Schulich MEDICINE & DENTISTRY

Western

THE DEPARTMENT OF CLINICAL NEUROLOGICAL SCIENCES, WESTERN UNIVERSITY PRESENTS

2026 CNS RESEARCH AND EDUCATION INNOVATION DAY

TUESDAY, JUNE 9, 2026

8:00 AM TO 4:00 PM

KING'S UNIVERSITY COLLEGE, LONDON, ONTARIO

WELCOME

On behalf of Department of Clinical Neurological Sciences, the CNS Research Committee and CNS Education Committee, I am pleased to welcome you to the 2026 CNS Research and Education Innovation Day on Tuesday, June 9th at King's University College in London Ontario.

Research Day was established in 2004 with the goal of promoting research, collaboration and continuing education within the Department, institution and beyond. Our event allows members of the Department to share their passion for research and present their current research. Attendees have the opportunity to learn about clinical and basic research advances that push forward topics in the neurosciences, specifically in neurology and neurosurgery. This year, we also highlight educational innovation, recognizing how teaching excellence and curriculum design drive our community forward. By uniting research and education, we celebrate the full spectrum of academic achievement that defines our Department.

We are proud to feature over 55 abstracts submitted by clinical fellows, post-graduate students, residents, medical students and other undergraduate students. We have planned an exciting and interactive day that exemplifies the great research within our Department. The event will include a blend of oral and poster presentations, Q&A periods and our Keynote Address by Dr. Christopher Watling.

I would like to take a moment to highlight our industry sponsor Surgi-One for their generous contribution. We are very thankful of your continued support of our research initiatives and Department in general. We welcome some of our industry members here today and hope you have a great time.

Lastly, I would like to thank our judges, moderators and administrative support for their commitment to this event. We would like to acknowledge the support from Amanda, Michelle and other King's University staff for their help in planning today's event. A special thank you to Dr. Elizabeth Finger, Director of Research, Dr. Michelle-Lee Jones, Director of Education, the CNS Research Committee and the CNS Education Committee for their design of this year's program, and to Kristie Lau for her incredible planning of today's events.

I hope you have an enjoyable experience and I am looking forward to a great event.

Sincerely,

David A. Steven, MD, MPH, FRCSC, FACS
Professor of Neurosurgery
Richard and Beryl Ivey Chair
Department of Clinical Neurological Sciences

EVENT ITINERARY

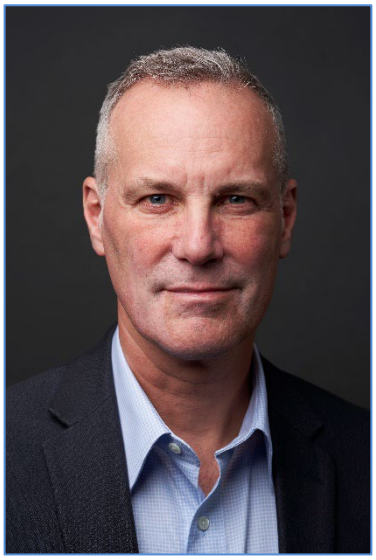
8:00 to 8:20 a.m.	**Registration and Continental Breakfast**	**Garron/Spriet Lounge**
8:25 to 8:35 a.m.	**Opening Remarks** *Dr. David Steven, Richard and Beryl Ivey Chair, Department of Clinical Neurological Sciences*	**Kenny Theatre**
8:40 to 9:35 a.m.	**Keynote presentation** *"Finding Your Voice as a Researcher"* Dr. Christopher Watling Professor, University of Western Ontario Chief Executive Officer, Royal College of Physicians and Surgeons of Canada, and Royal College Canada International	**Kenny Theatre**
9:40 to 10:10 a.m.	**Oral Presentation Session #1** *A series of 5-minute presentations.* *Each presenter will be allotted 3 minutes for questions.*	**Kenny Theatre**
10:15 to 11:10 a.m.	**Refreshment Break and Parallel Poster Tours #1** *A series of 3-minute presentations*	**Garron/Spriet Lounge**
11:15 a.m. to 12:40 p.m.	**Oral Presentation Session #2** *A series of 5-minute presentations.* *Each presenter will be allotted 3 minutes for questions.*	**Kenny Theatre**
12:45 to 1:30 p.m.	**Lunch**	**Garron/Spriet Lounge**
1:35 to 2:50 p.m.	**Oral Presentation Session #3** *A series of 5-minute presentations.* *Each presenter will be allotted 3 minutes for questions.*	**Kenny Theatre**

EVENT ITINERARY *(continued)*

2:55 to 3:50 p.m.	**Refreshment Break and Parallel Poster Tours #2** *A series of 3-minute presentations*	**Garron/Spriet Lounge**
3:55 to 4:05 p.m.	**Closing Remarks and Awards** *Dr. Elizabeth Finger, Research Director, Department of Clinical Neurological Sciences* *Dr. Michelle-Lee Jones, Education Director, Department of Clinical Neurological Sciences*	**Kenny Theatre**

KEYNOTE ADDRESS

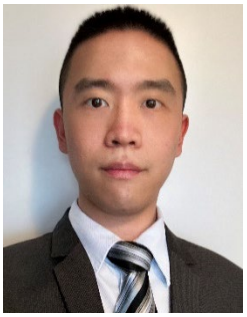
DR. CHRISTOPHER WATLING



Dr. Christopher Watling, MD, MMedED, PhD, FRCPC is the Chief Executive Officer of the Royal College of Physicians and Surgeons of Canada, and of Royal College Canada International. Prior to starting as CEO in July 2024, he had a 25-year academic career at Western University in London, Canada, where he held several leadership positions including Associate Dean for Postgraduate Medical Education, Vice Dean for Education Scholarship and Strategy, and Director of the Centre for Education Research and Innovation. A neurologist by clinical training, he holds a Masters in Medical Education from the University of Dundee and a PhD in Health Professions Education from Maastricht University. His research explores how and why feedback influences learning, and how medicine's professional culture shapes its educational practices.

JUDGES

In addition to having our esteemed Keynote Dr. Christopher Watling judge the presentations, we are thrilled to announce our 2026 judges;



DR. YIU-CHIA CHANG

Dr. Yiu-Chia Chang received his MD from the University of Ottawa. He subsequently completed his neurology residency and neuromuscular fellowship at Western University. He joined the Department of Clinical Neurological Sciences in 2025, with a clinical practice focused on myopathies and immune-mediated neuromuscular disorders. Dr. Chang is also passionate about medical education. He is currently pursuing a master's degree in Health Professions Education at Maastricht University. In addition, he serves as the UME CNS lead for the neurology teaching at Western University. Dr. Chang's research interests include nerve ultrasound and its application to chronic inflammatory neuropathies, as well as the diagnostic utility and performance of antibody testing in various neurological conditions. He also conducts medical education research aimed at improving teaching and learning during EMG rotations.

DR. BEYZA CIFTCI

Dr. Beyza Ciftci is a Clinician Researcher and an Assistant Professor of Neurology at the University of Western Ontario specializing in Multiple Sclerosis and Neuroinflammatory Disorders. Dr. Ciftci completed her neurology residency at the University of Health Sciences and medical school at Istanbul University Cerrahpasa Medical School, in Istanbul, Turkey, and her clinical fellowship in Multiple Sclerosis and Neuroinflammatory Disorders at the University of Toronto, Hospital for Sick Children, Canada. In addition to her clinical training, Dr. Ciftci completed a Master of Science at the University of Toronto studying machine learning and visual outcomes in MS.

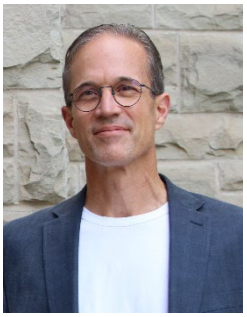
DR. DEEPA DASH

Dr. Deepa Dash is an Assistant Professor and clinical researcher in the Division of Neurology at Western University and a movement disorders neurologist at London Health Sciences Centre. Her research focuses on population-based health research in Parkinson's disease and patient-oriented research across the broader movement disorders field. Her work aims to identify patients' unmet needs and develop

innovative, patient-centered solutions through shared decision-making.

Dr. Dash has also played an active role in the International Parkinson and Movement Disorder Society, contributing to evidence-based medicine reviews for treatments in movement disorders. Most recently, she served as the first author of the Society's task force review on medical treatments for Essential tremor.

She has authored more than 62 peer-reviewed publications and has been extensively involved in national and international research collaborations, grant development, and knowledge translation initiatives.



DR. ROBERT HAMMOND

Born and raised in London, Dr. Hammond received his MD (1987) and his residency training in Neuropathology at Western University (1992). Postdoctoral neuroscience fellowships at the University of California San Diego and the Salk Institute (Dr. Fred Gage) and University of Pittsburgh (Dr. Clayton Wiley) were followed by a return to London in 1995 to join the Departments of Pathology and Clinical Neurological Sciences.

Dr. Hammond has enjoyed research, teaching and administrative roles locally, nationally and abroad. He is Past President of the Canadian Association of Neuropathologists and Professor of Pathology & Laboratory Medicine and Clinical Neurological Sciences at Western University and London Health Sciences Centre.

DR. ALEXANDER KHAW

Dr. Khaw is an Associate Professor at the Department of Clinical Neurosciences, Western University and London Health Sciences Centre. He graduated medical school at the Johannes Gutenberg Universität of Mainz, Germany, and completed residency training at Mannheim University Hospital of Ruprecht Karls Universität of Heidelberg, University of Ulm, and Ernst Moritz Arndt Universität of Greifswald, Germany. His doctoral thesis on the fetal evolution of glycoconjugate patterns in human vertebral column tissues was rewarded magna cum laude at Johannes Gutenberg Universität of Mainz. He completed a clinical research fellowship at the Stroke Centre of the Neurological Institute, Columbia University, New York City. Dr. Khaw was Director of the Stroke Unit and Neuro-IMC, Ultrasound Laboratory and Cerebrovascular Clinic at the University Hospital Greifswald before joining Western University and LHSC.

He has been for 7 years Co-Medical Director and Steering Committee member of the Southwest Ontario Stroke Network, Steering Committee member of the Regional Stroke

Project with the Southwest and Erie St. Claire LHIN to re-organize and continuously improve care provided to stroke patients in the region by evidence-based standards, and member of CorHealth Ontario's Stroke Evaluation and Quality Committee.

Dr. Khaw´s research interests lie in neurovascular medicine and include establishing progressive acute stroke treatment options, acute stroke imaging (esp. perfusion imaging), cerebrovascular diagnostic ultrasound, vascular malformations, intracerebral haemorrhage and the interaction between acute stroke/other cardiovascular disorders and cognitive decline by advanced imaging methods (MRI/PET co-registration).

DR. JOSEPH MEGYESI

Dr. Joseph Megyesi received his MD from Western University in 1985. He then completed a comprehensive surgical internship and a Master's degree in Biochemistry, also at Western University. He did his neurosurgical residency at the University of Alberta in Edmonton, where he also received his PhD degree in Experimental Surgery. As part of his training, Dr. Megyesi completed a fellowship at Harvard University. Dr. Megyesi joined the Clinical Neurological Sciences Department at Western University in 1998 and specializes in neurosurgical oncology. He is chairman of the Scientific Program Committee at the Canadian Neurological Sciences Federation, sits on the Continuing Professional Development Committee at the Royal College of Physicians and Surgeons of Canada and is past-chairman of the board of the Brain Tumour Foundation of Canada. He is currently Professor in the Division of Neurosurgery at Western University.

EVENT SPONSORS

We would like to thank our event sponsor for their contribution to the 2026 CNS Research and Education Innovation Day. We are appreciative of your continued support of this event and our Department. We look forward to future collaboration!

PLEASE NOTE: ABSTRACTS ARE ORGANIZED IN ORDER OF SCHEDULE

ORAL PRESENTATIONS

Session #1

PLAT-1

Surgical residency attrition in Canada - Trainee Perspectives on leaving surgical training

Amirti Vivekanandan, A. Sepulveda, K. Squires, S. Singh, K. MacDougall, A. Harvey, S. Lopushinsky, O. Daodu

Importance: Resident attrition continues to carry consequences for departing trainees, their colleagues, and programs. Although prior studies have examined attrition rates and program level factors, less is known about trainees' personal motivations and decision making processes.

Objective: This study explores the lived experiences of residents who left surgical training.

Design and Participants: This was a national multiphase explanatory-sequential mixed methods study involving trainees who had exited any surgical residency programs across Canada. In phase 1, a survey was distributed to individuals who had left surgical training, capturing demographic characteristics and factors influencing their decision to leave training. In phase 2, semi-structured interviews explored trainee experiences/perspectives. Qualitative data, including free text responses and interview transcripts, were coded and analyzed using phenomenographic methodology to identify recurring themes.

Results: 40 trainees who left surgical training completed the survey, and 13 were interviewed. Six themes emerged from the surveys and interviews: (1) Dysfunctional training culture that undermined belonging and learning; (2) Mismatch between expectations and surgical reality; (3) Work intensity and lifestyle conflict that eroded well being; (4) Insufficient support and supervision leading to increased vulnerability; (5) Stalled skill development diminishing confidence in professional growth; (6) Stigmatization of leaving, with departure ultimately enabling personal and professional renewal.

Conclusions: Attrition was largely driven by perceived workload–well being imbalance and a training culture misaligned with safe, learner centered education. To retain trainees, surgical programs should consider the balance of service and education, strengthen mentorship and normalize conversations about career fit and transition. Addressing these gaps can support trainee development and, ultimately, the surgical workforce.

PLAT-2

Evaluating the Dear MD to Be Podcast as an Equity, Diversity, and Inclusion Resource: A Cross-Sectional Survey Analysis

H. Inibhunu, I. Kherani, C. Osei-Yeboah, M. Bushra, M. Mahendiran, M. Mylopoulos, and M. Law

Importance: Equity-deserving groups are communities marginalized from institutional power by oppressive forces. The Dear MD to Be is a medical-student-led podcast created to interview physicians of intersectional backgrounds about their institutional experience. This study aimed to evaluate the podcast as a tool for knowledge, mentorship, and psychological safety for equity-deserving listeners.

Methodology: Between February and March 2022, we recruited medical students across all levels of training from English-speaking Canadian medical schools using email listservs and social media. We disseminated a cross-sectional questionnaire assessing demographics, knowledge gained from podcast engagement, attitudes towards podcasts as a tool for mentorship, and psychological/emotional gains from the podcast content. We conducted descriptive and frequency analyses of quantitative data and applied thematic analysis to qualitative data.

