Scientific Proceedings

Global Ismaili Health Professionals Conference 2026
April 17 to 19, 2026
Houston, Texas

Global **Ismaili**
Health Professionals
Conference
2026 • HOUSTON

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Clinical Practice

Transition of Care in Pediatric Neurosurgery: National Survey of Program Structures, Barriers, and Best Practices

Laila Mohammad

Background:
The transition of care for pediatric neurosurgical patients with chronic conditions such as hydrocephalus and spina bifida is critical to maintaining health outcomes into adulthood. However, program structure, institutional support, and patient experiences vary widely.

Methods:
Pediatric neurosurgeons were invited to participate in an electronic survey distributed via the AANS/CNS Joint Section on Pediatric Neurosurgery listserv in 2024, with follow-up semi-structured interviews conducted in 2025. The survey included closed-ended items on program characteristics and clinic structure, with qualitative free-text responses on challenges and practices. Quantitative data were summarized descriptively; qualitative responses and interview transcripts underwent inductive thematic analysis.

Results:
Eighty individuals completed the survey; 32/80 (40%) reported having established transition programs. Fifteen (18.8%) agreed to follow-up interviews. Only 20% of hospitals had a coordinator dedicated to transition. Formal transition pathways were reported by 60% (hydrocephalus) and 80% (spina bifida). Advanced practice providers (APPs) were used in 93.3% of institutions, but only 20% had APP-specific clinics. Average pediatric care age limits were 21 years of age for both conditions. Thematic analysis revealed four dominant themes: (1) Continuity of care, with “warm handoffs” and “congenital neurosurgery” models cited as optimal; (2) Financial and administrative barriers, including low RVU generation, limited departmental funding, and Medicaid acceptance challenges; (3) Patient/family experience, marked by anxiety, reluctance to leave pediatric providers, and difficulty finding adult “landing spots”; and (4) Multidisciplinary care and tracking, with team-based clinics valued but hindered by data infrastructure limitations.

Conclusion:
Pediatric to adult transition programs in neurosurgery are inconsistently structured and under-resourced despite strong institutional recognition of need. Effective models emphasize multidisciplinary collaboration, formalized pathways, APP engagement, and patient empowerment. These findings suggest that long-term sustainability will require dedicated funding, supportive policy, and evidence-informed protocols and implementation strategies to meet the growing needs of pediatric neurosurgery patients transitioning to adult care.

Risk Factors and Clinical Implications of Incidental Left Common Iliac Vein Compression

Zohaib Lakhani

Background:
Compression of the left common iliac vein by the overlying right common iliac artery, classically termed May-Thurner Syndrome (MTS), is a known risk factor for left lower extremity deep vein thrombosis (DVT). While symptomatic MTS is well characterized, this finding is often encountered incidentally on cross-sectional imaging in asymptomatic patients. The clinical significance of incidental iliac vein compression remains incompletely understood. This study evaluates risk factors and clinical outcomes associated with incidental left common iliac vein compression on computed tomography (CT).

Methods:
This IRB-approved retrospective study reviewed venous-phase abdomen and pelvis CT scans performed at a single institution over a two-week period in March 2025 to identify patients with incidental extrinsic compression of the left common iliac vein due to an overlying right common iliac artery. Patients were excluded if they had a prior diagnosis of MTS or if imaging was performed for MTS workup, acute DVT, or lower extremity edema. A total of 726 patients were included (364 females, 362 males; mean age 61.9 ± 15.9 years). Board-certified radiologists reviewed all CT scans to identify significant incidental left iliac vein compression defined as >50% luminal narrowing. Patient comorbidities, laboratory values, and DVT history were reviewed. Hydration status was assessed using the BUN/creatinine ratio, with >20 considered hypovolemic.

Results:
Significant iliac vein compression was identified in 114 patients (15.7%) and was more common in females (19.5%) than males (11.9%) (Odds ratio [OR]: 1.80; 95% Confidence interval [CI] 1.19–2.71; p<0.01). Patients with >50% iliac vein compression had significantly lower BMI compared with those without compression (24.8 ± 6.2 vs 28.7 ± 7.2 kg/m², p<0.01). No significant differences were observed based on BUN/creatinine ratio (p=0.15), diabetes mellitus (p=0.35), chronic kidney disease (p=0.44), heart failure (p=0.41), or coronary artery disease (p=0.81). Patients with incidental compression had a higher rate of prior left lower extremity DVT (OR 2.17; 95% CI 1.55–4.08; p=0.02), but not ipsilateral lower extremity edema (p=0.12).

Conclusion:
Incidental left common iliac vein compression was present in approximately 16% of patients and was more frequent among females. Compression was associated with lower BMI and more than twice the rate of ipsilateral DVT, despite no prior diagnosis of MTS. These findings emphasize the importance of iliac vein

evaluation among patients with newly diagnosed lower extremity DVT, as significant MTS may go undiagnosed and undertreated.

Ethnographic Approach to Explore Educational Learning Preferences of Anesthesia Providers: A Qualitative Study at Holy Family Surgery Center in Honduras

Marvesh Mendhi

Background:
Anesthesia providers have a critical role to deliver safe patient care. Anesthesia provider ratio per 100,000 population in Honduras (2.23) is low compared to the USA (20.82). Several volunteer-based foundations, organize anesthesia providers to fill the gap. From a sustainability perspective, the core issue is to build capacity within the developing nation. Anesthesia education is limited in rural areas. The aim is to create a culturally-appropriate sustainable education process in a rural area of Honduras at Holy Family Surgery Center (HFSC). This qualitative research explored the anesthesia providers' current practice, learning and teaching style.

Methods: Exploratory qualitative ethnographic approach was utilized to collect the data during the volunteer trip to Honduras. 1) field notes, 2) semi-structured interviews with the medical director and nurse anesthetist educator, 3) two focus group discussions with Honduras anesthesia providers. The investigators included a Spanish-speaking anesthesiologist to conduct the focus group discussion and interviews. The NVivo 10 qualitative tool was used for transcriptions and translation of Spanish to English. The data was analyzed by Spanish-speaking investigators and a Spanish-speaking qualitative researcher.

Results:
The semi-structed interviews revealed that the HFSC is mostly staffed by volunteer teams and rarely used the Honduran anesthesia providers. During the focus group discussion, they voiced their learning style preferences as demonstration by doing actual cases together and discussion teaching style with Spanish speaking anesthesia providers. There is opportunity to enhance education and build capacity so they can provide safe anesthesia within the HFSC

Conclusion:
The knowledge gained will contribute to development of culturally-appropriate educational collaboration. The plan includes to work with the anesthesia educator from Honduras, Spanish speaking anesthesia providers from Mayo Clinic. A three-step process will be proposed: 1. Focused anesthesia lectures in Spanish prior to the volunteer trip. 2. Do cases with the anesthesia providers during the volunteer trip. 3. Discuss each case in Spanish.

Effects of Eliminating Sugar-Sweetened Beverages in Diabetics on an Inpatient Behavioral Health Unit: A Pilot Study

Rozina Virani

Background:
Diabetes mellitus affected approximately 34 million Americans in 2019 and contributed to an estimated $367 billion in healthcare expenditures. Frequent consumption of sugar-sweetened beverages (SSBs) is associated with obesity, poor glycemic control, cardiovascular disease, and other metabolic complications. Although national initiatives promote reducing SSB availability in healthcare settings, no studies have examined the impact of eliminating SSBs on glycemic control among hospitalized patients with diabetes, particularly in behavioral health units where management of psychiatric conditions may overshadow chronic disease management.

Methods:
This pilot study evaluated the effects of eliminating SSBs on glycemic control among adults with type 1 or type 2 diabetes mellitus admitted to a geriatric behavioral health unit in an urban community hospital in Chicago. A retrospective control group with usual access to SSBs (3 months) was compared to an intervention group with restricted access to SSBs (4 months) during 2019–2020.

The intervention included elimination of SSBs (sodas, sports and energy drinks, sweetened milk, tea, coffee, fruit punch, lemonade, and powdered sweetened beverages), increased availability of healthier beverage options, and a multidisciplinary educational campaign. Data were collected through chart audits and included hemoglobin A1c (A1c), mean daily glucose levels, number of glucose checks, medication use, and medication adherence. The study received institutional review board approval.

Results:
The sample included 43 patients (n=19 control; n=24 intervention). Ninety percent had type 1 diabetes mellitus. The mean A1c was 7.46% (range 5.1%–14.1%), and 7.2% had an A1c <5.7%. Diabetes treatment included oral medications (23%), insulin (30%), and combined oral plus insulin therapy (44%). The control group demonstrated higher medication adherence (89.5% vs. 70.8%), although this difference was not statistically significant ($p=0.14$). Mean daily glucose levels were significantly predicted by A1c ($\beta=0.60$, $p=0.001$) and use of combined oral plus insulin therapy compared to oral therapy alone ($\beta=0.30$, $p=0.02$) (model $p<0.001$, $R^2=0.64$). The number of glucose checks was predicted by medication adherence ($\beta=-0.68$, $p<0.001$) and A1c ($\beta=0.37$, $p=.08$) (model $p=0.002$, $R^2=0.41$). Elimination of SSBs did not significantly reduce glucose levels during hospitalization. Annual cost savings associated with eliminating SSBs were estimated at $22,469.

