABSTRACT ID: PP-003

HLA-B*15:02 association to Carbamazepine-induced Stevens-Johnson syndrome and toxic epidermal necrolysis in Malaysia, Myanmar and Indonesia: a meta-analysis

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(Affiliations not provided)

Introduction: Various human leukocyte antigen (HLA) alleles have been found to be predictive for drug-induced hypersensitivity reactions. One of this allele is HLA-B*15:02 in association to Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) induced by Carbamazepine (CBZ), a frequently prescribed anticonvulsant for epilepsy, trigeminal neuralgia and bipolar disorder. This association has been demonstrated in several populations in Southeast Asia. HLA-B*15:02 has been reported to be prevalent in Asian populations. This study aimed to confirm HLA-B*15:02 allele association with Carbamazepine-induced Stevens-Johnson syndrome (CBZ-SJS/TEN) in Malaysia, Myanmar and Indonesia populations. We further performed a meta-analysis of all the data to evaluate the strength of the association between HLA-B*15:02 and CBZ-SJS/TEN.

Methods: CBZ-SJS/TEN patients and CBZ tolerant controls were recruited from: University of Malaya Medical Centre (UMMC), Kuala Lumpur; Hospital Sultanah Bahiyah, Alor Setar, Kedah in Malaysia; Hasan Sadikin Hospital, Bandung, Prof RD Kandou Hospital, Manado, and Cipto Mangunkusumo Hospital, Jakarta in Indonesia; and Yangon General Hospital in Myanmar. HLA-B genotyping was performed on a total of 45 CBZ-SJS/TEN patients and 333 CBZ tolerant controls.

Results: There is significant association between HLA-B*15:02 and CBZ-SJS/TEN in two populations: Malaysia (Odds ratio (OR) = 26.6; 95% confidence interval (CI) = 12.80 - 55.25; p = 2.31x10-26) and Myanmar (OR = 51.15; 95% CI = 2.36 - 1106.95; p = 0.003). Whereas Indonesia population demonstrates a borderline association (OR= 3.71; 95% CI = 1.09 - 12.61; p = 0.052). The meta-analysis of all three populations shows a strong association (OR = 14.35; 95% CI = 4.74 - 43.51; p < 0.00001). Conclusion: HLA-B*15:02 is associated with CBZ-SJS/TEN in Malaysia, Indonesia and Myanmar populations.

ABSTRACT ID: PP-004

Exploring potential microthrombogenic markers for cerebral small vessel disease (CSVD) in apparently asymptomatic individuals: Diffusion Tensor Imaging (DTI) and haemostatic assay studies

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Background: Cerebral small vessel disease (CSVD) is a spectrum of clinical and imaging abnormalities linked to pathology of small penetrating arteries and arterioles in the brain irrigating subcortical structures. The prevalence of CSVD seemingly asymptomatic manifestation such as silent brain infarcts is increased with age. On magnetic resonance imaging (MRI), these microchanges are seen as white matter hyperintensities (WMH). However, conventional MRI is limited, and correlations with clinical parameters including cognition have often been found to be weak to moderate. Therefore, more concise correlation markers and reliable lesion surrogates are needed to improve the assessment of CSVD, including white matter tractography using newer MR-diffusion tensor imaging (DTI) modalities. In addition, CSVD pathomechanism can be further explored using novel microthrombus haemostatic biomarkers to predict the risk and progression of CSVD and can be further supported by correlations with the assessment of neuropsychological test.

Methods: To date, sixty healthy individuals have been recruited based on their QRISK2 (low to moderate risk) cardiovascular risk prediction. All of them had completed their baseline MRI scanning
and neuropsychological test, and blood test for microparticles using flow cytometer method.

Results: Among 60 individuals; 23 of them have WMH, whereby most of them are older individuals (40’s to 60’s). Age does significantly correlates (p<0.05) with QRISK2 cardiovascular risk prediction. Age was significantly correlated with the outcomes of neuropsychological test. Cognitive and memories ability did correlate with the prevalence of WMH with respect to the location of the lesion. Participants with WMH+ found to have lower neuropsychological performances and higher microparticles counts when compared with the WMH- participant.

Conclusion: Finally, further data collection and analysis are still in progress, which include a repeat MRI brain at one-year follow-up for all the subjects, as well as the establishment of blood microparticles testing. In addition, further DTI analysis will be conducted to better correlate the degree of white matter damage with serial of haemostatic biomarkers and neuropsychological test.

ABSTRACT ID: PP-005

Association Study of SCN Polymorphism in Epilepsy Refractoriness in Malaysia

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Refactory epilepsy, also known as drug resistant epilepsy is a condition where seizures remain uncontrolled despite antiepileptic drug therapy. Studies have shown that polymorphisms in genes encoding for sodium voltage-gated channel alpha subunits are associated with antiepileptic (AED) drug responsiveness. This study aims to discover the association between sodium ion channel gene polymorphisms and AED responsiveness in a multi-ethnic Malaysian population. A total of 118 unrelated Malaysians (38 Malay, 54 Chinese and 26 Indian) with epilepsy were recruited in this study. Among the patients, 81 of them were drug resistant and 37 of them were drug responsive. Genomic DNA was extracted from peripheral blood or buccal swap samples followed by targeted re-sequencing of SCN1A, SCN1B and SCN9A genes in these patients. 15 polymorphic variants were identified and tested for their associations with drug response. We found a significant association (p < 0.05) between SCN1A variant (rs2298771) and drug resistant in Chinese. This result is consistent with previous studies conducted in Han Chinese from China. On the other hand, a variant in SCN1B (rs55742440) was significantly (p < 0.05) associated with drug resistant in Malay. No significant association was detected in Indian patients. In conclusion, our findings indicate that specific genetic variants in sodium channel genes might influence AED responsiveness in Malaysian patients.

ABSTRACT ID: PP-006

Effect of lavender essential oil on behavior and neurogenesis in an animal model for depression

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Background: Depression is a major health problem that affects about 350 million people worldwide. Patients with depressive symptoms frequently make use of complementary and alternative therapies such as aromatherapy. Lavender essential oil (LEO) is one of the most commonly used essential oils in aromatherapy for the treatment of sleeping disorders, anxiety and depression. However, the mechanism of action by which LEO exerts its antidepressant effect is still unknown. Neurogenesis is a physiological process that occurs in restricted areas of the adult brain (hippocampus and subventricular zone), has been linked to the regulation of emotional behaviour and is a promising target process for the study of psychiatric disorders such as major depression.

Aim: The aim of the present study is to evaluate the effect of LEO on behaviour and neurogenesis in an
**Materials and methods:** Young adult male Sprague-Dawley rats were grouped into 4 groups: (1) Control (vehicle), (2) corticosterone, (3) LEO, (4) LEO + Corticosterone. Animals were exposed to the vehicle and LEO in a chamber containing a cotton impregnated with the correspondent treatment. After 14 days of treatment, behavioural tests were carried out to measure depression-like behaviour and anxiety-like behaviour. On day 16, perfusion was carried out and brains were collected for immunohistochemical analysis targeting newborn neurons (BrdU positive cells) and immature neurons (DCX positive cells).

**Results:** LEO treatment prevented the corticosterone-induced depression-like and anxiety-like behaviour. Furthermore, LEO stimulated neurogenesis.

**Conclusions:** The present study contributes to the understanding of the antidepressant effect of LEO at a behavioural and cellular level.

**ABSTRACT ID: PP-007**

Toll-like Receptor 4 (TLR4) agonist causes motor behaviour deficits through modulation of neuronal morphology, dopamine and glutamate receptors in striatum and cerebellum of mice

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The alcohol addiction is one of the possible factors to stimulate brain microglia activation and leads to neuroinflammation through toll-like receptor which is present in microglia. In fact, alcohol addiction ultimately caused motor deficits through neuroinflammation. However, the underlying mechanisms of neuroinflammation inducing motor behaviour through activation of TLR4 receptors have not yet been elucidated. Toll-like receptors (TLR) are always found to be associated or involved in the induction of neuroinflammation in neurodegenerative diseases. Activation of TLR4 is stimulated by TLR4 Agonist, LPS, and the TLR4-LPS interaction has been found to result in physiological and behavioural changes including retardation of motor activity in the mouse model. Therefore, the present study aimed to investigate the neuronal morphological, dopamine receptors (Dopamine D1 receptor and Dopamine D2 receptor) and glutamate (EAAT1 and EAAT4) in the striatum and cerebellum following treatment with toll-like receptor 4 agonist. The animals were divided into four groups: (1) Control (n=6), (2) LPS treatment (0.83mg/kg) (n=6) and (3) LPS-5 (0.25mg/kg) (n=6). After treatment, behaviour studies were carried out in Rota rod, hanging method, wooden beam walking, open field test and hole board method. Following behaviour test, animal’s brains were harvested for morphological changes and gene expression studies. The results showed that there were morphological changes in striatum and cerebellum motor neurons. The gene expression studies suggested that there were significant changes in dopamine receptors (Dopamine D1 receptor and Dopamine D2 receptor) and glutamate (EAAT1 and EAAT4) in the striatum and cerebellum along with motor deficits. In conclusion, toll-like receptor 4 causes motor deficits through regulation of dopamine and glutamate receptors in striatum and cerebellum.

**ABSTRACT ID: PP-008**

Dysregulations in metabolic activity of neurospheres derived from embryonic Ts1Cje mouse model for Down syndrome

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Down syndrome (DS) is a genetic disorder caused by triplication of human chromosome 21 (Hsa21) and is the most common cause of intellectual disability. While a vast majority of previous literature has been focused on the molecular aspects, current knowledge on the underlying metabolic dysregulation in neural stem and progenitor cells (NSPCs) derived from embryonic Ts1Cje mice is limited. Ts1Cje is one of the most studied mouse models for DS, which has been indispensable in expanding our knowledge on the molecular and cellular pathogenesis of the disorder. Using Biolog Phenotype MicroArray (PM), metabolic profiling was performed to establish a correlation between genotype and phenotype of NSPCs from embryonic Ts1Cje mice. Four PM colourimetric assays (PM-M1, PM-M2, PM-M3 and PM-M4) coated with 367 biochemical substrates, including oxidizable carbon and nitrogen sources, were employed. Analysis of Biolog PM data was performed using a previously established statistical pipeline that involves three steps, including grouping, normalization and effect identification. Briefly, metabolic profiles are separated into active and non-active groups and are subsequently normalized to make replicates comparable to each other. This is followed by the effect identification step, which identifies significant differences in substrate utilization between NSPCs of Ts1Cje mice and wild-type (WT) control. Preliminary results suggest that most of the metabolic profiles of both WT and Ts1Cje neurospheres are similar, except for 18 substrates, in which Ts1Cje exhibited reduced utilization compared to WT control. Some of the substrates include D-glucose-6-phosphate, α-D-glucose-1-phosphate, hydroxyl-L-proline, and dipeptides consisting of isoleucine, valine, glycine, serine and tryptophan. Further downstream validation analyses will be performed on the differentially utilized substrates to determine their function and identify dysregulations in metabolic pathways. Metabolic profiling can complement previous studies on genomic, transcriptomic and proteomic characterization of neurospheres from embryonic Ts1Cje mice and highlight potential aberrations in cellular metabolism.

Roles of EphA2 in angiogenesis pathway mediated by VEGF and its receptors in DBTRG cell line

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Glioblastoma multiforme (GBM) is assigned under fourth pathologic grades (grade IV) of astrocytic tumor. Current GBM treatments commonly aim to target the bulk of the tumor, and yet still less targeting on angiogenesis process which is crucial for tumor growth. EphA2 plays important role in regulating angiogenesis and known to be over expressed in GBM tumors. This study aims to investigate the roles of EphA2 in angiogenesis signaling pathway by discovering its relation to angiogenesis related markers; VEGF, VEGFR-1 and VEGFR-2. Small interfering RNA (siRNA) targeting EphA2 with the appropriate transfection reagent was used to transfect DBTRG cell line for gene silencing. Quantitative real time PCR was used to evaluate the expression difference before and after the inhibition. The similar method also been applied to observe the relation of EphA2 gene silencing to tumor angiogenesis related markers; VEGF, VEGFR-1 and VEGFR-R2. Relative gene expression level of EphA2 in siRNA-EphA2 treated group compared to untreated group showed a significant knockdown of EphA2 gene expression by p=0.0137 (p<0.05). Consequently, it led to overexpression of VEGF dR=1.38 (p=0.21) but downregulation of VEGFR-2 expression by dR=0.72 (p=0.15). Meanwhile, VEGFR-1 gene from RT-PCR analysis was undetected in DBTRG cell line. In conclusion, this study has shown that inhibition of EphA2 gene expression had affected the expression of both VEGF and VEGFR-2 genes which may play roles in angiogenesis pathways of human malignant gliomas cells.
ABSTRACT ID: PP-010

Evaluation of Rx drug to enhance neurogenesis via gliogenesis suppression in the foetal mouse brain. H. Hamzah, N. Nordin, M. A. Abdullah, P. S. Cheah, K. H. Ling

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JAK-STAT pathway is important in regulating gliogenesis in the brain. Dysregulation of this pathway leads to abnormality in brain development as seen in Down syndrome individuals’ predominantly low initial neuronal-glia ratio. Thus, suppression of JAK-STAT pathway would be advantageous to reverse gliogenesis towards potentially enhance neurogenesis of which may serve as an important building block for intellectual capability in Down syndrome individuals. This study dawdles on the Rx ability to suppress JAK-STAT pathway thus reversing gliogenesis with promising result of neural progenitor cell into producing more neurons. Coherently a control group fed with only methylcellulose as vehicle and another five groups of pregnant mice were treated daily with Rx via oral administration during pregnancy E7.5 through E21 prior delivery. At P1.5 post-delivery, multiple organs were harvested from the mothers such as blood, liver, kidney and spleen for toxicity screening whereas pup whole brains were dissected for JAK protein analysis. Inherently, blood biochemistry showed normal reading on liver and kidney analytes, while histology observation revealed normal cellular morphology without discernible lymphocyte infiltration thus establishing the drug, Rx is safe for consumption on pregnant mouse. Subsequently, western blot analysis of the P1.5 brain lysates showed affirmative result of protein markers for neuron, Tuj1 over housekeeping gene, GAPDH, was present consistently high in all groups as compared to Glial Fibrillary Acidic Protein (GFAP) marker for glia cells, which expression levels were negatively correlated with the dosage of Rx used for treatment. Subjected to further fictional analyses, the application of this study would institute prepregnancy prescription of Rx as a supplementation to expecting mothers of late maternal age who are at high risk of having a baby with developmental disorders such as Down syndrome.

ABSTRACT ID: PP-012

Effects of U0126 MAPKS inhibitor on tactile allodynia and thermal hyperalgesia in painful diabetic neuropathy rat model: a preliminary study

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Painful diabetic neuropathy (PDN) is a common complication of diabetes mellitus and one of the neuropathic pains that affected diabetic patient. The main aim of the present study is to determine the effects of U0126 (MAPKs inhibitor) on behavioural testing-pain stimulus in streptozotocin induced diabetic neuropathy rats. Twelve adult male Sprague-Dawley rats were used in this study (200-250g). They were randomised into 4 groups (n=3 each group); control saline (no STZ-induced) (CB+S), STZ-induced treated with saline (STZ+S), STZ-induced treated with U0126 MAPKS inhibitor (STZ+U) and non-painful diabetic neuropathy (not develop into painful diabetic neuropathy rats after STZ-induced) (NPDN). The rats were examined for behavioural testing: tactile allodynia and thermal hyperalgesia pain behaviour. There was a significant difference in total body weight gain/loss and fasting
blood glucose level between STZ induced diabetic and control groups. Tactile allodynia test showed significant reduced on percentage of pain threshold in STZ+S and STZ+U groups whereas significantly increased in CB+S and NPDN groups. Effect on thermal hyperalgesia that indicated by the duration of paw licking or jumping after thermal stimulation showed significant increased in all STZ induced diabetic group except NPDN group when compared at day 0, 14, 22 within all groups. The percentage of thermal threshold revealed significant increase in NPDN group at day 14 when compared to other groups whilst there was no significant effect was seen between the groups on Day 22. Our preliminary data reported that U0126 was not conclusive showed anti-allodynic and anti-hyperalgesic effects on painful diabetic neuropathy rat model. However further studies will be carried out with bigger sample size in order to determine the effects of U0126 on behavioural testing-pain stimulus in streptozotocin induced diabetic neuropathy rats. The correlation between the behavioural pain assessments and biochemical parameters are also needed to be clarified.

**ABSTRACT ID: PP-013**

**Diffusion Tensor Imaging and Tractography of the Pedunculopontine Nucleus among Parkinson Patients and Healthy Controls**

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DT-MRI was carried out on healthy human control subjects and PD patients, together with high-resolution T1-weighted structural images. The acquired data was then processed using the FSL software. Tracts observed below and above the level passing through the PPN were then classified according to their region and structure. Differences in the tracts between the two groups were recorded and tabulated. Tract volume was also calculated using the ‘fslstats’ tool to obtain total and mean volume of tracts. Statistical analyses were then carried out to validate the significance of differences between these two groups. A significant difference was shown in the proportion of tracts to and from the PPN to the hindlimb and frontal lobe, the inferior posterior lobe of the cerebellum and also the upper spinal cord. Tracts were more prominently observed in healthy controls rather than PD patients. There is also an almost significant difference in the orofacial area, where tract dispersion is more prominent in PD patients. There is no significant difference in mean or total tract volume between controls and patients. However, mean tract volume is higher in controls compared to patients, and vice versa for total tract volume. There is also no significant difference in tract mean volume for patients within the different stages. However, mean tract volume decreases from stage 1-3, and increases again in stage 4. No significant difference was observed for total tract volume as well for patients within different disease stages. However, total tract volume increases from stage 1-2, and then decreases again from 3-4. A general conclusion for the fluctuating discrepancies seen in PPN tract volume and distribution of PD patients could be due to tracts going through processes of degeneration and adaptability in order to maintain normal physiology in brain functions.

**ABSTRACT ID: PP-014**

**Effects of MPEP on open and closed arm rest time and distance in automated elevated plus maze: Assessment of ethanol withdrawal induced anxiety in rats**

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Cessation of alcohol consumption following long term binge intake triggers onset of various withdrawal symptoms that greatly risks the successful management of alcohol use disorder. Recent research at preclinical stage has revealed mGlu5 as a potential target in pharmacological intervention of alcohol dependence. This study investigates the effects of 2-methyl-6-(phenylethynyl)-pyridine (MPEP), a mGlu5 antagonist on ethanol withdrawal (EW) induced anxiety-like syndrome using automated elevated plus maze (EPM). Male Wistar rats were given a Modified Liquid Diet consists of maltodextrin, sucrose, low fat cow milk with a gradual increase in ethanol content (2.4, 4.8, and 7.2 %) for 20 days. On the final day of the experiment, ethanol was withdrawn from the diet to induce manifestation of withdrawal symptoms. Following six hours of abstinence period, the rats were intraperitoneally administered with normal saline, MPEP (2.5, 5, 10, 20, and 30 mg/kg) and acute ethanol (2.5 g/kg, 20 % v/v), respectively and placed in an automated EPM for 5 minutes. Ethanol withdrawn rats spent the most significant time resting as well as travelling the greatest distance in the closed arms of the EPM. Ethanol withdrawn rats that given 10 and 30 mg/
kg MPEP travelled the greatest distance in the open arms of the EPM. However, rats given 30 mg/kg spent significantly more time resting in the closed arms of the maze compared to the rats given 10 mg/kg. Our results clearly demonstrate the efficiency of 10 mg/kg of MPEP in attenuating ethanol withdrawal induced anxiety when tested in EPM, however, considering the multi-faceted aspects of anxiety; further studies are required to fully understand the therapeutic efficiency of this drug.