Results: Thirty-eight individuals completed the entire survey from all levels of training, with 97% self-identifying with at least one equity-deserving group. 100% agreed that the Dear MD to Be podcast was an accessible form of mentorship; participants appreciated self-pacing mentorship and interacting with many narratives. Listeners gleaned lessons about wellness, advocacy work, allyship, cultural imposter syndrome, and navigating discrimination. Furthermore, most listeners felt represented, empowered, and legitimized by podcast content.

Conclusions and Relevance: Podcasts can serve as a medium for accessible equity-centered mentorship. By disseminating multiple underrepresented narratives in medicine, the Dear MD to Be podcast serves as a source of EDI knowledge while contributing to learner safety.

PLAT-3

A National Quality Assessment of Headache Medicine Fellowship Training Programs in Canada

Jihad Al Kharbooshi

Importance: Headache disorders are among the leading causes of neurological disability worldwide, yet access to subspecialty care remains limited. The quality and consistency of fellowship training in Headache Medicine directly shapes provider preparedness and long-term patient outcomes across Canada.

Objective: To evaluate the structure, strengths, and variability of Headache Medicine fellowship training in Canada from the perspectives of program directors and fellows.

Design and Participants: This mixed-methods quality assessment combined semi-structured interviews with program directors and a structured Qualtrics-based fellow survey. Program directors from five Canadian centers were recruited by convenience sampling and completed one-hour virtual interviews. Current and recent fellows were recruited via email distribution lists. A total of 30 participants were included: 5 program directors and 21 survey respondents (38% current fellows, 62% recent graduates across four training institutions).

Results: Fellows reported high overall satisfaction (mean 4.64/5), strongly endorsing the learning environment and equity of training (both 4.82/5). Procedural adequacy was high for onabotulinumtoxinA and occipital nerve blocks (means 5.80 and 6.00/6), but ultrasound-guided procedures were rarely performed and rated extremely inadequate (mean 1.25/6). Only 27% of fellows were fully funded; lack of funding was perceived to limit academic opportunities (mean 3.55/5). Preparedness for billing was the lowest-rated practice management domain (mean 3.20/5, SD 1.40).

Program director interviews revealed substantial inter-institutional variability in curriculum structure, inpatient exposure, research expectations, and assessment frameworks. Inpatient access, research requirements, and formality of trainee evaluation differed markedly across programs. All directors identified Canadian Headache Society (CHS) funding as systemically inadequate, with stipends falling below institutional minimum salary requirements at several centers. Directors converged on four national priorities: a CHS-led core curriculum with minimum clinical hour standards, inter-center elective rotations, structured onboarding for international fellows, and a formal certification pathway modeled on established Canadian subspecialty frameworks.

Conclusions and Relevance: Canadian Headache Medicine fellowships demonstrate consistently high trainee satisfaction and mentorship quality, but reveal significant variability in inpatient exposure, procedural breadth, research integration, and funding equity. These findings provide an empirical basis for national training reform, and engagement with the CHS to develop standardized benchmarks, sustainable funding mechanisms, and a formal certification framework is recommended to strengthen the headache medicine workforce in Canada.

ORAL PRESENTATIONS

Session #2

PLAT-9

Decoding Cognitive and Oculomotor Signals from Prefrontal Cortex Neural Ensembles During Naturalistic Behavior

M. Abbass, B. Corrigan, R. Johnston, R. Gulli, A. Sachs, J. Lau, J. Martinez-Trujillo

Importance: Understanding how lateral prefrontal cortex (LPFC) neurons encode behaviourally relevant information in naturalistic environments is essential for translating cognitive neuroscience into clinical applications. Such representations may provide a foundation for developing novel brain computer interfaces (BCIs) capable of decoding complex, real-world cognitive states.

Objective(s): To determine how single neurons and neuronal ensembles in the LPFC encode and integrate task-relevant and unconstrained variables during naturalistic behavior, and to assess whether these features can be separated into distinct neural subspaces relevant for decoding applications.

Design and Participants: Two non-human primates were trained to perform a virtual reality associative memory navigation task. Animals freely explored an environment using gaze and joystick control without fixation constraints. A total of 753 neurons were recorded from dorsal and ventral LPFC using multi-electrode arrays. Single-neuron tuning was assessed using multivariate regression, and population-level representations were analyzed using principal component analysis and linear discriminant approaches.

Results: Neuronal activity in the LPFC demonstrated dynamic and mixed selectivity for both task-relevant features (context, goal, and target side) and unconstrained variables such as eye position. Ventral LPFC neurons preferentially encoded non-spatial task features, whereas dorsal LPFC neurons more strongly encoded spatial and oculomotor variables. At the population level, task features and eye position were represented in separate orthogonal subspaces, enabling simultaneous encoding without interference. Decoding analyses demonstrated that task-relevant variables could be reliably extracted from neural ensemble activity in a temporally structured manner, corresponding to behavioral demands. Mixed selectivity, including both linear and non-linear interactions, was observed across neurons, enhancing representational dimensionality.

Conclusions and Relevance: LPFC neuronal ensembles dynamically encode and segregate task-relevant and behavioral variables in naturalistic settings, supporting high-dimensional representations that are robust to ongoing sensory and motor variability. These findings provide a mechanistic framework for utilizing LPFC activity in clinical BCI systems, particularly for decoding cognitive states, goals, and visuospatial intent in patients with neurological impairment. Further work is required to validate these representations in humans and assess their stability for real-time clinical decoding.

PLAT-5

Comparative evaluation of machine learning models for automatic detection of the caudal zona incerta for surgical planning

J. Thrower, A. Taha, A. Thurairajah, D. Bansal, V. Liu, A. R. Khan, K. W. MacDougall, A. G. Parrent

Importance: The caudal zona incerta (cZI) is a small gray matter region known to be an effective target for treating essential tremor through deep brain stimulation. While our group has shown that the cZI and the surrounding white matter structures can be visualized using ultra-high field (7 Tesla or 7T) magnetic resonance imaging (MRI), limited access to these systems necessitates the optimization of indirect localization approaches for targeting.

Objective(s): We looked to determine whether ML models could target the cZI with millimetric accuracy from clinical-field strength MRI and develop a fully automated pipeline for patient-specific targeting.

Design and Participants: We retrospectively collected preoperative T1w MRI scans from patients who underwent cZI-DBS. Electrode localization was performed using either post-operative CT or MRI with Lead-DBS. For each patient, the coordinate of the electrode tip was paired with 32 automatically generated anatomical landmarks (github.com/afids/autoafids). These landmarks sample brain structures and have confirmed salience on structural MRI. Landmark coordinates were used as features to predict ideal cZI-DBS contact location. Seven ML models were assessed via Euclidean distance (ED) using leave-one-group-out cross-validation.

Results: A total of twenty-two patients (8 male, 14 female) were included in the study. For patients implanted unilaterally (n=5), x-coordinates were flipped to imitate bilateral data. All models had a median ED between 1-2.5 mm. BayesianRidge had the best performance (1.97 ± 1.11 mm), while K-Nearest-Neighbour (2.40 ± 1.57 mm) had the worst performance and greatest variability.

Conclusions and Relevance: We developed an ML-based workflow for automatic cZI-DBS targeting that integrates with the current clinical imaging specifications and streamlines surgical planning, while reducing inter-rater variability. This framework allows the cross comparison of different ML models and can be used as a platform for further optimization of cZI targeting and extended to other surgical targets. Next steps are to train the models using manually curated cZI segmentations.

PLAT-16

Examining Cortical Excitability Using Magnetoencephalography

K. Kim, G. Pellegrino

Importance: Cortical excitability, referring to the level of responsiveness of neural systems to stimulation, is crucial for optimal brain functioning and has been implicated in a variety of neuropsychiatric disorders. However, the relationships between resting-state magnetoencephalography (MEG) measures proposed to track cortical excitability remains unclear.

Objective(s): To determine if proposed resting-state MEG measures of cortical excitability reflect a shared underlying neural property of if they capture distinct aspects of neural dynamics.

Design and Participants: The cross-sectional study analyzed resting-state MEG recordings from 169 adult participants obtained from the publicly accessible Welsh Advanced Neuroimaging Database (WAND).

Results: Across 169 adults, hierarchical clustering revealed two distinct clusters of MEG measures including one comprising aperiodic exponent and alpha power, and another comprising detrended fluctuation analysis and excitability index. Clusters were largely distinct in spatial patterns ($\rho = -0.537$, $p = .006$), suggesting these measures may capture distinct neural dynamics. The relationship between clusters was dependent on brain region and functional network, with greatest separability observed in the prefrontal cortex, parahippocampal cortex, precuneus, and default mode network. Additionally, clusters showed differentially associations with neurotransmitter receptor densities, suggesting different biological features may support these measures.

Conclusions and Relevance: These findings suggest that no one resting-state MEG measure fully captures cortical excitability. The incorporation of multiple measures may better characterize cortical excitability in clinical contexts.

PLAT-6

Longitudinal trajectories of neurodevelopmental and neurodegenerative outcomes in genetic frontotemporal degeneration

I. So, J. Lombardi, A. Staffaroni, J. Rohrer, B. Boeve, A. Boxer, H. Rosen, S. Lee, E. Finger, on behalf of Frontotemporal Dementia Prevention Initiative Investigators

Importance: Converging evidence hints at neurodevelopmental effects in genetic frontotemporal degeneration (FTD). For some genes, young adult FTD variant carriers show cross-sectional differences in brain volumes and cognition compared to familial non-carriers; however, longitudinal trajectories may more sensitively capture FTD-related neurodevelopmental vs. neurodegenerative changes than cross-sectional approaches.

Objective: This study examined longitudinal trajectories of brain volumes, executive function, and plasma biomarkers in young adult carriers compared to familial non-carriers, as measures of neurodevelopmental and neurodegenerative outcomes of FTD-causing variants.

Design and Participants: This longitudinal cohort study comprised participants, aged 18-30 years, from the FTD Prevention Initiative across Europe, Canada, and the USA. Genetic groups included C9orf72 (47%), MAPT (30%), and GRN (23%). Linear mixed-effects models were computed to assess longitudinal outcomes across age between groups, controlling for sex, scanner (for brain volumes), and education (for executive function); random effects accounted for between-subject variability nested within family membership.

Results: Variant carriers (n=147) and familial non-carriers (n=113) did not differ in age (mean±SD, 25.9±3.2 years), sex (53% female), or number of visits (2.1±1.7). Young adult C9orf72 carriers exhibited smaller thalamic volumes than non-carriers with large effect size (b=-982.8mm3, SE=317.0, p=0.0046, f2=0.32), with relatively stable trajectories across ages 18-30. Trajectories of rostral anterior cingulate volumes differed in C9orf72 carriers and non-carriers across age with small-to-medium effects, where carriers showed relatively stable trajectories and non-carriers showed age-appropriate declines (b=64.4mm3, SE=29.9, p=0.035, f2=0.07). For MAPT and GRN, there were little to no differences in total brain, cortical, or subcortical volumes between groups and over time. No longitudinal differences were observed between carriers and non-carriers in executive function, or plasma NfL or GFAP for any genetic group.

Conclusions and Relevance: C9orf72 repeat expansions were linked to smaller average subcortical volumes and stable trajectories between ages 18 to 30, potentially supporting neurodevelopmental origins. The absence of NfL, GFAP, and executive function differences suggest minimal early neurodegeneration and potential compensation in young adulthood. Findings from this study support neurodevelopmental effects of some forms of genetic FTD. It highlights the importance of longitudinal FTD studies in youth (<18 years) to distinguish developmental resilience and vulnerability from emerging neurodegeneration.

PLAT-7

Disrupting Pannexin 1 Signalling Suppresses Glioblastoma Growth

M. Huver, D. Johnston, R. Kanji, S. Leighton, J. Kelly, J. Ronald, M. Hebb, S. Penuela

Importance: Glioblastoma (GBM) remains the most aggressive primary brain tumour in adults, with poor prognosis and limited effective therapies. Identifying novel molecular drivers of GBM growth is critical for developing new therapeutic strategies.

Objective(s): To determine whether pannexin 1 (PANX1) contributes to GBM growth and oncogenic signalling, and to evaluate the therapeutic potential of genetic and pharmacological PANX1 inhibition.

Design and Participants: This experimental study used patient-derived GBM cell lines as a convenience sample. PANX1 expression was assessed using publicly available RNA-sequencing datasets. CRISPR-Cas9 was used to generate PANX1 knockout (KO) cell lines, and proliferation was assessed using in vitro growth assays. Transcriptomic profiling was performed to identify pathways altered by PANX1 deletion. Pharmacological inhibition was evaluated using spironolactone (SPIR) across multiple patient-derived GBM cell lines in vitro and in a Chick chorioallantoic membrane (CAM) xenograft model.

Results: PANX1 expression was elevated in GBM relative to normal brain tissue. Genetic deletion of PANX1 reduced proliferation across patient-derived GBM models in vitro. Transcriptomic analysis revealed enrichment of cancer-associated pathways in PANX1 KO cells, including Hippo signalling and crosstalk with β-catenin/WNT pathways, although corresponding changes in total YAP and β-catenin protein levels were not consistently observed. SPIR treatment reduced growth across multiple GBM cell lines in vitro and decreased tumour burden and bioluminescence in the Chick-CAM model, with variable responses between models.

Conclusions and Relevance: Disruption of PANX1 signalling suppresses GBM growth and alters oncogenic transcriptional programs, supporting PANX1 as a potential therapeutic target. However, differences between genetic and pharmacological effects highlight the need for further mechanistic studies before clinical translation.

PLAT-8

International, Multicentre, Real-World Data on PFO and Recurrent Ischemic Stroke in Young Adults: Results From the IMPROVE Registry

Fawaz Alotaibi, Diana Ayan, Lakni Abeyesekera, Eduardo Soriano Navarro, Arturo Gonzalez Lara, Jaime Rodriguez Orozco, Zahra Mirza Asgari, Lauren Mai, Sebastian Fridman, Antonio Arauz, Rodrigo Bagur, Luciano A. Sposato

Importance: Patent foramen ovale (PFO) is present in approximately 25% of the general population and is associated with cryptogenic ischemic stroke in young adults. Randomized controlled trials demonstrated that PFO closure reduces stroke recurrence compared to medical therapy alone. However, the effectiveness of PFO closure in real-world, geographically diverse clinical settings remains unclear.

