RD 2026 MAY 11th

DEPAPARTMENT OF SURGERY ANNUAL RESEARCH DAY PROGRAM AND ABSTRACTS

DALHOUSIE UNIVERSITY

nova scotia health

IWK Health

OPHTHALMOLOGY & VISUAL SCIENCES

FACULTY OF MEDICINE
Department of Surgery

FACULTY OF MEDICINE
Department of Anesthesia, Pain Management & Perioperative Medicine

2026 DEPARTMENT OF SURGERY RESEARCH DAY – MAY 11, 2025

Schedule of Events

07:30 AM	Halifax Convention Center ROOM C1
	COFFEE
08:00 AM	**Welcome**
	Dr. Michael Bezuhly - Director of Research, Department of Surgery
	Opening Remarks
	Dr. Kim Brooks, President, Dalhousie University
08:15 AM	**Session I**
	Chair: Dr. Heather McFadgen
10:20 AM	**BREAK**
10:40 AM	**Session II**
	Chair: Dr. Nadim Joukhadar
11:50 AM	LUNCH BREAK – Main Foyer Meeting Area
12:15 PM	Meet the Keynotes – Session for Trainees – ROOM C5
13:00 PM	Collaborative Keynote Address: Dr. Brian Nosek – ROOM C1
13:45 PM	3D Departmental Presentations
14:15 PM	**BREAK**
14:40 PM	**Session III**
	Chair: Dr. Catherine Deshaies
16:30 PM	**Closing Remarks**
	Dr. Gail Darling – Head, Department of Surgery
16:40 PM	Collaborative Social and Annoucement of Winners – Main Foyer Meeting Area

Planning Committee:
Dr. Michael Bezuhly, Chair
Dr. Adrienne Weeks
Dr. Alison Wallace
Dr. Emily Krauss
Elaine Kosziwka Marsh

Judges:
Dr. Alexandra Quimby
Dr. Christine Herman
Dr. Sam Jessula

Sessional Chairs:
Dr. Heather McFadgen
Dr. Nadim Joukhader
Dr. Catherine Deshaies

Dr. Gail Darling
Head, Department of Surgery

It is my pleasure to welcome you to our 36th Annual Research Day in the Dalhousie University Department of Surgery. This day is a flagship event in the Department, as it is the one day we bring together faculty, alumni, residents, medical students, graduate students, allied health professionals and friends of the Department to celebrate each other, and our outstanding research.

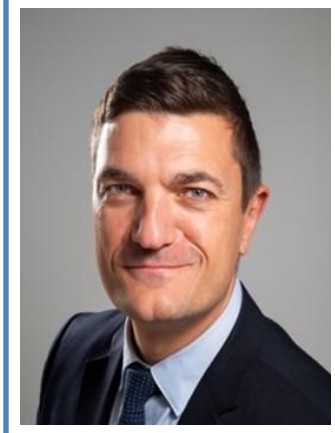
Thirty inquisitive minds will present their research projects spanning the full breadth of impactful research we do here in the Department of Surgery. Dr. Michael Bezuhly is in his second year in the Research Director role and has revamped and re-directed research dollars to best align with sustainable long-term objectives in both divisional and departmental research productivity.

Dr. Brian Nosek from the University of Virgina Medical School is this year's Dr. Gordon Bethune Visiting Professor and Collaborative Research Day Speaker. His noon time keynote lecture ***"Shifting incentives from getting it Published to Getting it Right"*** will be of interest to all.

One of my major goals as Department Head is to promote a culture of research in our department and to provide support to all our researchers in basic and translational science, quality, education, health systems patient outcomes. We aim to promote a culture of inquiry, laying solid foundations across the Department for all our members.

I am confident that the Departments efforts towards these research initiatives will be apparent to all by the end of the day.

Dr. Michael Bezuhly
Director of Research, Department of Surgery



Welcome to the 36th Department of Surgery Research Day.

In a spirit of collaboration, we are once again delighted to hold this event with our colleagues in the Department of Ophthalmology & Visual Sciences and Department of Anaesthesia, Pain Management & Perioperative Medicine.

I would like to thank our Planning Committee who had the difficult tasks of selecting presenters from among the **over 68** abstracts submitted. This event is an opportunity to celebrate the research being conducted by our surgical residents, clinical fellows, medical students and graduate students. Trainees represent the future of our Department and based on today's program the future is bright indeed!

Our keynote lecture by **Dr. Brian Nosek from the University of Virginia**, will be followed by the **3D Spotlight Series.** Each Department has a trainee present on research that showcases a collaborative link between Surgery, Anesthesia and Ophthalmology. The Department of Surgery's presenter this year is **Regan Duffy**, an undergraduate kinesiology student, whose abstract is entitled "**Pediatric FFP-free cardiopulmonary bypass prime solution QI initiative**."

Finally, I would like to take this opportunity to thank the members of the Planning Committee, and **Elaine Marsh** without whom today would not be possible. I hope you enjoy the Program!

Dr. Brian Nosek
Collaborative Research Day Keynote

Dr. Brian Nosek is a Professor in the Faculty of Medicine at the University of Virginia with a primary appointment in the Department of Psychology.

