

Presents

THE TRAUMATIC BRAIN INJURY REVOLUTION: Evidence to Transform Diagnosis

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THE TRAUMATIC BRAIN INJURY REVOLUTION

Evidence to Transform Diagnosis

The program for this 4th Re:Cognition Health Brain Injury this online training addresses the continued rapid scientific progress underpinning the development of new and increasingly sophisticated biomarkers for the diagnosis of traumatic brain injury. Discussion includes the elucidation of emerging characteristic neurological and neuro-psychiatric symptoms and syndromes, which correlate with the new biomarkers for brain injury.

The spectrum of brain injury is reviewed, with particular focus on the complex entity known as "mild" traumatic brain injury (mTBI) due to a single episode of head trauma, repetitive brain injury due to contact sports, PTSD and chronic traumatic encephalopathy leading to dementia.

Diagnostic techniques discussed in detail include MRI imaging with diffusor tensor imaging (DTI) and other functional imaging techniques, PET amyloid and tau imaging, genotyping and Megencephalography (MEG), plus new plasma and CSF analyses. These techniques provide objective evidence of microscopic axonal and microvascular brain injury, not detected on conventional imaging or laboratory testing.

The utility of genetic and chemical biomarkers to predict risk of longer term brain injury in certain individuals is explored.

Discussion of the implications of providing objective evidence of microscopic traumatic brain injury is reviewed, in the context of emerging clinical applications and therapeutic interventions.

New treatments and therapies including Spike-timing-dependent plasticity (STDP), aimed at specific and accurate confirmed diagnosis of brain injury and their evidence will be explored.

The training concludes with insights into the implications for medicolegal interrogation of brain injury cases in court, in the context of these rapidly accepted scientific and clinical advances. The medical implications for effective treatments, is discussed, especially when these treatments can be delivered, much earlier and when results of intervention can be monitored with objective evidence from new biomarkers.

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ONLINE PROGRAMME

Sponsor's welcome

Stuart Brazington, Partner, RWK Goodman

Session 1 - 50 minutes

mTBI revolutionised by Re:Cognition of the evidence

The Traumatic Brain Injury Revolution continues to gather pace...

It is now eight years since Re:Cognition Health's first conference in this series. During this time we have witnessed very significant advances in the understanding and detection of structural brain injury. Dr MacSweeney provides an introductory review of the increasingly sophisticated neuro-imaging techniques, including new biomarkers, designed to interpret and objectively measure brain injury. The application of these scientific and technical advances in neuro-imaging enable a greater understanding of the brain, particularly in the context of mTBI (mild traumatic brain injury) and PTSD in clinical and medico-legal practice, now and in the near future.

Dr Emer MacSweeney, Founder & CEO Re:Cognition Health & Consultant Neuroradiologist

Session 2 - 42 minutes

Clinical symptoms in mTBI: From the wings to centre stage

Careful, informed analysis of clinical symptoms remains the centrepiece of clinical medicine. The clinical utility of this approach in the assessment of patients following head injury has been a polarised clinical debate for over a century. The updated data is clear, clinical assessment remains a powerful diagnostic tool post head injury and so it should return to its typical place of 'centre stage' of patient assessment. This talk will present this updated data, illustrating the key findings, their clinical importance and how to deploy it.

Dr Steve Alder, Consultant Neurologist, Director of Neurological Services, Re:Cognition Health

Session 3 - 35 minutes

Neuropsychiatric Interpretations of mTBI: The brain, the mind, or the bind between?

Dr Julius Bourke, Hon.Senior Lecturer Neurophysiology and Clinical Psychiatry, (QM University of London) & Consultant Neuropsychiatrist, Re:Cognition Health

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Session 4 - 47 minutes

Neuropsychology in mTBI: Past, present and future

Neuropsychology's role in assessing and tracking the effects of mild traumatic brain injury (mTBI) was launched with the 1974 Lancet publication by Gronwall & Wrightson titled "Delayed recovery of intellectual function after minor head injury." Traditional neuropsychological methods have provided considerable descriptive information about the cognitive, emotional, behavioural and physical after effects of mTBI, but these methods have not kept pace with advanced multi-modal neuroimaging techniques, image analysis methods, especially those involved in network neuroscience and neuropathological developments associated with having sustained a mTBI. This lecture will review the historical role of neuropsychology in research as well as clinical settings, but will emphasize how neuropsychological assessment methods will need to change in the future if they are going to provide any unique information to better understand the long-term effects of mTBI.