ABSTRACT ID: PP-015

Variants in MCCC1/LAMP3 and DGKQ Identified Through GWAS Are Not Associated With PD in a Malaysian Malay Cohort

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Introduction: Parkinson’s disease (PD) is the second most common neurodegenerative disorder after Alzheimer’s disease. Previous genome wide association studies (GWAS) have shown that a variant in the MCCC1/LAMP3 locus (rs12637471) reduces the risk of PD in Caucasians while the rs11248060 variant in DGKQ increases the risk of PD in European and Han Chinese cohorts. These variants have not been screened in a Malay PD cohort and the objective of this study was to investigate any association with these variants.

Materials and Methods: A Malay case-control cohort comprising 187 PD patients (mean age 54.9±12.0 years) and 144 controls (mean age 59.7±9.2 years) were genotyped using Taqman® allelic discrimination assays on Applied Biosystems 7500 Fast Real-Time PCR machine.

Results: There were no deviations from Hardy Weinberg Equilibrium (HWE) for either variant in both groups. There were no significant differences between PD patients and controls for the MCCC1/LAMP3 rs12637471 variant (odds ratio 1.28, 95% CI 0.73-2.22, p = 0.390) as well as between CC+CT and TT genotypes for rs11248060 (odds ratio 1.65, 95% CI 0.43-6.24, p = 0.510). Conclusion: Preliminary findings revealed that the MCCC1/LAMP3 rs12637471 and DGKQ rs11248060 variants are not associated with risk of developing PD in our Malaysian Malay cohort. Further studies with a larger sample size are needed to understand the unique genetic risk in the Malay PD population, and collaborative efforts from neurologists across Malaysia are welcome.

ABSTRACT ID: PP-016

A novel non-opioid mechanism for acupuncture analgesia: Involvement of orexin and endocannabinoid systems

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Acupuncture has been used to relieve pain for thousands of years through poorly understood. We previously revealed a novel analgesic mechanism elicited by orexin-induced disinhibition in the ventrolateral periaqueductal gray (vlPAG), which is mediated by 2-arachidonoylglycerol (2-AG), an endocannabinoid, generated after OX1R activation (Ho et al., J Neurosci 31:14600, 2011). Here, we validated a hypothesis that acupuncture can induce analgesia through this mechanism based on a report that electroacupuncture (EA) reduced GABA levels in the vlPAG in a manner blocked by a CB1R antagonist (Fu and Longhurst 106:1800, 2009). EA-induced analgesia was accessed by the hot-plate response in mice receiving bilateral electrical stimulation (2 Hz, 2 mA, 0.15 ms) at the PC6 acupoint (EA-PC6) for 20 min under isofluorane anesthesia. Orexin A and GABA levels in the vlPAG were measured by ELISA and HPLC, respectively. EA-PC6, but not at a non-acupoint location or in the shame group of mice that received acupuncture needle insertion but no electrical stimulation, increased the number of c-Fos expressing-orexin neurons in the lateral hypothalamus, increased orexin A levels and lowered GABA levels in vlPAG, and reduced nociceptive responses in the mouse hot-plate test. Systemic injection of an OX1R or CB1R antagonist significantly attenuated EA-PC6-induced antinociception and restored GABA levels in the vlPAG. Intra-vlPAG inhibition of 2-AG synthesis or blockade of OX1Rs or CB1Rs, but not opioid receptors, attenuated EA-PC6-induced antinociception. In Cnr1-/- mice, which lack CB1 receptors, EA-PC6 elicited a much smaller antinociceptive effect than in wild type mice. These findings suggest that EA-PC6 activates hypothalamic orexin neurons, releasing orexins that induce analgesia by inhibiting GABA release in the vlPAG through a cascade that is sequentially mediated by OX1Rs, 2-AG and CB1Rs, and is opioid-independent. The latter characteristic of EA-PC6-induced analgesia may provide a novel strategy for pain management in opioid-tolerant patients.

Reconsolidation is an active process that induces after reactivation of previously consolidated memories. Recent studies in our and other laboratories suggest that stress or glucocorticoids receptors are involved in modulation of fear memory reconsolidation. On the other hand the endocannabinoid signaling is recruited by stress and glucocorticoid hormones to modulate emotional and cognitive processes. Despite the growing evidence suggesting a role for stress/GCs-eCBs interaction in consolidation and extinction stages of learning and memory, no study has addressed whether the interaction of these two important system on reconsolidation of an aversive memory. Therefore, in the present study, we investigated the role of cannabinoid receptors on acute stress-induced impairment of memory reconsolidation in mice, in an inhibitory avoidance task. In this experimental study male adult mice (n=100) were trained and tested in an inhibitory avoidance task (1 mA foot-shock, 3 Sec). Animals received 10 min acute stress by restrainer in the present or absence of Win21212 0.1 and 0.25 mg/kg as a cannabinoid receptors agonist and AM251 0.1 and 0.25 mg/kg as a cannabinoid receptors antagonist immediately following memory reactivation. Memory retention tests were done 2, 9, 11 and 13 days after memory reactivation. The results show that stress-induced impairment of memory reconsolidation was blocked by cannabinoid receptors agonist (Win) and enhanced by cannabinoid receptors antagonist (AM) (P<0.05). These findings indicate that cannabinoid receptors play an important role in the acute stress effects on memory reconsolidation.

**ABSTRACT ID: PP-017**

An interaction between cannabinoid receptors and acute stress on reconsolidation memory

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Role of infralimbic dopamine D1 receptor in corticosterone-induced facilitation of auditory fear memory extinction in rats

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Introduction: Medial prefrontal cortex (mPFC) involved in extinction that is defined as a decline in conditioned fear responses in the absence of aversive conditioned stimulus. Also recent studies showed that brain glucocorticoids are involved in fear memory extinction. Despite of the dopaminergic activity in fear extinction, its interaction with glucocorticoid receptors is not explored. In present study we focused on whether pre training dopaminergic activity within the infralimbic (IL) area of prefrontal cortex is required for mediation the facilitating effects of glucocorticoids on memory for auditory fear conditioning (AFC) task.

Methods: To achieve these goals, adult male rats microinfused with corticosterone (CORT) as a glucocorticoid receptor ligand (20 ng/0.5 µl/ per side) and dopamine type 1 (D1) receptor antagonist SCH 23390 ) 500 ng/0.5 µl/ per side 10 minute before intra-IL infusion of CORT into the IL part of the mPFC and AFC paradigm were used.

Results: In the first experiment, we observed facilitatory effects of corticosterone on fear extinction. ANOVA for repeated measure showed significant difference between saline and CORT infused groups (P < 0.05). But Intra-IL infusion of SCH 23390, did not change CORT-induced enhancement of fear extinction. However, intra-IL infusion of SCH 23390, was ineffective. These findings provide evidence for the involvement of other types of dopamine receptors in area IL in CORT-induced facilitation of contextual fear memory extinction.

Diffusion Tensor Imaging in stroke follow up over 1 year: A series of 4 patients

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Introduction: Stroke is a major health problem and third leading cause of morbidity and mortality in Malaysia. This study designed to measure the changes in mean diffusivity (MD) and fractional anisotropy (FA) in the stroke over 1 year.

Method: 4 stroke patients (mean age: 54.5) provided a consent to undergo MRI at 3 to 5 days, 2 weeks, 12 weeks and 1 year after stroke. DTI scan performed using MRI 1.5T (Signa HDx; GE, USA) using TR/TE = 17 000/101.1 ms and b-value=1000 s/mm2. Data analysis was carried out using Osirix software (v5.8.1). ROI draw to acquire the value of FA and MD in the infarcted regions and corresponding contralateral regions.

Result: A total of 94 areas measured. FA value of infarcted regions and corresponding contralateral area were 0.3339 ± 0.18 vs 0.4154 ± 0.16 (p>0.05) on 3 to 5 days post stroke, 0.2339 ± 0.10 vs 0.3777 ± 0.13 (p>0.05) 2 weeks post stroke, 0.2225 ± 0.17 vs 0.3887 ± 0.17 (p>0.05) 12 weeks post stroke and 0.2648 ± 0.20 vs 0.3920 ± 0.14 (p>0.05) after one year of stroke. MD value were 63.99 ± 3.2 vs 91.44 ± 26.7 (x 10-5 mm2/s) (p<0.05), 88.87 ± 27 vs 81.96 ± 5.9 (x 10-5 mm2/s) (p>0.05), 138.4 ± 59.57 vs 96.42 ± 23 (x 10-5 mm2/s) (p>0.05) and 134.48 ± 41 vs 89.82 ± 13 (x 10-5 mm2/s) (p<0.05) respectively.

Discussion: There is no significant different in FA, but the trend shows the FA value in normal tissue is more compared to infarcted area. Furthermore, the trend of MD in normal tissue is unchanged, in contrast to increase MD in infarcted tissue, consistent with previous study by Yang et. al (1999).
Conclusion: Measurement of FA and MD may provide additional information about cellular changes in stroke over time.

ABSTRACT ID: PP-020

Andrographolide ameliorates the cognitive functions in cerebral hypoperfused rats

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Cerebral ischemia is a neurological condition where it is diagnosed as loss of blood supply followed by cascade of events including glutamate excitotoxicity, overload of calcium, oxidative stress and inflammation, eventually lead to cell death by both necrosis and apoptosis. The effective treatment of stroke involved many molecules which are develop series of biochemical complex that potent as therapeutic targets. The Food and Drug Association (FDA) revealed that the tissue-type plasminogen activator (tPA) was the only therapy for ischemia stroke. Adding to that, continuously dependent on tPA may lead to hemorrhage and edema, thus increasing mortality rate. We have identified new compound known as Andrographolide, isolated from Andrographis paniculata, to evaluate its effect on cognitive functions in cerebral hypoperfused rats. The cerebral hypoperfused rat was developed by permanently occluded the bilateral of common carotid arteries (PBCCAO). The rats were divided into four groups; sham, PBCCAO + vehicle, PBCCAO + andrographolide (5 and 10mg/kg). All the rats were subjected for locomotor activity using automated open field and morris water maze. The result shows both doses of andrographolide were increased in the number of locomotor activities. Spatial learning test shows that sham group was performed well but not for andrographolide treated groups. Both doses of andrographolide significantly increase in the time spends in the target quadrant when compared with PBCCAO+vehicle. In conclusion, Andrographolide showed improving effect on memory in cerebral hypoperfused rats and could be a potential therapeutic target for the treatment of vascular dementia and AD. Keywords: Cerebral ischemia, Andrographolide, Andrographis paniculata, Locomotor activity, Morris water maze.

Neuroregenerative potential of Umbelliferae extract on in vitro and in vivo oxidative stress of neurodegenerative disease models

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Natural products research has gained increasing interest globally. One of such plants is from Umbelliferae family of species namely X, which has been demonstrated to enhance learning and memory, thus making it a suitable candidate as an adjunct treatment for neurodegenerative diseases (ND) associated with oxidative stress. We aimed to evaluate the neuroregenerative effects of extract X on in vitro and in vivo oxidative stress of ND models. In vitro model was established by treating rat amniotic fluid stem cells (R3)-derived neurons with hydrogen peroxide (H2O2) as opposed to commonly used cancer cell lines. Neurons were obtained by an established neural induction protocols, called adherent monoculture, and then were exposed to H2O2 for 24 hours, followed by treatment with extract X for 48 hours. Neuroregenerative effect of extract X on H2O2-induced neurons were analyzed by morphological features, cell viability, and intracellular production of ROS (H2DCF-DA assay). Meanwhile, permanent ischemic model was chosen as in vivo model using male Sprague Dawley rats undergoing permanent bilateral occlusion of common carotid arteries (PBOCCA). After 2 weeks post-surgery, rats were fed with extract X at 300 mg/kg via oral gavage once daily for 30 days. Untreated rats were used as control. The effect of extract X on behavioral deficits in PBOCCA model was examined for anxiety-like behavior (elevated plus-maze), spatial memory (Morris water maze) and locomotor activity (open-field test). Extract X was observed to have the ability to restore cell survival and regenerate the damaged R3-neurons by increasing the cell viability and...
decreasing the ROS activity. Treatment of extract X at 300 mg/kg affects cognitive and memory, as well as anxiety behaviors and enhancing locomotor activities of PBOCCA rats. Our findings strongly suggest that extract X has high potential to act as good neural inducer which could be useful as adjunct treatment for ND.

**ABSTRACT ID: PP-023**

LPS-RS modulates neuroinflammation and downregulates the genes associated with drug-seeking behavior in prefrontal cortex following chronic restraint stress in Swiss albino mice.

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Alcohol addiction is one of the major problems in worldwide. There are numerous factors mediated or motivated for alcohol addiction. Among, neuroinflammation following chronic stress is considered to be vital and key mediators to alter reward pathways for alcohol addiction. Until today, few attempts has been made to elucidate the involvement of neuroinflammation in mesocortical pathway following chronic restraint stress in a mouse model. The mesocortical pathway is a dopaminergic pathway that connects the ventral tegmentum to the prefrontal cortex which thought to be involved in emotional and motivation responses as well as consist of reward circuits. However, the neuroinflammation and the specific genes which associated with drug-seeking behavior in prefrontal cortex following chronic restraint stress (CRS) has not been much studied. Therefore, the present study aimed to investigate the role of LPS-RS on neuroinflammation and the genes involved in drug seeking behavior following chronic restraint stress in mice. Animals were divided into three groups; (1) Control (n=6), (2) Chronic restraint stress (n=6) and (3) Chronic restraint stress + LPS-RS (n=6). The stress group animal’s undergone restraint for 6hr daily from 8.30-14.30 later kept in isolated condition. Drug group was received LPS-RS before undergo restraint stress and kept in isolated condition. Control animals were received LPS-RS before and harvested brain for morphological changes and prefrontal cortex dissected out for gene expression studies. The results revealed that LPS-RS attenuated neuroinflammation (TLR4, NF-kappaB (NF-kB) and downregulated the genes (FOSB, CREB, CYP2A, DRD3 and OPRM1). In conclusion, LPS-RS mediated mechanisms could be one of the possible therapeutic approaches for controlling or suppressing alcohol seeking behavior of mice following chronic restraint stress.

**ABSTRACT ID: PP-024**

Neural Enhancer Property of Umbelliferae Family Extract: A potential Preventive Adjunct for Neurodegenerative Diseases

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Unavailability of efficient treatment for neurodegenerative diseases (ND) has led scientists to search for an alternative, such as natural product, to act as the preventive adjunct for ND. Extract of family Umbelliferae has been demonstrated to possess anti-oxidant property and has been traditionally used to improve clarity of thinking. Here, we aimed to unravel the effect of a raw extract of a species from this family, known as CA, on stem cells-generated neurons in vitro and on hippocampus neurons of Sprague Dawley rats in vivo. The in vitro effect was investigated by analysing the expression of selected neural protein markers on neurons differentiated from rat full-term amniotic cells. In vivo, CA was administered parenterally for 3 weeks following 6hr daily for 6 days per week. The results revealed that CA attenuated neuroinflammation (TLR4, NF-kappaB (NF-kB) and downregulated the genes (FOSB, CREB, CYP2A, DRD3 and OPRM1). In conclusion, CA mediated mechanisms could be one of the possible therapeutic approaches for controlling or suppressing neurodegenerative diseases in vivo.
fluid stem cells (R3) upon treatment with CA by flow cytometry analysis. The ability of CA to enhance neuron formation when treated onto differentiated R3 cells at early cell fate commitment (DIV 1-3) and early neural commitment (DIV 5-7) during monolayer differentiation process was carried out. The in vivo part was done by feeding Sprague Dawley rats with different concentrations of CA via oral gavage for 21 days followed by RNA and protein analyses of the hippocampus region on selected neural and oxidative stress-associated (Hox1 and Trx1) markers by RT-PCR and immunohistochemistry, respectively, prior to semi-quantification using Image J. Interestingly, high expression of neuronal markers particularly the markers for cholinergic neurons was observed from both in vitro and in vivo studies, highly suggesting the role of CA in enhancing the formation of neurons during in vitro neural differentiation process of stem cells as well as the hippocampal neurons in vivo. Expression of Trx1 and Hox1 was also observed to be appropriately expressed, signifying the anti-oxidant property of CA in vivo. These findings clearly advocate the potential role of CA as a neural enhancer that could act as potential preventive adjunct for ND.

**ABSTRACT ID: PP-025**

Effects of morphine and Ketum-alkaloid mitragynine sensitisation on daily explorative tendencies and circadian pattern of Swiss albino mice housed in the IntelliCage® system

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**Background:** Mitragynine is the major alkaloid compound of Mitragyna speciosa (Ketum), a plant native to the northern region of Malaysia and southern region of Thailand. Literature indicates that mitragynine produce effects similar to morphine, hence subjects to high addictive liabilities. Disturbances in behavioural and circadian patterns have been associated with chronic morphine exposure in rodent and human subjects. The aim of this study is to investigate daily explorative tendencies and circadian pattern alterations induced by mitragynine and morphine sensitisation.

**Methods:** Male Swiss albino mice were subjected to a 14-day regimen with mitragynine (5-25mg/kg, ip, n=6), or morphine sulphate (5mg/kg, sc, n=6). Control group received Tween-20 vehicle (1ml/kg, ip, n=6). The automated home-cage IntelliCage® learning system was used as the behavioural sensitisation setting to observe mice exploratory activities and circadian patterns.

**Results:** Mitragynine and morphine sensitisation significantly increased mice exploratory activities, measured by the number of corner visits in the novel (p<0.005) and familiar (p<0.005) IntelliCage® environment compared to the vehicle group. In the circadian pattern paradigms (measured over Day 8-14 of intervention), the mitragynine and morphine-treated mice displayed irregular and unstable circadian pattern activities. Data indicated that the pattern of activities between mitragynine and morphine-treated group were remarkably similar (p>0.05). Both groups failed to show active/inactive cycle during the 12-hour light/dark phase as shown by the vehicle group.

**Conclusion:** These findings suggest that chronic misuse of mitragynine and morphine had both resulted in lasting neuroadaptive effects, which may in turn influence the exploratory activities and circadian pattern. Future studies to deliberate the underlying neuronal basis are warranted, particularly in relation to emerging Ketum use and misuse.

**ABSTRACT ID: PP-026**

Neural Markers of Fixations and Saccades in EEG Data during Reading in Dyslexics

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Neural Markers of Fixations and Saccades in EEG Data during Reading in Dyslexics In this study we analysed EEG signals obtained during reading in dyslexics and controls to identify neural markers of fixations and saccades. The method shows the time of onset, progress and end of fixations and saccades from the EEG data. It is known that beginning and dyslexic readers have longer fixation and shorter saccades. They move their eyes shorter distances with smaller angle, read less letters and make more regressions than skilled readers. The phenomenon
of saccadic suppression shows that during saccades there is partial reduction of neural signals in the magnocellular pathway and a total loss of signals in the parvocellular pathway. EEG signals obtained from dyslexic readers and controls during reading are decomposed into intrinsic mode functions (IMF). The corresponding instantaneous frequencies (IF) are obtained by applying Hilbert-Huang transform (HHT) to these modes. It is seen that in certain frequencies, there is periodic and rapid drop of intensity for a duration of about 25ms. When the intensity drops to ambient noise levels, spiking in the time-frequency spectrum takes place. The results indicate how fixations and saccades are identifiable from EEG data. From this we are able to show the differences in fixation and saccade onset and duration between dyslexics and controls while reading.