"Shifting Incentives from Getting it Published to Getting it Right"

Learning Objectives for the Keynote:

1. Summarize the scholarly norms and values of research.
(CanMEDS roles: Medical Expert, Scholar)
2. Assess the gap between those values and the culture and reward system for researchers.
CanMEDS roles: Medical Expert, Scholar)
3. Describe the strategies that are changing the norms, incentives and policies for researchers and consider their applicability for one's own research area.
(CanMEDS roles: Scholar, Communicator, Collaborator)

The currency of academic science is publishing. Producing novel, positive, and clean results maximize the likelihood of publishing cusses because those are the best kind of results. There are multiple ways to produce such results:

1. Be a Genius
2. Be Lucky.
3. Be Patient
4. Employ flexible analytic and selective reporting practices to manufacture beauty. In a competitive marketplace with minimal accountability, it is hard to avoid.

BUT there is a way. With Results, beauty is contingent on what is known about their origin. With methodology, if it looks beautiful, it is beautiful. The only way to be rewarded for something other than the results is to make transparent how they were obtained. With openness, I won't stop aiming for beautiful papers, but when I get them, it will be clear that I earned them.

Learning Objectives for Department of Surgery Research Day:

1. Review and discuss research in the Department of Surgery
   (CanMEDS roles: Scholar Collaborator)

2. Identify innovative research approaches for impactful health care
   (CanMEDS roles: Medical Expert, Health Advocate)

3. Develop oral presentation skills needed to effectively present scientific research data
   (CanMEDS roles: Scholar, Communicator)

4. Develop skills related to defending research results.
   (CanMEDS roles: Medical Expert, Scholar, Communicator)

DALHOUSIE UNIVERSITY | CONTINUING PROFESSIONAL DEVELOPMENT & MEDICAL EDUCATION

Educationally approved by Dalhousie University Continuing Professional Development and Medical Education.

In keeping with CMA Guidelines, program content and selection of speakers are the responsibility of the planning committee. Support is directed towards the costs of the course and not to individual speakers.

*As an accredited provider, Dalhousie University Continuing Professional Development and Medical Education, designates this continuing professional development activity for up to **6.25 hours** as an accredited group learning Section 1 activity as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada.*

Through an agreement between the Royal College of Physicians and Surgeons of Canada and the American Medical Association, physicians may convert Royal College MOC credits to AMA PRA Category 1 Credits™. Information on the process to convert Royal College MOC credit to AMA credit can be found online at edhub.ama-assn.org.

SESSION I
CHAIR – Dr. Heather McFadgen

TIME	#	Presenter	Abstract
08:15	**1**	Balgees Ajlan Resident - Neurosurgery	Femoral Access-Site Complications Among Patients Undergoing Neurointerventional Procedures: A Quality Improvement Project note: started early. NL
08:25	**2**	Claire Carruthers Medical Student Plastic Surgery	The Utilization of Brachial Plexus Blocks for Distal Nerve Repairs and Transfers Wonky narration? Notes? She used notes at the podium.
08:35	**3**	Allison Loewen Resident Orthopaedics	Quality Improvement Protocol: Retrospective Chart Review of Delayed Hip Fracture Surgeries (>48 Hours) at the Halifax Infirmary pretty pretty good.
08:45	**4**	Darien McBride Medical Student General Surgery	4. Preoperative Soluble AXL in Plasma Predicts Futility of Resecting Pancreatic Ductal Adenocarcinoma – Middle author…
08:55	**5**	Nadim Ammoury Graduate Student Biomedical Engineering	Knee morphological phenotypes differ by sex and frontal plane kinematics during walking in patients with end-stage knee osteoarthritis. – excellent.
09:05	**6**	Takhliq Amir Resident Cardiac Surgery	Size-Dependent Growth of the Ascending Aorta in a Large Contemporary Cardiac CT-Based Surveillance Cohort
09:15	**7**	Nicholas Cheverie Graduated Student General Surgery	Targeted Hyperthermia Induces Immunogenic Tumor Remodeling and Demonstrates Early Clinical Response in Immunotherapy-Refractory Metastatic Melanoma
09:25	**8**	Victoria Taylor Resident - Otolaryngology	Oncologic outcomes in p16-positive oropharyngeal squamous cell carcinomas with extranodal extension: A retrospective cohort study
09:35	**9**	Peter Wong Clinical Fellow Orthopaedics	To walk or not? A prospective randomized controlled trial to evaluate the effect of weight bearing on patient outcomes following first metatarsophalangeal joint fusion
09:45	**10**	Adele Orovec Resident - General Surgery	Predictors of Delay to Colorectal Surgical Cancer Care in Nova Scotia