Objective(s): To determine whether PFO closure is associated with a lower risk of recurrent ischemic stroke compared to no closure in a large international registry of young adults with ischemic stroke and PFO.

Design and Participants: We conducted a prospective and retrospective international registry across 24 countries (IMPROVE). We included 1,759 patients aged <60 years with ischemic stroke as the index event and a PFO. We categorized patients into two groups: PFO closure (n=858) and no PFO closure (n=901). We used Cox proportional hazards models with PFO closure as a time-dependent covariate, adjusted for age, sex, hypertension, diabetes, smoking, dyslipidemia, prior myocardial infarction, prior ischemic stroke or transient ischemic attack (TIA), and type of inclusion (retrospective or prospective). We included country as a frailty term.

Results: We analyzed 1,759 patients (mean age 45.0 years, SD 10.6; 813/1,759 [46.2%] female). Median follow-up was 1.68 years (IQR 1.05-3.53). PFO closure was associated with a 64% lower risk of recurrent ischemic stroke (HR 0.36, 95% CI 0.16-0.81, P=0.013). The adjusted 2-year incidence of ischemic stroke was 1.0% in the PFO closure group compared to 2.9% in the no closure group (absolute risk difference 1.9%, 95% CI 1.0-2.9%). PFO closure was also associated with a lower risk of ischemic stroke or all-cause death (HR 0.45, 95% CI 0.23-0.87). Prior ischemic stroke (vs. TIA) was the strongest predictor of recurrence (HR 3.25, 95% CI 1.67-6.31, P=0.001).

Conclusions and Relevance: In this large international registry spanning 24 countries, PFO closure was associated with a significantly lower risk of recurrent ischemic stroke in young adults compared to no closure. These real-world findings are consistent with the results of randomized controlled trials and support the effectiveness of PFO closure across diverse healthcare settings.

PLAT-10

Outcomes of Valproic Acid Withdrawal in Females Before or During Pregnancy: A Systematic Review and Meta-analysis

M.C. Burbano, R.G.Couper, P.H. Espino, J.G. Burneo

Importance: The potential teratogenic effects of valproic acid (VPA) have been widely discussed; however, outcomes after VPA withdrawal in females are less well known.

Objective: This review summarizes the evidence of switching or withdrawing VPA in people with epilepsy of childbearing potential or during pregnancy.

Methods: We searched Embase, MEDLINE, and Scopus databases in June 2025 for studies measuring outcomes including seizure frequency, side effects, or maternal/fetal complications, in female patients withdrawn from VPA before or during pregnancy. Reference lists included were screened. Risk of bias assessments included the National Institutes of Health (NIH) Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies and Quality Assessment Tool for Case Series Studies. Studies with comparison groups and common outcomes were included in meta-analyses.

Results: The systematic review included nine studies, and meta-analysis included three studies. Overall, 277 females who were pregnant or planning pregnancy withdrew or switched from VPA, while 2206 females remained on VPA. We calculated odds ratios of tonic-clonic seizures (TCS) recurrence in females with VPA changes compared with those maintained on VPA using random-effect models. Female patients planning pregnancy and pregnant females withdrawn from VPA had increased odds ratio of TCS recurrence during pregnancy (OR 1.73, 95% CI 1.06-2.84). Between 7.9% and 72.2% females withdrawn from VPA before or during pregnancy later restarted VPA.

Conclusion: Withdrawal of VPA during pregnancy had significantly higher odds ratio of TCS recurrence compared to maintained VPA. Evidence on fetal outcomes or maternal complications remains limited; studies with longer-term outcomes beyond pregnancy are needed.

PLAT-11

Association Between Serum Neurofilament Light Chain Levels and MRI Activity Across Disability Levels and Treatment Contexts in Multiple Sclerosis

Z. Alfares, A. Alanazi, A.Svendrovski, B. Ciftci, J. Racosta, P. Riccio, C. Casserly

Imprtance: The clinical utility of serum neurofilament light chain (sNfL) as a biomarker of MRI disease activity in multiple sclerosis (MS) may vary by age, disability status, and disease-modifying therapy (DMT).

Objectives: We aimed to examine whether sNfL levels are associated with MRI-identified disease activity across clinical subgroups, including patients receiving high-efficacy therapy (HET).

Design and Participants: In this retrospective cohort study, sNfL levels from 401 people with MS were linked to brain MRI scans performed within ±3 months, yielding 291 paired assessments. Associations between sNfL levels and MRI activity were evaluated across subgroups defined by age (≤55 vs >55 years), MS subtype, disability status (EDSS ≤5 vs >5), and current DMT. A pre-specified subgroup analysis examined associations between sNfL levels and MRI activity in patients receiving (HET).

Results: The accuracy of sNfL for detecting MRI activity was similar across age groups and MS subtypes. Sensitivity was higher in individuals with EDSS >5 compared with those with EDSS ≤5 (46.2% vs 18.2%, p=0.032). In subgroup analysis, sNfL identified MRI activity with (74.5%) accuracy (94.2% specificity and sensitivity 18.9%), among patients receiving HET (n=141).

Conclusions and Relevance: The performance of sNfL for detecting MRI activity varies by disability status but remains limited among patients receiving HET, supporting the need to interpret sNFL within the treatment context.

PLAT-12

Structure-Function Coupling for Epileptogenic Zone Network Identification and Connectivity Analysis in Paediatric Focal Epilepsy

A. Oremakinde, R. Eagleson, A. Khan, G. Pellegrino

Importance: Paediatric focal epilepsy affects 5-6 per 1,000 children; approximately 30% develop drug-resistant epilepsy requiring surgery, yet seizure freedom rates remain suboptimal (50–80%) due to incomplete epileptogenic zone network (EZN) localization.

Objective: To determine whether a multimodal computational pipeline integrating scalp EEG with diffusion MRI through structure-function coupling (SFC) analysis can improve EZN identification in paediatric focal epilepsy, and to quantify connectivity disruption within EZN parcels relative to healthy controls and contralateral regions.

Design and Participants: Prospective consecutive-sample cohort study. Patients with focal epilepsy were consecutively recruited as they presented to clinic and consented to participate. Of 40 enrolled patients, 18 were excluded due to poor MRI or EEG data quality or incomplete data acquisition, yielding 22 analyzable patients. Fourteen age-matched healthy controls were drawn from the Healthy Brain Network (HBN) dataset. An automated open-source pipeline integrated: (1) wavelet-based interictal spike detection; (2) sLORETA source localization; (3) Brainnetome atlas parcellation (246 regions); (4) structural connectivity (SC) via probabilistic tractography and fractional anisotropy (FA); (5) functional connectivity (FC) via EEG coherence; and (6) SFC quantification via distance correlation. Pathological parcels were identified using combined z-scores (≥2) and clustered using SC adjacency matrices. Pipeline output was validated against independent neurologist localization and lateralization assessments using Cohen's kappa.

Results: Among 22 patients (12 male, 10 female; median age 15 years, IQR 12-18) and 14 controls (5 male, 9 female; median age 11.6 years, IQR 7.0-16.2), lateralization concordance was 78.9% (15/19; κ=0.59, p=0.008) and lobar localization concordance was 50.0% (9/18). Patients had significantly elevated spike counts versus controls (median 528,944 vs. 36,439; U=280, p<0.001). EZN parcels showed reduced FC coherence (0.63 vs. 0.81; t=−4.21, p<0.001), diminished SC tract density (228 vs. 1,372 streamlines; U=12, p<0.001), lower FA (0.081 vs. 0.157; U=43, p<0.001), and disrupted SFC by distance correlation (FA–outflow: t=−5.94, p<0.001; tract–coherence: t=8.92, p<0.001).

Conclusions and Relevance: This open-source pipeline identifies EZN parcels through coordinated structural-functional connectivity disruptions, with strong lateralization concordance supporting presurgical utility. SFC distance correlation metrics are robust EZN biomarkers. Lobar localization (50%) warrants refinement; prospective validation against surgical outcomes is required before clinical implementation.

ORAL PRESENTATIONS

Session #3

PLAT-13

Clinically Feasible pH-Weighted Imaging at University Hospital: A Proof-of-Concept Study

D. Wong, S. Pandey, P. Malik, J. Megyesi, R. Bartha

IMPORTANCE: The 2021 World Health Organization (WHO) classification of central nervous system tumours emphasizes molecular profiling, recognizing that tumour behaviour is driven more by molecular subtype than histology. Conventional imaging, including gadolinium-enhanced MRI, provides structural information but lacks sensitivity to tumour molecular characteristics. Imaging techniques capable of probing tumour biology could meaningfully enhance clinical decision-making. In gliomas, molecular alterations influence cellular metabolism and the intracellular microenvironment, including pH. Therefore, pH-weighted MRI could capture clinically important information not captured by current imaging protocols.

OBJECTIVE: The objective of this proof-of-concept study was to demonstrate the feasibility of acquiring high-quality pH-weighted images using amine-amide concentration independent detection (AACID) chemical exchange saturation transfer (CEST) MRI on clinical hardware within a clinically acceptable scan time.

DESIGN: The AACID-CEST sequence was installed on the 3T Siemens MRI scanner at University Hospital. A phantom consisting of twelve 50 mL test tubes filled with egg white solutions was prepared, with varying lactic acid concentrations to produce a range of pH values. Imaging parameters, including frequency offsets and B1 amplitude, were systematically varied. Data were reconstructed using custom software to generate pH-weighted maps, and parameter sets were evaluated to optimize pH contrast while minimizing acquisition time. The optimized sequence was subsequently incorporated into a standard brain tumour imaging protocol.

RESULTS: High-quality pH-weighted images were successfully acquired using clinical-grade hardware. AACID-CEST image values demonstrated a strong linear inverse relationship with pH. The greatest linear slope of this relationship (corresponding to maximum pH contrast) was achieved at a B1 of 0.8 μT. Integration of the optimized sequence into a clinical protocol required an additional 3 minutes and 27 seconds of scan time.

CONCLUSIONS: AACID-CEST enables pH-weighted imaging on a clinical MRI system with a clinically feasible scan time and without specialized hardware or contrast agents. This technique has been integrated into routine tumour imaging protocols at University Hospital and is ready for research use in patients with gliomas. Broader implementation may facilitate large-scale studies of neurological conditions associated with altered tissue pH, including stroke, traumatic brain injury, and spinal cord injury.

PLAT-14

First Canadian Experience of Stroke Fellows Implanting Loop Recorders in Stroke Patients: Preliminary Results of the B2AD-Risk AFDAS Study

Eduardo Soriano Navarro, A. Diana Ayan, B. Lakni Abeyesekera, C. Fawaz Alotaibi, D. Arturo Gonzalez Lara, E. Jaime Rodriguez Orozco, F. Zahra Mirza Asgari, G. Lorne Gula, H. Alan Skanes, I. Jason Andrade, J. Lauren Mai, K. Sebastian Fridman, L. Thalia Field, M. Michael Hill, N. Rodrigo Bagur, O. Luciano A. Sposato

Importance: Atrial fibrillation detected after stroke (AFDAS) affects up to 24% of ischemic stroke patients without prior arrhythmia, representing an estimated 1.3 to 1.5 million new cases globally each year. AF burden evolution in these patients is critical for optimizing secondary stroke prevention strategies.

Objective(s): To present preliminary results of the B2AD-Risk AFDAS study, a prospective, observational, proof-of-concept cohort study designed to characterize the longitudinal evolution of AF burden, cardiac biomarkers, left atrial size, and risk factor profiles in ischemic stroke and transient ischemic attack (TIA) patients with newly diagnosed paroxysmal AF.

Design and Participants: We designed a prospective cohort study at London Health Sciences Centre (London, Ontario, Canada). We enrolled consecutive adult patients with acute ischemic stroke or TIA and newly diagnosed paroxysmal AF. We categorized patients into two groups based on the AF diagnostic modality: (a) AF detected on 12-lead electrocardiogram (ECG-AF, n=12) and (b) AF detected on 14-day Holter prolonged cardiac monitoring (PCM-AFDAS, n=12). All patients received implantable loop recorders (ILR) placed by stroke fellows. We collected blood biomarkers (NT-proBNP, troponin, C-reactive protein, creatinine, CBC, HbA1c, lipids), echocardiographic measurements, cardiac computed tomography (CT), and vital signs at enrollment and at the 12-month end-of-study visit. We assessed AF burden as total duration of AF episodes, maximum single-episode duration, relative AF burden, and AF pattern at 3, 6, and 12 months post-ILR insertion. We are following participants for a minimum of 12 months with in-person visits at 1-week post-implantation and 12 months, and telephone visits at 1, 3, and 6 months.

Results: We present preliminary results of at least 12 patients with AFDAS enrolled in the B2AD-Risk AFDAS study. Data are currently being analyzed, and final results will be presented at the meeting.

Conclusions and Relevance: The B2AD-Risk AFDAS study represents the first Canadian experience of stroke fellows implanting loop recorders in stroke patients. These preliminary findings will inform the design of a larger randomized controlled trial aimed at determining the optimal AF burden threshold for initiating anticoagulation in AFDAS patients. This study was funded by the Canadian Stroke Consortium, Brain Canada, and the Heart and Stroke Foundation.

PLAT-15

Reducing the Rate of Urinary Tract Infections (UTIs) on the Neurology Ward

Trevor Jairam, David Hudson, Anita Florendo-Cumbermack

Importance: Urinary tract infections (UTIs) significantly increase healthcare costs and are associated with adverse outcomes, including increased length of stay, complications, and mortality. Unnecessary treatment of asymptomatic bacteriuria can lead to missed diagnoses, increase the risk clostridium difficile infection, and promote the emergence of resistant microbes.

Objectives: To reduce the rate of UTIs among patients discharged from the stroke and general neurology inpatient wards by 50% (i.e. 7.4% to 3.7%) by the end of 2026. The initial phase of this project was a root cause analysis to guide implementation of interventions for subsequent phases.

Design and Participants: Consecutive patients admitted to our centre from January 1st to December 27, 2024, under any service and discharged from the stroke or general neurology service were included (n = 1217). Charts of patients with a positive urine culture were manually reviewed (n = 122) to determine the UTI rate and explore root causes.