ABSTRACT ID: PP-027

Long-term isolation elicited depression and anxiety-related behaviors by modulating oxytocinergic system

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Oxytocin is a neuropeptide produced in the paraventricular nucleus (PVN) of the hypothalamus and associated with social behaviors. Long-term deprivation of social interactions impairs mood stability and evokes comorbid anxiety. To date, neural mechanisms of chronic social isolation-induced depression and anxiety are undetermined. In the present study, we aimed to investigate whether chronic isolation-induced depression and anxiety is attributed to dysfunction of oxytocinergic circuit. Herein, we demonstrated that social isolation increased 1) depressive-like behaviors in the forced swimming test and the sucrose preference test, 2) anxiety-related behaviors in the open field test, and the zero maze for 5 weeks. Intra-amygdala injection of oxytocin ameliorated the chronic isolation-induced depression and anxiety-associated behaviors. Fluorescent microscopic findings showed that neurons in PVN made synaptic connections with oxytocin receptor-expressing neurons in central amygdala (CeA), which also expressed glutamic acid decarboxylase 67, a marker for γ-Aminobutyric acid neurons. Quantification analysis of mRNA of oxytocin receptor in the neurons of CeA demonstrated that long-term isolation significantly decreased oxytocin receptor expression in the neurons of CeA. Taken together, our results suggested that chronic social isolation induced depressive and anxiety-related behaviors by weakening circuit from PVN to CeA.

ABSTRACT ID: PP-028

Altered Adipokine, Cytokine and Glucose Homeostasis Associated with Metabolic Syndrome in Patients Receiving Antipsychotics

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Background: Atypical antipsychotics are remarkably efficacious in management schizophrenia, bipolar disorder, schizoaffective disorder, psychotic depression and autism. Beside their clinical efficacy they alters levels of lipids, glucose, insulin, proinflammatory cytokines and adipokines and leads to metabolic syndrome (MetS), diabetes mellitus, insulin resistance and obesity. With this background the present study was aimed to investigate the association of serum TNF-α and adiponectin level with metabolic syndrome in patients receiving antipsychotics.

Methods: 220 patients satisfying inclusion and exclusion criteria were enrolled for the study, after getting informed consent. Sociodemographic and anthropometric data were collected with questionnaire. International Diabetes Federation (IDF) criteria for MetS was followed i.e. waist circumference >90 cm (male) and >80 cm (female), elevated TG >150mg/dl, decreased HDL<40mg/dl (male) and 50mg/dl (female), elevated FBS ≥100 mg/dl, elevated blood pressure (≥135/85 mmHg). Fasting plasma blood sugar, lipid profile, TNF-α and adiponectin levels were assessed in serum samples of the patients. Results: The study included 220 (143 male and 77 female) patients among them, disease
wise distribution was; schizophrenia > bipolar disorder > schizoaffective disorder > psychotic depression > psychosis NOS. Percentage of patients developed MetS was found to be 47% which was highest with olanzapine followed by risperidone, clozapine and aripiprazole. TNF-α level was found significantly high while adiponectin was found reduced in patient with MetS as compared to patients without MetS. Fasting plasma blood sugar was found relatively high in patients with MetS.

**Conclusion:** Increased TNF-α and reduced adiponectin levels in patient receiving antipsychotics were associated with altered metabolic parameters and increased BMI.

**Keywords:** Antipsychotics; Metabolic Syndrome; Insulin Resistance; TNF-α; Adiponectin

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**ABSTRACT ID: PP-029**

**Emotional empathy and verbal fluency mirrored in alpha desynchronization in Sura Fatiha recitation listening**

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Alpha event-related desynchronization (ERD) participates in inhibitory process that involves of cognitive performance and psycho-emotional condition. In addition, this 8 to 13 Hz brainwave frequency also indicates a relaxed mental state where many attempts were done to achieve. Listening to Sura Fatiha, a most memorized sura from the complete literary structure of the Holy Quran perhaps could enhance one’s memory capacity that entrain brainwave producing neuronal excitation engaging with cognitive processes. 28 normal healthy subjects (14 males 14 females) were recruited and EEG recording were done using 128-electrode sensor net (Electrical Geosics, Inc.) with impedance of ≤ 50kΩ. They were listened to Sura Fatiha recited by Sheikh Qari Abdul Basit bin Abdul Samad. Arabic news and no sound were chosen as positive and negative control, respectively. Waveform were analysed by Fast Fourier Transform (FFT) to get the power in frequency bands. Our result found that oscillatory correlates unique to Sura Fatiha auditory stimuli produce event related desynchronization (ERD) distinctly in alpha frequency band (8-13Hz) in both middle temporal region (T7 and T8) and both inferior frontal region (F7 and F8). Decreased power significantly in the bilateral middle temporal regions is related to activation of verbal and emotional memory to acoustic memory development. In addition, reduced oscillation in the left and right inferior frontal regions is associated to control of verbal and emotion expression, respectively. While inferior frontal cortex implements a brake over response tendencies where damage into this region impacts of impulse control disorder. With respect to functional anatomy of memory, this brain region activation has been attributed to interaction between amygdala and other brain regions such as hippocampus that modulates cognitive performance. In conclusion, listening to Sura fatiha recitation might be accompanying to internalized attention and to verbally and emotionally positive memory state.

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**ABSTRACT ID: PP-030**

**In utero overexpression of miR-3099 transgene during cerebral corticogenesis in mice**

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MicroRNA is a small non-coding RNA that plays an important role regulate gene expression during brain development. The miR-3099 is expressed throughout embryogenesis, and in the developing central nervous system. Moreover, miR-3099 targets and negatively regulates Gfap, a key marker for astrogliogenesis. It is suggested that miR-3099 play a crucial role in regulating neuronal cell development by suppressing Gfap. Therefore, this study aimed to determine the effect of overexpression of miR-3099 during corticogenesis in mice. The plasmid that carried miR-
miR-3099 was constructed and validated before injected into E15.5 of pups' brain. The plasmid consisted of a reporter marker known as green fluorescent protein (GFP), would indicate the expression of miR-3099 transgene in vivo. The brain was harvested at E18.5 prior to cryosection. Then, the expression of miR-3099, Tuj1 and Gfap marker was determined using immunohistochemistry technique. The analysis revealed that the expression of miR-3099 transgene was found primarily in the neuron within the cerebral cortex. The expression of miR-3099 was overlapping with Tuj1, a marker for immature neuron but not with Gfap. Thus, a better-characterized differentiated neural stem cell culture would allow a more refined analysis of the cellular function and molecular targets of miR-3099, especially during neuronal cell development.

These findings indicate that endocannabinoids in the Amygdala facilitate extinction induced dose-dependent decrease of fear conditioning extinction.

ABSTRACT ID: PP-032

Improved cognitive function during mid-trimester pregnancy: an Event Related Potential (ERP) and neuropsychology study

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Deficit of cognitive function like memory, learning, attention etc were reported previously during certain period of pregnancy which are important to develop executive function. There is a lack of study to assess the cognitive function during second (mid) and third trimester of pregnancy at the same time. Here we intended to investigate the auditory cognitive and behavioral functions during mid and third trimester of pregnancy which were compared with control healthy subjects using event related potential (ERPs) and neuropsychology tests, respectively. ERPs were studied by using 128-sensor net and PAS, WCST, ZCT, RAVLTIM, RAVLTTDR, RAVLTTTS and BDI were tested for neuropsychology assessment. Total 48 subjects were recruited for control groups (G1, n=15, non-pregnant), mid trimester (G2, n=12, 13-26 weeks gestation), third trimester (G3, n=12, 26-40 weeks gestation). Auditory oddball paradigm was used during ERP study. Subjects counted silently only target stimuli with giving attention by ignoring standard stimuli. The P50, N100 and P300 ERP components were analyzed at 19 electrode sites. G3 possessed highest amplitudes of P50 and N100 but next highest amplitudes of P300 components at most of the sites among groups. In case of latencies, G3 evoked shortest latencies of P300 but next shortest latencies of P50 and N100 components. G2 evoked next highest amplitudes of P50 and P300 components but shortest latencies of P50 and N100 components at most of the sites among groups. G2 possessed the highest score in PAS, WCST, RAVLTTTS, RAVLTTIM but next highest score in ZCT among groups. G3 had the next highest score in PAS, RAVLTTTS, RAVLTTIM, RAVLTTDR, BDI. These findings suggest that there might be a possibility of good auditory attention, memory and executive function.
in pregnant groups comparing with the control group. Mid trimester group was better comparing third trimester group.

ABSTRACT ID: PP-033

A Retrospective Study of Electroencephalography in Adult Patients in Universiti Kebangsaan Malaysia Medical Centre

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The number of electroencephalography (EEG) request had been increasing in the past five years. However, there was no proper data collection and archiving done. The purpose of the study was to investigate the incidence of normal and abnormal EEG cases from 2012 to 2016 in Neurophysiology Laboratory, Universiti Kebangsaan Malaysia Medical Centre (UKMMC). This was a retrospective study looking at the EEG reports of all adult cases for the last five years. The data was classified into normal and abnormal cases which were then divided into demographic factors such as age group, gender and race. The results showed the total number of 1336 cases in which 58.7% was normal and 41.3% was abnormal. There was higher number of male compared to female patients (52.9% vs 47.1%). The EEG abnormalities were found to be the highest among patients in the age group of 13-28 years (x2 = 22.32 P = 0.001). They were significantly associated with non-epileptic seizures, juvenile myoclonic epilepsy and idiopathic generalized epilepsy. Non-epileptic seizures were significantly higher in female (x2 = 14.3 P = 0.001). Generalized epilepsy contributed to the highest number of abnormal cases in this present study. In conclusion, this study provides a comprehensive data of the incidence of normal and abnormal EEG in UKMMC. The data helps clinicians in systematic management of the patients. It sets a platform for future research in epilepsy and its related disorders.

ABSTRACT ID: PP-034

The role of the cholinergic system in chronic cerebral hypoperfusion-induced memory impairment in rats

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Chronic cerebral hypoperfusion (CCH) can induce the accumulation of reactive oxygen species, which lead to oxidative damage, neuronal injury and central cholinergic dysfunction in selected vulnerable regions of the brain, especially the hippocampus and cerebral cortex. Together, these effects can lead to significant cognitive impairment. In the present study, the role of the cholinergic system in cognitive function was evaluated using behavioural tasks and electrophysiological recordings (in urethane-anaesthetized rat) following CCH induced by permanent, bilateral occlusion of the common carotid arteries (POCCA). Male SD rats were subjected to POCCA or sham surgery. The rats showed significant deficits in several behavioural tasks (passive avoidance task and Morris water maze) as well as suppression of long-term potentiation (LTP) formation in the hippocampus. Treatment with the acetylcholinesterase inhibitor, physostigmine (0.1 mg/kg, i.p.) or the muscarinic receptor agonist oxotremorine (0.1 mg/kg, i.p.) resulted in a significant improvement of learning and memory function in rats subjected to POCCA. Further, the inhibition of LTP in the POCCA model was improved after treatment with physostigmine and oxotremorine. The present data suggest that the cholinergic system mediates the CCH-induced cognitive deficits and these could be an effective therapeutic target for the treatment of vascular dementia.

ABSTRACT ID: PP-082

Epilepsy Misdiagnosis: A Game-Theory Perspective

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An accurate and timely diagnosis is a crucial part of establishing the treatment regime for a patient. One of the least looked upon neurological disorder in misdiagnosis is epilepsy. Despite being a chronic disorder requiring specific medications, epilepsy today is highly manageable if diagnosed correctly and given the right medication. Whilst delayed diagnosis still gives the patient access to their rightful treatment later on, a missed diagnosis may deny the patient of it altogether. Nonetheless, it is the other portion of patients who are misdiagnosed that is rather concerning given the possible negative outcomes. Driven by the consequences associated with epilepsy misdiagnosis, researchers have begun looking beyond the prevalence and implications of epilepsy misdiagnosis alone. The focus has in recent
times shifted to the measures against diagnostic errors as medical decisions are often made under various non-optimal circumstances. In addition to the time constraint, medical decision makers are often subjected to other uncertainties such as imperfect clinical information which if tackled properly, has the potential to improve diagnostic accuracy significantly. With proper implementation, game theory can offer strategies that can aid medical personnel to manage complex medical situation under uncertainty. Over the years, this branch of applied mathematics has been utilized by researchers in various fields, healthcare included, to arrive at practical solutions to contemporary challenges. The consideration of using game theory approach in addressing the issue of epilepsy misdiagnosis may seem a long shot at first glance. However, by breaking down the big issue of epilepsy misdiagnosis into the many aspects that contribute to the problem it seems apparent that aside from improving the existing diagnostic tools and decision support systems, the easiest and probably a cost-effective way of addressing this issue is to overcome the ambiguities caused by imperfect clinical information (patient history).

ABSTRACT ID: PP-035

Hydrocephalus after craniectomy: experience in our institution

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The aim of this study was to outline the clinical feature of hydrocephalus after craniectomy. Hydrocephalus after craniectomy is one of major concern in neurosurgery, since this condition will significantly impact outcome. In many cases, CSF diversion is the only choice in order to manage this condition. We conducted a retrospective study in all adult patients who developed hydrocephalus after craniectomy from January 2016 to December 2016 and analyzed the clinical profile. Between January and December 2016, we did 219 craniectomy procedures regarding any indication. Fourteen patients (6.4%) developed hydrocephalus post craniectomy. Most of hydrocephalus cases were oncology (50%), followed by trauma (28.6%) and hemorrhagic stroke (21.4%). All of the pathology was obstructive hydrocephalus. Mean time between craniectomy and hydrocephalus was 3.5 months. Bulging defect was the only complaint in most of the cases (64.3%). All the patients underwent VP shunt and sunken scalp syndrome after shunting was found in two cases (14.2%). In conclusion, hydrocephalus after craniectomy is one of the rare complications of craniectomy. CSF diversion may be the only option to improve the neurologic status.

ABSTRACT ID: PP-036

High Risk Medulloblastoma: When Total Removal cannot be achieved

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Medulloblastoma is the most common malignant pediatric brain tumor. For treatment purpose, this tumor is classified into two categories, average and high risk. Surgical extension is very important, since patients with residual tumor size after surgery of greater than 1.5 cc are considered high risk. Here we report two cases of medulloblastoma with subtotal resection and devastating outcome. The first case was a 13-year-old girl who had residual tumor following subtotal removal and craniospinal irradiation with complete disappearance of the tumor one year before. She underwent re-resection and chemotherapy, but passed away six months later. The second case was a 10-year-old boy who underwent subtotal resection and craniospinal irradiation. Six months later, he came back with headache and low back pain. Imaging revealed metastasis to the temporal region as well as spinal lumbar and sacral region with no residual lesion on the cerebellum. He underwent resection of the temporal lesion, but passed away one month after.
ABSTRACT ID: PP-037

Diffusion Tensor Imaging (DTI) in paediatric brainstem tumour surgery

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Background: Understanding of brainstem safe entry zone is essential in brainstem surgery. However, the pattern of long fibre tracts distortion by brainstem lesions is often unpredictable.

Methods: We illustrate two cases of paediatric brainstem lesion surgery where the approach was improvised based on DTI. CASE 1 Eight year old boy, known congenital giant melanocytic naevi, presented with horizontal gaze palsy and cerebellar signs. MRI showed homogeneously enhanced caudal pontine tumour. The initial surgical plan was suboccipital telovelar approach for the tumour excision. However after reviewing the DTI, the main white matter fibers are pushed and gathered over the dorsal part of pons. Thus, a right suboccipital retrosigmoid approach was chosen. Debunking surgery achieved via lateral pontine zone. Post-operation, no significant neurological deficit. Histopathological examination showed it is malignant melanoma. CASE 2 Two year old girl, presented with cerebellar signs and head tilt to left with neck pain. MRI showed heterogeneously enhanced pontine tumour. DTI showed both descending fibres being displaced laterally to left. We approached the tumour via right subtemporal transtentorium, debunking surgery achieved via supratrigeminal zone. Post-operation, no significant neurological deficit. Histopathological examination showed it is glioblastoma.

Discussions: Despite MRI clearly delineates the lesion from surrounding brain parenchyma, it has its own limitations in identifying the eloquent fibers. DTI can be used to estimate the course, extent, and connectivity patterns of the white matter structures in the brainstem. In our case series, both cases had gained benefit by using DTI perioperatively. We found that DTI had provided important information for selecting the surgical approach and extent of safe surgical margin to prevent main white matter fiber damaged.

Conclusions: DTI appraises accurate anatomical relationship of the long tracts to brainstem lesion. The incorporation of MRI with DTI into surgical planning can help in selecting a more appropriate surgical approach to brainstem lesions.

ABSTRACT ID: PP-038

A 2-year single-centre audit for prevalence and outcome of primary and metastatic brain tumours

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(Affiliations not provided)

Background: Brain tumours carry a high mortality rate and have a devastating impact on patients and their families. This study was aimed to review the prevalence and trends of brain tumors treated in our neurosurgical centre in year 2015 and 2016.

Methods: We analyzed the data compiled from 376 patients with brain tumors admitted to Neurosurgery Department, Sarawak General Hospital from 2015 to 2016. Data related to the age, gender, ethnic, tumor site, tumor pathology, symptoms, signs, and first clinical manifestation were collected and analyzed. The prevalence of different histological types of brain tumors was analyzed from surgical biopsy, debunking or excision. Image guidance surgery (neuronavigation with DTI, ultrasonography) is helpful in accurate determination of the tumour location and amount of diseased tissue removed.

Results: The female to male occurrence ratio was 1.01 (49.7% males, 50.3% females). Brain tumors were most commonly diagnosed in the 51-60 year age group followed by the 61-70 year and 41-50 year age groups. And finally, the >71 year age group showed the lowest percentage. The five most common histological types of brain tumours were meningioma followed by metastasis, pituitary adenoma, astrocytoma, oligodendroglioma, and ependymoma. The most common site is in the supratentorial. The most common primary symptoms/signs were headache, vomiting, seizure, hemiparesis and visual loss.

Conclusions: Overall, the prognosis for patients with metastatic brain tumour is poor due to the disease progression. Successful brain cancer treatment depends on early and accurate diagnosis and it is a multidisciplinary team care involving radiology, pathology, and medical oncology and radiation therapists.
ABSTRACT ID: PP-039

An innovative external ventricular drainage (AW-EVD) board system

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External ventricular drainage (EVD) is the most simple and common neurosurgical procedure. We perform more than 100 EVDs per year in our centre Sarawak General Hospital.

The cost of the commercialised EVD system is a constraint to our departmental budget which may be experienced in some developing countries. Here we utilised the readily available common and cheap medical consumables to assemble the AW-EVD drainage system. We recycled medical equipment box and old faded expired radiograph film to build the EVD board system.

This was innovated by the senior author (AW) where we used recycled medical equipment box together with discarded radiograph film to build the EVD board system. A simple intravenous drip set and micro-drip chamber administration set were utilised to create the EVD drainage system in a sterile manner intraoperatively, Nylon rope is incorporated into the EVD Board for height adjustment.

We conducted a study to assess the integrity of the EVD drainage system. Nursing team participated in the evaluation of ease of use and robustness of the system. There were 14 patients and the results showed no leakage of the system and there were no evidence of infection from sampled cerebrospinal fluid (CSF). We concluded the AW-EVD innovation was easy to use and cost effective.

ABSTRACT ID: PP-040

Colour Doppler Ultrasonography Guided Clipping of a Distal PCA Aneurysm: A Case Report

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Interest in the use of colour Doppler ultrasonography (USG) to aid surgical excision of vascular lesions began in the 1980s. Despite showing great promise as an adjunct to surgical management, utilization of such techniques has remained infrequent in the decades since. Here, we report a case of a distal PCA aneurysm which was surgically treated with intraoperative guidance from colour Doppler USG. A 58 year old lady presented to our Neurosurgical unit with a complaint of sudden onset blurring of vision and severe headache. Examination revealed a homonymous left hemianopia with intact visual acuity and no other neurological deficits. Initial plain computed tomography (CT) imaging of the brain displayed a right occipital intraparenchymal haemorrhage which was then found to originate from a ruptured P4 segment aneurysm via CT angiography and digital subtraction angiography of the brain. The patient underwent an occipital craniotomy and aneurysm clipping. Intraoperatively, colour Doppler USG allowed the cortical segment of the PCA to be rapidly identified and traced until the aneurysm was fully visualized ultrasonographically. Surgical dissection guided by these real time images enabled direct skeletonization of the aneurysm with minimal disruption to surrounding normal anatomy. Securement of the aneurysm neck with a surgical clip was uneventful. Obliteration of flow in the aneurysm and patency in the parent vessel was confirmed immediately after clip placement via colour Doppler USG. Adequate intraparenchymal clot evacuation was also aided by intraoperative ultrasonography. The patient made a complete recovery with resolution of her presenting visual field deficit and was discharged home well. This case demonstrates that ultrasonography retains a beneficial role in modern Neurosurgical practice as an adjunct in the management of intracranial aneurysms. Nonetheless, adequate preoperative planning via cerebral angiography remains paramount and appropriate case selection for ultrasonography crucial to achieve optimal outcome for future patients.