Erin D. Bigler, Emeritus Professor of Neuroscience & Psychology, Brigham Young University, Adjunct Professor of Neurology & Psychiatry, University of Utah and Volunteer Clinical Professor of Neurology, University of California-Davis

Session 5 - 45 minutes

At the edge of neuroimaging in mTBI and PTSD: use of magnetoencephalography and emerging technologies

In this talk, Professor Dunkley will discuss their ongoing work to uncover the neurophysiological bases of mild traumatic brain injuries (or concussion) and posttraumatic stress disorder. For this, they have been primarily been using magnetoencephalography, an advanced brain imaging technique that measures neural activity and dynamics, and combining this with AI-ML algorithms to accurately identify the biological signatures of these disorders. Using this powerful technique, they are beginning to uncover the mechanism of injury, and identify targets for emerging interventions, including neuromodulation and psychedelic medicine.

Benjamin T. Dunkley, Scientist, Diagnostic Imaging, Neurosciences & Mental Health, Hospital for Sick Children & Assistant Professor, Psychology & Medical Imaging, University of Toronto, Chief Scientific Officer, MYndspan Ltd

Session 6 - 43 minutes

Diffusion Tensor Imaging (DTI) in TBI: from the lab to clinic

DTI acquisition and analysis methods have developed over time and have found a strong place within academic group level research. The translation into the clinic has been somewhat slower. Recent work on application in moderate-severe TBI patients, paediatrics, Rugby players and how insights on an individual level can be derived will be presented.

Dr Niall Bourke, Research Fellow, King's College London and Director, Metacognition Ltd

Session 7 - 43 minutes

Hard lessons learnt in the courtroom

This presentation will analyse how judicial scrutiny sharpens the methodology employed by clinicians engaging in medico-legal work.

Marcus Grant, Barrister Personal Injury, Clinical Negligence, Temple Garden Chambers

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Dr Emer MacSweeney

BSc (Hons), MRCP, FRCR, CEO & Consultant Neuroradiologist, Re:Cognition Health

Dr MacSweeney is CEO and Medical Director of award-winning brain and mind clinic Re:Cognition Health. She graduated at the University of London and underwent postgraduate training in medicine at the London postgraduate hospitals. Dr MacSweeney trained in radiology at Hammersmith Hospital and neuroradiology at the National Hospital Queen Square. She was appointed as a Consultant Neuroradiologist and later Director of Neuroradiology at Atkinson Morley's Hospital, St George's Healthcare Trust, specialising in interventional vascular neuroradiology.

Dr MacSweeney co-founded Re:Cognition Health in 2011 to provide a specialist service in the neurological assessment and imaging of cognitive impairment, neurovascular diseases and traumatic brain injury, including the provision for medico-legal expert opinion. The Re:Cognition Health Clinics in London, Birmingham, Essex, Surrey and Plymouth and Washington DC are also major centres for international trials of disease-modifying and new symptomatic drugs for Alzheimer's disease and other neurological conditions. Re:Cognition Health's expertise has been recognised with numerous prestigious accolades including:

Global Awards Winner 2022, Cognitive Health Expert of the Year;

Lawyer International Legal 100 Winner 2021 Cognitive Health Experts of the Year;

Leaders in Law, Global Awards 2021 Winner,

ACQ5 Country Awards 2020, Winner Niche Legal Support Advisory of the Year

ACQ5 Country Awards 2020 UK Best Practice Operator Of The Year (Cognitive Healthcare Services)

EY Entrepreneur of the Year Winner- Societal Impact 2019 (London and South England)

Growing Business Awards- Positive Impact Winner 2019,

CEO Today Magazine - Healthcare Awards Winner 2019,

LaingBuisson Healthcare Awards for Excellence (finalist or winner; 2012, 2013, 2015, 2018, 2019, 2020), Health Investor Awards 2020 finalist,

KPMG Entrepreneur of the Year Winner 2016, The Elipse Personal Injury Award Winner 2015.

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Dr Steve Alder

Consultant Neurologist and Clinical Director for Neurological Services at Re:Cognition Health

Dr Alder is a Consultant Neurologist. He offers both clinical and medicolegal neurological services. He is also the local Primary Investigator on several global Phase 3 studies relating to Parkinson's Disease and Clinical Director for neurological services at Re:Cognition Health.

Dr Alder's main clinical focus is traumatic brain injury (TBI), and functional neurological disorders (FND). With respect to TBI, Dr Alder provides a clinical and medicolegal services for the assessment of patients with TBI across the whole spectrum of injury severity i.e moderate - severe to mild; and across diverse aetiologies of TBI i.e. civilian, sport's and military.