Results: 7.4% (90/1217) of patients received a diagnosis of UTI, 44.4% (40/90) of which were catheter-associated. Most catheters were inserted for urinary retention (58.2% [39/67]) and accurate input/output measurements (31.3% [21/67]). Among patients with a positive urine culture and at least 1 catheter day for urinary retention, 51.2% (22/43) had constipation, which was associated with medication use (i.e. opioids, daily iron, anticholinergic agents, or non-dihydropyridine calcium channel blockers) 59.1% (13/22) of the time. For 54.4% (49/90) of patients with a diagnosis of UTI, no symptoms of infection were documented. During their hospital course, 3.3% (3/90) of patients diagnosed with a UTI developed clostridium difficile infection after antibiotic treatment.

Conclusions and Relevance: These findings support the notion that reducing the number of catheter days and increasing provider recognition of asymptomatic bacteriuria may lead to a reduced UTI rate. A bundle of interventions designed to standardize criteria for indwelling catheter insertion, treat underlying causes of urinary retention (i.e. constipation and benign prostatic hyperplasia) early, and expedite trial of void for catheterized patients is underway for the second phase. Subsequent phases could better address overtreatment of asymptomatic bacteriuria.

PLAT-17

Did not consent to having abstract posted online*

PLAT-18

THE EFFECTS OF 78-WEEK TREATMENT WITH AMBROXOL ON COGNITIVE, MOTOR, AND NEUROPSYCHIATRIC SYMPTOMS IN PARKINSON'S DISEASE DEMENTIA

C.R.A. Silveira, K.K.L. Coleman, K. Borron, R.G. Tirona, C.A. Rupar, G. Zou, R.A. Hegele, E.C. Finger, R. Bartha, S.A. Morrow, J. Wells, M. Borrie, P.A. MacDonald, M.E. Jenkins, M.S. Jog, G. Dresser, S. Fox, R. Camicioli, B. Feagan, D.A. Mendonça, S.H. Pasternak

Importance: Currently there are no disease-modifying treatments for Parkinson's disease or Parkinson's disease dementia. Carrying a mutation in the gene for glucocerebrosidase (GBA1 gene) is a major risk factor for Parkinson's disease and Parkinson's disease dementia, and raising glucocerebrosidase levels lowers α-synuclein in cell and animal models. Ambroxol is a pharmacological chaperone for glucocerebrosidase, which stabilizes and increases the levels and activity of glucocerebrosidase.

Objectives: To examine the effects of ambroxol on cognitive, motor, and neuropsychiatric symptoms of PDD patients enrolled in both double-blind and open label extension (OLE) phases of clinical trial NCT02914366 and describe the safety and pharmacology of ambroxol during the OLE.

Design and Participants: 34 PDD patients were included. Of these, 17 stayed on ambroxol for 78 weeks and 17 received placebo for 52 weeks (double blind) and then ambroxol for 26 weeks (OLE). ADAS-Cog-13, MDS-UPDRS-III, and NPI assessed cognitive, motor, and neuropsychiatric symptoms, respectively, from baseline to week 78.

Results: Six individuals withdrew from the OLE. Changes in ADAS-Cog-13 were smaller than clinically meaningful in both groups (<3 points). Yet, GBA1 mutation carriers continuously on ambroxol had an improvement of -9, -4, and -12 points from baseline to week 78. No treatment benefits were observed in motor symptoms (<5 points). A clinically meaningful change in neuropsychiatric symptoms (> 3 points) was observed, with an improvement in participants on treatment for 78 weeks (-5) and a worsening for those switching from placebo to ambroxol (+4). There were 4 serious adverse events and 212 adverse events reported in the OLE. Individuals switching from placebo to ambroxol began to experience more gastrointestinal adverse events (17%) than previously. Ambroxol plasma concentrations in the OLE changed from 4.5 micromolar to 6.3 micromolar (ambroxol-to-ambroxol) and 0 micromolar to 5.2 micromolar (placebo-to-ambroxol). GCase activity levels in the OLE changed from 11.6 nmol/h/mg to 11.8 nmol/h/mg (ambroxol-to-ambroxol) and 8.9 nmol/h/mg to 10.8 nmol/h/mg (placebo-to-ambroxol).

Conclusions and Relevance: Ambroxol had an overall positive effect on neuropsychiatric symptoms over 78 weeks, whereas only GBA1 mutation carriers seemed to show cognitive benefit. Safety and pharmacology in the OLE were similar to the double-blind phase.

PLAT-20

Thalamic microstructural changes in focal epilepsy identified using 7T MRI

D. George, A. Thurairajah, D. Bansal, D. Steven, K. MacDougall, J. Burneo, A. Suller-Marti, Western Epilepsy Research Group, A. Khan, J. Lau

Importance: The thalamus is a key target for neuromodulation in drug-resistant epilepsy (DRE), yet how epilepsy damages individual thalamic nuclei remains poorly understood.

Objective: To determine whether thalamic microstructural damage in DRE follows known unimodal-to-transmodal functional organization, and to determine if these changes are associated with clinical features including disease duration and seizure type.

Design and Participants: This is a cross-sectional study of 95 consecutive focal DRE patients undergoing 7T MRI and stereoelectroencephalography (SEEG) at London Health Sciences Centre. Quantitative susceptibility mapping (χ), R2* relaxometry, and T1 mapping were acquired at 0.75 mm isotropic resolution. Thirty thalamic subnuclei were parcellated using the NextBrain histological atlas, and age/sex-adjusted z-scores were computed for six microstructural metrics (mean and standard deviation of χ, R2*, and T1) per subnucleus per patient. Per-patient gradient conformity quantified whether each patient's thalamic damage selectively targeted higher-order associative nuclei over sensory relay nuclei.

Results: 67 patients (median age 33 years, 48% female, median epilepsy duration 13 years) were included and compared to 48 controls (median age 36 years, 46% female). Patients exhibited widespread thalamic microstructural homogenization, with reduced within-nucleus variance across all three MRI contrasts (median Glass's Δ: χ = −0.30, R2* = −0.09, T1 = −0.10; PFDR < 0.05). This homogenization was not spatially uniform: a composite damage score correlated with the functional gradient (ρ = −0.71, p < 0.0001), with transmodal nuclei (mediodorsal, midline, anterior) more affected than sensory nuclei (geniculate, ventral posterior). Gradient conformity worsened progressively with epilepsy duration (ρ = −0.37, p = 0.005) independent of age (partial ρ = −0.33, p = 0.013). Patients with focal-to-bilateral tonic-clonic seizures (FBTCS) showed greater gradient-conformity than those without (median −0.39, IQR −0.52 to −0.26 vs −0.24, IQR −0.34 to −0.09; p = 0.010). These associations were independent of MRI lesion status, epilepsy etiology, and SEEG-confirmed epileptogenic zones.

Conclusions and Relevance: Thalamic microstructural damage in DRE selectively affects higher-order integrative nuclei, aligns with known thalamic functional gradients, and scales with epilepsy severity/disease duration independent of age. These findings provide a microstructural basis for thalamic hub vulnerability and may inform individualized neuromodulation target selection. Future studies should validate these findings in patients undergoing thalamic SEEG and neuromodulation.

PLAT-21

Status Epilepticus Management in Resource-limited Settings: An International Expert Survey

G. Couper, A. Soni, J. Burneo

Importance: Status epilepticus (SE) is a neurological emergency with disproportionate mortality and morbidity in low- and middle-income countries (LMICs). Existing SE guidelines are largely based on high-income country (HIC) contexts, limiting applicability in settings with constraints.

Objectives: We aimed to examine expert clinician perspectives on SE management across resource-limited settings to identify common barriers and context-specific strategies.

Design: This study used a convergent parallel mixed methods approach, with quantitative and qualitative data collected from an online survey. Experts in SE management were purposively sampled to balance clinical expertise across three physician disciplines (neurology, emergency medicine, and critical care) and geographic locations. Invitations to participate were sent to 48 experts from 22 different countries. Qualitative data using thematic analysis and descriptive statistics for quantitative analysis was used.

Results: We received responses from 28 clinical experts, spanning 15 countries across four continents. Experts highlighted inadequate SE education at multiple levels, but less than half (12/28) reported discussing SE management during routine clinic visits. A common theme was a lack of access to anti-seizure medications (ASMs), with 86% (24/28) agreeing that oral ASMs should be included in SE guidelines. Only 39% (11/28) of experts had consistent access to electroencephalography (EEG), and there was little agreement about the duration and frequency of serial intermittent EEGs in the absence of continuous EEG. Other proposed solutions included implementing locally adapted practices to improve care, such as remote tele-monitoring, and improving SE education and training.

Conclusion: Inclusive, context-sensitive frameworks and implementation strategies are urgently needed.

PLAT-22

Electrophysiological Signatures of SEEG After Radiofrequency Ablation: Clinical Interpretation

IE Castro, MC Burbano, A Ahmadi, H Kreinter, G Pellegrino, JG Burneo, ML Jones, KW MacDougall, JC Lau, DA Steven, D Diosy, A Suller Marti

Importance: Stereoelectroencephalography-guided radiofrequency thermocoagulation (SEEG-guided RFTC) has emerged as a safe and effective diagnostic and therapeutic approach for focal drug-resistant epilepsy (DRE), with its use steadily increasing in recent years, but the clinical significance of post-ablation SEEG findings is not well established. Understanding these electrophysiological changes is critical to refine prognostication and guide subsequent therapeutic interventions.

Objective: The aim of this study is to describe the acute electrophysiological findings on SEEG recordings following SEEG-guided RFTC in patients with focal DRE.

Design and Participants: Retrospective, analytical, single-center study included patients who underwent SEEG-guided radiofrequency thermocoagulation (SEEG-RFTC) and continued to be SEEG monitored post-intervention. Thirty-two patients were included. Demographic characteristics, number of electrodes and contacts ablated, hours of recording post SEEG-guided RFTC, electrophysiological findings (interictal activity and seizures) and responder rate (defined by more than 50% reduction of seizure frequency in a lapse of at least 3 months) were analyzed.

Results: Thirty-two patients were included, 46.9% (n=15) were female. The median age at RFTC-SEEG was 34.5 years (IQR 24-44.5). A median of 14 electrodes (IQR 13-16) were implanted per patient, with a median of 11 contacts ablated (IQR 5-17.5). In 46.9% (n=15), the seizure onset zone was completely ablated. The most frequently ablated region was the insula (50%, n=16) followed by the frontal lobe (34.4%, n=11). Post-RFTC SEEG recordings lasted a mean of 79 hours (IQR 23-120, range 18-360).Thirteen patients (40.6%) showed interictal spikes in ablated contacts. Nine patients (28%) experienced seizures post-RFTC, of which seven were electroclinical. The median latency of seizures post-RFTC was 17 hours (IQR 10-30).

Six of these patients underwent a second SEEG-guided RFTC, with five achieving responder status. From the total cohort of patients who underwent SEEG-guided RFTC, twenty patients (62.5%) were considered responders after SEEG-guided RFTC. Out of these, nine (47.4%) were seizure-free at 3 months, and five (26.3%) remained seizure-free at 6 months following SEEG-guided RFTC.

Conclusion: Our findings suggest that post-RFTC SEEG recordings provide clinically meaningful information, including the presence of seizure recurrence, which may guide the decision to perform additional ablations during the same monitoring period. Further studies with larger cohorts are necessary to validate these observations and better define the clinical utility of post-RFTC SEEG monitoring.

PARALLEL POSTER TOUR

Session # 1

TOUR A

POST-1

Left Atrial Volume Index Changes After Patent Foramen Ovale Closure for Secondary Stroke Prevention: A Potential Explanation for Increased Risk of Atrial Fibrillation

Sawaya, R, Federico Liberman, Eduardo Soriano Navarro, Juan Vargas Gonzalez, Diana Ayan, Pantelis Diamantouros, Sarah Blissett, Rodrigo Bagur, Luciano A. Sposato

Importance: Patent foramen ovale (PFO) closure for secondary stroke prevention is recommended for up to 4% of all ischemic stroke patients, representing over 300,000 candidates worldwide annually. While PFO closure is effective, it carries a 5-fold higher risk of incident atrial fibrillation (AF) compared to medical treatment alone, paradoxically exposing patients to a condition that itself confers a 5-fold higher stroke risk. The underlying mechanism remains unknown. AF is closely associated with left atrial enlargement, and abrupt changes in left atrial structure, volume, or intracavitary pressures following device implantation may represent a plausible pathophysiologic mechanism.

Objective(s): To evaluate longitudinal changes in left atrial volume index (LAVI) before and after PFO closure in patients with ischemic stroke or transient ischemic attack (TIA), and to investigate the association between LAVI changes and the incidence of post-procedural AF.

Design and Participants: This is an investigator-initiated, single-centre, retrospective cohort study. We included patients aged ≥18 years with a diagnosis of ischemic stroke or TIA who underwent PFO closure at London Health Sciences Centre (LHSC), University Hospital, between January 1, 2014, and March 10, 2024. Patients were identified through the International Multicenter Patent Foramen Ovale & Stroke (IMPROVE) Registry and the cardiology PFO closure quality improvement database at LHSC. Inclusion required a baseline echocardiogram prior to PFO closure and at least two post-closure echocardiograms. LAVI will be measured serially and analyzed using mixed-effects models or repeated measures ANOVA. Incident AF will be assessed using Kaplan-Meier survival curves and Cox proportional hazards models. Correlation and regression analyses will explore the LAVI–AF relationship, with subgroup analyses examining the influence of relevant clinical characteristics.

Results: Data collection and echocardiographic analysis are ongoing. We hypothesize that LAVI will increase significantly following PFO closure, and that greater post-procedural LAVI changes will be independently associated with a higher incidence of AF. If confirmed, these findings would support the hypothesis that structural left atrial remodeling, triggered by acute hemodynamic alterations after device implantation, represents a key mechanism underlying post-PFO closure AF.

Conclusions and Relevance: LAVI changes after PFO closure may represent a measurable and clinically actionable biomarker for AF risk stratification in stroke patients undergoing this procedure. Identifying patients at the highest risk of post-procedural AF could inform monitoring strategies, guide anticoagulation decisions, and ultimately improve outcomes in this growing population. This study has the potential to shed light on a poorly understood complication of an increasingly performed intervention.

POST-2

Optimizing Response to Status Epilepticus in the Epilepsy Monitoring Unit: A Quality Improvement Initiative

S. Alotaibi, A. Khan, R. Zhou, A. Florence-Cumbermack, D. Hudson

Introduction: Status epilepticus is a neurological emergency associated with high morbidity and mortality. Seizure duration is the sole modifiable factor influencing outcomes and despite established status epilepticus management guidelines, there are significant discrepancies between protocols and real-world practice in terms of timing, dosing and sequence of antiepileptic medications administration.