ABSTRACT ID: PP-041

The road not taken: The importance of neuroimaging in ruling out intracranial tumour that causes psychiatric symptoms

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**Introduction:** The incidence of psychiatric symptoms in patients with brain tumours has been reported as high as 50 to 78%. A large number of psychiatric patients were missed out on the diagnosis of intracranial tumor in the older days mainly due to lack of imaging technology.

**Case Report:** This is a case of a young patient who presented with progressive behavioral changes, poor memory and social isolation over the past 10 years and was treated as Major Depressive Disorder in a private institution. He was subsequently referred to Psychiatry team at Sarawak General Hospital for electroconvulsive therapy in view of failed medical therapy. A CT scan of brain was done and noted patient has a large Falcine meningioma. He underwent bifrontal craniotomy and tumor excision. Post operatively patient had a good recovery, verbally more active, cheerful and able to communicate well with family.

**Discussion:** Neuroimaging is still not a routine investigation for psychiatric patients in general, despite the wide availability and accessibility of imaging facilities nowadays. However, some authors were not recommending the use of neuroimaging in patients who presented with typical psychosis or first episode of psychosis. Frontal lobe intracranial tumour can present solely with symptoms mimicking psychiatric disorders without any obvious neurological deficit, as in our case. We suggest neuroimaging to be considered, at least a plain CT scan of brain, in patients with frontal lobe syndromes, before the diagnosis of psychiatric disorders are made.

**ABSTRACT ID: PP-042**

**Primary CNS Lymphoma: A shifting trend?**

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This retrospective study analyses the epidemiological trend of primary central nervous system lymphomas (PCNSL) diagnosed surgically in Neurosurgery Department of Sarawak General Hospital. Immunodeficiency is known to be a strong risk factor in the development of PCNSL. However, there has been an unexplained rise in the incidence of primary CNS lymphoma (PCNSL) among their immunocompetent counterparts. Our study reflects the dramatic rise in PCNSL rates among the older immunocompetent patients worldwide. Nineteen consecutive histopathologically proven primary CNS lymphoma patients from January 2012 to October 2016 were reviewed retrospectively. All nineteen patients were HIV negative. The mean age was 56.1±9.9 years, mainly affecting the female population (74%). Hemiparesis was the most common presenting complaint. Four patients had multiple admissions due to tumour recurrence and progression. On CT scans, non-AIDS related PCNSL appear as solitary homogenously enhancing lesions, whereas their AIDS-related counterparts often harbor multiple multifocal ring enhancing lesions with a necrotic center. Similarly, most of our patients presented with solitary homogenously enhancing lesions, with the most number of lesions located in the parietal lobe followed by the frontal lobe and basal ganglia. A total of 24 surgical procedures were performed for these patients. Twelve patients underwent open tumour biopsy/debulking, nine stereotactic biopsy, two external ventricular drainage and one requiring a ventriculoperitoneal shunt. Twelve patients received chemotherapy with/without radiotherapy, two patients passed away before treatment was commenced, one patient refused treatment and four patients were lost to follow-up. Twelve out of nineteen (63%) patients passed away. Our experience showed that contrary to older literature where PCNSL is an acquired immunodeficiency syndrome (AIDS)- defining condition, our patients were all immunocompetent. With the current advances in research, this paradigm shift should stimulate further molecular and genetic studies to identify the etiology of this phenomenon.

**ABSTRACT ID: PP-043**

**It is a Medulloblastoma in an adult**

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(Affiliations not provided)

**Background:** Medulloblastoma is a highly malignant embryonal tumor which commonly arises in the cerebellum. It is relatively rare and accounts for less than 2% of all primary brain tumors. The tumor primarily occurs in childhood; however, rarely, it may be found in an adult population. In addition, medulloblastoma in adult population shows features which are quite distinct from the pediatric group.
**Case description:** We are reporting the case of a 36 years old Malay male that presented to our hospital with chief complaint of giddiness and imbalance gait. His presentation also associated with headache and CT brain showed posterior fossa mass with obstructive hydrocephalus. This patient was proceed with ventriculo-peritoneal shunt and subsequently retro-sigmoid sub-occipital craniotomy and tumour excision. Intra operative finding showed mixed intra and extra-axial tumour at the left cerebellar was managed to excise in total. The histopathology and immunohistochemical result revealed a medulloblastoma. Patient then was referred to oncology for radiotherapy.

**Conclusion:** This case was choose as an adult medulloblastoma is a rare occurrence tumour in our centre and from location of the tumour and radio imaging studies give high possibility of meningioma. However from histopathology and immunohistochemical result was established the diagnosis of this tumour.

**ABSTRACT ID: PP-044**

**Auditory brainstem implant (ABI); a case series**

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(Affiliations not provided)

Patients who are deaf as a result of loss of integrity of the auditory nerves were confined to a world devoid of sound. The first auditory brainstem implant was first performed in 1979 and designed to bypass the cochlear and the cochlear nerve by stimulating the cochlear nuclei directly which resulted in the restoration of limited hearing in these patients. Thus, allowing them to recognise environmental sounds and augmenting their ability to communicate through lip reading. The purpose of this series is to illustrate the outcome of the 3 cases of ABI surgery. -the first one done in Malaysia- done in our centre. The first 2 cases were NF2 with bilateral residual vestibular schwannoma operated in June 2016 while the 3rd case operated in March 2017, was bilateral cholesteatoma with recurrent meningitis. All 3 cases had bilateral profound sensorineural hearing loss. We used MEDEL ® SONNET soft silicon matrix with 12 contact electrodes Implant placement were done via translabyrinthine approach and confirmed intraoperatively. 2 had complete 12 electrodes contact. All 3 passed the safety test and started their rehabilitation training 6 weeks post operatively. Currently, all 3 patients do not have non auditory stimulations which are sometimes seen in patient with ABI. The first two progress slowly comparatively to our latest patient but both of them able to distinguish sounds and have increase in communication effectiveness especially between 40-60 decibels. Our last patient only had 3 follow up since activation but currently she already able to distinguish and identify all the sounds with pictures given during follow up test. ABI provide a new hope and method especially patient with NF 2 to restore their hearing and hopefully improving their quality of life.

**ABSTRACT ID: PP-045**

**Case report: treatment of chronic subdural hematoma with dexamethasone in patients with bleeding diathesis (non-surgical treatment)**

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**Background:** Chronic subdural hematoma (CSDH) is one of the most common problems in neurosurgical practice, with an estimated incidence rate about 5 per 100,000 populations. Craniostomy burr hole and drainage is the recommended choice of surgical treatment for CSDH. However, it might not be feasible in patients with increased surgical and anaesthetic risks. For these selected groups of patients, there have been reports that recommend the use of oral corticosteroids as a safe alternative non-surgical treatment for CSDHs. We report 2 patients who were treated with oral dexamethasone as monotheraphy treatment for CSDH.

**Case Presentation:** One is a 68 year old male with underlying myelodyplastic syndrome and another is an 80 year old male with ischemic heart disease on long term double anti-platelet medications. Both patients presented to us with a Markwalder Grading Score of 2. They were treated with a starting dose of T. Dexamethasone 4mg TDS for 3 days, then 4mg BD for 4 days, then 2mg tds for 1 week, then 2mg bd for 1 week and finally 2mg od for 1 week (total 4 weeks of therapy). They were then followed up as outpatient with serial CT scan to observe the resolution of the hematoma. Both patients showed remarkable improvement neurologically with dexamethasone as monotherapy treatment, without any associated side effects. Clinically their neurological deficit resolved, albeit with slightly delayed hematoma resolution on follow up brain CT scan.
**Conclusion:** Oral dexamethasone shows to be promising as a non-surgical primary treatment for CSDHs especially in patients with higher anaesthetic and surgical risks. However, a larger scale evidence-based prospective study is needed to properly validate its value and efficacy in patients with CSDH.

**ABSTRACT ID: PP-046**

**Spinal epidural arachnoid cyst, a case report and literature review**

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**Introduction:** Spinal epidural arachnoid cyst (SEAC) is a rare condition accounting for less than 1% of all spinal epidural lesion and is mostly found in the middle to lower thoracic spine. Its aetiology remains unclear although congenital, traumatic, post-surgical and infection have all been reported associations. SEAC is commonly asymptomatic but can give rise to back pain and compressive neurological symptoms. Magnetic resonance imaging (MRI) is the investigation of choice and surgery is the standard treatment for symptomatic patients.

**Case presentation:** We report the case of a 51-year-old male with no significant past medical history. He presented with difficulty walking over 5 months associated with urinary incontinence. Clinical examination revealed spastic paraparesis of bilateral lower limbs. MRI showed a T7-T9 epidural arachnoid cyst with an area of flow void on the right side of T8 and T9. A right hemilaminectomy was performed and the dural defect was identified and repaired primarily. The patient recovered well and was discharged on post operation day 3.

**Discussion:** The severity of compression caused by SEAC is dependent on its size and location within the spine. Imaging modality that best visualises the communication between the cyst and sub-arachnoid space is a computer-tomography (CT) myelogram or MRI flow study. Surgical interventions include repair of dural tube defect, complete excision or fenestration of the cyst.

**Conclusion:** We hereby present a case report and review of the presentation, recommended investigations, management and outcomes of patients with SEAC.

**ABSTRACT ID: PP-047**

**Ventriculoperitoneal (VP) shunt infection in Sultanah Aminah Hospital (HSA) – then and now**

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**Background:** Ventriculoperitoneal (VP) shunting is the most common neurosurgical procedure performed in Neurosurgical Department Hospital Sultanah Aminah for the management of hydrocephalus. Infection following VP shunting remains a significant complication with an incidence rates ranging from 5-20% as reported in previous studies.

**Aim:** To identify the incidence of infection in the ventriculoperitoneal shunt cases and if duration of surgery remains a significant factor in the Neurosurgery Department Hospital Sultanah Aminah Johor Bahru.

**Design:** A retrospective study of electronic records as well as hospital notes of patients who receive VP shunt treatment in HSA from January 2015 to May 2017. Patients were identified through the Computerised Operating Theatre Documentation System (COTDS) database, clinic follow up and admission notes.

**Results:** A total of 67 patients underwent ventriculoperitoneal shunt procedure; out of which 29 (43%) patients had their surgery done within 60 minutes and the remaining 38 (57%) patients the procedure was done longer than 60 minutes. From the total number of patients, none of them developed infection for surgery lasting less than 60 minutes however 6 patients developed infection in surgery lasting more than 60 minutes, which is about 8% of the total population. In the previous study conducted in Hospital Sultanah Aminah, the infection rate was 14.4% (Theophilus et al., 2011). The study showed that only duration of surgery had a significant influence on the incidence of post-operative VPS infection in the non-methicillin group (P = 0.02). The non-methicillin group had an 8 times greater risk of developing post-operative VPS infection than the methicillin group for surgery lasted longer than 1 hour (Theophilus et al., 2011). Conclusion: 10 years later, even though the incidence of VP Shunt infections has greatly reduced from 14.4% to 8% but duration of surgery remains a significant factor in predicting the risk for ventriculoperitoneal shunt infections in Hospital Sultanah Aminah Johor Bahru.
The Utility of Intraoperative Magnetic Resonance Imaging (iMRI) In Neurosurgical Patient

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Background: Intraoperative MRI is becoming an important tool in the arsenal of neurosurgeons worldwide due to its versatility in providing accurate image guidance during surgery. It is an advanced but expensive endeavour to establish. The benefits of iMRI in neurosurgical cases in achieving better resection is being extensively studied upon, only to counter arguments which says otherwise. The capability of iMRI in identifying incomplete surgery as well as allowing a better resection, May it is a complete or incomplete resection is an important aspect to ponder upon which may prove iMRI to be beneficial.

Methodology: In UMMC, we have established iMRI since September 2015. To date, we have operated on 75 patient using iMRI. We did a retrospective review of patients undergoing intraoperative MRI in UMMC from December 2015 to July 2017. We looked into pathology of cases, number of iMRI, indication for an intraoperative imaging, detection of incomplete resection and number of instances where further resection was initiated after an iMRI showed incomplete resection.

Results: In general, most cases underwent a pre-operative and post-operative MRI as to ascertain the completion of resection. In select base of skull surgeries, an intraoperative MRI was routinely done to assess if resection is adequate to relieve symptoms as not all cases are subjected to complete resection or further debulking due to patient safety and other operative limitations. About 21 cases out of 75 patients were noted to have an incomplete resection necessitating further resection. The majority of the remainder showed complete resection on post-operative MRI.

Conclusion: Intraoperative MRI is beneficial to identify incomplete resection and it allows for further safe resection for better patient outcome while ensuring safety of the patient. The usage of intraoperatively obtained newer MRI image sets will provide for a better navigation in achieving better resection.

Image Guided Prophylactic External Ventricular Drain (EVD) Insertion In Retrosigmoid Tumor Resection

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Background: Retrosigmoid approach for cerebellopontine angle tumours often present problems of access due to limited space and a tendency for the cerebellum to herniate. Release of cerebrospinal fluid (CSF), either from subarachnoid spaces or from the ventricle has frequently been utilised to reduce the intracranial pressure, thus minimising brain retraction and trauma. We have routinely employed the use of EVD placement under image guidance during retrosigmoid approach. We report our technique of EVD insertion.

The Technique: All patients who underwent surgery via retrosigmoid approach had a EVD inserted routinely prior to opening of the dura. The patients were placed in semi lateral position with head flexed laterally and fixed. The burr hole for EVD was placed within the area of surgical incision under image guidance to facilitate a trajectory towards occipital horns of the ipsilateral lateral ventricle. The image guidance probe was passed via a corticotomy. Once the ventricle was breached, the probe was withdrawn and the EVD catheter passed via the same tract as the probe till minimal egress of CSF was noted, confirming the placement within the ventricle. The EVD was then tunnelled out and then clamped until it is necessary for further release of CSF to facilitate tumour resection.

Outcomes: Between 2013 and 2016, a total of 77 cases of CP angle tumor were operated via retrosigmoid approach. Of these, 54 patients had routine prophylactic EVD insertion. Only 10 out of 54 patients required a permanent CSF diversion in the form of a ventriculoperitoneal shunt. Conclusions: Intraoperative image guided prophylactic insertion of EVD is an excellent adjunct to achieve CSF release and adequate brain relaxation and minimise retraction. It is a versatile tool for improving exposure and therapeutic tool in managing post-operative complications like hydrocephalus and CSF leak.
ABSTRACT ID: PP-050

Challenges in diagnosis and management of Nosocomial Rhinosinusitis in nasogastric tube dependent, recumbent neurosurgical patients


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Introduction: The diagnosis of rhinosinusitis in ill and unconscious patients remains a challenge. Rhinosinusitis is a known complication of nasotracheal intubation. However the role of nasogastric tube insertion causing rhinosinusitis in patients who cannot swallow remains unclear. We report a case series of patient on nasogastric tube presenting with rhinosinusitis and highlight the challenges in diagnosis and management.

Case series: We present these 5 cases of unconscious patients, in which 4 had nasogastric tube insertion, while 1 had orogastric tube insertion. Similarly, they remain febrile despite empirical treatment with broad spectrum antibiotics. Investigations were exhausted to identify the sources of infection, in which all had failed to locate the infection. Subsequently, the computerized tomography (CT) scan of paranasal sinuses were done. Out of the 4 cases which imaging was suggestive of rhinosinusitis, three cases was confirmed diagnosis of rhinosinusitis via fibre-optic endoscopic (FESS). Pus aspirate which were obtained during FESS were sent for culture, only one yielded Proteus sp. and Escherichia coli, the other grew mixed organisms.

Discussion and conclusion: Current practice of managing rhinosinusitis based on Clinical Practice Guideline (CPG) by American Academy of Otolaryngology-Head and Neck Surgery may not be applicable in this case series. Treating physician should have a high index of suspicion and initiate multi-disciplinary management, comprising of treating physician, radiologist, otorhinolaryngologist and infectious disease physician.

ABSTRACT ID: PP-083

Intraventricular Haemorrhage management in Sabah: A Single Centre Experience

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Introduction: Intraventricular haemorrhage can be either primary or secondary. It can occur either primarily inside the ventricles or as extension from bleeding at the paraventricular areas usually via the lamina terminalis. IVH increases morbidity and mortality due to obstructive hydrocephalus and needs urgent surgery to prevent death from elevated ICP. Neuroendoscopy has changed the management of IVH with the use of endoscope for intraventricular clot washout under direct vision.

Objective: To analyse the best measure of surgical treatment in cases of hydrocephalus secondary to IVH compared between EVD placement alone or endoscopic clot washout with EVD placement.

Methodology: All patients admitted with hydrocephalus secondary to IVH from January 2012 to December 2016 at the Queen Elizabeth 2 Hospital and Sabah Women & Children Hospital in Sabah, Malaysia are enrolled in this study. Patients are categorized into “Group A” for those receiving EVD placement alone or “Group B” for endoscopic clot washout with EVD placement as their surgical management. Patients undergoing other measures of treatment are excluded. Data analysed retrospectively for mean difference of time of surgery, incidences of recurrent EVD blockages and ventriculoperitoneal shunt (VPS) dependency between these 2 groups.

Results: We have a total of 57 patients operated for hydrocephalus secondary to IVH. Out of the 57 patients, group A had 31 and group B had 26 patients. The commonest aetiology was hypertensive intracranial haemorrhage with intraventricular extension while the rarest were IVH caused by AVM and intraventricular tumours. Mean surgical time for group A patients was 33 minutes while group B was 72 minutes. Recurrent EVD blockages were 67.7% in group A and 26.9% in group B. VPS dependency rate
was lower in group B at 50% while group A was at 83.8%.

**Conclusion:** Neuroendoscopy has changed the management of hydrocephalus secondary to IVH in our centres. We have been able to reduce the rate of shunt dependency among IVH patients and at the same time reduce the incidences of recurrent EVD blockages. We believe that the field of neuroendoscopy has more to offer with newer techniques being introduced and that the management of IVH can be improved.

**ABSTRACT ID: PP-102**

**Audit on cranioplasty: 3 dimension pre-mould in comparison to intra-operative implant in HTAA**

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Cranioplasty is a procedure to restore the appearance of skull defect after craniectomy. Various methods has been postulated to achieve the perfect fit implant ie 3 dimensional pre-mold implant using various types of materials such as titanium and acrylic to reduce duration of operation, post-operation complication, shorten the hospital stay and cosmesis values. This audit has been done in Hospital Tengku Ampuan Afzan from January 2016 until June 2017 to evaluate the effectiveness of pre-mould implant in comparison to traditional method of intra-operative mould implant, discussing the materials of choice, post-operative complications and the process of making a titanium pre-mold cranioplasty at this center. Total number of cranioplasty done during this period was 34, however 9 patients unable to trace the old notes, 11 were pre-mold and 14 for intra-operative mold implant. Average duration of operation for pre-mold implant group versus intra-operative group was 1.7 hours and 2.4 hours respectively. Significant difference of operation duration can be seen in this cohort, with shorter duration in pre-mold implant. In titanium plate intra-operative mould prostheses, one patient had a tattooing of the implant marking on superficial skin and one with sharp edge causing discomfort. One case of infected implant requiring removal was seen in intra-operative mould implant.