Conclusion:
Eliminating sugar-sweetened beverages in an inpatient behavioral health unit did not significantly improve short-term glycemic control during hospitalization. Glycemic outcomes were more strongly associated with baseline A1c levels, medication regimen, and medication adherence. These findings suggest that strategies to improve glycemic control in this population should prioritize medication adherence and optimization of pharmacologic therapy. Larger randomized controlled trials are warranted to further evaluate the impact of environmental dietary modifications on glycemic outcomes in behavioral health settings.

Outcomes of Fetal and Maternal Complications in Women with a History of Stroke in an Integrated Health Care System

Zahra Ajani

Background:
Stroke in women of childbearing age is not only disabling but also may have lifelong consequences for their family planning. There are no large studies on maternal and fetal outcomes in patients with a history of stroke.

Methods:
In this retrospective study, we collected data between 1/2004 to 12/2021 on women aged 18-50 years old who had a pregnancy within 16 years from their cerebrovascular event (CVE). ICD-10 codes were used to identify the eligible subjects. Demographic data including maternal age, race, gestational age, mode of delivery, associated medical conditions were collected.

Results:
219 patients were included in this cohort with mean age at the time of CVE 29.1±6.2 y, median time between CVE and delivery 34 m (IQR:13-65). 17 (7.8%) had a history of factor V Leiden, protein C deficiency or lupus associated hypercoagulable state. The initial CVE was identified as acute ischemic stroke in 77 (35.2%), transient ischemic attack (TIA) in 64 (29.2%), subarachnoid hemorrhage in 46 (21%), intracerebral hemorrhage in 23 (10.5%), and cerebral venous thrombosis in 9 (4.2%). Maternal adverse events were seen in 38 (17.3%) patients: 29 (13.2%) with HELLP syndrome/eclampsia/pre-eclampsia, and 9 (4.1%) with recurrent TIA/stroke within 1 year after pregnancy. The rate of maternal adverse events decreased 5 years after the stroke. Patients with a history of stroke were at higher risk of having preterm delivery 38 (17.4%) than the general population. 27 (12.3%) of newborn infants had 1 min Apgar<7 while 6 (2.7%) had 5 min Apgar<7. The rate of neonatal poor outcomes (preterm birth or Apgar<7) decreased over time.

Conclusion: The rate of maternal and neonatal adverse events decreases after about 5 years after the CVE.

Safety and Efficacy of Low-Intensity Monitoring Protocol Following IV Thrombolysis in a Community Setting

Zahra Ajani

Background:
The OPTIMIST main trial demonstrated the feasibility of reduced intensity neuromonitoring in select patients treated with intravenous thrombolytics. Building on this evidence, we evaluated the safety and effectiveness of a low-intensity monitoring protocol (LIMP) in a community hospital setting.

Methods:
We retrospectively analyzed 61 patients who received IV thrombolysis and monitored under LIMP versus standard of care between August 2022 and April 2025. All patients received standard of care monitoring per current AHA guidelines for the first 12 hours. Patients were eligible for LIMP if they had a baseline NIHSS < 6 and did not have clinical deterioration or require IV antihypertensives within the first 12 hours. LIMP was initiated at 12 hours post thrombolysis and was characterized by reduced frequency vital sign assessments every 4 hours and NIHSS evaluations every 2 hours between 12 to 24 hours compared to hourly assessments in the standard of care group. Eligible patients were transferred to the telemetry stroke unit when beds were available; otherwise, they remained in the ICU but were monitored at the reduced frequency. Outcomes included NIHSS trends, clinical deterioration or safety concerns, length of stay (LOS), and modified Rankin Scale (mRS) at 90 days.

Results:
Of the 61 patients, 41 (67%) were managed under the LIMP protocol and 20 (33%) received standard care. No patients in either group experienced neurological worsening at 24 or 36 hours, or at discharge. There were no significant differences in LOS (LIMP: 2.77 ± 1.17 days vs. standard: 5.12 ± 5.19 days, p=0.2) or mRS at 90 days (LIMP: 0.59 ± 1.07 vs. standard: 1.00 ± 1.22, p=0.5). No complications were reported in either group.

Conclusion:
This study highlights that LIMP is a safe and effective alternative to standard monitoring in patients who receive IV thrombolysis for symptoms of mild to moderate stroke. Healthcare systems should consider incorporating LIMP allowing for more cost-effective resource utilization in community settings.

APP-Led Survivorship Clinic for Prostate Cancer Patients Following Radiation Therapy

Amina Huda

Background:
Prostate cancer survivors treated with radiation therapy frequently experience urinary, bowel, sexual, and psychosocial sequelae affecting quality of life. National guidelines recommend structured survivorship care including PSA surveillance, systematic assessment using validated instruments, and coordinated follow-up, yet delivery remains inconsistent. No dedicated prostate cancer survivorship clinic existed within Stanford Health Care Radiation Oncology.

Objectives:
This project implemented an advanced practice provider-led survivorship clinic to improve care continuity, standardize survivorship planning, and systematically address late effects through guideline-concordant interventions.

Milestones:
The clinic launched in 2021, initially serving high-risk patients. Eligibility expanded to all prostate cancer patients receiving radiation, with referrals from three oncologists across two campuses. Survivorship visits are integrated into first post-treatment follow-up. In 2024, an APP Survivorship Taskforce was established to standardize tools and expand the program.

Progress:
First visits occurred in January 2020 (Campus 1) and April 2022 (Campus 2). Annual volume increased from 55 to 162, representing 194% growth ($p<0.01$). Total: 576 patients. Survivorship care plans were documented for all patients. Validated instruments assessed urinary, bowel, and sexual function at baseline and each visit. Distress assessments occurred quarterly. Care included risk-stratified PSA surveillance, testosterone monitoring during and after androgen deprivation therapy to track response and recovery, bone and cardiovascular health screening, symptom management (fatigue, hot flashes, mood and sexual changes), fall prevention counseling, nutrition and exercise recommendations, specialty referrals, colonoscopy coordination, genetic testing, and lung screening per NCCN guidelines.

Challenges:
Challenges included demographic homogeneity and scaling beyond prostate cancer. Taskforce priorities address these through standardized assessment tools and implementation frameworks.

Breast Cancer-Related Lymphedema: A Comparative Study of Shear Wave Elastography and B-Mode Measurements for Assessing Lymphaticovenous Anastomosis

Zohaib Lakhani

Background:
Lymphedema grading relies on subjective and indirect objective measures. Ultrasound shear wave elastography (SWE) provides a quantitative, non-invasive assessment of tissue stiffness (Young's modulus, E), which may reflect disease severity and improve objectivity in staging lymphedema. This pilot study (NCT 05613946) evaluates the utility of SWE and B-mode skin and subcutaneous thickness for grading upper extremity lymphedema in patients with treated breast cancer undergoing lymphaticovenous anastomosis (LVA) surgery.

Methods:
Nine patients with upper extremity lymphedema secondary to breast cancer underwent ultrasound preoperatively (baseline) and six months following LVA. Soft tissue thickness and stiffness were measured in the affected limb and contralateral unaffected limb (control). Imaging findings were correlated with routinely collected objective metrics, including limb volume and bioimpedance spectroscopy.

Results:
At baseline, the affected limb demonstrated slightly lower soft tissue stiffness than the unaffected limb (mean dermal E: 75.4 ± 10.6 kPa vs. 78.0 ± 12.8 kPa; mean subcutaneous E: 40.8 ± 17.7 KPa vs. 45.5 ± 19.5 KPa). At six-month follow-up, dermal and subcutaneous stiffness increased, on average more in the untreated limb. Post-operative changes in stiffness showed weak to moderate positive correlation with changes in arm volume (Dermal E: slope (m) = 0.02, R^2 = 0.37, Subcutaneous E: slope (m) = 0.01, R^2 = 0.14) and no correlation with electrical impedance.

Baseline dermal and subcutaneous thickness were similar between limbs. At six-month follow-up, Dermal and subcutaneous thickness also increased in both arms.

Treated limb volume decreased (mean Δ: −276.3 ± 326.1 mL) and impedance increased (mean Δ: +14.7 ± 22.3 Ohms), consistent with clinical improvement.

Conclusion:
Postoperative increase in dermal stiffness and soft tissue thickness were not intuitive. Potential confounders that could explain this result include increased patient weight or variability in sonographic technique. The increasing trend for subcutaneous stiffness is noted in the literature and may be due to underlying chronic fibrosis. Additional research

is warranted to clarify the role of SWE and B-mode measurements in lymphedema assessment.

Anti-CASPR2 Antibody Autoimmune Encephalitis in a 2-Year-Old Female with Elevated Mercury Levels and COVID-19

Sahar Panjwani

Background:
We present a case of a 2-year-old female with elevated serum mercury levels and acute COVID-19 who was admitted to our hospital with worsening chills, insomnia, full body rash, hand and foot swelling, behavioral changes, tremors, tachycardia, and hypertension. She had been previously admitted to an outside hospital with an extensive workup notable only for borderline mercury level elevation.