BREAK
09:55 – 10:20AM

SESSION II
CHAIR: Dr. Nadim Joukhadar

TIME	#	Presenter	Abstract
10:20	**11**	Methila Biswas Raya Graduate Student Cardiac Surgery	A Multistage ML-based Delirium Risk Stratification with SHAP-driven Clinical Decision Support for Cardiac Surgery
10:30	**12**	Dylan Patel Resident General Surgery	Application of the Palliative and Therapeutic Harmonization (PATH) Program for Shared-Decision Making for Severely Frail or Cognitively Impaired Patients Scheduled for Cancer Surgery
10:40	**13**	Kassandra Coyle Medical Student Vascular Surgery	Missed Opportunities for Surveillance: Incidence of Prior Aneurysm in Patients Presenting with Ruptured Abdominal Aortic Aneurysm
10:50	**14**	Gizelle Francis - Resident Otolaryngology	Functional and Oncologic Outcomes After Transoral Laser and Robotic Surgery for Oropharyngeal Carcinoma
11:00	**15**	Haley Glazebrook Medical Student Orthopaedics	Video-Based Assessment of Surgical Skill in Orthopaedic Surgery: External Reviewer Validation and Evaluator Bias
11:10	**`16**	Hamza Imtiaz Graduate Student Neurosurgery	Preliminary Analysis of Neural Activity in Patients with Drug-Resistant Epilepsy Using the Percept™ Neurostimulator
11:20	**17**	Felix Leathead Resident Thoracic Surgery	Environmental and Economic Impact Assessment of Cape Breton Thoracic Surgery Clinic
11:30	**18**	Jamil Muradov Medical Student General Surgery	Comparing Prospective Colorectal Cancer Outcomes in Nova Scotia with an International Benchmark
11:40	**19**	Lauren Westhaver Graduate Student Neurosurgery	Longitudinal peripheral blood immune profiling to monitor disease progression in glioblastoma

LUNCH
11:50-13:00 PM Main Conference Space - Buffet

COLLABORATIVE KEYNOTE ADDRESS
Chair: Dr. Balwantray Chauhan

TIME	#	Presenter	Presentation Title
13:00		**Dr. Brian Nosek** Collaborative Research Day Keynote	*Shifting Incentives from Getting it Published to Getting it Right*
13:15		**Room C5**	**Meet the Keynotes – Trainee Lunch Session**
		Departmental Presentations	**3D Presentations**: A Spotlight on Interdisciplinary Research in the Departments of Anesthesia, Ophthalmology and Surgery 7 minute Presentation, 3 Minute Q&A
13:45	**31**	**Regan Duffy** Undergrad Student	**SURGERY:** Pediatric FFP- free Cardiopulmonary Bypass Prime Solution. QI Initiative
13:55		**Brianna Samson** Graduate Student	**OPHTHALMOLOGY:** Quantifying the Compression Mechanical Properties of Retinal Tissue Using Spherical Indentation
14:05		**Emma Nielson** Resident	Anesthesia: Experience and Correlates of Adverse and Trauma Events in Pediatric Perioperative Providers.

BREAK

SESSION III
CHAIR: Dr. Catherine Deshaies

TIME	#	Presenter	Abstract
14:40	**20**	Suna Jung – Resident Neurosurgery	Safety and outcomes of deep brain stimulation for dystonia in young children excluded from the FDA Humanitarian Device Exemption: Analysis of the CHILD-DBS registry
14:50	**21**	Ilinca Georgescu Resident General Surgery	Updated Results – A Nova Scotia-Based Total Neoadjuvant Treatment Study: Assessing Success of Implementation and Outcomes Data Associated with a Provincially Standardized Algorithm for the Treatment of Locally Advanced Rectal Cancer
15:00	**22**	Noah Stevens Undergrad Student Medical Sciences	Genetic Glomerular Podocytopathies: Developing a genetic model to understand Steroid-resistant Nephrotic Syndrome (SRNS) and Focal Segmental Glomerulosclerosis (FSGS)
15:10	**23**	Emmanuel Egwuatu Medical Student Orthopedics	Temporal Trends and Site-Level Variation in Surgical Management of Degenerative Spondylolisthesis
15:20	**24**	Olalekan Olasehinde Clinical Fellow Global Surgery	Impact of Multi-Level Educational Interventions on Breast Cancer Care Uptake in Ile-Ife: Applying the WHO Global Breast Cancer Initiative Framework.
15:30	**25**	Hannah Brennan – Resident Otolaryngology	Cost-Efficiency Analysis of Office-Based Endoscopic Biopsies for Laryngopharyngeal Lesions
15:40	**26**	Camille Zeitouni – Resident Plastic Surgery	Better Care Sooner: Assessing Efficiency and Resident Educational Value of Dedicated Plastic Surgery Trauma Clinics
15:50	**27**	Joel Bierer – Resident Cardiac Surgery	High-exchange ULTrafiltration to enhance Recovery After pediatric cardiac surgery: the ULTRA Randomized Controlled Trial
16:00	**28**	Isabella Mendoza – Graduate Student Thoracic Surgery	Early Airway Epithelial Responses to PM2.5: Implications for Environmentally Driven Lung Cancer Risk
16:10	**29**	Gracious Kasheke Medical Student Vascular	Is the COBRA-OS® 4 French Aortic Occlusion Device Feasible for Partial REBOA?
16:20	**30**	Harshal Patel Medical Student Orthopaedics	Decreasing Wait times in Nova Scotia: A Pilot Multi-Disciplinary Orthopaedic Rotator Cuff Assessment Pathway

Closing Remarks – Dr. Gail Darling
Social Hour and Awards Ceremony

SESSION I

ABSTRACT #1

FEMORAL ACCESS-SITE COMPLICATIONS AMONG PATIENTS UNDERGOING NEUROINTERVENTIONAL PROCEDURES: A QUALITY IMPROVEMENT PROJECT

Ajlan BA, Alwadei A, Cora A, Weeks A, Jarrett J, Pickett G

Balgees Ajlan – Resident – Neurosurgery

Background: Transfemoral arterial access is the standard approach for most neuro-interventional procedures but carries a risk of access-site complications. Defining the incidence and contributing factors of these complications is essential to optimizing procedural safety.