Recognition Health, under Dr Alder's clinical leadership, are completing a 4 years collaboration with the Aston Brain Centre looking at the clinical utility of Magnetoencephalography (MEG) in TBI, especially mTBI where MRI including DTI is normal. This has been a successful collaboration which will lead to the development of several improved diagnostic tools for mild TBI. The collaboration has also led to further projects across a wide spectrum of TBI aetiologies, engaging new partnerships with Nottingham University, Toronto Sick kids, and several commercial organisations.

Since 2020, Dr Alder and Recognition Health have developed a new primary academic collaboration with King's College Hospital. This joint work is exploring two complementary areas. Firstly, the utility of more sophisticated MRI sequences to further enhance diagnostic and pathophysiological insights into mild TBI, especially sports related TBI. Secondly, we are exploring how deployment of state-of-the-art neuro-computational techniques can reveal the mechanisms underlying how structural injury from TBI creates the clinical profiles seen in these conditions. It is hoped this will lead to improved treatment strategies.

With respect to Functional Neurological Disorder Dr Alder has long standing interest and is a founding member of the FND Society. Dr Alder offers a clinical and medicolegal service for the assessment of patients with suspected FND. Dr Alder has a long-standing collaboration with Dr Leo Russell and Prof Allan Abbass, who are leading practitioners and researchers in a treatment modality for FND termed Intensive short-term dynamic psychotherapy (ISTDP). ISTDP is modality with a strong neuroscience rationale and empirical evidence base supporting its effectiveness. Dr Russell has recently joined Recognition Health and is working with Dr Alder to enhance our clinical offering for this patient group and extend research into the mechanisms by which this treatment modality creates improvements for patients.

Recent publications:

Alder, S and MacSweeney, E. Recent developments in Neuro-Imaging for Traumatic Brain Injury. Journal of Personal Injury Law (in Press)

Russell, L., Abbass, A., Alder, S A Review of the Treatment of Functional Neurological Disorder with Intensive Short-term Dynamic Psychotherapy (ISTDP). Archives of Medical Psychology (submitted)

Alder S, Post Traumatic Pain – A Neurological Perspective. Pain News (in press)

Bigler & Alder Traumatic Brain Injury, Neural Networks and Neuroimaging: Practical Approaches for the Neurorehabilitation Clinician. NeuroRehabilitation (in press)

Bigler, E. D., & Alder, S. (2021). Neuroimaging in functional outcome. N.Y.: Springer.

Hall M, Alder S and Furlong P. Resting state and task induced oscillations in chronic post-concussion syndrome: A pilot study. 21st International Conference on Biomagnetism (BIOMAG), Philadelphia, PA, USA, August 26-30, 2018

Russell, L., Abbass, A., Alder, S. and Noborsky, R., Applying intensive short-term dynamic psychotherapy to the treatment of medically unexplained symptoms: integrating theories of cause and theories of change, Archives of Medical Psychology, August 2017 (Volume 9, Issue 1), 1-24.

Russell, L.A., Abbass, A.A., Alder, S.J., A pilot study of reduction in healthcare costs following the application of intensive short-term dynamic psychotherapy for psychogenic nonepileptic seizures, Epilepsy & Behaviour 63 (2016) 17-19.

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Dr Julius Bourke

MBBS, MRCPsych, MD(Res), Hon.Senior Lecturer Neurophysiology and Clinical Psychiatry, (QM University of London) & Consultant Neuropsychiatrist, Re:Cognition Health

Dr Julius Bourke is a consultant neuropsychiatrist and liaison psychiatrist and has a special interest in the assessment and management of neuropsychiatric disorders such as Parkinson's disease, brain injury and "concussion", and the treatment of depression, anxiety, PTSD, OCD and stress-related conditions, particularly those that appear treatment-resistant. He is an expert in the diagnosis and management of functional somatic and functional neurological disorders, including chronic fatigue and chronic pain syndromes, which lie at the interface between general medicine, surgery, neurology and psychiatry.

He has frequently instructed in the provision of expert medico-legal opinions on psychiatric disorders, head injury and mTBI. Dr Bourke is an Honorary Clinical Senior Lecturer in Neurophysiology and Clinical Psychiatry at Queen Mary University London. His specialist research interests are in the neurophysiology of chronic pain, somatic syndromes and stress-related disorders, for which he has been awarded a post-graduate doctoral degree in medicine by the University of London. He has given numerous talks and presentations on both a national and an international basis and has been widely published on an array of field-related topics. He has co-authored a textbook on psychiatry and has contributed chapters to numerous others, including world-leading textbooks on internal medicine and vestibular disorders, in addition to others on chronic pain, fatigue and neuropsychiatric disorders.