Case Description:
Despite chelation therapy, her symptoms continued to worsen and she presented to our ED 6 days after discharge. She was found to be agitated, hypertensive, drooling and incidentally COVID-19 positive. Physical exam was significant for profuse diaphoresis and tremor as well as laboratory tests showing leukocytosis, anemia, thrombocytosis, elevated catecholamines, and elevated neutrophils. CT abdomen and renal Doppler were negative for pheochromocytoma and renal artery stenosis along with reassuring abdominal MRI. HMA, VMA, and 5-HIAA testing were negative.

Multiple antihypertensives were required for adequate blood pressure control, including ACE- inhibitors and non-selective beta blockade once renal artery stenosis and pheochromocytoma were excluded. EEG findings were nonspecific but MRI brain with and without contrast demonstrated patchy T2/FLAIR signal abnormality in periventricular and deep white matter structures, as well as scattered throughout the supratentorium with extensive cortical involvement, most concerning for encephalitis. LP was done under anesthesia and CSF results were significant for elevated protein level and anti-contactin-associated protein-like 2 (CASPR2) antibody.

Discussion:
Anti-CASPR2 antibody has previously been seen in adults and older children with median age of presentation in children being around 12 years old. This patient’s aggressive behaviors and regression in language and gross motor skills were consistent with initial differential diagnoses of autism spectrum disorder or Rett syndrome but given dysautonomia and agitation, encephalitis was considered in the differential. With the diagnosis of autoimmune encephalitis confirmed, the etiology of hypertension was thought most consistent with autoimmune encephalitis associated dysautonomia.

Implications:
For pediatric patients presenting with a constellation of symptoms such as this case not improving with initial therapy, broad diagnostic work-up is necessary and encephalitis should be considered as part of the differential diagnoses.

Urinary Tract Infection (UTI)-Free and Recurrent UTI (rUTI)-Free Survivals Following Bladder Electrofulguration in Women with a History of Antibiotic-Recalcitrant UTI

Amyn Malik

Background:
Recurrent UTIs (rUTI) contribute to significant morbidity and impaired quality of life. Electrofulguration (EF) of areas of chronic cystitis harboring deep-seated bacteria is an outpatient procedure increasingly considered in antibiotic-recalcitrant rUTI patients; however, its long-term effectiveness on outcomes is not well understood.

Methods:
To evaluate UTI-free and rUTI-free survival following EF we conducted a retrospective cohort study of women with culture-confirmed symptomatic and antibiotic-recalcitrant UTIs who underwent EF between 2006 and 2024. Kaplan-Meier survival analyses compared survival outcomes by age group and cystitis stage. Multivariable Cox proportional hazards models evaluated the independent associations of age and stage with each outcome.

Results:
During the follow-up period, 291 of 601 patients (48.4%) developed a post-EF UTI. The median time to first UTI was 50 months (95% CI: 40.8–64.8). Increasing age was associated with higher risk of post-EF UTI (aHR = 1.01 per year; 95% CI: 1.00–1.02; $p = 0.013$). Compared to patients with Stage 1 cystitis, patients with Stage 4 had a significantly shorter median post-EF UTI-free survival (24.5 vs. 69.3 months; aHR: 1.90, 95% CI: 1.33–2.71; $p < 0.001$). Post-EF rUTIs occurred in 87 patients (14.5%), with a median time of recurrence at 153 months. Older age (aHR: 1.02; 95% CI: 1.00–1.04; $p = 0.019$) and Stage 4 cystitis (aHR = 3.23, 95% CI: 1.78–5.85; $p < 0.001$) were independently associated with higher risk of post-EF rUTI.

Conclusion:
Electrofulguration offers meaningful benefit in prolonging UTI-free and rUTI-free survivals among women with antibiotic-recalcitrant rUTI. However, its effectiveness is influenced by baseline cystitis extent by stage and age.

A Learning Health System Intervention to Increase Sodium Glucose Transporter-2 Inhibitor (SGLT2i) Use in Patients with Chronic Kidney Disease

Areef Ishani

Background:
Sodium-glucose cotransport-2 inhibitors (SGLT2i) have been shown to improve clinical outcomes for patients with type 2 diabetes and chronic kidney disease (CKD), yet their uptake in clinical practice remains low. The aim was to assess whether a pharmacist-led outreach intervention would increase initiation of SGLT2i among patients with type 2 diabetes and CKD.

Methods:
Through an established VA diabetes dashboard, eligible patients were divided into two groups based on the last digit of their social security number, creating a pseudo-randomized treatment assignment. Those with an odd social security number served as the intervention group while the evens served as the control. The study was conducted from February 2022 to April 2024 at eight VA health systems in the Midwest United States. 8658 veterans with CKD (eGFR 25-59 mL/min/1.73m^2) and type 2 diabetes were included. Patients were excluded if they were already prescribed an SGLT2-inhibitor, had type 1 diabetes, or had contraindicating conditions. As part of a learning health system initiative, eligible patients were mailed a letter describing the benefits of SGLT2i. Patients were then scheduled for a 30-minute telephone visit with a pharmacist. If the patient was determined to be a candidate for the medication, they were started on empagliflozin. The primary outcome was initiation of an SGLT2i. The secondary outcome was SGL2i prescription fill at 12 months while the exploratory outcome included a composite of all-cause mortality, kidney failure, heart failure, myocardial infarction, and stroke along with the individual outcomes.

Results:
Of 8658 eligible patients, 4505 were assigned to the pharmacist intervention and 4378 were assigned to usual care. The cumulative percent of SGLT2i filled one year post assignment was 33.5% for the intervention group compared to 15.5% for the control. At 12 months, 19.6% of intervention patients initiated an SGLT2i compared to 9.7% in the control group. The hazard ratio for initiation of an SGLT2i between the intervention group and control was 1.913 (95% CI, 1.69-2.16; p<0.0001) No significant difference was observed in the composite clinical outcome (win ratio 1.02; 95% CI, 0.97-1.07; p=0.54).

Conclusion:
Pharmacist-led outreach significantly increased initiation of SGLT2i and the number of SGLT2i filled 1 year after study arm assignment. While no short-term clinical outcome differences were seen, this scalable learning health system approach may enhance uptake of guideline-recommended therapies in real-world settings.

Comparison of Quantitative Transmission Imaging and MRI for High-Risk Screening of Breast Cancer: A Pilot Study

Zohaib Lakhani

Background:
Screening mammography and magnetic resonance imaging (MRI) are standard imaging modalities for women at elevated lifetime risk of breast cancer. American College of Radiology guidelines recommend supplemental ultrasound for high-risk patients unable to undergo MRI, but counsels that the cancer detection rate of ultrasound is inferior to that of MRI. Quantitative Transmission Imaging (QTI) is an FDA-cleared, non-ionizing, ultrasound-based 3D whole-breast imaging system that captures anatomical and functional breast data. This is a prospective pilot study that evaluates the effectiveness of QTI compared with MRI as a supplemental screening tool in high-risk patients.

Methods:
Twenty-six women with an elevated lifetime risk of breast cancer (>20%) scheduled for screening breast MRI were enrolled. QTI was performed within 30 days of the scheduled MRI. Images from both modalities were independently interpreted by four breast radiologists with 2-24 years of experience. For each finding, imaging characteristics, size, and location were recorded, and a Breast Imaging Reporting and Data System (BIRADS) score was assigned. Agreement between paired MRI and QTI BIRADS scores was evaluated using weighted Cohen's kappa for the ordinal (BIRADS 1–5) scale and unweighted kappa after dichotomization into binary categories of negative (1–2) or positive (3–5).

Results:
All patients underwent bilateral breast MRI and QTI, with up to three imaging findings recorded per breast. Across both imaging modalities, 71/104 breasts (68%) had no findings, 30/104 breasts (29%) had one finding, and 3/104 breasts (3%) had two findings. Exact BIRADS agreement between MRI and QTI was observed in 34/52 (65%) breasts, with a weighted Cohen's kappa of 0.28 [-0.093, 0.594]. Binary agreement was observed in 47/52 breasts (90%) with unweighted Cohen's kappa of 0.23 [-0.083, 0.781]. A BIRADS 4 MRI finding with benign pathology on biopsy was classified as BI-RADS 3 on QTI.

Conclusion:
Absolute agreement between QTI and MRI was high, suggesting comparable effectiveness of QTI and MRI in identifying positive findings. However, this pilot study was limited by its small sample size as well as rarity of positive findings. Studies with larger sample size or investigating populations undergoing biopsy of high-suspicion lesions are warranted to further evaluate the effectiveness of QTI as a supplemental screening tool in high-risk patients.

Evaluating the Role of the VA Network in the NHLBI-Funded ACTIV-4 Acute COVID-19 Platform Trial

Narlina Lalani

Background:
Hospitalized COVID-19 patients face high risks of multi-organ failure and death. Microvascular inflammation and thrombosis are central to the disease's pathophysiology and clinical sequelae. A Multicenter, Adaptive, Randomized Controlled Platform Trial of the Safety and Efficacy of Antithrombotic and Additional Strategies in Hospitalized Adults with COVID-19 (ACTIV-4 A), an NHLBI-funded initiative utilized an adaptive platform trial designed to evaluate antithrombotic and anti-inflammatory agents to improve clinical outcomes in this high risk population.