**Pleocytosis in a case of Idiopathic Intracranial Hypertension: coincidence?**

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**Introduction:** Idiopathic intracranial hypertension (IIH) is clinical syndrome characterized by increased intracranial pressure without any evidence on neuroimaging of structural brain disease. One of the accepted diagnostic criteria for idiopathic intracranial hypertension (IIH) strictly specifies normal CSF composition. The presence of pleocytosis indicates a working diagnosis of meningitis

**Method:** Case report Summary: A 61-year old man presented with bilateral blurring of vision for 2 weeks duration associated with mild headache. Visual acuity was 6/36 over both eyes. Anterior segment examination was unremarkable. Fundoscopy revealed bilateral optic disc swelling. CT brain showed normal findings. A lumbar puncture was done and the opening pressure was high (42 cm H2O). CSF composition showed normal biochemistry with increased cell counts (64) and polymorph (97). Diagnosis of presumed subacute meningitis was made and patient was treated with 2 weeks of intravenous antibiotic. CSF cultures were negative. MRI brain orbit showed features of IIH which is flattening of posterior sclera, slight tortuosity and elongation of the nerve and distension of perioptic subarachnoid space. Patient was started on oral acetazolamide for 6 month and improves clinically.

**Conclusion:** This report illustrates a disorder of chronic meningitis that mimics the course of IIH. However in this patient workout for the cause remains elusive and patient responded to treatment of IIH.

**ABSTRACT ID: PP-052**

**Disparities in Patterns of Hospital Admission of Stroke Patients to Seberang Jaya Hospital between Years 2010 to 2016: National Stroke Registry Update**

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Year by year, diseases burden such as stroke are evolving as the development of our country and technology. The current study aimed to determine the disparities in pattern of hospital admission of stroke patients to Seberang Jaya Hospital (SJH), Penang, Malaysia within 7 years of data collection. Data of stroke patients who were admitted to SJH from 2010 to 2016 were collected through National Stroke Registry. Patients’ age, sex, ethnicity, underlying diseases and risk factors were recorded. From the total of 1548 patients, 1116 are ischemic; 189 are hemorrhagic; 79 are transient attack; whilst 157 are undetermined for stroke classification. The average of mean age is 62.1 years old. Result from the analysis shows that there is no significant difference of mean age between these 7 years (p value = 0.094). For sex, female is more than male on 2010 (60.3%) but the trend were changes in following years till 2016 where male became the majority of the patients instead (p value < 0.001). For ethnicity, Malay is the commonest ethnic and there is significant difference between years (p value < 0.001). There are no significant differences between years for underlying diseases like hypertension (p value =0.454), diabetes mellitus (p value = 0.079), hyperlipidemia (p value = 0.373) and ischemic heart disease (p value = 0.477). For risk factors, there are significant differences (p value < 0.001) between years for current smoker, family history of stroke and obesity. In conclusion, this study evaluated the stroke epidemiology following changes in trend by years specifically in Seberang Jaya which can serve to improve the stroke care in the Northern region of Malaysia.

**ABSTRACT ID: PP-053**

**Body composition in Parkinson’s disease**

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**Background:** Unintentional weight loss is a common problem among patients with Parkinson’s disease (PD). Reduced skeletal muscle mass has been associated with functional impairment and physical disability in elderly persons, and the incidence of osteoporosis is also higher in elderly persons who are at risk of falls and fractures. However, the literature regarding body composition in PD patients remains limited.

**Objective:** To compare body composition in PD patients and non-PD controls.

**Method:** 100 PD patients and 78 non-PD spousal/sibling controls were recruited and underwent body composition assessment using dual-energy X-ray absorptiometry (DEXA).

**Results:** PD patients were older (66.7±8.3 vs. 63.0±8.3 years, p=0.004) but there was no significant between-group difference in gender. Mean body mass index was lower in patients (24.2±3.9 vs. 25.5±4.3 kg/m², p=0.044). The prevalence of underweight was 7.0 vs. 2.6% in patients versus controls, respectively, but this difference was not significant. Interestingly, the amount of whole-body fat in terms of both the absolute value (18.7±7.8 vs. 23.5±7.8 kg, p<0.001) and percentage (30.7±8.9 vs. 36.7±8.1%, p<0.001) were lower in the patient group. Using the Asian Working Group for Sarcopenia (AWGS) criteria, 19.0% of PD patients and 15.4% of controls had reduced skeletal muscle mass (p=0.549). There were no between-group differences with regards to total lean muscle mass, height-adjusted appendicular skeletal muscle mass, whole-body mineral density, and the proportion of subjects with osteopenia or osteoporosis. Using multiple regression models including age, gender and diagnosis of PD as potential confounders, only diagnosis of PD had a significant main effect on absolute whole-body fat (Beta=0.273, p<0.001).

**Conclusion:** We found reduced fat mass and preserved lean muscle mass in PD patients, suggesting that weight loss in PD may be due to loss of fat. Further studies are needed to understand the mechanisms underlying weight loss in PD.

**ABSTRACT ID: PP-054**

**Osmotic Demyelination Syndrome - Treatment Experience with Immunotherapy**

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**Objective**: To illustrate 3 cases of ODS. Results: Case 1: 66 y/o man on hydrochlorothiazide presented with reduced conscious level. Sodium increased >15mmol within 24 hours. CSF protein was high (2g/L). MRI brain two weeks later showed T2/FLAIR hyperintensities involving the right dentate nucleus, thalamus, basal ganglia and corona radiata, consistent with EPM. IV methylprednisolone was given. Patient recovered subsequently.

**Case 2**: 54y/o lady on indapamide/perindopril, presented with dizziness. Sodium was overcorrected > 25mmol/L within 24 hours. Patient subsequently developed shuffling gait, slurred speech and reduced conscious level. MRI brain showed DWI hyperintensities at grey-white matter junctions of pre and post central sulcus, bilateral centrum semiovale, basal ganglia, thalamus, corona radiata and central pontine regions. Patient improved markedly after plasmapheresis.

**Case 3**: 55 y/o lady on indapamide/perindopril presented with dizziness and vomiting. Sodium was overcorrected > 25mmol/L in 12 hours. Her conscious level deteriorated later. MRI brain showed trident shaped T2W/FLAIR hyperintensity at central pons, bilateral thalamus and basal ganglia. Normal CSF results. Patient undergone plasmapheresis and improved clinically.

**Discussion**: ODS can result in abnormally high CSF protein (case 1). MRI features of our patients includes 1) Central pontine trident hyperintensities, 2) Bilateral basal ganglia, thalamus lesions with globus pallidus sparing, 3) Cortical-subcortical symmetrical involvement in pre and post central gyrus. Rarely, ODS can result in cortical laminar necrosis. Imaging findings may delay up to 2-4 weeks. Immunotherapy and plasmapheresis showed good outcome. It is believed that they reduce or remove myelinotoxic products after osmotic stress insults.

**Conclusion**: ODS can result in irreversible neurological deficits. However, not all ODS has poor prognosis especially if diagnosed and treated early with immunotherapy and plasmapheresis.

**Ophthalmoplegic migraine presenting as recurrent acute surgical 3rd cranial nerve palsy**

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**Objective**: To report an uncommon case of recurrent 3rd cranial nerve palsy (CNP)

**Method**: Case Report. Result: A 24 year old gentleman presented with sudden onset of right eye ptosis with diplopia preceded by headache. On further questioning, he had recurrent similar presentation yearly since the age of 9 year old with spontaneous resolution after a month. There was no other neurological deficit. On examination, there was right complete 3rd CNP with pupillary involvement. Visual acuity was normal. There were no other neurological sign detected. An urgent contrasted CT scan of brain and orbit was done and unremarkable. Subsequent CT angiography and MRI brain, orbit and spine showed no evidence of aneurysm or feature of Multiple Sclerosis (MS). Patient had spontaneous resolution but presented with similar complaint after 6 months. MRI/MRA brain and orbit showed prominent enhancing right 3rd CN seen in cisternal portion superior to cavernous sinus and prominent right cavernous sinus with no sign of aneurysm or MS. Blood investigation for connective tissue disease, vasculitis, Myasthenia Gravis(MG), Sarcoidosis and MS were negative. A lumbar puncture was also performed and unremarkable. A diagnosis of Ophthalmoplegic Migraine was made.

**Conclusion**: In this case of recurrent 3rd CNP with pupillary involvement, surgical cause such as aneurysm had to be ruled out. Medical cause had to be considered as this case had recurrent basis with spontaneous resolution. Possible diagnoses such as MG, MS were ruled out with investigation. Other differential diagnoses are Ophthalmoplegic Migraine (OM) and Tolosa-Hunt syndrome (THS). This patient had OM as three quarters of the cases involving 3rd cranial nerve with focal thickening and enhancement of 3rd CN on MRI. Tolosa-Hunt syndrome typically involved multiple ophthalmic cranial nerves and this is not the presentation in our patient. Here, we highlight a case of Ophthalmoplegic Migraine presented with recurrent 3rd CNP.
ABSTRACT ID: PP-056

Dengue hemorrhagic encephalitis in the post recovery phase – an unreported case

(Affiliations not provided)

Introduction: We report a case of dengue hemorrhagic encephalitis, which occurred in the post recovery phase of dengue fever.

Case presentation: A 58-year-old lady presented with 1 day history of lethargy, headaches and diarrhea. She had recovered from dengue fever 3 days ago prior to this presentation. At the Emergency Department, she developed generalized tonic clonic seizures. Physical examination and vital signs were normal. Hematologic parameters revealed hemoglobin 11g/dL, white blood cell count of 9.7 x 10^9/L and platelet count of 222 x 10^9/L. She was not hypoglycaemic. Apart from significant hyponatremia at 115mmol/L (which was due to dehydration), other electrolytes were normal. Liver function test and coagulation profile were normal. Serology for dengue IgM and IgG was positive. She was tested negative for malaria, leptospirosis, hepatitis, HIV, HSV, EBV and mycoplasma. Lumbar puncture had a normal opening pressure with normal cerebrospinal fluid analysis. Computed tomography revealed an ill-defined hypodensity in the midbrain. Magnetic resonance imaging showed left parietal cortical hyperintensity with gyriform hemorrhage, which suggested hemorrhagic encephalitis. She was treated with intravenous methylprednisolone 500mg once daily for 3 days. Her sodium was normalized with appropriate correction. She remained seizure free with no neurological sequelae upon discharge.

Discussion: Neurological manifestations associated with dengue fever can broadly be classified into encephalopathy, encephalitis, neuromuscular and neuro-ocular complications. The pathogenesis of neurological syndromes remains to be elucidated. Direct invasion of the virus as well as immune mediated mechanism are postulated to cause the neurological sequelae. Given the temporal relationship of her recent dengue fever and clinical manifestations with negative studies of other infections, dengue hemorrhagic encephalitis was diagnosed. Treatment for dengue encephalitis is mainly supportive.

Conclusion: Dengue hemorrhagic encephalitis, though very rare, should be suspected in a patient from an endemic region with typical symptoms and evidence of encephalitis, even in the post recovery phase.

ABSTRACT ID: PP-057

Study on Characteristics of Adult Myasthenia Gravis Patients at Neurology Clinic of Hospital Seberang Jaya

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(Affiliations not provided)

Introduction: Myasthenia gravis (MG) is an autoimmune disease that impacts an affected individual’s control of the skeletal muscles.

Objective: To understand the common characteristics of MG patients who attend the adult neurology clinic at Hospital Seberang Jaya, Penang from Jan - Dec 2016. Methods: In this retrospective and descriptive study, the medical records of 60 patients from the neurology registry of neurology clinic of Hospital Seberang Jaya were traced. The data obtained were analysed using SPSS version 23.

Results: Our results show almost equivocal in gender distribution. 67.5% patients are above the age of 55 years with slight female preponderance of 51.7%. The Chinese constitute 56.7% in ethnicity. The commonest clinical features are ptosis which constitutes 55% of clinical presentation. Ocular type of MG predominates by 55%. Government hospitals and clinics constitute 62.1% of all referrals to the neurology clinic. Almost one third had associated thyroid disease (33.9%). Thymoma seen in 18.3% cases and 10% had thyroidectomy done.

Conclusion: Ptosis is the commonest clinical symptom and ocular MG is the more prevalent type of presentation to Hospital Seberang Jaya. No significant gender distribution is noted. More than sixty percent of all referrals are from the government sector. The findings of the present study will aid primary health care doctors to watch for early signs and to formulate strategies to have early detection and intervention of MG. Further studies on the characteristics will give a more comprehensive picture of the presentation of MG to Hospital Seberang Jaya.
A Rare Cause of Complex Ophthalmoplegia in an elderly man

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Cerebral Venous Thrombosis (CVT) is a neurological condition occurring as a result of thrombosis involving the cerebral venous sinuses. We present a rare clinical manifestation of cerebral venous thrombosis in an elderly Chinese man who presented with restricted eye movement and double vision. Despite extensive investigation there was no better explanation for his clinical symptom and sign apart from cerebral venous thrombosis involving left transverse and sigmoid sinuses which was confirmed by Magnetic Resonance (MR) Venography of the Brain.

Acute abdomen, a rare occurrence in MELAS syndrome.

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Background: MELAS syndrome (mitochondrial cytopathy, encephalomyopathy, lactic acidosis and stroke like episodes) is a rare maternally inherited mitochondrial disorder. It affects many organ systems resulting in a wide range of clinical manifestations that include stroke-like episodes, seizures, recurrent headaches, lactic acidosis, myopathy, diabetes and sensory-neural hearing loss. The usual age of presentation is 3-15 years old. Late onsets of presentation or acute abdominal symptoms are rarely reported.

Case Description: A 40-year old female presented to surgical ward with severe epigastric pain associated with nausea and vomiting for ten days. Initial diagnosis of acute abdomen with sepsis was made, but no definite cause was found. Further history revealed symptoms of altered behaviour with one episode of seizure. She had bilateral hearing impairment since childhood with short stature. On examination, she was stuporous and hypotensive, requiring vasopressor therapy. Further investigations found persistent raised serum lactate with endocrinopathy that comprises of hyperglycaemia, hypothyroidism and hypocortisolism. There was cardiac involvement with hypertrophic cardiomyopathy. CT brain showed hypodensity over occipito-parietal region. Diagnosis of MELAS was confirmed by genetic study of A3243G mutation. She was treated with intravenous arginine, thiamine and Co enzyme Q10. She recovered to baseline after therapy.

Conclusion: Presentation of acute abdomen with multisystem involvement especially with lactic acidosis or neurological symptoms, without specific attributable cause, should raise a suspicion of mitochondrial cytopathy. Diagnosis would easily be missed if the awareness of the disease is lacking. There is no specific therapy but treatments to improve respiratory chain or to reduce the oxidative stress due to impaired mitochondrial metabolism have been tried with variable success.

Pure spinal Multiple Sclerosis in the absence of brain lesions: A possible limited entity within the Multiple Sclerosis spectrum not fulfilling the 2010 Revised McDonald criteria

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Introduction: The 2010 Revised McDonald criteria has allowed for earlier diagnosis of Multiple Sclerosis (MS), with dissemination in space and time established by the presence of the pre-specified number of characteristic lesions in the typical areas for MS. However, there exists a small group of patients with typical short cord MS-like lesions with positive CSF oligoclonal bands and recurrent attacks only in the spinal cord. These patients recover well after short courses of steroid treatment but do not develop brain lesions on follow-up. They do not fulfill the 2010 McDonald criteria for MS and comprehensive investigations for other causes are negative. Here we describe 4 such cases seen over a 10 year period. Presentation: Among the 198 patients diagnosed with MS, 4 presented with relapsing partial myelitis within the cervico-thoracic cord. All were females with mean age of onset: 30 years, age at diagnosis:
34 and mean disease duration: 6.5 years. Sequential MRI brain and whole spine done for all 4 of them showed demyelinating MS plaques relapsing only in the cervico-thoracic spinal cord with no typical MS-like lesion in the brain and normal visual evoked potentials even on follow-up over 7 years. Oligoclonal bands were detected in 3 of them. Investigations for all other differential diagnoses including neuromyelitis optica spectrum disorder (NMOSD) were negative. 3 of them were treated with interferon beta-1a with subsequent stabilization of disease, mean EDSS score of 2.5 with only 1 patient relapsing once throughout the 13 cumulative years on disease-modifying therapy necessitating escalation to Fingolimod.

Conclusion: Our study demonstrates the presence of a cohort of patients with relapsing short cord myelitis who behave like MS partial myelitis rather than NMOSD and do not fulfil the 2010 Revised McDonald criteria. Thus we postulate an entity of pure spinal MS.

ABSTRACT ID: PP-061

Medication adherence between first event and recurrence stroke: Are there any difference?

(Affiliations not provided)

Background: Several medications have shown to reduce the risk of first event and recurrent stroke. However the benefit was not fully achieved since the medications adherence among them was still suboptimal. This study aimed to compare the medications adherence levels between first event and recurrent stroke as well as assessing the factors associated with adherence to medications.

Methods: This is a retrospective secondary data review from the National Neurology Registry of Malaysia. It involved patients diagnosed with stroke and admitted to hospitals throughout Malaysia from January 2014 to December 2015. Medication adherence was assessed using the 8-item Morisky Medication Adherence Scale.

Results: A total of 822 stroke patients were included. They were distributed almost equally by sex. 58.4% were elderly 60-79 years old and 93.1% were from the Malay ethnic group. More patients with first stroke event (71.5%) registered, while ischaemic stroke being the most common type of stroke seen (88.1%). 7.3% of them died. First event and recurrent stroke patients were comparable in terms of sex, age groups, race, types of antihypertensive medications, types of stroke and outcomes. There is no significance difference in the 8 items of MMAS between both groups. They scored low on the MMAS-8 (less than 6) which indicates low adherence to their medications (64.1% for first event stroke patients and 63.2% for recurrent stroke patients).

Conclusions: Stroke patients had reported low adherence to their medications irrespective of the event of stroke with unintentional non adherence as a prominent reason.

ABSTRACT ID: PP-062

Age-Related Differences among Patients with Acute Ischaemic Stroke at Seberang Jaya Hospital

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Background: Stroke is one of the leading causes of mortality and morbidity worldwide. Age is an important non-modifiable risk factor and older stroke patients tend to fare worse. However, an age-related difference among local population with acute ischaemic stroke (AIS) is unclear.

Objectives: We aimed to compare the AIS patients’ demography, clinical presentation, comorbidities, and acute stroke-related complications among patients from different age groups.

Methods: We analysed the stroke registry of Seberang Jaya Hospital for patients with AIS from January 2015 to December 2016. Data on patients’ demography, clinical presentation, comorbidities, stroke type and complications were collected and compared based on three different age-groups (≤45, 45.1-64.9 and ≥65 years). Statistical analysis was performed using IBM SPSS version 22, with level of significance set at 5%. Results: A total of 284 AIS patients were enrolled during the study period. Almost half of AIS patients were aged ≥65 years (47.1%), followed by aged 45.1 - 64.9 years (45.4%) and ≤45 years (7.5%). Male and Malay patients were predominant in all groups. Lacunar infarct was the most common stroke type in all age groups. Hypertension (73.9%) and atrial fibrillation (9.7%) were common risk factors among older patients (p = .001). The most frequent clinical presentations were hemiparesis and speech
Impairment in all three age groups. More patients from the younger age group experienced headache and nausea (28.6%, p = 0.001 and 19%, p = 0.007). More middle-age patients presented with vertigo (23.3%, p = 0.047) whereas older patients tend to present with altered sensorium (17.2%, p = 0.024) and had a higher rate of stroke-associated pneumonia (15.7%, p = 0.006).