Methods: Retrospective cohort study of all patients at our centre who underwent neuro-interventional procedures via femoral artery between 2021-2024. Outpatient diagnostic angiograms were excluded.

Results: A total of 215 patients underwent treatment for aneurysm, AVM or carotid stenosis. (mean age 59.6 years; 59.9% female). The femoral access-site complication rate was 9.3%. Complications included access-site hemorrhage (4.3%), groin hematoma (3.3%), retroperitoneal hematoma (2.4%), and femoral artery pseudoaneurysm (4.3%). Femoral artery dissection and peripheral arterial occlusion were rare (each 0.5%). Seven patients (3.3%) required emergent open surgical repair, and 2.4% required blood transfusion. Angio-Seal closure devices were used in 71.2% of cases. Dual antiplatelets (43.2%) were not associated with increased hemorrhagic complications. Sheath use was not associated with pseudoaneurysm formation ($p = 0.894$), while larger sheath sizes (7–8 Fr) showed a trend toward higher risk ($p = 0.051$).

Conclusion: Femoral access-site complications were common and occasionally severe, most frequently involving hemorrhage and pseudoaneurysm. Larger sheath size may contribute to increased risk, whereas closure device use and dual antiplatelet therapy were not associated with higher complication rates. A national study is currently underway.

SESSION I

ABSTRACT #2

THE UTILIZATION OF BRACHIAL PLEXUS BLOCKS FOR DISTAL NERVE REPAIRS AND TRANSFERS

Claire Carruthers, John Gobran, M. Kwesi Kwofie, Emily M Krauss

Claire Carruthers – Medical Student – Plastic Surgery

Background: Regional anesthesia (RA) has traditionally been avoided in distal nerve surgery due to concerns with intraoperative nerve stimulation, postoperative function, and healing. Advances in RA have improved its safety and accuracy, offering a less invasive alternative to general anesthesia (GA) that may reduce surgical stress and improve postoperative pain. However, the use of RA for distal nerve surgery remains limited.

Objective: Evaluate the safety and effectiveness of brachial plexus blocks for distal nerve repairs and transfers.

Methods: A retrospective chart review of patients undergoing distal upper-extremity nerve repairs or transfers under brachial plexus block at the Halifax Infirmary between January 2022 and November 2025. Outcomes included intraoperative nerve stimulation, conversion to GA, intraoperative narcotic use, and function at longest follow-up.

Results: Fifty-nine patients underwent distal nerve operations under brachial plexus block. Thirty-seven patients (62.7%) underwent nerve transfers, and 22 (37.3%) underwent nerve repairs. The nerves operated on included 42 ulnar (71.2%), 8 median (13.6%), 6 radial (10.2%), and 3 digital (5.1%). Among ulnar nerve injuries, 12 were traumatic and 30 compressive. Intraoperative nerve stimulation was successful in all patients, was consistently used to confirm donor nerve branches, and did not alter operative plans. Three patients required conversion to general anesthesia, and 9 required intraoperative narcotics. At mean longest follow up of 28.9 weeks all except one patient had improved function from baseline. This patient was seen 34-weeks post supinator to posterior interosseous nerve transfer after a complex workplace injury. Four postoperative complications were reported, including 3 surgical site infections and 1 case of complex regional pain syndrome.

Conclusion: Brachial plexus block is a safe and effective anesthetic for distal nerve surgery, preserving intraoperative nerve stimulation and outcomes, with low rates of conversion to GA and narcotic use. These findings support broader consideration of RA in distal nerve surgery.

SESSION I

ABSTRACT #3

QUALITY IMPROVEMENT PROTOCOL: RETROSPECTIVE CHART REVIEW OF DELAYED HIP FRACTURE SURGERIES (>48 HOURS) AT THE HALIFAX INFIRMARY

Allison Loewen, Korede Akindoju, Nikki Shahin, Jo-Anne Douglas, Lynn Lethbridge, Alissa Decker, Michael Dunbar

Allison Loewen – Resident – Orthopaedics

Objectives: Timely surgical intervention for hip fractures, within 48 hours of diagnosis, is associated with improved patient outcomes. The objectives of this quality improvement initiative were to 1) identify the incidence of hip fracture surgeries in the QEII delayed beyond 48 hours from diagnostic xray, 2) determine causes of surgical delays exceeding 48 hours and 3) analyze patterns of delay factors to identify potential modifiable factors.

Methods: This retrospective observational cohort study looked at patients 18 years or older with a diagnosis of hip fracture who received surgical management at the QEII between Jan 1, 2023 and December 31, 2024 as selected from hospital discharge data. Chart reviews identified reasons for delays and patient characteristics.

Results: 668 patients meet inclusion criteria. 423 (63.3%) received surgical management within 48 hours. Of the 245 (36.7%) who did not receive timely management, the Charlson Comorbidity Index, ASA scores, and percentage on anticoagulants were significantly higher, and they were more likely to have presented to an outside hospital. The primary reasons for delay were OR availability (23.3%), transfer delays (19.2%), medical optimization delays (18%), anticoagulant associated delays (15.9%), resource constraints (15.5%) and consultant availability (7.3%). The median time to surgery in the delayed group was 61.0 hours (IQR 61.0-92.2) compared to 28.6 hours (IQR 18.8-40.4) in the non delayed group. Only 5.2% (35/668) of surgeries were performed after hours. There was no difference in delays based on patient age, sex, baseline mobility status, fracture type, surgery type, or day of the week of presentation.