Objective: Reduce time from seizure onset to first antiseizure medication administration to <= 5 minutes and time to second antiseizure medication to < 30 minutes. Improve adherence to SE guidelines >80%.

Method: This ongoing quality improvement initiative utilizes the Plan-Do-Study-Act (PDSA) cycles framework. In the Plan phase, baseline data were collected by identification of EMU staff of status epilepticus cases and chart reviews to identify gaps in timely recognition and treatment of status epilepticus, and targeted interventions were designed. During the Do phase, we have implemented admission power plan with nonmodifiable as needed benzodiazepines orders using the recommended status epilepticus dose. Educational session was conducted for EMU nursing staff on seizure recognition and status epilepticus management. For the STUDY phase, we plan to measure the outcomes by May 2026 and refine and modify the interventions for subsequent cycles.

Results: There were three cases of status epilepticus reported from September to November 2025. The time from onset to administration of first antiseizure medication was 8, 22 and 21 minutes with inappropriate dose in 1 case. Time from seizure onset to administration to second antiseizure medication was 55, 32 and 54 minutes.

POST-3

Clinical and Molecular Features of Biomarker Shifting in Breast Cancer Brain Metastases

R. Wang, R. Abdo, Q. Zhang, J. Megyesi

Introduction: Breast cancer brain metastases (BCBMs) are associated with poor prognosis and remain challenging to treat. BCBMs are known to differ molecularly compared to the primary breast tumour and biomarker shifting can commonly occur. However, the underlying mechanisms driving this shift are not known. This study aims to investigate the molecular underpinnings of BCBM biomarker shifting.

Methods: Patients with matched primary tumour and BCBM biomarker data were identified and clinical information was collected. Matched tumour tissue blocks were selected and a tissue microarray (TMA) was constructed. 10X Genomics Xenium spatial transcriptomic analysis using the Prime 5K gene panel was done. Downstream analyses will be conducted using Seurat.

Results: Fifty-one patients with matched biomarker data were identified. Ten (19.6%) patients exhibited a subtype switch with hormone receptor (HR) loss (6/10, 60.0%) being the most common change. Subtype switching did not impact OS (p=0.41), however it was associated with developing BCBMs later (p=0.012). For our Xenium experiment, tumour samples from seven patients with HR+, HER2+ or HR+, HER2- disease - four with subtype switching and three without switching - were arranged over two TMA blocks. The runs yielded 410206 cells in block 1 and 318755 cells in block 2 with 366 and 484 median transcripts per cell, respectively. Downstream analyses will be conducted to examine cell population, tumour microenvironment, and gene expression differences related to subtype shifting.

Conclusions: BCBM biomarker shifting is common and may have important clinical implications. Spatial transcriptomic analyses of matched tumour samples may yield tumour microenvironment and molecular differences associated with subtype shifting.

POST-4

Longitudinal Assessment of Motor Cortical Activity and Hand Dexterity in Degenerative Cervical Myelopathy Patients Using Functional MRI

D. Wong, S. Detombe, R. Bartha, N. Duggal

IMPORTANCE: Degenerative cervical myelopathy (DCM) causes disabling neurological dysfunction, most commonly impaired hand dexterity. Although surgical decompression enables recovery in many patients, functional outcomes are variable and poorly predicted by clinical or spinal imaging features. Functional MRI (fMRI) studies have demonstrated motor cortical reorganization in DCM that partially normalizes after surgery, suggesting brain activation patterns may provide prognostic insight. However, prior fMRI studies have treated DCM as a homogeneous condition. Characterizing brain activation differences between clinically relevant subgroups may help identify factors influencing surgical response.

OBJECTIVE: To determine whether brain activity varied amongst subgroups of DCM patients, stratified by baseline hand dexterity and by surgical response following decompression.

DESIGN AND PARTICIPANTS: 55 patients with DCM (mean age 63 ± 13; 26 male) without other neurological disorders were recruited between November 2018 and March 2025. All underwent surgical decompression.

Participants underwent task-based fMRI and hand dexterity assessment preoperatively and at 6, 12, 24, and 52 weeks postoperatively. Not all participants completed every follow-up; analyses used all available data.

Percent blood oxygen level dependent (BOLD) signal change (cortical activation) and volume of activation (VOA; cortical recruitment) were quantified in major motor regions. Linear mixed-effects models assessed longitudinal changes stratified by baseline dexterity severity and by surgical response, defined as improvement in hand dexterity from preoperative assessment to 12 weeks postoperatively.

RESULTS: Across all patients, percent BOLD signal and VOA decreased over time in the bilateral Rolandic areas, consistent with postoperative normalization. These longitudinal cortical changes did not differ by baseline dexterity severity. When stratified by surgical response, responders demonstrated lower VOA in the bilateral Rolandic areas compared with non-responders. No significant group-by-time effects were detected, indicating similar trajectories of cortical change between responders and non-responders.

CONCLUSIONS: Motor cortical activation and recruitment followed similar longitudinal trajectories regardless of baseline hand dexterity severity or surgical response. However, overall motor cortical recruitment was lower in surgical responders. This suggests that baseline differences in cortical organization, rather than postoperative plasticity may distinguish surgical responders from non-responders. Preoperative brain activation patterns may offer insight into recovery potential and warrant further investigation as prognostic biomarkers in DCM.

POST-5

Portable intraoperative MRI during endoscopic endonasal pituitary adenoma resection: an early institutional experience

M. Alostad, B. Santyr, D. Lee, B. Rotenberg, L. Sowerby, N. Duggal

Importance: In endoscopic endonasal pituitary adenoma surgery, accurate intraoperative assessment of residual tumor is important for maximizing extent of resection while avoiding unnecessary manipulation of critical neurovascular structures. Portable ultra-low-field intraoperative MRI may provide real-time imaging feedback without the infrastructure requirements of conventional intraoperative MRI.

Objective(s): To evaluate the feasibility and early accuracy of portable ultra-low-field intraoperative MRI in assessing extent of resection during endoscopic endonasal pituitary macroadenoma surgery.

Design and Participants: This retrospective case series reviewed a consecutive sample of patients who underwent endoscopic endonasal resection of pituitary macroadenomas at our institution in Q4 2025 with the incorporation of portable intraoperative MRI (Hyperfine Swoop) into the operative workflow. Intraoperative images were compared with conventional postoperative 1.5T MRI obtained within 48 hours of surgery. Image interpretation was performed by an experienced neuroradiologist.

Results: Four patients were included (mean age, 60.3 years; 4 male). Preoperatively, all tumors had a suprasellar component and cavernous sinus invasion (Knosp grade 2-4). The most useful sequences for identifying residual tumor were sagittal and coronal T1-weighted images and coronal T2-weighted images. Mean intraoperative image acquisition time was 26 minutes, with less than 45 minutes added to overall operative workflow. Portable intraoperative MRI demonstrated resection of the suprasellar component in all 4 cases. In 2 cases, persistent cavernous sinus disease was identified intraoperatively, prompting further resection.

Conclusions and Relevance: Portable ultra-low-field intraoperative MRI was feasible to integrate into endoscopic endonasal pituitary surgery and showed early utility for assessing residual tumor, particularly in the suprasellar and cavernous sinus compartments. These findings suggest it may improve intraoperative decision-making and extent of resection in selected cases. Larger prospective studies are needed to better define accuracy, workflow efficiency, and clinical impact.

POST-6

Minimally Invasive Approach for Subdural Hematoma

R. Moshref, R. Ragguett, B. Santyr, W. Ng

Importance: The supraorbital keyhole craniotomy provides minimally invasive access to the subfrontal region. It has been successfully applied to vascular, neoplastic, and traumatic etiologies. Compared with traditional craniotomies, this approach may reduce operative time, infection risk, and cosmetic morbidity.

Design and Participants: Case report and review of literature.

Objective (s): To highlight utilization of minimally invasive procedure in trauma in reducing mortality and improved functional outcome.

Results: We report a 46- year-old male patient who presented with progressive headaches and fluctuating level of consciousness following head trauma, associated with headaches and functional decline. His past medical history was significant for traumatic brain injury requiring prior craniotomy 3 years prior. Imaging demonstrated a large, low-density subdural hematoma, and he was deemed an appropriate candidate for evacuation via an eyebrow mini-craniotomy. Postoperative computed tomography demonstrated significant reduction of the hematoma. The patient recovered well and was discharged six days after surgery.

Conclusions and Relevance: This case supports supraorbital keyhole craniotomy for subdural hematomas. Earlier evacuation has been associated with lower mortality, improved functional recovery, and reduced postoperative delirium. However, limited operative exposure remains an important consideration.

POST-7

Comparison of Outcomes Between Retrosigmoid and Translabyrinthine Approaches for Vestibular Schwannoma Resection

A. Mastrolonardo, B, Ajlan, SP. Lownie

Importance: Vestibular schwannoma surgery has evolved from high-morbidity procedures to modern strategies emphasizing functional preservation and maximal safe resection. However, comparative outcome data between retrosigmoid and translabyrinthine approaches remain inconsistent, particularly with respect to facial nerve function and cerebrospinal fluid (CSF) leak risk.

Objective: To compare facial nerve outcomes and CSF leak rates following retrosigmoid versus translabyrinthine resection of vestibular schwannoma.

Design/Participants: We designed a retrospective cohort study of patients undergoing vestibular schwannoma resection via retrosigmoid or translabyrinthine approaches in a two-surgeon series involving neurosurgery and neuro-otology. The primary outcomes were postoperative facial nerve dysfunction and CSF leak. Facial nerve outcomes were assessed using the House–Brackmann (HB) grading system, with HB I–II considered favorable and HB III–VI unfavorable. The need for additional facial nerve interventions (e.g., tarsorrhaphy) was also evaluated. Associations between tumor size, tumor–nerve interface, intraoperative monitoring, and postoperative outcomes were analyzed.

Results: A total of 149 cases were identified (101 were analyzed before abstract submission; study is ongoing). The mean age at surgery was 49 ± 14 years. Surgical approach distribution was 47% retrosigmoid and 53% translabyrinthine. There was no statistically significant association between surgical approach and facial nerve outcomes at follow-up, need for tarsorrhaphy, or CSF leak rates ($p = 0.62–0.89$). Larger tumor size demonstrated a trend toward worse facial nerve outcomes, although this did not reach statistical significance ($p = 0.061$). Cases performed by combined neurosurgery and neuro-otology teams were associated with fewer complications overall; however, this finding was exploratory and limited by cohort heterogeneity.

Conclusions: Surgical approach alone was not predictive of facial nerve outcomes or CSF leak following vestibular schwannoma resection. Tumor size and multidisciplinary surgical involvement may play a greater role in determining postoperative outcomes than approach selection alone.

PARALLEL POSTER TOUR

Session # 1

TOUR B

POST-8

A Personalized Summary Sheet Improves Patient Understanding and Reduces Anxiety in Multiple Sclerosis: Preliminary Results of the MANGOES Quality Improvement Initiative

S. Cao, A. Alanazi, J. Arocha Perez, Z. Alfares

Importance: Up to 65% of patients with multiple sclerosis (pwMS) experience cognitive impairment affecting memory, attention, and processing speed, which can compromise their ability to retain complex care plans discussed during outpatient visits.

Objective(s): To evaluate whether a personalized, printed summary sheet provided after MS clinic consultations is perceived as helpful by patients, and to explore its effect on clarity of next steps and anxiety reduction. As a secondary objective, we explored sex-based differences in these outcomes.

Design and Participants: We conducted a quality improvement initiative (MANGOES) at the MS outpatient clinic at London Health Sciences Centre. We provided patients with a printed summary at the end of each visit, including follow-up timing, investigations, referrals, medication changes, and clinic contact information. We collected anonymous survey responses using Likert scales. The primary outcome was patient-rated helpfulness. Secondary outcomes included clarity of next steps, anxiety reduction, and confidence in following the care plan. This is a preliminary analysis. As such, we used univariable analyses (Fisher's exact test) to explore differences between female and male respondents.

Results: We analyzed responses from 60 consecutive patients (44/60 [73.3%] female, 16/60 [26.7%] male; most common age group 40-49 years [21/60, 35.0%]). Only 8/60 (13.3%) had previously received a written visit summary. For the primary outcome, 55/60 (91.7%) rated the sheet as very or extremely helpful. Additionally, 56/60 (93.3%) reported very or extremely clear next steps, 48/60 (80.0%) agreed the summary reduced their anxiety, and 57/60 (95.0%) felt confident following their care plan. In total, 51/60 (85.0%) wanted to receive a summary after future visits. In univariable sex-stratified analyses, female respondents reported higher rates of helpfulness (43/44 [97.7%] vs 12/16 [75.0%], P=0.015) and anxiety reduction (39/44 [88.6%] vs 9/16 [56.2%], P=0.010) compared to male respondents.

Conclusions and Relevance: In this preliminary analysis, over 90% of pwMS rated the personalized summary sheet as very or extremely helpful. Female patients reported significantly higher helpfulness than male patients. This difference may reflect sex-based differences in health information-seeking behavior, as studies in chronic disease populations show that women tend to engage more actively with written health materials. These findings require confirmation in the full cohort.

POST-9

Real-World Performance of Automated MRI Lesion Detection Programs in Focal Epilepsy

M. Li, G. Pellegrino

Importance: Surgical resection can eliminate seizures in drug-resistant focal epilepsy, but success depends on accurately localizing the epileptogenic lesion on MRI. A large proportion of surgical candidates have no visible abnormality on routine imaging, limiting presurgical planning.

Objective: To determine whether spatial agreement between two automated MRI lesion detection programs, MELD and deepFCD, improves concordance with clinical reference standards compared to either program alone.

Design and Participants: Retrospective cohort study of 250 adults with focal epilepsy drawn from three referred samples at London Health Sciences Centre: the MRI2EEG project, the EpLink consortium, and a dedicated focal cortical dysplasia cohort. Patients were included if they had a confirmed diagnosis and a 3D T1-weighted MRI acquired during presurgical evaluation, and excluded if MRI processing failed or age was below 18 years. Both programs were run independently, and consensus clusters were defined as regions in a patient flagged by both programs simultaneously. The output was compared to references including the patient's neuroradiology reports, SEEG seizure-onset zones, and resection cavities.