**Conclusion:** There are important age-related differences in the clinical presentation and risk factors among AIS patients in our registry. Awareness of such differences provides valuable insight for the diagnosis and management of AIS.

**ABSTRACT ID: PP-063**

Non-traumatic, non-aneurysmal convexal subarachnoid hemorrhage in a patient with Evans syndrome

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(Affiliations not provided)

**Background:** Non-traumatic, spontaneous subarachnoid hemorrhage occurs in approximately 85% of cases where there is a ruptured saccular aneurysm. An additional 10% of cases arise from non-aneurysmal peri-mesencephalic hemorrhages. Spontaneous non-traumatic, non-aneurysmal convexal subarachnoid hemorrhage is a rare entity – of which there are multiple possible etiologies.

**Case study/report:** A young female, with underlying Evans syndrome presented to the hospital with classical right sided hemiparesis and associated facial asymmetry, indicative of stroke. Plain and contrasted computed tomography of the brain revealed left high parietal cerebral edema, with no other features to suggest hemorrhage. Further assessment via magnetic resonance imaging revealed an acute convexal subarachnoid hemorrhage.

**Conclusion:** Despite being rare, non-traumatic non-aneurysmal subarachnoid hemorrhages are known to occur. Knowledge of the predisposing conditions and etiologies aids in timely diagnosis and appropriate subsequent management. Magnetic resonance imaging with selected sequences is a powerful tool in assessing this entity, when computed tomography findings are equivocal. Pre-eruptive Unilateral Cerebellar Ataxia in an Immunocompetent Adult: A Rare Case of Varicella

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**Introduction:** Varicella-zoster virus (VZV) infection is usually a self-limiting childhood disease. However, it can result in neurological complications either caused by primary infection or viral reactivation.

**Case Report:** We report the case of a 23-year-old immunocompetent woman who presented with unilateral cerebellar ataxia that antedated the varicella exanthem by 28 days. Her magnetic resonance imaging/angiogram (MRI/MRA) of the brain was normal and cerebrospinal fluid analysis was sterile. She was treated as left cerebellitis and intravenous methylprednisolone 1g daily for 3 days was given. Four weeks after the initial presentation, she developed the typical chickenpox exanthematous skin eruption. Serum varicella-zoster IgG and IgM were positive. She was given 1-week course of oral acyclovir 800mg 5 times a day. At 2 months clinic follow up, she showed almost complete neurological recovery with no functional limitation.

**Discussion:** Acute cerebellar ataxia is the most common neurological complication of VZV infection in children, whereas encephalitis and meningitis are more common in adult especially among elderly and immunocompromised patient. Pre-eruptive cerebellar ataxia in varicella is rare and all the published reports described the phenomenon in children. The interval between the onset of cerebellar ataxia and development of rash was variable, up to 19 days as reported by Takeuchi. There is no pathognomonic neuroimaging feature, but the most common finding is bilateral diffuse abnormalities of the cerebellar hemispheres. Treatment with antiviral is recommended for patients at risk of severe disease. However, evidences are mainly from children and lacking in adult. The prognosis is generally favourable with very low mortality and recovery is a norm.

**Conclusion:** Pre-eruptive cerebellar ataxia in varicella is very rare especially in adults. Clinicians should always consider the possibility of VZV infection in dealing with cerebellar syndrome. This is the first case reported in adult, with the longest duration of pre-eruptive period.
Industry-sponsored neurology clinical trials in Malaysia

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The pipeline of drugs for neurological disorders currently stands at more than 400 compounds, many of which have undergone testing in clinical trials to find new breakthroughs in treating these complex diseases. The total number of approved industry-sponsored neurology clinical trials in Malaysia between 2012 and 2016 was compiled from all thirteen ethics committees in Malaysia and are characterized into the types of studies, number of principal investigators as well as sites that have conducted these trials. From 2012 to 2016, a total of 25 neurology clinical trials were conducted in Malaysia, with the highest number recorded in 2015 (n=8 trials). During this time period, 32 neurologists have taken up these trials, some of whom have conducted more than one trial in a single year. The majority of sites involved in these trials are the Ministry of Health (MOH) hospitals and health clinics (80%), and rest being public (20%) and private universities (20%). Clinical trials in neurodegenerative disorders and epilepsy/seizure (40%) account for the largest type of trials being conducted in Malaysia, followed by pain associated-neurological disorders (16%), demyelinating diseases (12%), neuroinfections (12%), stroke (8%), motor neuron disease (4%), traumatic brain injuries (4%) and others (4%). The Ministry of Health has developed several strategies to create a supportive clinical research ecosystem in the country to attract more ISRs. This includes allocating protected time for investigators to conduct clinical research, equipping the sites with the relevant facilities and raising awareness of clinical research amongst healthcare professionals. These initiatives were carried out by a concerted effort of Clinical Research Centre (CRC), the clinical research arm of the MOH, and Clinical Research Malaysia (CRM), a non-profit company established by the MOH that provides speedy and reliable end-to-end clinical research support to trial sites, investigators and the industry.

Risk factors and outcome in Ischemic Stroke: Gender variation

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Introduction: Several studies have shown that women have higher baseline risk factors and higher stroke mortality for stroke. Thus, in this study, we aim to see whether this is the trend in our population along with compliance level to treatment of their pre-stroke medical illnesses and outcome of their stroke.

Methods: Data from National Stroke registry had been extracted to perform this evaluation. Between 2010 and 2016, 9230 cases of acute ischemic stroke (AIS) were registered. Information regarding their stroke subtypes, risk factors, compliance level and outcomes were assessed. Results: Female had significantly higher prevalence of hypertension (AOR 1.551; 95% CI 1.403, 1.715), diabetes mellitus (AOR 1.365; CI 1.25,1.49 ), hyperlipidemia (AOR 1.220; 95% CI 1.110,1.342), as well as atrial fibrillation (AOR 1.616 ;95% CI 1.298,2.011), but less ischemic heart disease (AOR 0.636; 95% CI 0.541, 0.704). Despite that, female tend to have severe disability (AOR 1.111; CI 1.074, 1.147) but recorded less mortality (AOR 0.825; 95% CI 0.72, 0.944).

Conclusion: Our study demonstrated AIS poses major disease burden in female population due to higher post stroke morbidity leaving patients severely disabled. A significant gender differences in the baseline risk factors found in this study need to be explored for better understanding of the occurrence of stroke in our population. More action is needed to assist female gender in controlling their risk factors for stroke, with emphasize on the important of drug compliance is of upmost in order to reduce the incidence and severity of their stroke.
Exploring Quality of Life and Activities of Daily Living of Myasthenia Gravis Patients in Hospital Seberang Jaya: A Cross Sectional Study

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Introduction: Myasthenia gravis (MG) is an immune mediated neuromuscular disease with a wide range of clinical symptoms causing fatigability, which can influence quality of life (QOL) and activity of daily living (ADL). Patient-derived quality of life, as assessed by questionnaires has proven to be an essential outcome measures when used in conjunction with clinical examination. The objective of this study is to explore factors associated with QOL and ADL of MG patients in Hospital Seberang Jaya.

Methods: In this cross sectional study 35 MG patients were consented out of 60 patients from the registry of Neurology clinic of Hospital Seberang Jaya, Penang. An interview-administered questionnaire was utilized. The questionnaire consisted of 3 parts: Socio-demographics (age, gender, ethnicity; Clinical factors (MG type, MG crisis, Ach Antibody positivity, thymoma was recorded); QOL and ADL were assessed using validated MGQOL15 and MGADL questionnaires respectively. Descriptive and bivariate analysis was conducted using SPSS version 23.

Results: Our sample constituted of mainly women (52.5%) and aged 55 years and above (60.7%). In bivariate analysis, non-malays were 8 times more likely to have lower QOL compared to Malays (OR=8, 95%CI =1.726-37.09, p = 0.005). Patients with higher ADL score were 6.5 times more likely to have lower QOL compared to those with lower ADL score (OR = 6.5, 95% CI = 1.3-31.8, p = 0.016). Other clinical factors were not significantly associated with QOL. None of the patients has family history of MG.

Conclusion: Demographic factor (ethnicity) & ADL showed statistical significance with lower QOL in our sample. Clinical factors showed no statistical significance.

Sinus bradycardia after high dose intravenous methylprednisolone in a patient with multiple sclerosis

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Objective: To study the association of sinus bradycardia and pulse steroid therapy (PST), and the approach to managing it. Results: A 29 year old Malay lady, presented with acute onset of blurring of vision for 2 days. Neurological examination revealed right eye temporal pallor, relative afferent pupillary defect and visual acuity of 6/60. MRI brain showed lesions typical for multiple sclerosis (MS). She was diagnosed with right optic neuritis secondary to MS, treated with pulse steroid therapy (PST); intravenous (IV) methylprednisolone (MP); at an infusion rate of 250mg/1 hour four hourly. After 2 doses, she developed palpitations and bradycardia (heart rate (HR) of 30 beats per minute (bpm) thus it was withheld and she was referred to our center. Cardiac monitoring done showed that even when IV MP was withheld, the patient had intermittent sinus bradycardia. So IV MP was restarted cautiously at a slower infusion rate of 250mg over 6 hours, every 4 hours, with continuous cardiac monitoring. Holter done on day four of PST, showed sinus rhythm, HR ranging from 26-105 (mean of 44) bpm. She completed 5 days of IV MP without event. Discussion: Infusion rate and underlying cardiac disease are considered to influence the risk of bradycardia with PST. Cardiac monitoring is suggested in those who have underlying cardiac disease or suspicion of such. Consultation with electrophysiologists is important due to the possibility of future recurrent use of PST and disease modifying therapies at risk of bradycardia. Temporary pacing or pacemaker implantation may be considered in future to prevent untoward adverse events (AE). Therefore risk mitigation with stratification of cardiac risk in MS patients is vital. Conclusion: Sinus
bradycardia is an uncommon AE associated with PST. A collaborative multidisciplinary approach for MS patients with cardiac issues; involving general physicians, neurologists and cardiologists, is needed for optimal care.

**ABSTRACT ID: PP-069**

Proportion Of Stroke In Young Adults In Terengganu: Data From National Stroke Registry From 2010-2016

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Stroke is a disorder that occurs suddenly, caused by focal disturbance of cerebral circulation, followed by neurological deficits of varying intensity with duration of more than 1 hour; it mostly occurs in the old and middle aged but rarely in the young. The objective of our study is to determine whether the proportion of younger adult admitted to hospital for acute stroke has been increasing in trend. We analyzed data extracted from National Stroke Registry for HSNZ, Terengganu from 2010 till 2016. During this period, a total of 5900 patients with both hemorrhagic and ischemic stroke were admitted. The percentage of ischemic and hemorrhagic stroke in the age group of 18-55 years in Terengganu shows an increasing trend from 25.1% (2010) to 28.6% (2016) and from 31.8% (2010) to 41.3% (2016) respectively. In the respect of gender, ischemic stroke in female group with age of 55 and less is 20.7% (2010) to 29.92% (2016) and 23.5% (2010) to 28.57% (2016) in hemorrhagic group. In male with age of less than 55, ischemic stroke were 27.2% (2010) and 27.32% (2016), hemorrhagic 37.2% (2010) and 50% (2016). Stroke is commonly occurring in younger age group and in our study show the trend is increasing, especially in hemorrhagic stroke in both male and female group. A further study should be conducted to look at the prevalence of the risk factor contributing to the rise of the incidence.

**ABSTRACT ID: PP-070**

Positive psychology for people with epilepsy: A needs assessment

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**Background:** Positive psychological interventions (PPI) are increasingly used to help patients cope with physical and mental long-term conditions. Recently, PPI was applied on neurological populations. Its effectiveness on improving well-being in people with epilepsy (PWE) has been showed in a handful of studies. This study aimed to examine the needs and feasibility of PPI from the perspective of the potential participants.

**Methods:** Participants answered a needs assessment questionnaire eliciting information about their illness perception (Brief-IPQ), emotions (HADS), willingness to participate in psychological interventions, preferences in types of PPI and intervention designs, as well as barriers in seeking mental health services. Clinical and socio-demographic variables were also included.

**Results:** Total 154 patients with epilepsy participated, with mean age of 37.3 years (range 16 – 86 years), and 82 females. Mostly had focal epilepsy (68.2%), and drug-resistant (59.1%). Majority (58.4%) indicated a strong willingness to participate in PPI. Out of nine types of PPI, mindfulness-based technique (MBT) was highly preferred. Those with negative illness perception (p = .001), anxious (p = .004), and unemployed (p = .048) responded favorably in willingness to participate in PPI. Most participants preferred group rather than individual session, delivered in 30 minutes per session.

**Conclusion:** This study captured the unmet needs of epilepsy patients in the design of psycho-therapeutic interventions. Preliminary evidence suggested that
MBT, delivered in short group session was highly preferred. Future study is required to determine the feasibility of such design for epilepsy patients.

**ABSTRACT ID: PP-071**

**Induction therapy with cyclophosphamide and rituximab followed by fingolimod improves outcome in fulminant corticosteroid and plasmapheresis refractory multiple sclerosis.**

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Introduction: Fulminant multiple sclerosis is a subtype of fulminant demyelinating disease, associated with rapid progression to disability within several days to weeks. Approximately 7% of the patients presenting with multiple sclerosis (MS) have radiographic features of fulminant disease. The acute treatment for all fulminant demyelinating disease includes intravenous methylprednisolone followed by plasmapheresis or second course of intravenous methylprednisolone if response is suboptimal. In refractory aggressive cases, cyclophosphamide and rituximab have been reported to produce good outcome as acute therapy when needed.

Methods: Retrospective, Observational Case Report Out of 198 patients with multiple sclerosis at a single tertiary referral centre we identified one patient with fulminant multiple sclerosis treated with induction therapy with two agents followed by oral fingolimod. This case report illustrate a rare case of fulminant multiple sclerosis in a 39 year old female with more than 4 attacks of multiple sclerosis in a year refractory to steroids and plasmapheresis treated with induction therapy with two agents followed by oral fingolimod. MRI brain showed marked thickening of the meninges along the falx cerebri extending to the cranial base. The result for HIV, VDRL, Rheumatoid factor, ANCA, ENA, screening for tuberculosis and fungal, serum IgG were all negative. She developed frequent relapses although on immunosuppressive therapy. Over the years, her disease progressed and complicated with right orbital apex syndrome, permanent blindness, and seizures. Subsequent MRI did not show any significant changes but the EEG demonstrated abnormal interictal epileptiform discharges arising from right posterior head region suggestive of focal structural lesion with cortical irritability.

Conclusion: Induction therapy in aggressive fulminant multiple sclerosis with cyclophosphamide followed by rituximab in selected cases followed by de-escalation to fingolimod with careful long term monitoring for side effects can produce good outcomes in terms of clinical relapses and disability in patient with fulminant MS. Though observational this case report provides helpful data on the management of this challenging area in the absence of more compelling level 1 evidence.

**ABSTRACT ID: PP-072**

**Outcome and treatment of progressive Hypertrophic Pachymeningitis (HP): A case report**

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Background: Hypertrophic Pachymeningitis (HP) is a rare disease resulting in abnormal thickening and inflammation of the dura matter. It can be idiopathic or secondary to wide variety of conditions. The disease is debilitating with progressive neurological deficit which leads to poor quality of life. Remission is often not achieved with a corticosteroid alone with relapse rate of 46%, thus require a second line immunosuppressive therapy.

Case Description: A 49 year-old lady presented with ipsilateral headache and acute visual loss. Premorbidly she had history of temporal lobe epilepsy which was well controlled without medications. She has multiple cranial nerve palsies which initially improved with steroid. MRI brain showed marked thickening of the meninges along the falx cerebri extending to the cranial base. The result for HIV, VDRL, Rheumatoid factor, ANCA, ENA, screening for tuberculosis and fungal, serum IgG were all negative. She developed frequent relapses although on immunosuppressive therapy. Over the years, her disease progressed and complicated with right orbital apex syndrome, permanent blindness, and seizures. Subsequent MRI did not show any significant changes but the EEG demonstrated abnormal interictal epileptiform discharges arising from right posterior head region suggestive of focal structural lesion with cortical irritability.

Conclusion: This case illustrated the challenges in management of this rare disease and its long term complications. Azathioprine, cyclophosphamide, and methotrexate have been tested in relapse cases with variable long term success in few patients. Newer second line drugs such as Rituximab therapy maybe an alternative in relapse cases and require further study.
Bilateral thalamic and cerebellar involvement in a case of dengue encephalitis

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Introduction: Dengue fever (DF) is one of the most common and life threatening arthropod-borne viral diseases in Malaysia. Since dengue epidemic was first reported in 1779 in Indonesia, there has been a dramatic expansion in its distribution and spectrum of clinical manifestations in the last two centuries. The clinical course of dengue fever is unpredictable with 0.5% to 7.4% reported to have neurological manifestations. In 2009, WHO endorsed a new dengue guideline, which included neurological involvement in the classification of severe dengue. Hence, it is important to comprehend and anticipate the diverse CNS complications that may arise while managing dengue patients.

Case presentation: We report a case of dengue encephalitis in a 31-year-old Malay lady who had extensive brain MRI changes in the bilateral thalamic and cerebellar regions. Such imaging changes in dengue encephalitis is uncommon and only appear in isolated case reports and case series. Our patient who had dengue fever serotype DEN-1 presented with altered sensorium at day five of illness and required mechanical ventilation. Lumbar puncture, electroencephalogram and brain imaging were done to assess her condition. Her conscious level gradually improved with supportive management including airway maintenance, hydration and nutritional support. Albeit extensive brain MRI abnormalities, she had complete recovery with no neurological deficit.

Conclusion: With emerging number of CNS complications in dengue fever, high index of clinical suspicion should be emphasized for early detection and prompt treatment in patients with dengue encephalitis.

Neuromyelitis optica spectrum disorders: demographic characteristics in a Terengganu case series and the association with paroxysmal painful tonic spasm

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Introduction: Neuromyelitis optica (NMO) is an inflammatory CNS disorder distinct from multiple sclerosis (MS) that it preferentially affects the optic nerve and spinal cord causing optic neuritis and transverse myelitis. The discovery of serum aquaporin-4 immunoglobulin G antibodies (AQP4-IgG) and revision of NMO spectrum disorders (NMOSD) diagnostic criteria in 2015 have undoubtedly improved the diagnosis frequency and accuracy. Paroxysmal painful tonic spasm (PPTS) is one of the clinical features of NMOSD characterized by recurrent, localized muscle spasm accompanied by intense pain and dystonia.

Objective: To evaluate the demographic, clinical characteristics and presence of PPTS in patients with NMOSD in Terengganu.

Method: This is a retrospective cross-sectional study performed to assess patients with NMOSD admitted to Hospital Sultanah Nur Zahirah (HSNZ) from October 2014 to May 2017. Information pertaining to the demographic, clinical and paraclinical manifestations were collected and analyzed. Results: Nine patients (7 females and 2 males) with NMOSD, between 24 to 48 years of age were identified. AQP4-IgG seropositivity was detected in 77% of the patients of which 85% of them had PPTS during acute attack and 33% reported limb dystonia. The disease is aggressive with 88% reported longitudinal extensive transverse myelitis and 25% of them had entire spinal cord involvement. There is an association with other autoimmune disorder as one of our patients had concomitant anti-NMDAR encephalitis.

Conclusions: The characteristic of this case series demonstrated PPTS-associated myelitis as a common and debilitating symptom in patients with NMOSD; particularly in those with seropositive AQP4-IgG. Early symptom recognition is paramount for prompt treatment and rehabilitation to reduce the impact on the patients’ quality of life.
Mononeuritis Multiplex as an early sign of relapse leukemia

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We would like to present a case of a 29 year old gentleman with a diagnosis of T-Acute Lymphoblastic Leukemia (T-ALL) on 13th of December 2016. He received GMALL I and II induction followed by HYPERCVAD A1, B1, A2 and B2 latest on 28th April 2017. His BMA showed morphological remission, however he was not flowed for Minimal Residual Disease (MRD). He was initially planned for allogeneic hematopoietic stem cell transplantation counselling on 31st of May 2017. Unfortunately, he presented to hematology daycare on 24th May 2017 after two private clinic visits with sudden onset of drooping of right eyelid and right sided frontal headache and periorbital pain.