Methods:
This international, randomized, open-label study utilized a "Network of Networks" structure. The VA performance sites were managed by a coordinating center at the Minneapolis VA and the Center for Veterans Research and Education. Participants were randomized to receive crizanlizumab (a P-selectin inhibitor), an SGLT2 inhibitor, both, or standard of care. Inclusion required hospitalization for COVID-19, age >18, and enrollment within 72 hours of admission. The primary outcome was organ support-free days at day 21.

Results:
Results indicated that crizanlizumab did not improve organ support-free days. The SGLT2 inhibitor domain was closed on March 31, 2023. The VA network contributed 69 of the 353 total enrollments (19.5%) across nine sites, with Orlando (n=35) and Madison (n=11) as top contributors. Notably, the VA network achieved superior retention, with a 1.4% lost-to-follow-up rate compared to 4.8% in non-VA sites. This success was attributed to a dedicated network that was VA-specific and streamlined operations.

Conclusion:
The VA network effectively participated in a large-scale, NHLBI-funded study, demonstrating high enrollment and exceptional data retention. This established infrastructure serves as a proven model for future multi-site, externally funded clinical trials within the Veterans Administration healthcare system.

Diagnostic Yield of Genetic Testing for Non-Syndromic Early-Onset Obesity in a Multidisciplinary Pediatric Obesity Clinic

Farah Ladha

Background:
Obesity is a public health epidemic present in approximately 20% of the pediatric population in the US. Childhood obesity is defined as a body mass index (BMI) at or above the 95th percentile of the sex and age-specific growth charts. While obesity is a multifactorial trait, a subset of cases of early-onset obesity can be attributed to an underlying genetic etiology which can be syndromic or non-syndromic obesity (NSO). Pharmaceutical interventions are available for patients with pathogenic variants in genes involved in hypothalamus function or the leptin- melanocortin pathway. However, there is a lack of consensus for genetic testing recommendations in pediatric patients that present with early-onset NSO. We aim to determine the utility and diagnostic yield of clinical genetic testing in this population.

Methods:
The multidisciplinary Genetic Disorders of Obesity Program at Texas Children's Hospital evaluates pediatric patients with a BMI >99th percentile documented before age 5. Clinic evaluations were performed by an endocrinologist, medical geneticist, and genetic counselor. Following evaluation, the obesity was classified as lifestyle/environmental, NSO, or syndromic obesity. The NSO cohort was further categorized based on perceived utility of genetic testing based on family history, abnormal appetite, or discordant weight gain with lifestyle interventions.

Results:
A total of 370 individuals were evaluated during the study period. In this cohort, 47.0% (174/370) were determined to have an NSO presentation with good genetic testing utility, while 2.7% (10/370) were categorized as NSO with poor genetic testing utility and were excluded from the analysis. This cohort was comprised mostly of females (56.3%, 98/174), with an average age of 8.3 years old (range: 1.3-17.6). Abnormal eating patterns were noted in 50.6% (88/174) of individuals and 69.0% (120/174) had a positive family history of obesity. Genetic testing of some type was completed in 167 individuals, with 4.2% (7/167) having a positive genetic diagnosis for NSO. All positive results were a heterozygous pathogenic variant in the MC4R gene and were inherited from an affected parent.

Conclusion:
While this diagnostic yield is lower than the expected 10% in published NSO cases, the findings are consistent with MC4R being the most common genetic etiology for NSO. Confirmation of a molecular diagnosis can alter medical management due to the availability of therapeutic options and can inform recommendations for at-risk family

members. Further studies are needed to determine additional factors that can aid in ascertaining the cases of NSO that are more likely due to an underlying genetic etiology.

Reducing Hemoglobin A1c in a Primary Care Clinic with Type 2 Diabetes Mellitus by Administering a Diabetes Self-Management Education (DSME) Program

Shirin Chunara

Background:
The Diabetes-Self Management Education (DSME) program is a comprehensive program that enables people to equip themselves with self-learning behaviors, take control of their disease, and reduce blood sugar levels. This project was implemented at one of the primary care clinics in Houston, Texas.

Objectives:
To reduce the average glycosylated hemoglobin (HbA1c) level among adult patients with type 2 diabetes mellitus in a primary care clinic by at least one percentage point (from 9.64% to 8.64%) over a four-month period through implementation of targeted diabetes self-management interventions.

Milestones:
Baseline assessment
• Identified eligible patients with type 2 diabetes mellitus and established baseline HbA1c average (9.64%). Launched DSME program checklist, all participating providers trained on DSME checklist. Delivered initial DSME sessions; evaluated use of the checklist, patient engagement, and early feedback
• Midpoint HbA1c evaluation at 2 months
• Measured interim HbA1c trends to assess early clinical response. Second PDSA cycle implemented
• Adjusted intervention strategies (e.g., reinforcement sessions, follow-up calls, goal setting)
• Patient Self-Management Goal Documentation Achieved
• ≥80% of participants established individualized SMART goals
• Project Outcome Achieved (Month 4)
• Average HbA1c reduced by ≥1 percentage point (from 9.64% to 8.64%)
• Sustainability Plan Developed
• Standardized DSME workflow integrated into routine clinic practice..

Progress:
Following implementation of Diabetes Self-Management Education (DSME), progressive improvement was observed over the four-month project period. The baseline mean HbA1c was 9.64%. After initiation of structured DSME sessions and completion of the first PDSA cycle, early trends demonstrated modest glycemic improvement and increased patient engagement in self-monitoring and lifestyle modification, as evidenced by documentation using the DSME checklist. After two iterative PDSA cycles, HbA1c levels

improved steadily, decreasing from 9.64% at baseline to 8.64%, reflecting a sustained reduction of more than one percentage point over four months.

Strengthening Outcomes: Collaborative Care Visits as a Strategy to Lower Readmission Rates

Zarina Jiwa

Background:
Hospital readmissions are a major quality and cost concern influenced by many patient and system factors. Fiscal year 2025 (July 2024 - June 2025) rates at Baylor Scott & White Medical Center– Irving was not meeting the readmission goal, highlighting the need to strengthen patient and family engagement in education and discharge planning. Evidence shows such involvement reduces avoidable readmissions, leading to the introduction of collaborative care visits (CCVs).

Objectives:
1 - Demonstrate effective interprofessional collaboration to improve care transitions and communication.
2 - Describe the purpose and structure of collaborative care visits in supporting patient-centered care.
3 - Explain how collaborative care visits help reduce hospital readmissions by strengthening the coordination of care, engaging patients, and effective interprofessional collaboration.

Milestones:
1) Need Identified & Council Endorsement (May 2024)
Higher readmission rates led the readmission council to launch CCVs and support a coordinated, team-based, patient-focused, bedside intervention.
2) Standardized CCV Model & Early Tracking
Requires 2+ disciplines (plus family when possible) to align goals, clarify discharge plans, and
address complex needs; initially focused on high-risk patients and manually tracked.
3) Refined Population & Unit Pilot (MS1-6)
Narrowed focus to patients discharging home with home health services, a population identified as vulnerable to readmissions, then launched as a formal pilot on MS1-6 by embedding CCVs into the discharge planning process.

Progress:
a) Overall Results
As the number of CCVs increased over time, from 18 in July 2024 to peaks of 48–58 between April 2025 and November 2025, readmission percentages began to fall. The trend shows that months with higher CCV completion generally correspond to lower

readmission rates, demonstrating that structured CCVs helped reduce avoidable readmissions over time.

b) Pilot Results

Readmissions among CCV patients declined as the workflow strengthened, decreasing from 16.66% in October 2025 to 8.30% in January 2026, reflecting improved discharge readiness and clearer postacute coordination. MS1-6 overall readmissions also decreased, shifting from 20.59%–21.92% in July–September 2025 to 16.10%, 19.31%, 13.28%, and 11.43% from October 2025–January 2026. These trends demonstrate that CCVs contributed to reducing avoidable readmissions.

Challenges:

The CCV pilot faced challenges including unclear patient complexity criteria, limited ownership, low staff confidence, time-intensive coordination, and inconsistent processes. Weekend staffing barriers and last-minute change such as sudden shifts to discharge with home health services or new physician orders made timely CCVs difficult, disrupting workflow and reducing completion consistency.

Multimodal Salivary Transcriptomic and Ciliary Functional Signatures across the Spectrum of Bronchopulmonary Dysplasia Severity

Fatima Boricha

Background:
Bronchopulmonary dysplasia (BPD) is a major complication of extreme prematurity, characterized by impaired lung development, chronic inflammation, and increased morbidity and mortality. While immune dysregulation is increasingly recognized in BPD, the relationship between inflammatory gene expression and ciliary function across disease severity remains poorly defined. We aimed to characterize salivary inflammatory transcriptomic profiles in infants with established BPD and to evaluate severity-dependent differences in ciliary beat dynamics and epithelial ultrastructure.