Results: The cohort included 250 adults (128 female; mean age 32.4 years, SD 12.8); 157 (62.8%) were MRI-positive and 93 (37.2%) were MRI-negative. Both programs detected clusters in the majority of patients, but concordance with the clinical reference standard was low for each program individually. Consensus clusters, defined as regions flagged by both programs, were present in a smaller proportion of patients but showed substantially higher concordance with the reference standard than either program alone. Concordance was lower in MRI-negative patients across all conditions. False-positive cluster counts were higher for scans acquired at 1.5T than at 3T for both individual programs, though field strength did not significantly affect concordance for consensus clusters.

Conclusions and Relevance: Individual automated lesion detection programs produced high detection rates but poor concordance with clinical reference standards in a real-world cohort. Requiring agreement between both programs substantially improved concordance while reducing false positives. These findings suggest that multi-program consensus may be a useful filter in presurgical workflows, though concordance remained low in MRI-negative patients, where additional validation is needed before clinical adoption.

POST-10

Segmental Left Atrial Appendage Opacification: A Novel CT Imaging Biomarker for Individualized Stroke Phenotyping in Patients with and without Atrial Fibrillation

L. A. Abeyesekera, D. Ayan, F. Alotaibi, E. Soriano Navarro, F. Liberman, A. Gonzalez Lara, J. Rodriguez Orozco, Z. Mirza Asgari, L. Mai, S. Fridman, R. Bagur, M. Ahmed, N. Paul, L. A. Sposato

Importance: Stroke recurrence rates in patients with atrial fibrillation (AF) and embolic stroke of undetermined source (ESUS) approach 7% per year despite oral anticoagulant (OAC) therapy, suggesting that mechanisms beyond anticoagulation failure contribute to residual embolic risk. We hypothesized that markers of left atrial appendage (LAA) dysfunction on Cardiac CT could be used to phenotype embolic risk.

Objective(s): To introduce segmental left atrial appendage opacification (SLAAO) as a novel CT imaging biomarker of atrial thrombogenic dysfunction and to present the hypotheses and study design for its validation across the spectrum of cardioembolic stroke.

Design and Participants: This retrospective case-control study defined SLAAO as a contrast-based LAA phenotype identifiable on cardiac CT, classified into three subtypes: Type 1 (poor distal LAA opacification), Type 2a (contrast retention or pooling), and Type 2b (LAA wall contrast enhancement). We designed three prespecified comparisons using data from the DAYLIGHT trial, its post-implementation Phase-IV cohort, and the London Ontario Stroke Registry. Comparison 1 will assess SLAAO's association with breakthrough ischemic stroke in AF patients on OACs versus stroke-free AF controls using inverse probability of treatment weighting. Comparison 2 will compare SLAAO prevalence across three AF phenotypes: AF known before stroke (KAF), ECG-detected AF, and AF detected after stroke (AFDAS). Comparison 3 will compare SLAAO prevalence between KAF patients not receiving OACs and patients ESUS.

Results: Data collection and SLAAO adjudication are underway in approximately 750 patients. We hypothesize that SLAAO will be more prevalent in AF patients with breakthrough stroke than in AF controls without stroke, that SLAAO prevalence will follow a gradient across AF phenotypes (KAF > ECG-detected AF > AFDAS), and that SLAAO will be rare in ESUS patients compared to KAF patients. If confirmed, these findings would explain why anticoagulation trials in ESUS failed: the majority of ESUS patients may lack the mechanistic substrate for LAA-mediated embolism.

Conclusions and Relevance: SLAAO represents a novel approach to individualized stroke phenotyping that identifies atrial thrombogenic dysfunction on routinely available CT imaging. If validated, SLAAO could help identify stroke patients who may benefit from anticoagulation regardless of AF status, advancing precision medicine in secondary stroke prevention.

POST-11

Microscopic fractional anisotropy differences in genetic frontotemporal degeneration

I. So, R. Rios-Carrillo, K. Coleman, E. Finger, C. Baron

Importance: In genetic frontotemporal degeneration (FTD), cortical and subcortical volume differences can be detected using volumetric MRI decades before symptoms emerge, though underlying mechanisms remain unclear. Microscopic fractional anisotropy (μFA) is a relatively new diffusion MRI metric that is sensitive to diffusion anisotropy regardless of relative fibre orientations within a voxel (e.g., crossing fibres), and more accurate than conventional DTI metrics to detect age-related microstructural changes in healthy individuals and differences in some neurological diseases; however, it has never been examined in genetic FTD.

Objective: This pilot study compared the primary outcome of μFA between FTD variant carriers and familial non-carriers in the insula, frontal pole, and medial orbitofrontal cortex (mOFC). μFA utility was also assessed in relation to mean diffusivity (MD) and volume.

Design and Participants: This cross-sectional study included adults who were carriers (n=12) or non-carriers (n=8) of FTD pathogenic variants in C9orf72, GRN, or MAPT. A non-parametric aligned rank transform ANCOVA was computed per region to analyze between-group differences in μFA, while controlling for age. Additional models were computed for mean diffusivity (MD) and volume.

Results: Variant carrier and non-carrier groups did not differ in age (mean±SD, 58.1±9.21 years). FTD variant carriers exhibited lower insula μFA than non-carriers with large effect size: $F(1,19)=5.89$, 95% CI [-10.7,-0.75], $p=0.027$, $\eta 2p=0.26$. Older participants trended towards having lower insula μFA: $F(1,19)=3.83$, $p=0.067$, $\eta 2p=0.18$. No differences were observed in insula MD or volume, nor in μFA, MD, or volume of the frontal pole and mOFC.

Conclusions and Relevance: The findings of reduced insula μFA in FTD variant carriers aligns with established literature implicating the anterior insula as a region that is selectively vulnerable to the earliest signs of neurodegeneration in FTD. Reduced insula μFA could reflect a loss of cortical gray matter fibres, including of axons and dendrites from Von Economo neuron cell death, which Layer VI of the anterior insula contains, and which are especially vulnerable in FTD. This pilot study suggests that μFA may be more sensitive to microstructural changes in individuals with genetic FTD than traditional diffusivity measures, and replication in larger samples is warranted.

POST-12

Changes in Local and Network Brain Activity Across Repeated SEEG-Guided Thermocoagulation in Drug-Resistant Epilepsy

A. Ahmadi, C. Burbano, I. Castro, H. Kreinter, G. Pellegrino, J. Burneo, M. Jones, K. MacDougall, J. Lau, D. Steven, D. Diosy

Importance: Stereoelectroencephalography-guided radiofrequency thermocoagulation (SEEG-guided RF-TC) is an emerging treatment for drug-resistant epilepsy (DRE), though some patients need a second ablation due to incomplete seizure control. Understanding how local and network-level electrophysiological activity changes after initial or repeated thermocoagulation may help explain why this intervention did not fully eliminate seizures.

Objectives: This pilot study aims to characterize changes in interictal epileptiform discharges (IEDs), power spectral density (PSD), and functional connectivity (FC) following the first and second ablations.

Design and participants: SEEG recordings from 42 patients who underwent RF-TC were analyzed. All the patients had at least 24 hours of SEEG recordings. Interictal segments were selected from 15 minutes before and after each ablation. PSD across frequency bands, IED characteristics, and FC strength were quantified for thermocoagulated and adjacent contacts. Therapeutic response was defined as a ≥50% reduction in seizure frequency for at least one month after RF-TC. Changes in these electrophysiological features will be compared between the pre- and post-RFTC sessions, as well as between the responder and non-responder groups.

Results: Preliminary analysis suggests a more pronounced reduction in IED rate, spectral power, and FC strength following the ablation in responders (with highest change for beta band power AUC=0.8, Mann–Whitney U test, p<0.001). In contrast, persistent or increased local and network activity after a procedure may indicate incomplete modulation of epileptogenic tissue.

Conclusions and relevance: By assessing both local and network electrophysiological changes after RFTC, this pilot study aims to improve understanding of treatment resistance mechanisms and to identify potential electrophysiological markers for guiding RF-TC strategies in patients with DRE.

POST-13

Ondine's Curse (Central Hypoventilation Syndrome) as the Presenting Manifestation of Diffuse Midline Glioma

B. Dalal, M. Langford

Importance: Ondine's curse, also known as central hypoventilation syndrome (CHS), is a rare and potentially life-threatening disorder characterized by dysfunction of brainstem respiratory control centers, leading to impaired autonomic ventilatory drive. Acquired CHS is uncommon but its variable, unpredictable presentation should prompt clinicians to maintain a high index of suspicion and prioritize early airway management and supportive mechanical ventilation.

Objective: To report a patient with acquired CHS secondary to a brainstem glioma and highlight key clinical, radiologic, and diagnostic features aiding recognition.

Design/Participants: Case report.

Results: A 57-year-old previously healthy man was found unresponsive after a fall, left-sided weakness, and possible bulbar dysfunction two weeks prior. On arrival, he required intubation for altered level of consciousness, hypoxia, and respiratory acidosis, with associated hypotension, hypothermia, and metabolic derangements. Despite improved consciousness with supportive care, following extubation he developed hypercapnia (pCO_2 68 mmHg), increased work of breathing, and weak inspiratory effort, requiring re-intubation. Neuromuscular, spinal, infectious, and autoimmune etiologies were investigated, but exam showed preserved cognition, no ptosis, and near-normal strength, arguing against a peripheral cause. MRI brain (day 7) revealed a non-enhancing, expansile lesion centred on the medulla, concerning for brainstem glioma affecting respiratory centers. Biopsy was deemed unsafe, prompting CSF ctDNA analysis to identify an H3F3A K27M mutation with copy number alterations, confirming diffuse midline glioma, grade 4. The patient remained ventilator-dependent with features of CHS. He was counseled about a low likelihood of meaningful neurologic recovery from radiotherapy so he decided to transition to comfort care.

Conclusions & Relevance: CHS is a rare disorder of impaired autonomic breathing, classically congenital but rarely acquired from brainstem lesions. This case highlights CHS as a presenting feature of diffuse midline glioma, where pontomedullary involvement caused persistent hypercapnia and extubation failure despite preserved strength. It underscores the diagnostic challenge, as presentations may mimic neuromuscular or systemic disease. CSF ctDNA enabled diagnosis when biopsy was not feasible.

POST-14

Extraneuronal TAR DNA-Binding Protein 43/SARS-CoV-2 N Protein Condensates in Amyotrophic Lateral Sclerosis

A. Keating, J. Clarke, M. Strong

Importance: Amyotrophic lateral sclerosis is a fatal neurodegenerative disease in which dysregulated metabolism of the RNA-binding protein TDP-43—marked by cytoplasmic aggregation and nucleocytosolic redistribution—is observed in 97% of cases. We hypothesize that the SARS-CoV-2 nucleocapsid protein forms condensates with TDP-43 in spinal motor neurons and that extracellular vesicles mediate their intercellular transfer, contributing to disease propagation.

Objectives: To determine whether TDP-43/NCP biomolecular condensates form in spinal motor neurons and to determine whether there is evidence to support the EV-mediated intercellular transport of TDP-43/NCP condensates between spinal motor neurons.

Study Design: We examined post-mortem spinal tissue from a representative sample of ALS cases (n = 21) from the Strong Lab inventory. Cases were selected based on sex, age at death, and diagnosis (sporadic/familial). Antibody-mediated immunohistochemistry (IHC) and immunofluorescence (IF) were utilized to detect TDP-43 and NCP. Visualization was completed using brightfield and confocal microscopy. To assay for co-aggregation, co-immunoprecipitation assays were performed.

Results: 21 post-mortem ALS spinal cord tissue cases were examined (male and female, age at death ranging 46-85 years). Using IHC, we first confirmed the specificity of anti-NCP antibodies using SARS-CoV-2 infected human lung tissue. We then confirmed the presence of TDP-43 cytoplasmic inclusions in spinal motor neurons from neuropathologically-confirmed cases of ALS. Using confocal microscopy, we observed both TDP-43 neuronal cytoplasmic inclusions typical of ALS and punctate cytosolic NCP expression with colocalization observed in some, but not all cases. This latter finding was further supported by the co-immunoprecipitation of NCP and TDP-43 from ALS spinal cord protein lysates. We also observed extraneuronal deposits of TDP-43/NCP protein condensates, suggested to be transported in EVs.

Conclusion and Relevance: These preliminary data will be greatly expanded upon, but support a model where viral protein-host RNA binding protein interactions stabilize TDP-43 condensates and exploit EV pathways to spread pathology. This study is significant as it may provide insight into the mechanisms by which viral infection can affect the pathogenesis of neurodegenerative disease and aids in our understanding of ALS disease propagation.

POST-15

Improving the Identification and Documentation of Non-Motor Symptoms in Patients with Multiple Sclerosis: A Quality Improvement Study

A. Jamshidi-Shahvar, H. Minhas, J. Tran, V. Zeynalli, Z. Raza, P. Parikh, J. Atton, J. Mohamad, Y. Lin, K. Dwyer, C.S. Casserly

Importance: Multiple sclerosis (MS) is a chronic neurological disease associated with a broad spectrum of symptoms beyond motor dysfunction. Non-motor symptoms – including fatigue, cognitive impairment, mood disorders, sleep disturbances, and bladder or bowel dysfunction- are common and contribute substantially to reduced quality of life and disability. Despite their clinical importance, these symptoms are not consistently captured during routine neurology visits, potentially due to time constraints, competing clinical priorities, and the absence of standardized screening tools. Improving the systematic capture of non-motor symptoms may enhance recognition and management in clinical care.

Objectives: To evaluate baseline documentation of non-motor symptoms in patients with MS and identify gaps to inform development of a structured patient-reported symptom survey.

Design and Participants: This quality improvement study is a retrospective chart review of adult patients with MS attending a single tertiary care MS clinic. Eligible participants were adults (>18 years) with MS, enrolled in the MS Registry, and seen in clinic within the past year. A target sample size of 50 charts was selected based on feasibility and to provide stable estimates of symptom documentation across non-motor domains. Charts were reviewed using a standardized data abstraction tool. Data collected included demographic characteristics and documentation of predefined non-motor symptoms. Documentation rates were calculated for each symptom.

Results: A total of 36 participants have been included to date, with recruitment ongoing. Of these, 24 (66.7%) are female. Mean age is 47.9 years (SD 12.3), and mean disease duration from symptom onset is 16.8 years (SD 22.1). Preliminary analyses will characterize the frequency (n, %) of documentation of individual non-motor symptoms during routine clinical visits and identify areas of incomplete or inconsistent symptom capture.