He denies weakness, numbness or other focal neurology. Clinically he had mononeuritis multiplex as evidenced by right third nerve palsy, complete ptosis with ophthalmoplegia. He also had left lower motor neuron facial nerve palsy. CECT brain, MRI brain and orbit were reported as normal. Lumbar puncture examination was aseptic with negative culture. CSF cytology showed acellular smear with negative latex agglutination and Indian ink tests. He was subsequently transferred to Hospital Ampang for further evaluation of T-ALL CNS relapse.

His repeated full blood picture was noted to have suspicious circulating mononuclear cells seen. Repeated bone marrow aspirate showed presence of 6% small sized blasts and in correlation of flow cytometry, features are consistent of relapsed T-ALL. We bring this case for discussion as mononeuritis multiplex is a rare presentation of relapse in a patient with a background history of acute leukemia.

It is a harbinger of early CNS relapse with multiple roots involvement. Leukemic infiltration of peripheral nerves or neuroleukemiosis (NL) is exceedingly rare and we learn from this case is that mononeuritis multiplex can be a feature in relapsing acute leukemia and can precede hematologic evidence of relapse.

A Successful Intravenous Thrombolysis in a Wake-Up Stroke with Low CHA2DS2-VASc score Atrial Fibrillation Using Computed Tomography Perfusion to Assist Decision Making

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We report a case of successful intravenous thrombolysis in a cardioembolic wake-up stroke secondary to atrial fibrillation, using computed tomography perfusion as the basis for decision. A 42-year-old lady with newly diagnosed atrial fibrillation (CHA2DS2-VASc score of 1) woke up with left sided body weakness and slurred speech. The initial National Institutes of Health Stroke Scale (NIHSS) was 17.

Computed tomography (CT) of her brain revealed an acute ischemic infarct in the right middle cerebral artery (MCA) territory with Alberta Stroke Program Early CT Score (ASPECTS) of 8. Her immediate CT perfusion of the brain revealed significant penumbra of more than 50%. Concurrent computed tomography angiogram showed a thrombosis in the right M1 segment.

She was given intravenous recombinant tissue plasminogen activator (rtPA) based on the significant penumbra and her immediate cerebral angiogram after thrombolysis showed complete reperfusion. The NIHSS after 24 hours was 2 and she was discharged with modified Rankin Scale (mRS) of 1.
Facial diplegia - think of GBS

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Facial diplegia is a rare condition with an incidence of 1/5,000,000 population, usually due to underlying systemic diseases. GBS is an autoimmune-mediated polyneuropathy which can present with facial diplegia. We report 2 cases of GBS that presented with facial diplegia (FDP).

Patient 1 was a 41 year old male with numbness of the feet, hands and mouth preceded by diarrhoea. On examination he had bilateral lower motor neuron facial nerve palsy, mild proximal muscle weakness (4/5), areflexia and flexor plantar reflexes. Sensation was lost up till mid-palm and ankles with impaired proprioception. He was diagnosed with FDP variant of GBS.

CSF showed albuminocytologic dissociation. Nerve conduction studies showed axonal sensorimotor polyneuropathy. He responded well to intravenous immunoglobulin, with only residual paraesthesia and mild sensory ataxia.

Patient 2 was a 25 year old female, 15 weeks pregnant who presented with perioral numbness for 1 week preceded by fever. Clinically she had bilateral lower motor neuron facial nerve palsy, mild proximal myopathy with normal reflexes.

CSF showed albuminocytologic dissociation. Serial nerve conduction studies showed progressive symmetrical sensorimotor axonal polyneuropathy. She was commenced on intravenous immunoglobulin and responded well, with only residual facial weakness.

Discussion: Facial diplegia is a rare condition that occurs secondary to various systemic conditions such as diabetes, Lyme’s disease, sarcoidosis, GBS and leukaemia. It is idiopathic in only 20% of patients.

Amongst these, GBS is an important differential diagnosis that needs to be identified and managed promptly for the best outcome. These cases demonstrate that diagnostic vigilance for a secondary cause of facial diplegia is warranted and that it is prudent to think of GBS as a possible cause.

Finger drop sign: A characteristic pattern of distal weakness in axonal forms of Guillain-Barre Syndrome

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Guillain-Barre Syndrome (GBS) is an acute immune mediated polyneuropathy with several variant forms. It is thought to result from an immune response from a preceding infection that cross reacts with components of the peripheral nerves due to molecular mimicry. It is characterized by progressive symmetrical muscle weakness accompanied by absent or depressed deep tendon reflexes.

It is further classified based on electrophysiological findings into demyelinating and axonal forms. They include acute inflammatory demyelinating polyneuropathy (AIDP), acute motor axonal neuropathy (AMAN) and acute motor-sensory axonal neuropathy (AMSAN).

We would like to report an uncommon case of AMSAN, which showed a characteristic pattern of predominant finger extensor weakness. A distinctive pattern of weakness involving the fingers known as “finger drop sign” has been described to be specific in AMAN variant of GBS in the literature. It is characterized by severe distal upper limb weakness with varying degrees of proximal weakness. This pattern consists of severe finger extensor weakness (i.e. at the metacarpophalangeal and interphalangeal joints) in the presence of relatively normal power in finger flexion, wrist flexion and wrist extension. The key feature is the selectivity of muscle weakness i.e. very weak finger extension and reasonably preserved finger flexion, wrist flexion and extension. We have observed the “finger drop sign” in our patient with electrophysiological proven AMSAN variant of GBS.

This further suggests that this sign is not only specific to AMAN and could serve as an important distinguishing feature in axonal form of GBS against the demyelinating form. In resource limited setting where electrophysiological study may not be immediately available, such characteristic sign can be useful to diagnose and recognize this common disorder in a timely and appropriate manner.
ABSTRACT ID: PP-079

Melioidosis: An unusual cause of septic cavernous sinus thrombosis and cerebritis

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Melioidosis is an infection caused by the facultative intracellular gram negative bacterium, Burkholderia pseudomallei. It is endemic in Southeast Asia and northern Australia with sporadic occurrence in temperate countries. It has gained importance as one of the most potent emerging infections in certain states of Malaysia. It has myriad presentations with signs and symptoms ranging from benign skin and soft tissue infections to fatal septicemia. Primary neurological infections are rare and the clinical presentations were mainly pyemic such as brain abscess, subdural empyema and epidural abscesses. We report an unusual case involving a 55-year-old man with poorly controlled diabetes that was diagnosed to have cavernous sinus thrombosis and temporal cerebritis as a result of intracranial extension from a primary melioidotic middle ear infection.

He presented with high grade fever of one week duration and a painful suppurative right ear. On the day of admission, he complained of right eye pain and experienced rapid loss of vision, accompanied by right eyelid edema, complete ptosis and ophthalmoplegia. Proptosis became evident by the following day with gradual reduction in conscious level. Cultures obtained from the blood and pus discharge from the right ear grew Burkholderia pseudomallei. Contrasted CT scan of the brain showed a dilated right superior ophthalmic vein with filling defect seen within the right cavernous sinus. Similar findings were confirmed on the MRI.

Imaging also revealed bilateral opacification of all sinuses with hyperintense signal noted at the cortical and subcortical regions of the right temporal lobe with restriction in DWI. The patient unfortunately succumbed to septicemic shock from progressive infection of the central nervous system despite early provision of appropriate antibiotics. To our knowledge this is the first adult report of fatal melioidosis presenting as cavernous sinus thrombosis and cerebrities.

ABSTRACT ID: PP-080

“Nine” syndromes and its MRI brain findings

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One and a half syndrome is characterized by combined unilateral conjugate gaze palsy and internuclear ophthalmoplegia due to lesions affecting abducens nucleus or paramedian pontine reticular formation and the adjacent medial longitudinal fasciculus. Facial nerve palsy, in addition to one and a half syndrome, is called eight and a half syndrome (7 + 1.5 = 8.5); whereas a further addition of hemiparesis or hemihypesthesia would constitute a “nine” syndrome (0.5 + 8.5 = 9). We describe a rare presentation of pontine infarction in a lady who was on dual antiplatelet therapy. Magnetic resonance imaging of brain revealed acute infarction of the dorsal pons. A diagnosis of pontine lacunar stroke was made. She continued dual antiplatelet therapy and her symptoms resolved completely over three months.

ABSTRACT ID: PP-081

A case of anti-NMDAR encephalitis without tumor

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Introduction: Anti-N-methyl-D-aspartate receptor (Anti-NMDA-R) encephalitis is an immune-mediated syndrome which manifests psychiatric, neurological and autonomic symptoms. We describe a case of successfully treated Anti-NMDA-R encephalitis without tumor.

Objective: Create awareness of Anti-NMDA-R encephalitis among clinicians.
Case report: A 27 years old previously healthy female presented with agitation, aggressive behavior and auditory hallucinations. She was diagnosed with brief psychotic disorder and was discharged home. However, her symptoms progressed and readmitted for reduced consciousness, fever and seizures. Computed tomography and Magnetic resonance imaging of brain were normal. The empirical treatment of meningencephalitis was started with intravenous ceftriaxone and acyclovir. In intensive care unit, orofacial dyskinesia and twitching of neck muscle were observed. High dosage of anti-epileptic drugs and sedation were required for seizure control. Cerebrospinal fluid analysis revealed elevated protein with positive Anti-NMDA-R antibodies. Her EEG showed severe encephalopathy. Computed tomography of thorax, abdomen and pelvis; and tumor markers were normal. Anti-NMDA-R encephalitis was confirmed. She was subjected to plasma exchange after initial treatment with intravenous immunoglobulin and methylprednisolone showed no improvement. After six cycles of plasma exchange, she regained full consciousness with improvement of orofacial dyskinesia, seizures and hyperthermia. Symptoms however completely resolved after initiation of Rituximab. She was able to ambulate with assistance upon discharge.

Discussion: A diagnosis of Anti-NMDA-R encephalitis was made based on characteristic clinical features including psychiatric symptoms, seizures, decreased consciousness, autonomic dysfunction and dyskinesia with a positive NMDAR antibody in this young female patient. Treatments include immunotherapy and tumor removal if applicable. This patient had slower response to immunotherapy and required Rituximab ultimately due to absence of teratoma, as recovery duration is longer compared to patients with tumor. Absence of teratoma warrants periodic screening.

Conclusion: Early recognition of Anti-NMDA-R encephalitis with prompt intervention and timely initiation of treatment is crucial in preventing morbidity and mortality.

Paediatric Moyamoya Disease: Case Series
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Introduction: Moyamoya disease or syndrome is an uncommon chronic cerebral vasculopathy, characterized by progressive stenosis of the terminal portion of the internal carotid artery (ICA) and its main branches, in association with the development of compensatory collateral vessels at the base of the brain.

Case studies: We report three cases of moyamoya disease who presented with recurrent acute ischemic stroke (AIS) in a single tertiary center over the last 3 years (Jan 2014-Feb 2017). Age of presentation is between 11 month and 4 year of age. Angiography findings of these patients were in keeping with moyamoya disease. Case 1 presented with 2 episodes of AIS. MRA brain showed stenosis over bilateral distal carotid arteries, bilateral M1 segment of MCAs, and A1 segment of the left ACA. This patient did not undergo surgical intervention. Case 2 presented with 2 episodes of AIS. MRA showed tight and progressive stenosis at left distal ICA, right A1 segment of ACA and left MCA. Subsequent cerebral angiography showed strial and thalamic collaterals, in addition to the stenosis. The child underwent encephalo-duro-arteriosynangiosis (EDAS) at the age of 3.5 years old with favourable outcome. Case 3 presented with 2 episodes of AIS. MRA showed tight and progressive stenosis at left distal ICA, right A1 segment of ACA and left MCA. Subsequent cerebral angiography showed stria and thalamic collaterals, in addition to the stenosis. The child underwent encephalo-duro-arteriosynangiosis (EDAS) at the age of 3.5 years old with favourable outcome. Case 3 presented with 2 episodes of ischemic stroke. MRA after second ischemic stroke showed occlusion of supraclinoid segments of both ICAs. Subsequent cerebral angiography revealed multiple small collaterals from lenticulostriate and thalamic perforating arteries. We planned to perform indirect bypass. All patients are currently only have slight hemiparesis, and are on Aspirin.

Discussion: These cases highlight that moyamoya disease should be considered when paediatric patients presented with recurrent AIS. MRA findings of distal stenosis of ICA and proximal stenosis of its branches should prompt a conventional cerebral angiography whenever possible, as early recognition and intervention of moyamoya disease is important to prevent further strokes in these patients.
**ABSTRACT ID: PP-085**

**Atypical presentation of Leigh Syndrome: A case report**

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**Introduction:** Leigh syndrome is a rare progressive neurodegenerative caused by failure of oxidative metabolism in the mitochondria, which typically presents in the first 2 years of life with death expected within 2 years of diagnosis.

**Method:** We report a case of a 13 year old girl who presented at the age 2 years 11 months with global developmental delay.

**Results:** At initial presentation, she was a thriving child without any dysmorphic features with global development delay. Neurological examination was normal however Schedule of Growing Skills II showed that her motors and language function was equivalent to an 18 month old child. She developed an unsteady gait at 5 years old and her brain magnetic resonance imaging (MRI) showed high intensity signals in the basal ganglia. She was suspected to have a mitochondrial disorder; unfortunately she was lost to follow up and presented with a tiptoeing gait 2 years later. Further investigations showed a raised lactate level with metabolic acidosis. A diagnosis of Leigh syndrome was made. Her skin fibroblast biopsy was normal and the diagnosis was confirmed by detecting 50% mutation load of m.11777 C>A from her blood leukocyte. Her siblings were screened and 2 of them have similar mutations with different presentations. Her condition has deteriorated in recent years. She ambulates with support due to severe muscle weakness and contractures and there is evidence of worsening brainstem involvement resulting in dysarthria, swallowing difficulty and an abnormal breathing pattern.

**Conclusion:** Diagnosis may have been delayed due to significant improvement in motor functions with therapy in initial years and her late presentation and prolong survival could be explained by the heteroplasmic mtDNA defect whereby the phenotype is governed by the threshold effect of the genes and mitotic segregation. Mitochondrial disease should be suspected in children presenting with global developmental delay.

**ABSTRACT ID: PP-086**

**A Neonate with Exaggerated Startle Response.**


(Affiliations not provided)

**Introduction:** Hyperekplexia is a rare neuro-genetic condition characterized by exaggerated startle response and neonatal hypertonia. The prevalence worldwide is unknown. To the best of our knowledge this is the first case of hyperekplexia confirmed to have GLRA1 gene mutation in Malaysia.

**Case Report:** This infant was born term at 38 weeks of gestation in a private hospital via emergency caesarean section for failed labour induction with birth weight 2.87 kg and good Apgar score. Antenatally, mother was positive for Group B Streptococcus, had leaking liquor for more than 15 hours and given 2 doses of intravenous antibiotics prior to delivery. At 21 hours of life, he developed jitteriness of both upper and lower limbs with twitching of left eye for 15 minutes. He was given intravenous midazolam, intubated for cerebral protection and transferred to a nearby private centre for ventilation. Upon arrival however, his ETT dislodged. Despite this, he remained stable with good breathing effort. He was treated as presumed meningitis and started on intravenous crystalline penicillin, cefotaxime and phenytoin.

At Day 5 of life, he had another brief episode of jitteriness. He was subsequently referred to our hospital. His physical examination was unremarkable except for glabella and jaw tap which demonstrated excessive startle response. Lumbar puncture and EEG were both normal. He was diagnosed clinically as hyperekplexia and commenced on oral clonazepam. He responded well. By day 14 of life, less frequent startle response was observed and he was discharged home with oral clonazepam.

**Conclusion:** This case report highlights the clinical presentation of hyperekplexia and emphasize the need of its early recognition and appropriate management.
Anti-N-methyl-D-aspartate receptor encephalitis: an under diagnosed case of encephalitis

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Anti-NMDA receptor encephalitis is increasingly recognised as the underlying cause behind many neuropsychiatric syndromes that often respond well to treatment resulting in complete or marked recovery. This is a case of a 7 year old boy, who was previously well. He presented with status epilepticus with no fever. He was admitted and observed in paediatric ward and then discharged home against medical advice after fit free for 24 hours. Subsequently he developed more episodes of fitting at home associated with altered behaviour and was re-admitted for further investigations. Despite being started on antiepileptics, he was still having intermittent seizures. Concurrently he developed aggressive behaviours with agitation and crying spells. Multiple investigations including MRI brain shows grossly normal brain. Initial CSF results were also unremarkable. Despite on treatment, the child’s neurological status was not improving. Trials of methylprednisolone followed by course oral steroids were given. In view of the presentation of altered behaviour with recurrent seizures and the relentless course of the illness, autoimmune encephalitis was suspected; hence IVIG was given for 2 days. Retrospectively, detection of anti-NMDAR antibodies in CSF confirmed the diagnosis. In this case report we suggest the need of inclusion of anti-NMDAR encephalitis in the differential diagnosis of any cases of acute psychosis or abrupt change in behaviour in paediatric age group. A high index of suspicion is required for early diagnosis, as the role of early immunotherapy could change the outcome.

The prevalence of overweight and obesity is higher in children with Autism Spectrum Disorder (ASD) compare to children with non-ASD.

Aim: To determine prevalence of overweight and obesity in children with ASD and to identify the associated factors. Method: Fifty children with ASD (mean aged 9 years 3 months, range 2-12 years old in Child Development Clinic (CDC), Penang Hospital were assessed their Body mass index (BMI) and parents were interviewed regarding their dietary habit, food intake and physical activities.

Results: Twelve out of 50 children (24%) were overweight and obese and eight out of 50 (16%) were underweight. 44 out of 50 (88%) were boys and 6/50 (12%) were girls. 25/50 (50%) were Chinese ethnicity, 19/50 (38%) were Malay and 12% were Indian. Eating habits frequency (47/50) 94% eating 3 to 5 meals per day. 24/50 (48%) eat all types of food including fruits and vegetables, 52% have problems with food choices. 21/50 (42%) have abnormal eating behavior such as only eat certain food. 27/50 (54%) did light exercise, 30% did moderate exercise and 16% did not exercise.

Discussion: In Malaysia, 19.9% of children aged 6-12 years old were overweight and obese. Children with ASD are known to have food rigidity. Restricted food preference made healthy dietary intervention difficult and they also less likely involve in physical activities due to deficiency in motor and social skills.

Conclusion: 24% of children with ASD have overweight and obesity, higher than the general population. Their associated factors were eating habits, food choices, taking snack in between meals, abnormal eating behavior and lack of physical activities. Also noted that (8/50)16% were underweight. 88% were boys and 50% were Chinese ethnicity. This is a preliminary report of the study that will complete at the end of this year.
Parents’ responses towards parent training talk for children with autism spectrum disorder

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The time of diagnosis and waiting time for intervention can be stressful for parents of children with ASD. This study aims to study parents’ responses towards parent-training talk for children with ASD. Child Developmental Clinic HSI organizes 4-hour ASD parent training talk every month.

The ASD Parent training talk is divided into part 1 and 2. Part 1 talk focused on ASD education and parental emotional support while part 2 talk concentrate on strategies to improve patients’ social communication skills. After each session, feedback forms will be distributed to parents. Data was collected from August 2016 till April 2017.