Methods:
Saliva samples were collected from infants with BPD (n=20) and age-matched healthy controls (n=15). Expression of 590 immune-related genes was quantified using the NanoString nCounter platform. In a complementary prospective cohort, nasal epithelial samples were obtained via brushing from extremely preterm infants with mild (n=6), moderate (n=6), and severe BPD (n=8) at 36–42 weeks postmenstrual age. High-speed video microscopy was used to assess ciliary beat frequency (CBF), dyskinesia, immobility, and related dynamic parameters. Epithelial ultrastructure was evaluated using electron microscopy.

Results:
Salivary transcriptomic profiling demonstrated a consistent pro-inflammatory signature in infants with BPD. Differential expression analysis identified 18 genes significantly altered compared with controls (p<0.05), including upregulation of chemokine signaling pathways (CXCL1, CCL24, CCL4) and innate immune mediators (DEFB103B, DEFB4A), along with relative downregulation of adaptive immune and natural killer–associated genes.

Ciliary function varied significantly by BPD severity. Contrary to initial hypotheses, moderate and severe BPD were associated with higher mean CBF (9.5 Hz and 7.3 Hz, respectively) compared with mild BPD (6.0 Hz), driven by incomplete and dyskinetic beat patterns. The dyskinetic index was higher in moderate and severe BPD (33% and 28% vs. 12%). Severe BPD was further associated with reduced ciliary beat angle (p=0.045) and amplitude (p=0.028), increased immobility, and structural epithelial abnormalities, including mitochondrial changes and epithelial disruption, despite largely preserved axonemal ultrastructure. No statistically significant differences were observed in ciliary length (p=0.215), orientation vector (p=0.272), straight angle (p=0.141), bending index (p=0.245), or amplitude per second (p=0.085).

Conclusion:
Infants with BPD exhibit a dual phenotype of persistent airway inflammation and severity-dependent ciliary dysfunction. Upregulation of chemokine signaling pathways, particularly CXCL1, may serve as a non-invasive biomarker of chronic airway inflammation. Severe BPD is characterized by ineffective mucociliary clearance despite increased CBF, suggesting compensatory but dysfunctional ciliary activity. These findings highlight potential therapeutic targets and support proactive airway clearance strategies in infants with moderate to severe BPD.

Addressing Rural Health Disparities through a Home-Based Lifestyle Intervention: Protocol for a Randomized Controlled Trial

Shirin Reshamwala

Background:
Rural populations in Georgia, USA, experience disproportionately high rates of obesity and cardiometabolic disease, driven in part by geographic isolation and limited access to preventive healthcare services. This protocol describes a randomized controlled trial evaluating a low-cost, home-based lifestyle intervention designed to improve diet and physical activity behaviors among middle-aged adults at elevated risk of metabolic syndrome (MetS).

Methods:
This parallel-group randomized controlled trial will enroll 500 adults aged 50–69 years with central obesity and at least one additional MetS risk factor. Participants will be randomly assigned to either a 6-month home-based lifestyle intervention or a control group. The intervention is informed by Self-Determination Theory and Motivational Interviewing and includes mailed educational materials, resistance bands, and pedometers, supported by scheduled telephone and email coaching. Randomization procedures, allocation concealment, and outcome assessment will follow SPIRIT recommendations.

Results:
The primary outcomes are changes in MetS components, including waist circumference, blood pressure, fasting plasma glucose, and lipid profiles, assessed at baseline and 6 months. Secondary outcomes include changes in dietary fiber and fat intake, measured using the Fat and Fibre Barometer, and physical activity levels, assessed using the International Physical Activity Questionnaire–Short Form (IPAQ-SF).

Conclusion:
This trial will evaluate the effectiveness and feasibility of a scalable, home-based lifestyle intervention for reducing metabolic risk in rural populations. The results will inform future implementation of cost-effective strategies to address cardiometabolic health disparities in underserved rural communities.

A Tooth too Far: Odontogenic Infection Invading the Brain

Anjum Dhamani

Background:
Although dental infections are common, progression to the brain is exceedingly rare and potentially life-threatening. We hereby report a case of rapidly progressive odontogenic infection following dental extraction resulting in abscess formation.

Case Description:
A 48-year-old male with no significant past medical history presented to the emergency department with a two-day history of fever, blurry vision, left eye pain, swelling, and purulent drainage. He had undergone extraction of two maxillary teeth on the left side a few days prior to presentation. Magnetic resonance imaging of the brain revealed a multiloculated extra- and intraocular abscess on the left side with severe surrounding cellulitis, a left frontal dural abscess, and an epidural abscess over the left frontal lobe measuring 2.1 × 0.5 cm, associated with an epidural phlegmon. Neurosurgery was consulted, and the patient underwent emergent left anterior orbitotomy with drainage of the superior orbital abscess via a lid crease incision. A ¼-inch Penrose drain was placed into the abscess cavity and allowed to extend laterally through the incision. Several hours later, he underwent endoscopic left frontal sinusotomy, total ethmoidectomy, maxillary antrostomy, and left sphenoid sinusotomy, during which copious purulent material was drained from the sinuses. Operative cultures were obtained and were later reported to be negative. The postoperative course was uneventful. The patient was discharged on a six-week course of empiric intravenous cefepime, vancomycin, and metronidazole, with close outpatient follow-up.

Discussion:
The oral cavity harbors a diverse and dense microbial population, and dental infections may serve as a portal of entry for life-threatening intracranial and orbital infections. The unique anatomy of the orbit and its proximity to the sinuses and intracranial structures predispose to rapid spread, severe sequelae, and significant morbidity and mortality especially if the treatment is delayed. In this case, the patient initially appeared to have a routine post-extraction infection that was managed appropriately by the dentist, with no evident delay in referral. However, despite timely intervention, the infection progressed rapidly, likely facilitated by an oroantral communication, allowing contiguous spread to the orbit, paranasal sinuses, and intracranial compartment. Clinical presentation of odontogenic orbital and intracranial infections may be subtle and can be misdiagnosed as uncomplicated orbital cellulitis, particularly in the absence of a thorough dental history.

Implications:

This case highlights the importance of maintaining a high index of suspicion in patients presenting with orbital symptoms following recent dental procedures. Early imaging and multidisciplinary collaboration are critical for prompt diagnosis.

The Combined Action of Antibiotics and Bacteriophage for the Treatment of Biofilm-Associated Prosthetic Joint Infections

Alysha Ismail

Background:
Prosthetic joint infections (PJIs) present a major clinical challenge due to their rising prevalence and poor response to conventional antibiotic therapies. These infections are commonly associated with biofilm formation on implanted devices, which significantly limits antibiotic penetration and promotes bacterial persistence. Bacteriophages (phages), viruses that specifically infect and kill bacteria, represent a promising adjunct or alternative to antibiotics. Phages can disrupt the biofilm matrix, increasing its permeability to both antibiotics and host immune defenses. This study combines mathematical modeling with experimental validation to design optimized phage-antibiotic treatment strategies for PJIs. We utilized a clinical isolate of *Staphylococcus aureus* (MN8), a broad-host-range phage (PYOSa), and antibiotics commonly used in PJI treatment.

Methods:
Mathematical and computational models were first developed to predict conditions under which phage-antibiotic combinations would be most effective. These predictions were then tested experimentally. Biofilms of *S. aureus* were established on titanium disks to mimic the prosthetic joint environment. Established biofilms were treated with antibiotics alone, phages alone, or a combination of both. Bacterial viability was quantified before and after treatment using viable counts, allowing for comparison across treatment groups.

Results:
Modeling predicted that combination therapy would produce a synergistic reduction in biofilm-associated bacterial populations. Experimental results supported these predictions. Phage-only treatments resulted in moderate reductions in bacterial viability, while antibiotic-only treatments showed limited effectiveness, likely due to biofilm-mediated resistance. In contrast, combined phage-antibiotic treatment produced the greatest reduction in viable bacteria. These findings suggest that phage-mediated disruption of the biofilm enhances antibiotic penetration and activity.

Conclusion:
Phage-antibiotic combination therapy significantly reduces the viability of *S. aureus* biofilms compared to monotherapies. These results highlight the potential of bacteriophages as an effective adjunct treatment for PJIs. Further studies incorporating additional clinically relevant antibiotics are needed to optimize treatment protocols. Overall, this work provides a framework for developing improved therapeutic strategies to address biofilm-associated infections and enhance patient outcomes.

Ethics, Health Equity and Global Health

Technology–Based Rehabilitation Interventions for Children with Cerebral Palsy in Low- and Lower-Middle-Income Countries (LLMICs): A Scoping Review

Zahra Lalani

Background:
Cerebral palsy (CP) is a non-progressive neurological disorder affecting approximately 1.6 per 1,000 children worldwide. Children with CP in Low- and Lower-Middle-Income Countries (LLMICs) face significant barriers to accessing effective rehabilitation services, which can negatively impact their functional outcomes and quality of life. Emerging technology-based rehabilitation interventions, including 3D printing, virtual reality (VR), and telerehabilitation, offer innovative and potentially cost-effective approaches to address these challenges in resource-constrained settings.

Methods:
A systematic search of PubMed, Web of Science, and Scopus was conducted to identify studies published from 2015-2025 that evaluated technology-based motor rehabilitation interventions for children with CP in LLMICs, as defined by the World Bank. The scoping review followed Arksey and O'Malley's methodological framework. Two independent reviewers screened titles, abstracts, and full texts, with discrepancies resolved by consensus. Data were extracted on study characteristics, intervention types, outcomes, and contextual factors related to implementation in LLMICs.