Conclusions and Relevance: This quality improvement study systematically evaluates documentation of non-motor symptoms in MS care. Identifying gaps in routine clinical assessment is an important first step toward improving comprehensive symptom evaluation. Findings will inform the implementation of a digital patient-reported symptom screening tool to enhance the recognition and management of non-motor symptoms in outpatient MS care.

PARALLEL POSTER TOUR

Session # 2

TOUR A

POST-16

Correlating Post-mortem Gross Macroscopy with Histopathological Findings in the Caudate Nucleus in Frontotemporal Lobar Degeneration

S. Pejhan, B. Brower, H. Lee, L. Ang, E. Finger, Q. Zhang

Importance: Frontotemporal lobar degeneration (FTLD) is a heterogeneous neurodegenerative disorder characterized by abnormal protein aggregation, most commonly involving TDP-43 and tau. Clinical variability in presentation and disease course is not consistently reflected by neuroimaging findings, including MRI, raising the question of the underlying pathological correlates. In addition, subcortical structures, including the caudate nucleus, remain incompletely characterized despite their role in frontal–subcortical circuits and behavioral regulation.

Objective: We aimed to assess disease burden and neuroinflammation in the caudate nucleus in postmortem FTLD brain tissue. This was achieved by measuring caudate size on autopsy brain section photographs alongside assessment of microscopic hallmarks of FTLD within the caudate.

Design: A retrospective analysis of 27 clinically and neuropathologically confirmed FTLD cases from the London Health Sciences Centre Brain Bank was performed. Cases were grouped into FTLD-TDP and FTLD-tau. Caudate size was assessed from photographs of postmortem coronal brain sections. Immunohistochemistry for TDP-43 (total and phosphorylated), phosphorylated tau, TMEM-119, and HLA-DR was performed. Regions of interest within the caudate were analyzed using QuPath software for quantitative assessment of protein accumulation and microglial activation. Comparisons were performed between pathological subtypes, hemispheres, and by sex.

Results: Variation in caudate size was observed across FTLD subtypes, between left and right hemispheres, and by sex. In addition, a quantitative framework for digital IHC slide analysis within defined regions of interest was developed.

Conclusion: Integration of macroscopic assessment of caudate size with histopathological hallmarks, including disease-specific protein aggregates and neuroinflammatory measures, provides a structured approach to characterizing subcortical disease burden in FTLD.

POST-17

Did not consent to having abstract posted online.

POST-18

Treatment Outcomes of Advanced Combination Therapy in Multiple Sclerosis-Inflammatory Bowel Disease Overlap: A retrospective Single-Centre case series

A. Alanazi, S. Vuyyuru, P. Riccio, J. Racosta, C. Casserly, V. Jairath, B. Ciftci

Background: Inflammatory bowel disease (IBD) is among the most common autoimmune comorbidities in multiple sclerosis (MS), ranking third in some studies; however, treatment outcomes in patients with MS–IBD overlap receiving newer disease-modifying therapies (DMTs) remain poorly characterized.We describe a single-centre experience of people with MS-IBD overlap, focusing on treatment outcomes.

Methods: This retrospective, single-centre case series included patients with coexisting MS and IBD who were treated with at least one biologic therapy/small molecule drug for either condition. Data were summarized using descriptive statistics.

Results: Nine patients (38–64 years; 4 women) were included: eight with relapsing–remitting MS and one with secondary progressive MS. MS DMTs were ofatumumab (n=5), cladribine (n=3), siponimod (n=1). Five patients had Crohn's disease and four ulcerative colitis; IBD preceded MS in five. Five received concurrent IBD therapy (vedolizumab n=2, risankizumab n=1, ustekinumab n=1, 5-aminosalicylic acid n=1). Outcomes included IBD remission with MS clinical/radiologic stability in seven patients, a Crohn's flare on fingolimod resolving after switch to cladribine (n=1), and concurrent MS and Crohn's flares five years post-cladribine requiring dual immunotherapy (n=1).

Conclusions: Up to three quarter of patients achieved MS–IBD stability with newer DMTs, either as monotherapy or dual therapy, underscoring the feasibility of individualized, multidisciplinary care in this rare overlap population.

POST-19

Pediatric epilepsy surgery following stereoelectroencephalography: multi-level data on clinical factors and electrode contact-brain tissue sampling representation

K.P. Ferraris, A. Akbarpour, D. Adil, A. Thurairajah, A. Skovronska, M. Kregel, R. Eagleson, M.N. Nouri, A. Andrade, and S. de Ribaupierre

Introduction: We aim to describe the anatomo-electro-clinical factors of pediatric patients who underwent invasive monitoring with stereoelectroencephalography (SEEG) and eventual epilepsy surgery in our cohort.

Methods: A five-year retrospective review of our series was performed for cases done in the LHSC Children's Hospital. We collected patient-level clinical factors and decision patterns, as well as electrode contact-level anatomical subregions and probabilistic tissue values based on atlas segmentations. Comparative statistics and correlations were done between clinically meaningful variables. Regression analyses and clustering were done where possible.

Results: Forty-three pediatric patients underwent SEEG, with a mean age 12 years (range: 1.5—17). Age of onset of epilepsy averaged 4.7 years (range: neonatal period to 14 years) while the duration of epilepsy prior to having undergone SEEG averaged 7.2 years. Mean number of seizure types of the whole cohort was 2, and at least 3 diagnostic modalities were done for presurgical evaluation, with MRI and PET concordance having a statistically significant relationship (χ^2=26.83, p=.001). With respect to the concordance rate between presurgical evaluation and SEEG-identified seizure-onset zone (SOZ), no difference was found among the findings whether focal, multifocal-unilateral, or multifocal-bilateral, nor for how the pre-implantation hypothesis was either confirmed or further refined. Certain brain regions have a positive correlation with having received a focal treatment (p<0.05): cingulate, perirolandic, and frontal. In the 49% of patients who have overlap in their eloquent cortex and the SOZ—such as in Rolandic-perirolandic areas and dominant hemispheres—either resection or radiofrequency thermocoagulation (RFTC) was not an absolute contraindication. From the 4701 electrode-contacts (n=1760 with complete data), three clusters were identified: gray matter (39%), white matter (47%), and gray–white matter interface (14%). Our cohort had a mean follow-up period of 18.8 months and 30.2% (n=13) had ILAE class 1 or 2 outcomes. Subregions found to be predictive of contact-level SOZ were: frontal (OR=1.68, p<0.05), mesial temporal (OR=1.24, p<0.001), and occipital (OR=0.98, p<0.05).

Conclusion: Complex pediatric cases had to consider the trade-off between seizure freedom and neurologic deficit, as well as the window of neuroplasticity, thus necessitating combinatorial treatments. Granular contact-level data reveals higher SOZ discovery rates in the frontal, mesial temporal, and occipital lobes.

POST-20

Use of Responsive Neurostimulation Beyond the U.S.: International Experience and Outcomes

N, Valencia-Enciso, C. Burbano, I. Castro, J. Burneo, G. Pellegrino, M. Lee-Jones, JC. Lau, DA. Steven, KW. MacDougall, D. Diosy, A. Suller-Marti

Importance: Resective surgery remains the most effective treatment alternative for patients with drug-resistant focal epilepsy (DRFE). This option is not feasible when the epileptogenic zone overlaps eloquent cortex, involves multiple independent foci, or reflects a regional rather than focal network. Responsive Neurostimulation (RNS) is a closed-loop neuromodulation system and offers a palliative treatment. RNS records epileptiform activity and delivers targeted stimulation, with programmable parameters individualized based on quantitative electrographic data and clinical response. Despite FDA approval in 2013, evidence supporting seizure reduction and quality-of-life improvement, RNS remains very limited outside the US, including in Canada.

Objectives: In this case series we present local experience with post-implantation management of RNS, highlighting its clinical efficacy and demonstrating that appropriate follow-up can be successfully delivered within our setting.

Methods: We retrospectively analyzed patients with DRFE who were implanted with RNS (2019–2024) and are followed at our center. We reviewed demographics, epilepsy characteristics, prior treatments, intracranial findings, and seizure outcomes. Safety was assessed by reviewing reported side effects or complications after implantation. If the RNS led to refining the epileptogenic zone hypothesis was explored.

Results: Seven patients (ages 28–49) were included, and all were women. Epilepsy duration ranged from 6–40 years; patients had tried 1–12 antiseizure medications before implantation. Reason for implantation was mutifocal epilepsy in four patients and eloquent cortex overlap in three patients. All had hypothesis confirmation with intracranial electrodes. Follow-up ranged from 15–67 months. Mainly bitemporal and focal neocortical cases showed significant reductions in seizures. Long term follow up of 2 of the bitemporal lobe cases resulted in proposing temporal lobectomy, as the prevalence of seizures was lateralized using prolonged recordings.

Conclusions: Post-implantation RNS management is feasible in Canada. In this cohort, patients with independent bitemporal epilepsy had the greatest benefit. These results support the feasibility, therapeutic value, and need for broader national access to this intervention.

POST-22

Erdheim-Chester Disease Presenting as a Subdural Hematoma

W. Yaghmoor, J. Houpy, Y. Li, C. Howlett, L. Ang, J. Megyesi

Importance: Erdheim–Chester disease (ECD) is a rare histiocytic neoplasm with frequent central nervous system involvement and significant diagnostic challenges. Dural-based presentations mimicking subdural hematoma (SDH) are exceedingly uncommon and may lead to delayed diagnosis and repeated ineffective interventions.

Objective(s): To describe a rare case of ECD presenting as a recurrent subdural collection initially diagnosed as chronic subdural hematoma (cSDH), and to highlight diagnostic pitfalls and clinical implications.

Design and Participants: This is a single-patient case report of a 76-year-old woman presenting with progressive headache and left-sided weakness without antecedent trauma. Initial imaging demonstrated a right frontoparietal subdural collection with mass effect. The patient underwent burr-hole evacuation followed by middle meningeal artery embolization due to persistent collection. Recurrent symptoms prompted craniotomy and lesion resection. Histopathological, immunohistochemical, and molecular analyses were performed, followed by systemic staging.

Results: The patient (female, 76 years) underwent two surgical interventions. Initial evacuation yielded minimal fluid with persistent mass effect. At repeat surgery, the lesion was found to be a solid mass rather than a hematoma. Histopathology demonstrated foamy histiocytic infiltration within organizing hematoma. Immunohistochemistry showed CD68 positivity, CD1a negativity, and BRAF V600E positivity, confirmed by next-generation sequencing, establishing the diagnosis of ECD. Systemic imaging revealed characteristic skeletal sclerosis and perinephric infiltration, confirming multisystem disease. Postoperatively, the patient experienced complete neurological recovery and was referred for targeted therapy consideration.

Conclusions and Relevance: Dural-based Erdheim–Chester disease can rarely mimic chronic subdural hematoma, particularly in cases with atypical clinical or radiological features or poor response to standard treatment. This case underscores the importance of considering alternative diagnoses in recurrent or refractory SDH and highlights the critical role of histopathological and molecular evaluation. Early recognition has direct therapeutic implications, as targeted therapies against MAPK pathway mutations have significantly improved outcomes. Multidisciplinary management is essential for optimal care.

POST-23

Stroke Recurrence in Young Adults with TIA and PFO: Results From the IMPROVE International Registry

Fawaz Alotaibi, Diana Ayan, Lakni Abeyesekera, Eduardo Soriano Navarro, Arturo Gonzalez Lara, Jaime Rodriguez Orozco, Zahra Mirza Asgari, Lauren Mai, Sebastian Fridman, Antonio Arauz, Rodrigo Bagur, Luciano A. Sposato

Importance: Randomized controlled trials demonstrated that patent foramen ovale (PFO) closure reduces stroke recurrence in young adults with cryptogenic ischemic stroke. However, these trials excluded patients with transient ischemic attack (TIA) as the index event. Whether the risk of recurrence in TIA patients with PFO is high enough to justify closure remains unknown.

Objective(s): To compare the annualized rates of ischemic stroke recurrence between young adults with TIA versus ischemic stroke as the index event in a large international PFO registry.

Design and Participants: We conducted a prospective and retrospective international registry (IMPROVE) across 24 countries. We included patients aged <60 years with a PFO and either ischemic stroke (n=1,759) or TIA (n=286) as the index event. We categorized patients by PFO closure status: closure (stroke n=858, TIA n=103) and no closure (stroke n=901, TIA n=183). We used Cox proportional hazards models with PFO closure as a time-dependent covariate. We applied adjusted models for the stroke cohort and unadjusted models for the TIA cohort due to the low number of events.

Results: We analyzed 1,759 stroke patients (mean age 45.0 years, SD 10.6; 46.2% female) and 286 TIA patients (mean age 45.3 years, SD 10.2; 52.1% female). The unadjusted annualized rates of ischemic stroke recurrence were substantially lower in TIA patients than in stroke patients. Among those without PFO closure, the rate was 0.55 per 100 patient-years in TIA patients compared to 1.73 per 100 patient-years in stroke patients. Among those with PFO closure, the rate was 0.44 per 100 patient-years in TIA patients compared to 0.46 per 100 patient-years in stroke patients. In the stroke cohort, PFO closure was associated with a 64% lower risk of ischemic stroke recurrence (adjusted HR 0.36, 95% CI 0.16-0.81, P=0.013). In the TIA cohort, the comparison was inconclusive (unadjusted HR 0.56, 95% CI 0.04-7.25).

Conclusions and Relevance: The risk of ischemic stroke recurrence in young adults with TIA and PFO was substantially lower than in those with ischemic stroke as the index event. These findings suggest that the baseline recurrence risk in TIA patients with PFO may be too low to justify closure in the absence of data from randomized controlled trials.

PARALLEL POSTER TOUR

Session # 2

TOUR B

POST-24

Preclinical Safety and Efficacy of Intracranial Electrotherapy for Glioma Treatment

E. Iredale, N. Fulcher, S. Schmid, T. Peters, E. Wong, M.O. Hebb

Importance: Intratumoral Modulation Therapy (IMT) is an intracranial anti-cancer electrotherapy technique showing increasing promise for treating aggressive brain cancers like Glioblastoma (GBM), which remains the most fatal form of primary brain cancer. With IMT, low-intensity electric fields (<10 V/cm) at 200 kHz frequencies well above neural entrainment thresholds can be continuously applied directly to tumor regions using multiple implanted electrodes.