We extracted data mainly focusing on the main topics of part 1 and part 2 ASD talk which then graded from unsatisfactory, satisfactory, good and excellent. We have included insightful feedback from parents as well. There are a total of 242 participants. 146 out of the 242 participants attended Part 1 talk and 96 attended part 2 talk. For the topic on ASD education, 11% of the participants graded “good” while 89% of the participants rated “excellent”. Another aspect of the part 1 talk which focused on supporting parental emotional well-being, similar ratings were given by the participants whereby 11% rated “good” and 89% rated “excellent”.

For part 2 ASD talk which focused on the ways to improve social communication skills and language development, 31% of the participants rated “good” while remaining 69% rated “excellent”. All participants reported they would recommend part 1 talk to their friends whereas 92% of participants would do so for Part 2 talk.

Parent-training talk proven to play an important role in the management of families with children with ASD. We yielded better responses from parents with regards to ASD education and parental emotional support, suggesting this could be an aspect frequently neglected in clinical practice.

ADEM: A case of spontaneous recovery

M. K. Lim, H. K. Tan
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Acute Disseminated Encephalomyelitis (ADEM) is a rare monophasic autoimmune demyelinating disease of the central nervous system, affecting mostly children. We are reporting a case of ADEM who achieved spontaneous recovery.

Our patient is a 17 month-old boy presented with sudden onset of unstable gait for 2 days after a prodromal upper respiratory tract infection. Clinical examination showed truncal ataxia with upgoing right plantar reflex.

Cerebrospinal fluid analysis was normal. He was initially diagnosed with post viral cerebellitis as his symptoms resolved after 6 days. However, he presented again 4 days later with new symptoms of bilateral eye convergent squint.

Clinical examination revealed bilateral eyelid ptosis. MRI brain showed hyperintense signal on T2WI/FLAIR at bilateral centrum semiovale, bilateral occipital region, right side of midbrain, bilateral temporal and bilateral cerebellar peduncle which suggest demyelination.

The initial diagnosis proved to be a challenge as the child came with variable clinical presentation and absence of specific biochemical markers for ADEM. Furthermore, limitation in performing urgent MRI brain proves to be a disadvantage for early diagnosis. This highlights the need for MRI which holds the key for the diagnosis of ADEM.

Anti-inflammatory and immunosuppressive agents are the mainstay of treatment; however, there have been documented cases of spontaneous recovery.
Case Report: Grisel Syndrome

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Non-traumatic atlantoaxial rotatory subluxation, also known as Grisel’s syndrome (GS), is a rare entity and it follows upper respiratory tract infection. A case is described in an otherwise healthy 8 year old girl who presented with chronic headache for 1 month and acute torticollis 3 days following a mild upper respiratory infection with difficulty in swallowing fluid and solids.

Neurological evaluation revealed deviation of the tongue to the right, and pooling of secretion, other aspects of neurological examination were normal. CT cervical done – noted C1 rotatory subluxation and she was referred to tertiary centre (HRPB) for MRI spine which showed atlantoaxial rotatory subluxation (AARF) Type 1 with soft tissue enhancement at atlanto axial space and surrounding C1-non specific and may represent inflammatory changes. Antibiotic treatment was commenced.

The patient was then placed in a soft cervical collar and orogastric tube feeding was initiated. Repeated MRI after 10 weeks from first imaging showed similar rotatory deformity and soft tissue enhancement at atlantoaxial joint, however torticollis improved. Upon our last review in clinic 1 year after diagnosis, torticollis improved tremendously, with minimal restriction in lateral rotation of neck, with no other neurological deficit.

Grisel’s syndrome is a clinical diagnosis with relevant MRI findings, but its etiology is debated. Although several theories have been proposed, no mechanism for its pathogenesis has been generally accepted. Fielding proposed a staging system for the degree of subluxation in Grisel’s syndrome where conservative treatment is considered for type 1 subluxation (bed rest, antibiotics, relaxants, soft immobilization).

For type 2 subluxation, conservative treatment with spinal traction when appropriate is recommended. For types 3 & 4 subluxation, invasive treatment is indicated (halo immobilization, C1-C2 fusion, and arthrodesis).

This algorithm serves as a basis for management, but each case must be managed individually.

Osmotic Demyelination Syndrome: Report of Two Cases with Contrasting Sodium Concentration and Outcome

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(Affiliations not provided)

Objective: Osmotic demyelination syndrome (ODS) is a rare neurological disorder characterized by demyelinating disorder of the brainstem (central pontine myelinosis) or other parts of the brain (extrapontine myelinosis) that result from extreme fluctuations in serum sodium concentration and plasma osmolality. ODS usually occurs during rapid correction of hyponatremia, but has also been reported in hypernatremia cases.

Method: Here, we described 2 cases of infants presenting with dehydration, one with severe hyponatremia and another with hypernatremia, both complicated with rapid neurological deterioration with contrasting outcome.

Results: Case 1 is a four-month-old boy who presented with E.coli septicemia accompanied by symptoms of acute gastroenteritis. Severe hyponatremia was rapidly corrected within 24 hours. He developed neurological manifestation after 3 days. MRI brain showed abnormal changes in basal ganglia, thalamic and brainstem region. Following treatment with intravenous immunoglobulin and other supportive measures, he made good recovery and regained most of his neurological functions. Case 2 is a 13-month-old boy with underlying global developmental delay presented with severe hypernatremic dehydration which was successfully corrected within 24 hours. He later deteriorated with seizures, encephalopathy and cardiorespiratory arrest. CT brain showed cerebral oedema as well as basal ganglia hypodensities suggestive of extrapontine myelinosis. He was treated with intravenous mannitol, immunoglobulin and methylprednisolone, however continued to deteriorate and succumbed to death.

Conclusion: ODS can occur in extreme fluctuation of sodium concentration. It can lead to mortality and often results in significant neurological sequelae. However full recovery is still possible. There is no proven effective treatment. Cautious correction of sodium concentration in cases of severe hyponatremia and hypernatremia, as well as awareness of the condition are essential for prevention and early detection.
Awareness of Autism Spectrum Disorder Among Healthcare Workers

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Introduction: Autism spectrum disorder (ASD) is a lifelong neurodevelopment disorder that has a great impact on the affected children and their family members. Healthcare personnels are expected to have adequate knowledge as early recognition and intervention carry a better prognosis for these children.

Methods: This is a cross-sectional study to assess awareness among healthcare workers about ASD. We assessed the general knowledge of doctors and occupational therapists and their personal working experience with regards to ASD using a self-administered questionnaire.

Results: Out of 76 participants, 55% are doctors and 45% are occupational therapists. 78-80% of them know that ASD can be reliably diagnosed before 5 years of age, screening tool for ASD and sensory processing problems are commonly associated with ASD. 41% of the respondents thought ASD can be cured and 60% of them couldn’t list down 3 core features of ASD. In term of personal practice, 28% of the respondents are not aware about evidence-based therapy for ASD and 70% of them considered gluten free casein free (GFCF) diet as a recommended treatment for ASD. Only 21% of the respondents felt they had adequate training about ASD and less than 50% were comfortable working with family and children with ASD. Most of the allied health professionals were comfortable in providing therapy for children with ASD but most doctors were uncomfortable in making a diagnosis of ASD. Less than 30% of participants see improvement in their patients being treated for ASD six months following diagnosis.

Conclusion: Our findings showed that less than half of our participants had optimal knowledge about ASD and felt inadequate in training or exposure to ASD. Therefore, more training among healthcare workers is necessary to improve the care of children with ASD.

An Unusual Case of Cerebral Demyelination and Bilateral Optic Neuritis in an Infant with Suppurative Tuberculous (TB) Lymphadenitis

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Background: Cerebral demyelination and optic neuritis are often seen in children with acute disseminated encephalomyelitis (ADEM) following various infections and immunisations. We report a rare association between ADEM and tuberculous lymphadenitis in an infant.

Case Report: A ten-month-old girl initially presented with a left axillary lymph node swelling and an erythematous lace-like rash over her cheeks and trunk from 7 months old. She then developed acute encephalopathy, bilateral nystagmus, right hemiparesis and left facial palsy following an upper respiratory tract infection at 8 months of age. Ultrasound studies documented suppurative left axillary lymphadenitis and moderate hepatomegaly. Her electroencephalogram showed an encephalopathic process and visual evoked response study was grossly abnormal. Her MRI brain showed symmetrical hyperintensities on T2-weighted imaging in the midbrain, pons and bilateral cerebellar peduncles. She was treated presumptively as post-infectious cerebral demyelination with intravenous antibiotics, methylprednisolone and immunoglobulin. Left axillary lymph node excision biopsy detected Mycobacterium tuberculosis (Gene Expert test) that prompted initiation of antituberculous therapy. Her chest X-ray and cerebrospinal fluid examinations for tuberculosis are normal. She did not have any positive tuberculosis contact. She started to show significant recovery after two weeks. She is also investigated for primary immunodeficiencies.

Conclusion: This case illustrates a possible post or para-infectious cerebral demyelination and bilateral optic neuritis related to the suppurative TB lymphadenitis.
Starry Eyes: Neuro-Ophthalmological Manifestation of Cat-Scratch Disease.

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Background: Cat-scratch disease is a condition attributed to an infection caused by Bartonella henselae. It is a self-limiting condition characterized by fever, lymphadenopathy and less often central nervous system or ocular involvement. Cat-scratch disease related neuroretinitis is a relatively unusual pathology.

Case Report: We highlight a case of a 9 year old girl who presented with aseptic meningitis and raised intracranial pressure with acute bilateral visual loss. Best corrected vision was light perception bilaterally and fundus examination showed bilateral optic disc edema and macular star exudates. Contrast CT as well as MRI brain showed no space occupying lesion or optic nerve enhancement. Lumbar puncture revealed an opening pressure of 30cmH20, with clear cerebrospinal fluid, normal biochemistry and cytology. Serology for Bartonella henselae was positive. She responded dramatically to IV Methylprednisolone, tapering doses of steroids and a 6 weeks course of oral antibiotics.

This case illustrates the importance of identifying clinical red flags that require careful diagnostic assessment to rule out other possible etiology.

Isolated Broca’s Aphasia, Novel Presentation of a Startling Disease: anti-NMDA Receptor Encephalitis.

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Background: Anti-N-methyl D-aspartate receptor (anti-NMDAR) encephalitis, is a well recognized disease entity in the pediatric population. It is characterized by a prodromal phase of unspecified viral illness with fever followed by seizures, altered consciousness, movement disorders and psychiatric features.

Case Report: We report a case of 5-year-old girl who presented with focal seizures which progressed to isolated Broca’s aphasia. Briefly she presented with right focal seizures with secondary generalization and status epilepticus. Three days later she developed dysarthria, oro-buccal dyskinesia and quickly progressed to isolated expressive aphasia. Anti-NMDAR antibodies were positive in the CSF confirming anti-NMDA receptor encephalitis. She responded to aggressive immunotherapy with methylprednisolone, immunoglobulin and cyclophosphamide. At present, she has fully recovered her expressive language skills.

Conclusion: This case elucidates the importance of recognizing the broad clinical spectrum of anti-NMDA receptor encephalitis, as early treatment will enhance better outcome.
Ancient Schwannoma masquerading as Muscular dystrophy in a paediatric patient: a case report

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(Affiliations not provided)

Schwannoma is a relatively common benign tumour; however, ancient schwannoma is an uncommon pathology, characterised by degenerative changes. Due to its indolent behaviour and benign course, the diagnosis of schwannoma is always a challenge. In this report, we present a rare case of conus medullaris ancient schwannoma in a child without neurofibromatosis, which was initially treated for muscular dystrophy.

A 17-year-old Malay male presented with progressive bilateral lower limb weakness for four years. His physical examination showed kyphoscoliosis with muscle strength decline in both lower limbs. The rest of the neurological examination was normal and a muscle biopsy was consistent with muscular dystrophy.

However, he developed progressively worsening back and bilateral lower limb pain requiring multiple analgesics. His kyphoscoliosis, which occurred rather early in the context of muscular dystrophy, with severe pain prompted us to seek a second opinion for his muscle biopsy, which was reported to be normal by a neuropathologist. A magnetic resonance imaging (MRI) scan of the lumbosacral spine revealed an intradural extramedullary mass of the thoracolumbar spine from T10 to L2 and this child underwent a T12 – L2 laminectomy with tumour resection.

The histopathological findings of the tumor were compatible with those of an ancient schwannoma. The patient is currently undergoing rehabilitation. We believe that a high index of suspicion is needed to diagnose schwannoma, as complete excision is possible, thus affecting a cure.

Case report on Wilson’s disease

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Wilson’s disease is a rare metabolic disorder involving copper metabolism which may present with hepatic, neurological and psychiatric manifestations. Progressive hepato-ventricular degeneration occurs more frequently in male during adolescence.

We report a case of Wilson’s disease, presented with neurological manifestations without hepatic involvement. GM, 12 years old boy, born to non-consanguinous parents, presented with 6 weeks history of progressive right sided weakness, unsteady gait with clumsiness. There was also difficulty in speech and swallowing. His handwriting changed and he was slow to respond in class, with deterioration in schoolwork. At presentation, he was alert, cooperative and understands simple commands but there was severe dysarthria. There was generalized dystonia with rigidity, lack of motor coordination and ataxic gait.

There was no jaundice, hepatosplenomegaly, or any stigmata of chronic liver disease. Slit lamp examination of eyes revealed bilateral Kayser-Fleischer rings and sunflower cataract. Serum ceruloplasmin level was 0.04 g/L (0.22-0.58). 24 hours urine copper excretion was 121.57 mcg/24H (4.00-57.15). Diagnosis of Wilson’s disease was made based on his neurological presentations with KF rings, low serum ceruloplasmin and raised 24H urine copper. He was started with D-Penicillamine and supplemental pyridoxine. Diet deficient in copper was introduced. However, D-penicillamine was discontinued as he developed cutaneous eruptions and lupus-like syndrome. Antipsychotic drugs were added later due to newly evolved neuropsychiatric manifestations. He became bedridden because of progressive dystonia and increasing difficulty in controlling movements. In conclusion neurological features may be the presenting manifestation of Wilson’s disease even in the absence of clinical evidence of hepatic involvement. A diagnosis of Wilson’s disease should be considered in the evaluation of child presenting with extrapyramidal neurological symptoms.
Traumatic Brain Injury in Children: A 3 year Audit on the first 24 hours of Neuro-protection at Hospital Melaka and its Outcomes

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Traumatic brain injury in children is a devastating cause of mortality and morbidity. Numerous studies had shown improved outcome with good initial care during the first few hours.

Objectives: To assess adherence to key ICU indicators for neuro-protection based on the latest 2012 Guidelines for Management of Severe Traumatic Brain Injury in Infants, Children and Adolescents by Brain Trauma Foundation. To determine the neurological outcome of the patients discharged from the hospital according to the King’s Outcome Scale for Childhood Head Injury (KOSCHI). Method: A retrospective study of children admitted to PICU and GICU of Hospital Melaka from January 2014 till April 2017 with traumatic brain injuries who required ventilation and cerebral protection with no underlying neurological diseases. Children aged one month to 18 years of age were included in the study.

Data was collected using a standardized form measuring indicators at admission at referral unit/centre; then at intervals of every 4 hour after admission to PICU/GICU for the first 24 hours. Indicators measured include mean arterial pressure for age; oxygen saturation; partial arterial oxygen; partial carbon dioxide; temperature control; usage of hyperosmolar therapy; and prophylactic anti-epileptics. Results: The baseline mean adherence rate was 60%. Only 69% (18/26) achieved MAP for age; 61% (16/26) maintained normo-thermia; 72% (19/26) had paCO₂ more than 30mmHg. Prophylactic anti-epileptics were not commonly used (only 15.4%; 4/26) and hyperosmolar therapy was only used in 65% of patients. Adherence to avoiding hypoxia was achieved (97%). There were 26.9% deaths and 38.5% with severe disability (KOSCHI 2 and 3). Discussion: Standardized national TBI pathways need to be formulated and educated to all managing these children. There is a need and urgency to aggressively correct/ adhere to the key targets as evidence based guidelines had demonstrated association of adherence and improved discharge survival.

How to clinically differentiate paediatric arterial ischaemic stroke from its mimics?

C. M. Teh, Y. Y. Neo, V. Ganesan, H. I. Muhammad Ismail

Introduction: It is challenging to diagnose arterial ischaemic stroke (AIS) in children due to its diverse clinical manifestations and wide differential diagnoses. Acute focal neurological deficit is the commonest presentation of paediatric AIS but not uncommonly seen in its mimics too. Rapid clinical identification of possible stroke is paramount to facilitate early diagnostic neuro-imaging and timely therapeutic measures.

Aims: This study aimed to evaluate the differential diagnoses of acute focal neurological deficits in children and to identify the differentiating clinical features between paediatric AIS and its mimics.

Methods: This retrospective analytical study reviewed all children (<15years) with acute focal neurological deficits, referred to paediatric neurology unit, Hospital Pulau Pinang, from June 2014 to March 2017.

Results: Seventy two patients (61% male; mean age-7.3 years, SD: 3.9) were included in the study. Sixteen (22%) patients were diagnosed with AIS. Other important aetiologies encompassed acquired demyelinating disorder (22%), peripheral nervous system disorder (14%) and CNS infection (11%). Metabolic disorder, posterior reversible encephalopathy syndrome (PRES), immune-mediated encephalitis and conversion disorder were identified in ~5% of them each. The commonest focal deficits were focal weakness (44%) followed by gait difficulty / unsteadiness (40%), speech disturbance (22%) and visual disturbance (15%). About one-third of them had seizures and altered mental status respectively. Sudden onset (within minutes / hours) (p=0.002; OR: 10.7, 95% CI 2.4-47.8), focal weakness (p=0.041; OR: 5, 95% CI 1.1-23.5) and normal mental status (p=0.043; OR: 6.5, 95% 1.1-27.2) increased odds of AIS diagnosis.

Conclusion: There is wide spectrum of aetiologies for acute focal neurological deficits in children while AIS remains an important consideration. Motor dysfunction is the commonest deficit. Children with sudden onset of focal weakness and normal mental status have higher likelihood of AIS. Keywords: paediatric, arterial ischaemic stroke, mimics, aetiologies, differentiating clinical features.
Indonesian Dyslexia Early Identification System

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Dyslexia is a specific learning difficulty in language areas such as the language used for oral, written and social communication. Dyslexia causes difficulties in reading, writing, spelling and executive function. Therefore dyslexia causes difficulty in reading, further it will affect not only academic success but also self-esteem and social-emotional development.

Dyslexia cannot be cured, but the impact can be significantly reduced if identified and well intervened as early as possible (International Dyslexia Association, 2013).

Problems in Indonesia are minimal and unequal dyslexia awareness, huge population that brings high number of dyslexic children, very few dyslexic experts, time and cost inefficient to get assessment and intervention from reliable centre, all led to un-intervened cases that prone to poor long-term outcome.

Therefore a valid and reliable yet easily accessed tool for identifying risk of dyslexia in pre-school aged is mandatory. This study proposed dyslexia early identification system for Indonesian which can be used by everyone and applied for child as early as 5 to 7 years old at anywhere and anytime, and generate report that is in line with Indonesian language and culture.

Screening method is by filling questionnaire - consists of 21 questions for 6-7 year-old child and 17 questions for 5-6 year-old ones - by parents or caregiver of the child. It could be downloaded online from certain website using personal computer or smart phone.

Result would be “Risk” or “No Risk” of dyslexia. The aspects examined in the tool are as follows: children and parents backgrounds, academic abilities (language used for oral, written and social communication), and non-academic abilities (sequences and direction identification, capacity of working memory, and organization ability).

Processes in designing the instruments and the scoring methods were determining the objective of instrument, arranging parameters, writing questionnaire, identifying scoring technique, determining scoring guidelines, piloting instrument, and evaluating.

The total sensitivity was 0.805, the specificity was 0.929, and the accuracy was 84% and the area under Receiver Operating Characteristics (ROC) was 0.867 - meaning it has good accuracy.
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