Results:
From 1,788 titles and abstracts screened, 255 full-text articles were assessed for eligibility, resulting in the inclusion of 11 studies spanning Egypt, Jordan, Pakistan, and India. The identified interventions encompassed Kinect® sensor-based therapy, augmented reality applications, and exergaming platforms such as the Wii®. The predominant implementation challenge across LLMIC settings was the high cost and limited availability of virtual reality equipment. Nonetheless, the reviewed studies highlighted several opportunities including enhanced patient engagement, increased motivation, and the potential for delivering therapy in a safe environment.

Conclusion:
This scoping review highlights the growing implementation of technology-based rehabilitation interventions for children with CP in LLMICs. Technologies such as virtual reality, augmented reality, and exergames demonstrate promise in improving motor function and fostering patient motivation and engagement. Despite cost and accessibility barriers, these innovative tools including virtual and augmented reality and exergames represent viable, scalable solutions for augmenting rehabilitation services in low-resource settings.

Building Equitable Oncology Nursing Capacity in East Africa through Collaborative Virtual Education

Amina Huda

Background:
Limited access to oncology nursing education in East Africa contributes to gaps in symptom management and cancer care quality. Many nurses practice without formal specialty training, despite evidence that such education improves patient safety and clinical outcomes. With projected nursing shortages by 2030, building workforce capacity is critical to advancing equity in cancer care.

Objectives:
To implement a virtual oncology nursing education program co-designed with East African nursing leaders to strengthen nursing knowledge and expand access to training.

Milestones:
This initiative built on a five-year Stanford Health Care–Kenyatta National Hospital (KNH) partnership. At KNH's request, oncology nursing education was launched in 2024 with participation from nurses in Nairobi and other East African countries. A nine-week virtual program was delivered June-August 2024, with weekly sessions covering surgical oncology, cancer biology, chemotherapy administration, hazardous drug handling, oncologic emergencies, and survivorship. Following an on-site visit in October 2024, a second phase was developed to address locally identified needs, with a focus on advanced symptom management and palliative care. This phase is currently underway.

Progress:
Seventy-two nurses from five East African countries registered. Thirty nurses completed at least six sessions and pre- and post-course surveys. One week post-program, 93% rated their oncology knowledge as Very Good or Excellent versus 33% pre-program—a 60- percentage-point improvement. All participants reported the content was relevant to clinical practice and increased their confidence.

Challenges:
Limited internet access, clinical workload, and time zone differences affected attendance. Because participants were not given unique identifiers initially, individual survey responses could not be matched. Solutions included session recordings and ongoing program refinement, with unique identifiers introduced in Phase 2.

Developing a Sustainable, Scalable and Resilient Neonatal Microsystem Healthcare Model in Gilgit-Baltistan

Nazia Kabani

Background:
In Gilgit-Baltistan (GB), immediate and quality access to neonatal care is limited due to lack of resources, operational capacity, and geographical limitation. Per WHO, prematurity is the leading cause of death under the age of 5. Infant mortality in GB was a staggering 73.5 per 1000 live births, more than double the global average of 30 per 1000 live births in 2016-2017. In 2023, Aga Khan Health Services Pakistan (AKHSP) had an existing hub-and-spokes strategy in GB with Aga Khan Hospital Gilgit (AKHG) as the hub hospital with a 5-bed Level II nursery per WHO standards.

Objectives:
Aga Khan Health Board (AKHB) USA and AKHSP partnership aims to strengthen the neonatal healthcare microsystem by developing a sustainable, scalable and resilient neonatal ICU, capable of delivering Level II-III evidence-based NICU care in GB by strengthening the existing hub-and-spoke system. This partnership will build operational capacity for timely, evidence-based care to reduce neonatal morbidity and mortality.

Milestones:

February 2023: AKHB and AKHSP NICU Partnership started

July 2023: 1st visit for capacity building and site assessment. Equipment procurement and Unit design

August 2024: 2nd visit for clinical and operational capacity building

October 2024-March 2025: Neonatal Respiratory Therapy Proficiency Course designed and implemented.

April 2025: 3rd visit opening of Level 3 NICU scalable to an 8-bed NICU.

Progress:

Initiation of a Level II-III NICU

Establishment of Kangaroo Mother Care

17 Clinicians from AKHB USA remotely supporting clinical and operational capacity building

6 clinical case reviews conducted remotely with the AKHB team

Multiple staff trainings completed: Respiratory technician training, Breastfeeding training, Early Warning Signs in postpartum mother and neonates training, STABLE certification, Neonatal Resuscitation training, Family Centered Care training

Challenges:
Key challenges include periodic supply chain disruptions, time-zone misalignment, staff retention, financial burden exceeding resources, and interruptions in data and network connectivity. These barriers are consistently mitigated through substantial contributions of time, expertise, and financial support toward building clinical and operational capacity; the flexibility and rapid responsiveness of the US based support team; collaborative adaptation of clinical protocols; and continued knowledge exchange grounded in cultural humility and respect. We hope to continue to develop and enhance the capacity of the neonatal ICU healthcare team to consistently deliver prompt, effective, and high-quality evidence-based care that improves survival and reduces preventable morbidities among critically ill newborns in GB.

Health Innovation and Technology

Education as Service: Empowering Families Through Accessible Medical Knowledge

Laila Mohammad

Background:
A pediatric neurosurgical diagnosis can be overwhelming for families, often accompanied by fear, uncertainty, and difficulty understanding complex medical jargon. Recognizing this gap, I developed an educational platform centered on the belief that education itself is a form of service. By providing clear, accessible, and compassionate medical knowledge, this initiative aims to empower families to better understand their child's diagnosis, navigate treatment decisions, and feel supported throughout the continuum of care, from diagnosis through life beyond surgery.

Objectives:
The primary objectives of this project are to empower, educate, and support families of children with pediatric neurosurgical conditions. Specifically, the platform seeks to improve health literacy, reduce anxiety, and foster confidence among caregivers so they can actively participate in their child's care and communicate effectively with both medical teams and family members.

Milestones:
A dedicated educational website, www.kidsbraindoc.com, was created to serve as a centralized, easily accessible resource for families. Diagnosis specific templates and educational materials were developed and are shared both digitally and in print during clinic visits and hospitalizations. These resources are also disseminated to consulting providers, including pediatricians, neurologists, and NICU teams, to promote education to all members of the care team. Families frequently share these materials with extended family members to help them understand their child's condition and care plan.

Progress:
The platform is actively used in clinical settings, with positive informal feedback from families who report improved understanding and reduced stress. The materials have supported clearer communication between families and consulting providers and extended education beyond the clinic encounter.

Challenges:
Key challenges include finding dedicated time for ongoing content creation, ensuring materials remain up to date with evolving evidence, and developing sustainable strategies to maintain and expand the platform over time.

AEqhub: A Software-As-A-Service Platform for Identifying Disparities in Healthcare Datasets

Faris Gulamali

Background:
The growing adoption of diagnostic and prognostic algorithms in health care has led to concerns about the perpetuation of algorithmic bias against disadvantaged groups of individuals. Deep learning methods to detect and mitigate bias have revolved around modifying models, optimization strategies, and threshold calibration with varying levels of success and tradeoffs. However, there have been limited substantive efforts to address bias at the level of the data used to generate algorithms in health care datasets.

Objectives:
The aim of this study is to introduce a SaaS platform that implements AEquity, a simple metric that uses a learning curve approximation to distinguish and mitigate bias via guided dataset collection or relabeling in health care datasets.

Milestones:
Key milestones include developing a scalable backend API for bias metric computation and dataset analysis, an interactive web interface for visualization, and an agentic framework to help distinguish and analyze key types of biases and guide data collection recommendations.

Progress:
We developed a full-stack SaaS platform to operationalize AEquity for health care dataset evaluation. It includes a scalable backend API for bias metric computation and dataset analysis. The platform was validated using 2 well-known examples—chest X-rays and health care cost utilization—and deployed to detect novel biases in the National Health and Nutrition Examination Survey (NHANES). For chest X-rays, the algorithm can detect implicit racial bias from scan quality. For healthcare cost utilization, it can detect under-allocation of resources for minorities. For NHANES, it can detect differences in mortality prediction performances by different racial and socioeconomic statuses.

Challenges:
Key challenges include implementing containerized microservices for parallel processing of large-scale health care datasets, creating a system supports multiple machine learning frameworks, providing automated pipelines for model training, fairness evaluation, and comparative benchmarking across various model types, and making the platform HIPAA compliant without exceeding cost expectations.