Objective: To evaluate the in-vivo safety, efficacy, and field distribution of dynamic IMT in an F98 glioblastoma model.

Design and Participants: Dynamic IMT fields from a 3-electrode construct were applied for 7 days to the Fischer rat brain with F98 glioblastoma tumors grown for 4 days prior to IMT initiation (n=12 treated, n=12 sham). Tumor growth was evaluated with pre- and post-treatment bioluminescence imaging (BLI) (n=12 pairs), and ex-vivo 15.2T MRI (n=6 pairs). Longitudinal electrical measurements and computer simulations were used to evaluate the electric field distribution for each rat using their implanted electrode geometry from MRI and individual delivered voltage measurements. Brain temperature over time in the central field region was evaluated in non-tumor bearing Sprague-Dawley rats (n=5), using a thermocouple probe.

Results: The change in BLI signal over the 7 treatment days yielded an 8-times reduction in tumor growth for the treated rats compared to their sham counterparts (n=12 pairs, p<0.01). Tumor volume from MRI analysis yielded a 5-times reduction in tumor volume growth (n=6 pairs, p<0.05). The measured delivered voltage increased linearly over the 7 treatment days (r=0.98, p<0.001), along with tissue impedance (r=0.95, p<0.001), reflecting the physiological tissue response from electrode implantation. Average electrode separation from MRI was 2.2±0.2 mm. Rat-specific simulations yielded a central electric field of 6.7±1.0 V/cm, and >5 V/cm in surrounding tumor regions. The brain temperature within the central field region increased by 1.0±0.6°C, after reaching steady state (30 minutes).

Conclusions and Relevance: Our findings suggest that we may need higher than the accepted 1 V/cm threshold for reliable tumor suppression. The in-vivo safety and anti-cancer efficacy of dynamic IMT, and feasibility of individualized field mapping, support the translation to clinical trials to further assess safety and therapeutic effectiveness.

POST-25

Effectiveness and stimulation parameters of transcutaneous vagus nerve stimulation in patients with epilepsy: a systematic review

S. Papadopoulos, M. Elnazali

Importance: Drug-resistant epilepsy affects approximately 30% of patients and is associated with significant disability, morbidity and mortality. Transcutaneous vagus nerve stimulation (tVNS) is an emerging noninvasive neuromodulation therapy with potential therapeutic benefit.

Objective: To evaluate the clinical effectiveness of tVNS in reducing seizure frequency in patients with epilepsy and to assess the variability in stimulation parameters used across studies.

Design and participants: A systematic review was conducted using PubMed and Scopus databases for studies published between 2010 and 2025. Studies were included if they investigated tVNS in patients with epilepsy and reported stimulation parameters. Studies not involving tVNS or lacking parameter details were excluded. A total of 20 studies met the inclusion criteria, comprising 802 patients with epilepsy. Study designs varied, with heterogeneous patient populations and sampling methods.

Results: Across 20 studies involving 802 participants, seizure frequency in epileptic patients demonstrated variable outcomes. Several studies reported a reduction in seizure frequency in a proportion of patients, whereas others demonstrated no change or an increase of seizure frequency. The stimulation parameters varied in their frequency, intensity, pulse width, and stimulation location, which may have corresponded with the heterogeneity of the seizure frequency outcomes. Reported adverse effects were generally mild and included skin irritation at the site of stimulation, headaches, nausea, ear pain and hoarseness.

Conclusion and Relevance: tVNS demonstrates variable effectiveness in reducing seizure frequency in patients with epilepsy, with inconsistent outcomes observed across studies. Variability in stimulation parameters such as frequency, intensity, pulse width, and stimulation site could contribute to the inconsistency of seizure frequency reduction outcomes. Standardization of stimulation protocols and further studies are needed to optimize efficacy and establish more consistent evidence for its use in clinical care.

POST-27

Medulloblastoma in Two Infants with Gorlin Syndrome

O. Ananthakrishnan, M. Poon, A. Mastrolonardo, S. De Ribaupierre, C. Cacciotti

Gorlin syndrome (GS), or Nevoid Basal Cell Carcinoma Syndrome, is an autosomal dominant familial cancer predisposition often associated with mutations in PTCH1 or SUFU genes. Medulloblastoma, typically the sonic hedgehog (SHH) molecular subtype, occurs early in life in those affected, with an incidence of 5% by age two. Due to its rarity, the condition carries significant clinical implications, warranting further investigations, prompt management as well as familial testing.

Objective: This report aims to improve our understanding of the clinical course of infants with GS-associated medulloblastoma.

Design and Participants: A review of three databases identified 35 relevant articles. Data from these studies were analyzed alongside two cases of infants diagnosed with GS and medulloblastoma at our centre.

Results: The first case involved a six-month old boy with a PTCH1 germline mutation and SHH medulloblastoma. He underwent gross total tumour resection followed by chemotherapy. Despite a prolonged and complicated hospital course, he remains in remission.

The second case involved a 10-month old boy with a germline SUFU mutation and desmoplastic/nodular, SHH-activated medulloblastoma (subtype 2 MO). He underwent gross total tumour resection, followed by chemotherapy, including high dose chemotherapy and autologous stem cell rescue. The patient tolerated treatment relatively well, and is in remission.

In both these cases the familial cancer predisposition was not known prior to the tumour diagnosis. Subsequent genetic testing identified germline mutations prompting family counselling and initiation of surveillance.

Radiotherapy is typically avoided in young children with medulloblastoma due to neurocognitive toxicity. Instead, treatment strategies include surgery and chemotherapy, including high dose chemotherapy with autologous stem cell rescue when appropriate. GS patients with SUFU mutations have a 20-fold higher risk of developing medulloblastoma than those with PTCH1 mutations. Favorable outcomes are reported in M0 patients with desmoplastic/nodular or medulloblastoma with extensive nodularity (MBEN) histology, with five-year progression-free and overall survival rates approaching 90-100%.

Conclusions and Relevance: These cases contribute to the limited literature on GS-associated infant medulloblastoma. Surgery and chemotherapy are effective strategies, especially in patients with favorable histology. Early identification of GS is essential to guide management and ensure appropriate long-term surveillance for associated malignancies.

POST-28

Resolving Variants of Uncertain Significance in ALS through Integrated In Silico and Functional Approaches

M. Ahmed, K. Volkening, C. McLellan, T. Balci, C. Shoesmith, M. Strong

Importance: The use of genetic testing for neurological disease has increased exponentially with the advent of new gene therapies. A frequent outcome of genetic testing is receiving a variant of uncertain significance (VUS) whose interpretation has remained a challenging problem.

Objectives: To determine an algorithm that classifies VUS accurately in comparison to in vitro data. To determine the impact of oligogenicity on VUS interpretation.

Design and Participants: Using genetic information from 158 ALS patients from LHSC's Motor Neuron Disease Clinic between October 2023 and December 2024, we propose an algorithm to interpret VUS by combining predictive tools for splicing, population data, and protein pathogenicity. Findings were validated in vitro by expressing wild-type and mutant proteins in HEK293T cells and assessing subcellular localization via confocal microscopy.

Results: Using 158 ALS patients, a thorough literature review identified in silico tools and databases that could be used together to aid in variant interpretation. Utilizing this multimodal approach to VUS interpretation yielded predictions for different variants involved in amyotrophic lateral sclerosis (ALS). While these tools successfully offered predictions for some genes, a significant portion of pathogenicity is due to oligogenic inheritance that only in vitro experiments could appreciate.

Conclusion and Relevance: Our findings underscore the necessity for a multimodal approach to VUS interpretation and explored limitations of the single gene approach. VUS interpretation will be necessary to a future of precision medicine.

POST-29

Management of GSA: Case Report and Systematic Review of Treatment Strategies

K. Parikh, Dr. A. Mastrolonardo, Dr. A. Mascarenhas

Importance: Giant serpentine aneurysms (GSAs) are rare and complex vascular lesions characterized by their size (≥25 mm) and intricate treatment considerations with significant impact of treatment strategies on downstream territory perfusion. Understanding the nuanced approaches to their management is crucial.

Objectives: This review aims to synthesize existing treatment strategies for GSAs and present a detailed case illustrating the application of balloon test occlusion (BTO) followed by embolization.

Design: A comprehensive systematic review was performed by searching multiple databases, screening 272 studies, and identifying 40 that documented the treatment of intracranial GSAs. Data extracted included patient demographics, aneurysm location and size, presenting symptoms, treatment modalities, complications, and clinical outcomes.

Results: We report a case of a 64-year-old woman presenting with headaches and dizziness, with an unremarkable neurological exam. Imaging revealed a large serpentine aneurysm of the left middle cerebral artery (MCA). She underwent two balloon test occlusions; initially, occlusion of the pre-aneurysmal M1 segment induced symptoms, but occlusion at the post-aneurysm distal M2 segment was tolerated without symptoms. Embolization was performed starting at the outflow of the aneurysm and progressing proximally. She tolerated this well and experienced a transient expressive aphasia that fully resolved.

Among the reviewed cases, there were 31 males, 17 females, and 13 with unreported sex, indicating a male predominance. Patient ages ranged from 5 to 71 years (mean 39 years). GSAs were most commonly located in the MCA, anterior cerebral artery (ACA), and basilar artery (BA). Literature suggests favorable outcomes when robust collateral circulation is confirmed prior to parent vessel sacrifice. However, 3 cases reported thrombotic complications leading to postoperative paresis, likely related to the aneurysms' location in the vertebral and basilar arteries, also adding complexity in this perforator-rich region.

Conclusions: Treatment strategies for GSAs have advanced over time and include surgical bypass, parent vessel occlusion (via surgical, endovascular, or combined approaches), and flow diversion. Overall, outcomes are generally favorable when collateral circulation assessment guides intervention, and as such, we report an elegant case outlining this assessment and the endovascular management of GSA.

POST-30

Navigating The Unknown: Exploring the Lived Experiences of Persons Newly Diagnosed with Multiple Sclerosis in Canada

S. Hyarat, V. Smye, W. Koopman

Title: Navigating the Unknown: Exploring the Lived Experiences of Persons Newly Diagnosed with Multiple Sclerosis in Canada

Importance: Multiple sclerosis (MS) is a chronic neurological disease that significantly affects emotional well-being, identity, and daily functioning following diagnosis. Although Canada has one of the highest rates of MS worldwide, limited research examines the lived experiences of persons newly diagnosed with MS during the early adjustment period.

Objective: To explore the lived experiences of persons newly diagnosed with MS in Canada, with attention to emotional responses, challenges, personal strengths, coping strategies, and support needs.

Design and Participants: This qualitative descriptive phenomenological study was conducted within a constructivist paradigm and guided by Lazarus and Folkman's Stress, Appraisal, and Coping Theory. Adults aged 18–59 years diagnosed with MS within the previous two years were recruited using purposive sampling from the Multiple Sclerosis Clinic at London Health Sciences Centre (LHSC) and community MS organizations in Ontario, Canada. Semi-structured interviews (60–90 minutes) were conducted and transcribed verbatim. Data were analyzed using Giorgi's descriptive phenomenological method. Ten participants (n = 10) were included in the study.

Results: Participants described diagnosis as a disruption to bodily certainty, identity, and future orientation. Early experiences included unexplained bodily changes, prolonged diagnostic uncertainty, and complex emotional responses such as fear, shock, relief, and disbelief. Following diagnosis, participants reported challenges related to fatigue, cognitive changes, employment disruption, social withdrawal, and navigating fragmented healthcare systems. Participants also demonstrated resilience through maintaining continuity of self, relying on supportive relationships, pacing activities, engaging in meaningful routines, seeking information, and gradually taking an active role in their care. The early MS experience was characterized as an ongoing process of re-orientation rather than adjustment to a stable condition.

Conclusions and Relevance: The period following MS diagnosis is lived as an ongoing process of emotional, bodily, and practical re-orientation. Findings highlight the importance of coordinated post-diagnostic support, clear information pathways, and person-centered care addressing psychological and everyday life challenges for persons newly diagnosed with MS.

POST-21

The CanDo Brain Health Implementation Initiative

A Avan, A.J. Appleton, W.A. Fisher, S.N. Whitehead, J.K. Shoemaker, V Hachinski.

Importance: The aging population and the rising burden of stroke and dementia indicate a critical implementation gap where fragmented clinical advice fails to drive sustained behavior change. To bridge this gap, we propose the CanDo Brain Health Implementation Initiative, operationalizing the BASIC-S framework (Blood pressure, Activity, Sleep, Interaction, Consumption, Support).

Objectives: The primary objective of Phase 1 is to establish feasibility and acceptability, targeting ≥50% recruitment and ≥80% retention. The co-primary objectives of Phase 2 are to achieve a ≥6.7% improvement in BASIC-S scores and a ≥8.3% improvement in Integral Brain Health (IBH) scores at 24 months. Secondary objectives evaluate clinical efficacy, targeting a 15% relative increase in blood pressure control (<130/80 mmHg), alongside systemic reductions in workforce absenteeism.

Design and participants: We outline a three-phase protocol targeting hospital employees, pre-retirees, and their partners in London, Ontario. Phase 1 validates tools and assesses recruitment (N=200) with a focus on feasibility and acceptability. Phase 2 is a Randomized Controlled Trial (N=600-800) assigning participants 1:1 to the CanDo intervention (BASIC-S delivered via an AI-driven "Escalation Ladder" supported by coaches) or standard care. Metrics include the BASIC-S (behavior) and Integral Brain Health (IBH) Indices, alongside measured blood pressure, HbA1c, LDL-C, and digital cognitive screening. Phase 3 scales the model via the CanDo Center.

Anticipated Results: We hypothesize a statistically significant improvement in the adoption and maintenance of healthy lifestyle behaviors in the intervention arm compared to standard care. This will be quantified by the BASIC-S Index (a 5-item self-report tool scored 0–15) and the IBH Index (a 3-item tool assessing thinking, feeling, and connecting, scored 3–15, representing cerebral, psychological, and social health respectively). Secondary anticipated results include enhanced blood pressure control, significantly reduced health-related work absenteeism, improved workforce productivity, and lower estimated acute healthcare utilization costs.

Conclusions and Relevance: By developing an inclusive, technology-enabled strategy adaptable across sex, gender, and socioeconomic status, this proposal establishes a scalable, sustainable, and replicable model for brain health implementation.

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