Conclusion: Nationally 81% and provincially 83% of hip fractures are treated within 48 hours. At 63.3%, the QEII is below the standard of care. Targeted areas to meet standards based on this research include OR availability, transfer delays and current institutional guidelines regarding anticoagulants.

SESSION I

ABSTRACT #4

PREOPERATIVE SOLUBLE AXL IN PLASMA PREDICTS FUTILITY OF RESECTING PANCREATIC DUCTAL ADENOCARCINOMA

Samson, T., Aali, M., **McBride, D**., Arnason, T., Clarke, S. E., Ramjeesingh, R., Gonzalez-Chavez, L., Azizieh, Y., Walsh, M. J., Livingstone, S. M., Hiebert, S. E., Boudreau, J. E., & Gala-Lopez, B. L.

Darien McBride – Medical Student – General Surgery

Objectives: Pancreatic cancer is the eleventh most diagnosed malignancy in Canada, yet it is the third leading cause of cancer-related death. Population-based data show that despite improving medical and surgical interventions, mean survival remains as low as 9 months. In the current study, we evaluate the serum biomarker AXL receptor tyrosine kinase (sAXL) for its ability to discriminate early postoperative cancer-related mortality and potentially futile surgical interventions.

Methods: In an exploratory retrospective cohort study of 54 patients undergoing curative-intent pancreatic ductal adenocarcinoma (PDAC) resection, preoperative sAXL was evaluated for its ability to predict early postoperative mortality. Time-dependent receiver operating characteristic curves assessed discriminatory power. Youden indices uncovered optimal cutoffs at 6-month mortality, the most discriminatory time point. Cox proportional hazards models quantified the associations, and comparisons were made with carbohydrate antigen 19-9 (CA 19-9), the only FDA-approved biomarker for PDAC.

Results: Mortality within 6 months of surgery occurred in 13% of patients. Higher levels of serum AXL meaningfully identified patients at increased risk of mortality within 6 months and outperformed CA 19-9 (AUC 0.711 vs. 0.472). When the high vs. low sAXL threshold was set at 40.26 ng/mL, it predicted 6-month mortality with a sensitivity of 73% and specificity of 64%. Multivariable analysis revealed that high sAXL roughly doubled the risk of 6-month mortality (HR 2.42; 95% CI 1.16–5.65; p = 0.020), and this was independent of tumour grade (HR 4.02; 95% CI 1.68–13.2; p = 0.002). Therefore, serum sAXL has prognostic potential beyond grade, potentially capturing unique tumour biology.

Conclusions: The circulating protein sAXL independently predicted early mortality following curative-intent PDAC surgery. Although exploratory, these findings justify larger prospective validation and have the potential to meaningfully influence operative decision-making, improve patient care, and quality of life.

SESSION I

ABSTRACT #5

KNEE MORPHOLOGICAL PHENOTYPES DIFFER BY SEX AND FRONTAL PLANE KINEMATICS DURING WALKING IN PATIENTS WITH END-STAGE KNEE OSTEOARTHRITIS.

Ammoury, N., Fay, M., Dunbar, M., Civiero, S., Wilson, D., Richardson, G., Leighton, J., Sniderman, J. & Wilson Astephen, J.
Nadim Ammoury – Graduate Student PhD – Biomedical Engineering/Orthopaedics

---

Arthroplasty is an effective surgery at reducing pain associated with osteoarthritis, but many patients continue to walk with functional deficits one year after surgery. Recent advances in robotic-assisted arthroplasty offer opportunities to tailor clinical decisions to patient-specific function. However current surgical planning approaches depend solely on patient joint morphology, which may not fully reflect in-vivo joint function. We aimed to determine whether distinct morphological phenotypes exist in end-stage knee osteoarthritis and to examine differences in knee joint function during gait. Patients receiving robotic-assisted knee arthroplasty were prospectively enrolled. Their 3D joint kinematics were captured during overground walking pre-operatively. Three-dimensional patient-specific knee models were reconstructed from computed tomography images and statistical shape models (SSM) of the distal femur and proximal tibia were created. Agglomerative hierarchical clustering was applied to SSM features to identify knee phenotypes. Differences across clusters in gait outcomes were assessed.

Four morphological clusters were identified (n_total=107, F/M=78/29). Phenotype 1 (n=13, F/M=1/12) was characterized by larger bones, wider, more trapezoidal femurs and smaller medial tibial slope. Phenotype 2 (n=16, F/M=7/9) had relatively larger bones but had more square-shaped femurs and increased medial tibial slope. Phenotypes 3 (n=35, F/M27/8) and 4 (n=43, F/M=36/7) exhibited smaller bones with phenotype 3 having a relatively flatter distal joint line compared to phenotype 4. Significant sex differences were observed across phenotypes ($\chi^2(3)=31.33$, $p<0.0001$, Cramér'sV=0.54). Interestingly, the only difference in overground gait kinematics and lower limb alignment was phenotype 4 having significantly lower mean knee adduction during stance than other phenotypes ($p<0.005$).