Investigating Brain Stimulation Sites on Executive and Motor Functioning in Children with ADHD

Amsal Rajan

Background:
Attention Deficit/Hyperactivity Disorder (ADHD) is the most common neurodevelopmental disorder, affecting 8% of children worldwide. It is characterized by inattention and/or impulsivity and hyperactivity, often accompanied by difficulties with executive functions (EF; support goal-directed behaviour) and motor control that can negatively impact academic and social functioning. While stimulant medications are commonly prescribed, they are not effective for all children and can cause intolerable side effects. A promising alternative treatment with minimal side effects is transcranial magnetic stimulation (TMS), a form of non-invasive brain stimulation that applies a changing magnetic field to the scalp to stimulate brain areas. TMS is currently used clinically to treat other brain-based conditions, but not ADHD. To use TMS for ADHD, we must identify cortical targets for treatment. The right dorsolateral prefrontal cortex (rDLPFC) and right superior frontal gyrus (rSFG) are implicated in EF and motor difficulties in ADHD. This study investigated the effects of a single session of TMS applied to these regions on EF and motor task performance in children with ADHD.

Methods:
51 children aged 10-16 with ADHD were recruited. Participants were block randomized by age and sex to receive a single session of TMS targeting the rDLPFC (n=14) or rSFG (n=21), or a sham (placebo) treatment (n=16). EF and motor control were assessed using a cognitive battery and a motor control test before and after TMS, and changes in performance were compared within and between groups. The primary outcomes were the impact of TMS location on EF and motor skills. Linear mixed models tested whether TMS group affected changes in performance from pre- to post- stimulation. Due to limited prior use in children, an effect size could not be estimated, and a post-hoc power analysis would not provide meaningful information.

Results:
TMS targeting the rDLPFC significantly improved performance on a motor assembly task following stimulation ($p = 0.015$). No significant pre- to post-stimulation differences were observed in other assessments across the three groups.

Conclusion:
Although no significant effects were observed in EF measures, a single session of TMS to the rDLPFC improved performance on a motor assembly task requiring complex bimanual coordination in children with ADHD. These findings support the feasibility of targeting the rDLPFC for motor enhancement and warrant further investigation in a full-scale clinical

trial. This study represents an important preliminary step towards evaluating TMS as a potential treatment for ADHD in children and informing target selection for future studies.

Revolutionizing Healthcare Across Diverse Demographics with the World's First Multi-Agentic Clinical Intelligence Companion

Asma Merchant

Background:
Hami is the world’s first interactive clinical intelligence companion. This artificial intelligence (AI) platform was developed to enhance clinical workflows, elevate patient experiences, and optimize patient-provider interactions, ultimately improving provider efficiency and patient outcomes.

Objectives:
To ensure the safe and ethical implementation of this AI technology into healthcare environments.

Milestones:
Hami converses empathetically with the patient to take their medical histories at home/clinic before the provider’s appointment, formulating a comprehensive medical summary that optimizes the engagement and efficiency of patient-provider encounters. In the clinic, Hami’s ambient scribe enables real-time, structured, automated documentation of patient-provider consultations. At the completion of the visit, Hami generates patient summaries and provider notes, enabling patients to view and ask questions of their encounter, and enabling providers to automate administrative tasks such as billing. Specialty-specific personas built on a HIPAA-compliant, multi-agentic AI platform further empower providers to deliver better patient care.

Progress:
The platform has been deployed since August 2025 in Pakistan. Implementation has expanded to eight hospitals, and 22 medical specialties are supported. To date, over 22,000 patient-provider encounters have been performed by Hami. Such expansion of an AI tool in a resource-constrained setting is an achievement, where lessons learned from the region are informing Hami’s rollout in the West. Implementation is now expanding to the United States (US) and the United Arab Emirates (UAE), with multiple pilots/programs planned or deployed. A retrospective study has also been completed for clinician-independent telemedicine consultations. Continuous patient and provider feedback allows ongoing modifications to the platform.

Challenges:
Major implementation barriers in Pakistan include a limited infrastructure for and understanding of clinical AI platforms. Therefore, the majority of current implementations still require additional efforts to build trust in AI-supported clinical care.

Incision-Less Surgery (POEM) for Treatment of Achalasia

Aman Ali

Background:
Achalasia is a rare esophageal motility disorder characterized by impaired relaxation of the lower esophageal sphincter (LES) due to loss of inhibitory neurons, resulting in increased LES resting pressure and proximal esophageal dilation. The incidence is approximately 1.62 per 100,000 individuals and most commonly affects middle-aged adults. Management includes medical and surgical interventions. Surgically, Heller myotomy has traditionally been the standard treatment; however, peroral endoscopic myotomy (POEM) has emerged as a less invasive alternative. POEM is performed using an endoscope passed through the mouth, allowing the procedure to be done without external incisions. POEM is often preferred over laparoscopic Heller myotomy because of its ability to treat a broader range of achalasia subtypes, faster recovery rates, and its minimally invasive approach. This study evaluates the safety and efficacy of POEM in the treatment of achalasia.

Methods:
We performed a single-center retrospective review of 131 patients who underwent POEM for achalasia between September 2013 and December 2025. Collected data included patient demographics, procedural details, prior treatments, and postoperative complications. Procedural efficacy was assessed using preoperative and postoperative Dysphagia Handicap Index (DHI) (a measure of swallowing difficulty) and Quality of Life in Reflux and Dyspepsia (QOLRAD) scores.

Results:
Of the cohort, 45 patients (34.4%) had previously undergone therapeutic interventions for achalasia. Despite recurrent symptoms, POEM was completed in all patients without conversion to laparoscopic Heller myotomy or open surgery. The mean preoperative maximum esophageal diameter was 3.7 ± 1.6 cm. Intraoperative adverse events occurred in 32.1% of patients, most commonly capnoperitoneum and unintended mucosal injury. Symptom severity improved significantly following POEM, with mean DHI scores decreasing from 58.4 preoperatively to 17.7 postoperatively ($p < 0.001$). Postoperative opioid use was reported in 22.5% of patients, and the median length of hospital stay was one day.

Conclusion:
POEM is an incision-less surgery as there are no external skin incisions. POEM is a safe and effective treatment for achalasia. Significant improvement in postoperative DHI scores supports POEM as an efficacious minimally invasive therapeutic option.

Large Language Model (SymptomWise)–Generated Differential Diagnoses in Pediatric Neurology: Comparison with Expert Clinician Consensus

Salman Hashim

Background:
Differential diagnosis (DDx) generation is central to clinical practice, particularly in pediatric neurology where presentations are often heterogeneous and overlapping. Computer assisted diagnostic tools (CADs), including large language-model-based systems like SymptomWise, have potential as clinical decision-support resources. However, their performance in pediatric neurology and alignment with expert clinician reasoning remain incompletely characterized. In this study, we assess SymptomWise's ability to generate DDxs for expert-created pediatric neurology cases relative to practicing clinicians.

Methods:
Forty-two expert-authored pediatric neurology clinical vignettes were developed by two clinicians to reflect a range of neurologic subspecialty categories. Each case was reviewed by SymptomWise, which generated ranked DDxs, as well as four pediatric neurologists, whose assessments were used to establish a "consensus diagnosis". The consensus diagnosis was treated as the reference standard for comparison. SymptomWise performance was assessed measuring DDx inclusion and ranking accuracy against the consensus diagnosis. Subgroup analyses were performed across neurology subspecialty categories.

Results:
SymptomWise included the clinician consensus diagnosis as the top-ranked DDx in 30 of 42 cases (71%; 95% confidence interval [CI], 55%-84%), within the top three in 34 cases (81%; 95% CI, 66%-91%), and within the top five in 37 cases (88%; 95% CI, 74%-96%). Performance varied by neurologic subspecialty, with inclusion in the Top-3 DDx in epilepsy, neuroinfectious disease, and neurotrauma, whereas lower inclusion rates were seen in general pediatric neurology and toxic/metabolic disorder cases. In several cases with nonspecific or overlapping features, SymptomWise generated broader differential diagnoses compared with clinicians.

Conclusion:
SymptomWise demonstrated meaningful overlap with expert opinion across a diverse set of pediatric neurology cases. In nonspecific presentations, the model's broader differential generation may differ from the more targeted, neurology-focused differentials produced by pediatric neurologists. In one case, normal infant movements were classified as pathologic, reflecting a limitation in representing normal or physiologic variants. Overall, this study supports further investigation of large language model-based tools as

adjuncts to clinical reasoning, while emphasizing the necessity of clinician oversight when applying such tools in clinical or educational settings.

Leadership and Professional Development

Service Through Collaboration: Leadership and Professional Development in the Ismaili Neuroscience Community

Laila Mohammad

Background:
Ismaili physicians practicing in highly specialized and competitive fields, such as the neurosciences, often work in professional isolation despite a shared commitment to service, excellence, and global responsibility. This fragmentation can limit timely access to expert clinical input for Ismaili patients seeking second opinions and reduce structured mentorship opportunities for trainees and early career physicians. Recognizing the power of collective knowledge and community-based support, this initiative was created to connect Ismaili neuroscience specialists across borders through intentional, service oriented digital collaboration.

Objectives:
1. Facilitate rapid, high-quality consultation for Ismaili patients locally and internationally
2. Promote peer-to-peer clinical collaboration across subspecialties
3. Provide structured mentorship, career guidance, and leadership development for trainees and early career physicians within the Ismaili community.