Erin D. Bigler

Ph.D., Emeritus Professor of Neuroscience & Psychology, Brigham Young University, Adjunct Professor of Neurology & Psychiatry, University of Utah and Volunteer Clinical Professor of Neurology, University of California-Davis

Erin D. Bigler is an Emeritus Professor of Psychology and Neuroscience from Brigham Young University (BYU), who served as Chair of the Psychology Department from 1996 through 2002. In 1990, he established the Brain Imaging and Behavior Laboratory at BYU, which studies the role of neuroimaging variables in cognitive and neurobehavioral disorders such as traumatic brain injuries, neurodevelopmental

disorders including autism and learning disabilities, anoxic brain injuries and other acquired injuries of the brain as well as aging and Alzheimer's disease.

He is an Adjunct Professor of Psychiatry at the University of Utah and a Volunteer Professor of Neurology at the University of California-Davis. In 2013, he was the Founding Director of BYU's Magnetic Resonance Imaging Research Facility.

Dr. Bigler has been practicing since 1975 and is a Diplomate in clinical neuropsychology from the American Board of Professional Psychology.

- Past President of the International Neuropsychological Society (2014-2015).
- Past President of the National Academy of Neuropsychology (1989-1990).
- Written several neuropsychological tests, authored and/or edited 11 textbooks and published over 300 peer-reviewed articles.
- One of the founding associate editors for two journals in the field — the Journal of the International Neuropsychological Society (JINS) and Brain Imaging and Behavior.

Awards

- 1999, he received the Distinguished Clinical Neuropsychologist Award from the National Academy of Neuropsychology, where he was President of that organization from 1989-1990.
- In 1999, he was also the recipient of the Karl G. Maeser Distinguished Faculty Lecturer Award, BYU's top faculty honor.

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Benjamin T. Dunkley BSc MRes PhD

Scientist, Diagnostic Imaging, Neurosciences & Mental Health, Hospital for Sick Children
AND Assistant Professor, Psychology & Medical Imaging, University of Toronto, Chief
Scientific Officer, MYndspan Ltd

Dr. Dunkley is a Scientist in Diagnostic Imaging and the Neurosciences & Mental Health Program at the Hospital for Sick Children (SickKids), and Assistant Professor in the Institute of Medical Science and Department of Psychology at the University of Toronto. He studied for his PhD at Cardiff University, UK, and he completed his postdoctoral training at SickKids. He is a cognitive neuroscientist who studies neural circuits in health and disease using non-invasive brain imaging. His work mostly focuses on neurophysiology and systems neuroscience with an emerging research focus on the development of AI and neuromodulation for use in precision medicine. He is particularly interested in the impact of trauma on neural systems, and how 'invisible' injuries can be detected and eventually treated using advanced neuroimaging, neurostimulation and emerging therapeutic approaches. He has worked with Defence Research and Development Canada, the Canadian Armed Forces, Canadian Institute of Military and Veteran Health, and Department of National Defence for the last 8 years, studying the effects of PTSD, operational stress, and mild traumatic brain injuries on the mental health status, neurocognitive functioning, and brain health of those facing these challenges.



Dr Niall Bourke

Research Fellow, King's College London and Director, Metacognition Ltd

Niall completed an undergraduate psychology degree in Dublin developing a strong interest in traumatic brain injury (TBI). After working as a rehabilitation assistant at Acquired Brain Injury Ireland he moved to London, completing a MSc in neuroimaging at King's College London. Following this, he got a position with Prof. Sharp at Imperial College London working on a clinical trial exploring disruption to the dopaminergic system following TBI. This work tied in with outpatient clinical practice provided excellent translational research experience leading to a PhD investigating social cognitive impairments following TBI. Since completing a PhD, he has focused on paediatric brain development and clinical outcomes following a paediatric brain injury. He is now primarily based at King's College London working with a consortium including specialist neuroimaging centres including UCL, Cardiff, Harvard, Lund, UBC, and numerous clinical partner sites in low and middle income countries in Africa and Southern Asia. The aim of this project is to assess ultra-low field MRI in the young in settings where access to neuroimaging is more challenging. This team is working in collaboration with Hyperfine, the pioneers of portable, point-of-care brain MRI to improve the acquisition, analysis, and delineation of brain pathology.



Marcus Grant

Barrister, Temple Garden Chambers

Marcus is a leading barrister in TBI litigation, having appeared in eight of the leading cases over the last 15 years. He has been ranked as a Star Individual for personal injury litigation by Chambers & Partners in each of the last 5 years.

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