Knee morphology phenotypes exist and were only associated with one feature of frontal plane knee movement during gait and sex. Most functional deficits post-surgery are in sagittal plane mechanics, suggesting that surgical planning with morphology alone is not sufficient to address these persistent mobility deficits involved in the research design and execution to support data-informed pipelines for personalized surgical planning approaches.

SESSION I

ABSTRACT #6

SIZE-DEPENDENT GROWTH OF THE ASCENDING AORTA IN A LARGE CONTEMPORARY CARDIAC CT-BASED SURVEILLANCE COHORT

Amir, T., Yusuff E., Baptiste J., Gainer R., & Herman, C.

Takhliq Amir – Resident – Cardiac Surgery

Objectives: Thoracic aortic aneurysms (TAA) are commonly identified incidentally or following acute aortic syndromes. In asymptomatic patients, guidelines recommend surgery at diameters ≥5.5 cm or with rapid growth. We aimed to characterize longitudinal growth of the aortic root and mid-ascending aorta in a CT-based surveillance cohort and assess whether baseline diameter is associated with faster growth.

Methods: We conducted a retrospective study of adults undergoing TAA surveillance with ≥2 CT scans ≥6 months apart. Growth rates for the aortic root and mid-ascending aorta were calculated using linear regression of serial diameters over time. Growth was stratified by baseline diameter, assessed across clinically relevant thresholds, and evaluated using multivariable linear regression.

Results: 2,460 patients (9,320 CT scans) were included (median age 60 years (IQR 51-68), 72% male) with median radiologic follow-up of 5.4 years (IQR 3.1-8.4). Mean baseline ascending and root diameters were 4.0 ± 0.5 cm and 4.2 ± 0.5 cm, respectively. Median ascending growth was 0.06 mm/year (IQR 0.0-0.3), whereas median aortic root growth was 0.00 mm/year (IQR 0.0-0.2). Ascending growth differed across baseline diameter strata (<4cm, 4–4.4cm, 4.5–4.9cm, >5cm), with greater growth observed in larger strata ($p=0.02$). Ascending aortas ≥5.0 cm grew faster than those <5.0 cm (median 0.15 vs 0.06 mm/year, $p=0.017$). In multivariable analysis, larger baseline diameter ($\beta=0.11$ mm/year per cm increase, $p<0.001$) and female sex ($\beta=0.19$ mm/year, $p<0.001$) were associated with faster ascending growth. Root growth was not associated with baseline diameter or sex.

Conclusions: This large CT-based surveillance cohort demonstrated modest TAA growth. Whereas root growth was independent of baseline size, the ascending aorta showed a diameter-dependent pattern, with faster growth at diameters ≥5.0 cm. These findings support segment-specific differences in aortic growth that may help to refine risk stratification and management strategies for patients with TAAs.

SESSION I

ABSTRACT #7

TARGETED HYPERTHERMIA INDUCES IMMUNOGENIC TUMOR REMODELING AND DEMONSTRATES EARLY CLINICAL RESPONSE IN IMMUNOTHERAPY-REFRACTORY METASTATIC MELANOMA

Cheverie, N.P., Kennedy B.E., Dean, C., Clark, K., Marivel, G., Corscadden, K.J., Jordan, J.L., Gormley, C., Noftall, E., Giacomantonio, C.

Nicholas Cheverie – Graduate Student - General Surgery

Objectives: To evaluate the safety, feasibility, and early antitumor activity of Sona's Targeted Hyperthermia Therapy (THT) in patients with immunotherapy-refractory metastatic melanoma, and to define the mechanistic basis of THT-induced immune responses and resistance to inform rational combination strategies.

Methods: In a first-in-human, open-label feasibility study (NCT06894407), ten patients with stage 3C/3D/4M1 cutaneous metastatic melanoma progressing on checkpoint inhibitors received intratumoral gold nanorods followed by near-infrared (NIR)-mediated heating on days 1 and 8. Up to four lesions per patient were treated, targeting 42-48°C for 5 minutes. Safety and biological responses were assessed via adverse-event monitoring, imaging, and tumor biopsies at days 15 and 29. Parallel mechanistic studies were conducted in B16F10 melanoma models to characterize immune and transcriptomic responses to controlled hyperthermia.

Results: THT was well tolerated, with no treatment-related serious adverse events observed. By day 15, 8 of 10 patients demonstrated tumor regression in treated lesions. Complete histologic clearance occurred in 6 patients, partial regression in 2, and no response in 2. In preclinical models, controlled thermal dosing induced immunogenic cell death (ICD), marked by calreticulin and HSP70 exposure, alongside rapid activation of innate immune pathways, including chemokine and complement signaling. This was followed by early T-cell receptor remodeling and T cell engagement, consistent with effective tumor immune priming.

Conclusions: THT is safe, feasible, and induces rapid tumor regression in refractory melanoma. Mechanistic studies demonstrate that THT initiates a coordinated innate and adaptive immune response, supporting its role as a powerful tumor-conditioning strategy and providing a strong rationale for combination with immunotherapy to enhance response durability.

SESSION I

ABSTRACT #8

ONCOLOGIC OUTCOMES IN P16-POSITIVE OROPHARYNGEAL SQUAMOUS CELL CARCINOMAS WITH EXTRANODAL EXTENSION: A RETROSPECTIVE COHORT STUDY

Taylor, V., MacKay, C., Taylor, S.M., Trites, J., Al Afif, A., Mendez, A., Rigby, M.H.