Milestones:
Two WhatsApp-based professional groups were established. MINDS (Muslim Ismaili Neuroscience Dedicated to Service) include 9 neurosurgeons (across career stages and subspecialties), 8 neurologists (with varied subspecialties), a neuro-oncologist, and a neuroradiologist across the United States and Canada. MYELIN (Mentorship of Young & Established Leaders in Ismaili Neurosurgery) brings together 8 attending neurosurgeons, 1 fellow, 3 residents, and 2 pre-residency fellows focused on mentorship, board preparation, career planning, leadership opportunities, and professional development.

Progress:
MINDS has been actively used for real time clinical consultation on Ismaili patient cases, including international inquiries, as well as peer discussion on management of participants' own patients. MYELIN has facilitated board study guidance, job matching discussions, conference awareness, and mentorship across training levels. Both groups demonstrate strong engagement and trust-based collaboration.

Challenges:
Key challenges include balancing responsiveness with clinical workload and ensuring long term sustainability as groups grow. Formalizing governance and exploring expansion to other subspecialties are future considerations.

Mental Health & Wellness

Mindful Moments: Reducing Stress and Burnout in Nurse Practitioners

Hamida Khanmohammed

Background:
To assess the feasibility of implementing a mindfulness technique among nurse practitioners
(NPs) at a medical center, this project explores the potential for developing a tailored mindfulness program specifically for NPs. NPs play a critical role in providing optimal patient care; however, the demand to deliver high-quality healthcare amid limited resources, heavy patient workloads, and frequent exposure to patient suffering contributes to
significant physical and psychological stress. Practicing mindfulness has been shown to reduce
stress and enhance resilience among nurses.

Methods:
A doctorate of nursing (DNP) pilot project utilizing a pre-test and post-test design was conducted. A total of 14 NPs from a variety of specialties at Los Angeles General Medical Center (LAGMC) were recruited through convenience sampling. The Perceived Stress Scale (PSS), Copenhagen Burnout Inventory (CBI) and a demographic questionnaire were administered at baseline (pre-intervention) and at 10 weeks post-intervention to evaluate the effectiveness of a brief mindfulness intervention. The feasibility of using Headspace, a mental wellness application, was assessed using a Likert scale.

Results:
Significant declines were found in overall stress levels ($t = 5.38$, $p = 0.001$; $z = 3.15$, $p = 0.002$), client-related burnout ($t = 4.94$, $p = 0.001$; $z = 3.05$, $p = 0.002$), and work-related burnout ($t = 3.93$, $p = 0.002$; $z = 2.84$, $p = 0.005$). However, no statistically significant change was found in personal burnout ($t = 1.33$, $p = 0.206$; $z = 1.29$, $p = 0.196$). The feasibility assessment revealed that 57.1% of participants agreed or strongly agreed they intended to use the Headspace mindfulness application in the future.

Conclusion:
Research on the benefits of mindfulness interventions have shown it is beneficial to both the healthcare provider and patient outcomes. Offering a mindfulness program for NPs within the clinical setting is a start to regain focused care and improved patient outcomes. LAGMC could benefit from implementing strong policy changes for NPs to implement these mindfulness strategies for career longevity and improved patient outcomes.

Resilience and Well-Being of Haitian Refugees and Immigrant Families in Rural Communities: Using Academic Community Partnership Approach

Nasreen Lalani

Background:
Haitian immigrant families in the US experience compounding stressors from pre- and post-migration trauma, legal and economic precarity, and cultural and language barriers. They experience racial discrimination and violent behaviors causing insecurity and isolation. Socio-economic factors such as weaker social capital, poor housing, and lower median incomes further exacerbate these challenges. All these factors put them at high risk for poor coping and emotional well-being. This study used a strength-based family resilience framework and community-engaged approach to co-develop a culturally tailored intervention promoting family recovery, coping, and wellness. To achieve our goal, our study aims were: 1.) to explore the lived experiences of family stressors, anxiety, and trauma; 2.) to determine the social, ecological, and cultural factors affecting coping, resilience, and well-being; 3.) to develop and test the feasibility of family wellness intervention to improve the well-being and quality of life of the local Haitian immigrant community.

Methods:
Using a case study design, we conducted qualitative interviews including focus groups (N=3) with Haitian immigrant families and Key Informant interviews (N=8) with the service providers, faith community leaders, and health providers in Daviess County, Indiana, US. Walsh's Family Resilience Framework informed the development of interview guides and guided data interpretation. Audio recordings were transcribed and translated with AI-assisted tools, followed by thematic analysis to identify key family stressors, coping strategies, and culturally relevant needs and future actions. Findings informed the development of a modular family resilience and well-being program, focusing on emotional regulation, communication, and culturally grounded coping practices.

Results:
Participants reported chronic stressors (e.g., fear of deportation, housing and job insecurity, acculturation barriers) and protective factors (e.g., faith, kinship ties, cultural pride, communal support). Findings highlighted opportunities to support shared meaning-making, community connectedness, and shared coping abilities. Community feedback directly shaped session content, visuals, and delivery format. A pilot intervention is planned for late 2025. Community champions, including local Haitian volunteers and Extension educators, have been trained to deliver the intervention.

Conclusion:
This project demonstrates the value of community-academic collaboration in designing strength-based culturally responsive family resilience interventions. Training trusted local

champions enhances ownership, cultural fit, and sustainability. Findings offer a model for resilience-based mental health promotion among underserved immigrant families.

Public Health, Environmental Sciences and Preventative Medicine

US Adults' Intention to Vaccinate their Children against Measles, 2025

Amyn Malik

Background:
Since January 2025, over 2,147 cases of measles have been confirmed across the United States, threatening the country's elimination status achieved in 2000. Of these cases, 26% have occurred in children under five, and 93% have involved unvaccinated individuals or those with unknown vaccination status.

Since 2019, rates of childhood MMR vaccination have declined nationally. Current attitudes, intentions, and practices around measles vaccination among US adults remain poorly understood.

Methods:
We conducted a national survey in June 2025 to assess intention to vaccinate children against measles, recruiting 1,166 adults (18+) according to census-matched quotas for age, sex, race, ethnicity, and state population. Analyses were weighted by estimations from the American Community Survey 2022.

Results:
When asked if they would vaccinate a child under five against measles if recommended to do so by a healthcare provider, 79% of respondents (95% CI: 76%-81%, 914) said yes, 13% (11%-15%, 152) said no, and the rest did not know. Among parents, 82% (78%-85%, 548) were willing to vaccinate and 12% (9.2% – 15%, 80) were not. Among non-parents, 75% (70%-79%, 366) were willing and 15% (12%-19%, 72) were not.

Non-parents showed significantly lower vaccination intention than parents (aOR: 0.67, 95% CI: 0.36 – 0.98, p-value: 0.038). Respondents who believed the threat of measles was being exaggerated were also less likely to vaccinate children (aOR: 0.19, 95% CI: 0.12 – 0.31, p-value: <0.001), whereas those who perceived a higher threat of measles were more likely to do so (aOR: 1.5, 95% CI: 1.1 -2.0, p-value: 0.008). Intention to vaccinate also varied by state.

Conclusion:
While childhood MMR vaccination remains the social norm with ~80% intention to vaccinate, a significant resistant minority exists, sufficient to breach the nominal threshold required for herd immunity against measles (>95%). Behavioral interventions and communication should leverage this social norm to improve MMR vaccination attitudes among resistant communities.

Would You Vaccinate Your Child against Measles? Measles Vaccination Intent among Adults in Canada in the Context of National Outbreaks

Amyn Malik

Background:
In January 2025, Canada reported 5,393 cases of measles, resulting in the loss of its elimination status. Of these cases, 93% involved unvaccinated individuals or those with unknown vaccination status, and 20% occurred in children under five. Two infants died.

The outbreaks have been attributed to several factors; however, attitudes towards measles among Canadian adults and their intention to vaccinate children against measles are not well understood.

Methods:
In November 2025, we conducted a nationally representative survey assessing measles attitudes and vaccination intention among Canadian adults (18+). Participants provided basic demographic information and reported whether they would be willing to vaccinate a child under five against measles if recommended by a healthcare provider. Analyses were weighted using census estimations for sex, age, race, and education.

Results:
Of 878 total respondents, 54% were female, 81% were over the age of 36, and 33% identified as a visible minority (non-Caucasian in race or non-white in color). Most (70%) had achieved at least a postsecondary education, and 70% reported household incomes over 60,000 CAD.

When asked if they would vaccinate a child under the age of five against measles, 80% (95% CI: 77-83%) said yes and 20% (18-23%) said no or did not know. Among parents, 84% (80-87%) were willing to vaccinate and 16% (13-20%) were unwilling or unsure, compared to non-parents, of whom 76% (70-81%) were willing and 24% (19-30%) were unwilling or unsure. Half of respondents (50%) reported an average knowledge of measles, 67% (63-70%) felt they could protect themselves from measles, and 47% (43-51%) felt the threat of measles was not being exaggerated.

Conclusion:
Population-level protection against measles requires >95% of the population be fully vaccinated. However, we found that only 80% of Canadian adults would be willing to vaccinate a child against measles. This finding highlights an important minority sufficient to breach the nominal threshold for herd immunity. Public health practitioners should seek to understand why this minority is unwilling to vaccinate their children and how to address those barriers. Effective interventions should target this minority with evidence-based interventions, including messaging and education.