Victoria Taylor – Resident - Otolaryngology

Objectives: There has been a growing interest in treatment de-escalation strategies for human papillomavirus (HPV)-associated oropharyngeal squamous cell carcinomas (OPSCC). Identifying which patients are safe to select remains uncertain, particularly when extranodal extension (ENE) is present. This study evaluated whether ENE presence and extent (microscopic vs macroscopic) affect survival outcomes in patients with p16-positive OPSCC treated with primary surgery.

Methods: Retrospective cohort study of patients with p16-positive OPSCC treated with either surgery alone or surgery with adjuvant treatment from September 2014 to July 2024. Primary outcomes included overall survival (OS), disease-specific survival (DSS), and disease-free survival (DFS) up to 5 years after treatment. Kaplan-Meier survival curves were used to calculate oncologic outcomes, which were compared between groups using log-rank tests. Variables selected with LASSO regression were entered into Cox models with Firth penalization as needed.

Results: In total, 232 patients were included. ENE status was reported in 216 patients. ENE was present in 115 patients (53.2%); of these, 69.6% were macroscopic. Five-year OS, DSS, and DFS were 88.5%, 94.4%, and 89.0%, respectively. On univariable analyses, ENE positivity was not statistically associated with DSS (93.3% vs 94.6%, p=0.86) or DFS (87.7% vs 91.7%, p=0.46), but approached significance for worse OS (83.2% vs 93.4%, p=0.052). Five-year OS was 89.8% for microscopic ENE and 80.2% for macroscopic (p=0.22). DSS and DFS did not differ significantly by ENE extent (p=0.42 and p=0.82). On exploratory complete-case multivariable analyses, macroscopic ENE (HR=4.58, 95%Cl=1.06-19.80, p=0.042, N=96) increasing age, positive margins, lack of adjuvant therapy, and smoking were associated with worse OS.

Discussion: Macroscopic ENE was associated with worse OS on exploratory multivariable analyses, suggesting that ENE extent may provide important prognostic information beyond ENE positivity alone in HPV-associated OPSCC. Future studies with larger sample sizes are required.

SESSION I

ABSTRACT #9

TO WALK OR NOT? A PROSPECTIVE RANDOMIZED CONTROLLED TRIAL TO EVALUATE THE EFFECT OF WEIGHT BEARING ON PATIENT OUTCOMES FOLLOWING FIRST METATARSOPHALANGEAL JOINT FUSION

Scott D. Purdie, Haley M. Glazebrook, Ruchith Dissanyake, **Peter Wong**, Bernard N. Burgesson, Joel G. Morash, Mark A. Glazebrook

Peter Wong – Clinical Fellow – Orthopaedics

Objective: The objective of this study was to determine whether immediate weight bearing as tolerated (WBAT) following first metatarsophalangeal (MTP) joint arthrodesis leads to differences in patient outcomes compared to traditional non-weight bearing (NWB) protocols.

Method: A prospective randomized controlled trial was conducted on 76 patients undergoing isolated first MTP joint fusion. Patients were randomly allocated to either immediate weight-bearing as tolerated (WBAT) or non-weight bearing (NWB) protocols. All procedures were performed using standardized surgical techniques and fixation methods (screws or plate) by two fellowship-trained foot and ankle surgeons.

Primary outcomes were pain measured by the Visual Analogue Scale (VAS) and function measured by the Foot & Ankle Ability Measure, (FAAM–ADL subscale) at 12 months postoperatively. Secondary outcomes included non-union rates, complication, and patient satisfaction. Statistical analysis used t-tests and chi-squared or Fisher's exact tests, with significance set at $p<0.05$.

Results: Sixty-eight patients (33 WBAT, 35 NWB) completed the study. At a minimum follow-up of 12 months, both groups demonstrated significant improvements in pain and function. No statistically significant differences were observed between the WBAT and NWB groups in VAS pain scores (2.97 ± 2.22 vs 2.54 ± 2.15; $p = 0.423$), FAAM–ADL scores (81.31 ± 16.03 vs 85.02 ± 18.86; $p = 0.387$), or patient satisfaction (8.00 ± 2.76 vs 8.34 ± 2.52; $p = 0.594$). Complication rates were similar with one case of hardware irritation reported in each group ($p = 0.739$).

Conclusion: Following first MTP joint fusion, immediate weight bearing as tolerated is safe and provides comparable pain relief, functional outcomes, patient satisfaction, and complication rates to traditional non-weight-bearing protocols. These results support a shift toward more progressive postoperative strategies, with potential benefits for patient mobility.

SESSION I

ABSTRACT #10

PREDICTORS OF DELAY TO COLORECTAL SURGICAL CANCER CARE IN NOVA SCOTIA

Orovec, A; Swansburg, J; Li, T; Paffile, J; Neumann, K

Adele Orovec – Resident – General Surgery

Background/Objectives: Wait times for surgical care for colorectal cancer in Canada are extremely variable, potentially impacting oncologic outcomes. The purpose of this study is to determine patient-, disease-, and system-level factors associated with longer wait times for colorectal cancer surgery in a provincial population-level study.

Methods: This was a retrospective cross-sectional cohort study including patients undergoing elective colon and rectal cancer resections between November 2023 and November 2025. Baseline characteristics (clinical and administrative datasets) were compared between patients meeting and exceeding wait time targets (from ready-for-surgery to surgery in 21 days; from pathologic diagnosis to surgery in 42 days) using Wilcoxon rank-sum test for continuous variables and Pearson's chi-squared test for categorical variables. Univariate and multivariate logistic regression was performed to identify factors associated with delay.

Results: Of the 370 patients who underwent elective colorectal cancer resections only 135 (36%) patients met the 21-day target from ready-for-surgery to surgery, with a median wait time of 27 days. Multivariable regression identified surgery in central zone (tertiary and quaternary care facilities with subspecialty care) and neoadjuvant chemotherapy were strongly associated with surgical delay (OR 2.6, $p<0.001$, and OR 4.4, $p=0.038$, respectively). ASA score ≥ 3 was associated with lower odds of delay (OR 0.5, $p=0.036$). Of the 306 patients who did not receive neoadjuvant treatment, 151 (49%) met the 42-day target from pathologic diagnosis to date of surgery, with a median wait time of 43 days. Multivariable regression identified rectal cancer (OR 6.94, $p=0.003$) and obesity (OR 1.86, $p=0.037$) as independent predictors of system-level delay.

Conclusion: Colorectal cancer surgery wait times may be negatively impacted by disease- and system-level factors that warrant further investigation. Rectal cancer staging and decision-making algorithms may be a key element, as well as volumes associated with centralized care

SESSION II

ABSTRACT #11

A MULTISTAGE ML-BASED DELIRIUM RISK STRATIFICATION WITH SHAP-DRIVEN CLINICAL DECISION SUPPORT FOR CARDIAC SURGERY

Methila Biswas Raya MCS, Ryan Gainer MSc, Pallavi Singh MSc, Nathan Barton, Ashley Zahavich, Dr. Frank Rudzicz PhD, Dr. Gregory M Hirsch MD, Dr. Jamie Dougherty MD, Dr. Pieter de Jager MD

Methila Biswas Raya – Graduate Student – Cardiac Surgery

Objectives: Delirium is considered a neuropsychiatric complication characterized by acute cognitive dysfunction, and often leads to adverse consequences if not detected early. This proposed work aims to develop and evaluate machine learning models under the Artificial Intelligence for Dynamic Risk Assessment and Outcome Optimization (AIRO) framework for the prediction of delirium and personalized treatment.

Methods: We worked on a highly imbalanced dataset with 10.3% delirium cases using the Maritime Heart Centre (MHC) Database. Three different modeling strategies were developed including pre-operative (using baseline patient feature), post-operative (captures immediate impact of surgical stress and trauma) and combined model (integrating both pre-operative and post-operative features). We developed two approaches to detect delirium.

Model A is a deep learning pipeline which consists of a three-layer neural network combined with K-means clustering. To avoid overfitting, we have used regularization techniques.
Model B demonstrates a stacking ensemble architecture, employing a diversity-aware selection of base ML models aggregated by a Logistic Regression meta-learner. It included isotonic calibration and five-fold cross-validation to ensure clinical trustworthiness and stability. Models are evaluated using AUC-ROC.

Results: The combined model achieved the strongest performance compared to a pre-operative and post-operative model. The ensamble Model B outperforms deep learning Model A in AUC-ROC which is 0.749. In addition, explainable AI is implemented which identify individual patient specific and global modifiable and non-modifiable key risk factors. It helps to quantify high risk patients and their individual key risk factors.

Conclusions: Machine learning models within the AIRO framework are highly capable to predict delirium risk across different clinical stages. The combined modeling approach provides the best clinically actionable predictions. The ensamble model B demonstrates better AUC-ROC than model A. This work through AIRO represents a conceptual and implementation-focused approach to the integration of explainable machine learning into perioperative clinical care.

SESSION II

ABSTRACT #12

APPLICATION OF THE PALLIATIVE AND THERAPEUTIC HARMONIZATION (PATH) PROGRAM FOR SHARED-DECISION MAKING FOR SEVERELY FRAIL OR COGNITIVELY IMPAIRED PATIENTS SCHEDULED FOR CANCER SURGERY

Patel, D., Li, T., Courish, M.K., Butler, C., Bromley, A., Jean-Baptiste, J., Sheridan, L., Mallery, L., Shetty, N., Kieser, K., Moorhouse, P., Neumann, K., Knapp, G., Mason, R., MacDonald, D., French, D., Corsten, M., Gala-Lopez, B., Wilson, D., & Spence, R.T.

Dylan Patel – Resident – General Surgery

Objectives: To evaluate whether the Palliative and Therapeutic Harmonization (PATH) geriatric care pathway improves time spent at home in frail or cognitively impaired older adults undergoing cancer surgery.

Methods: We conducted a single-center, pragmatic randomized controlled trial at a tertiary care center. Patients aged ≥75 years scheduled for curative- or palliative-intent cancer surgery were identified and screened for frailty and cognitive impairment. Frailty was assessed using the Clinical Frailty Scale (CFS-FAST), and cognition using the Brief Cognitive Rating Scale (BCRS). Consenting participants were randomized 1:1 to the PATH geriatric care pathway or standard perioperative care (SOC) and followed for six months. The primary outcome was time spent at home. Eligible patients declining randomization were followed in a prospective observational cohort (PRO), with a retrospective cohort for those referred directly to PATH (RETRO).

Results: Seventy-one patients were included in the study; 7 (9.9%) to SOC, 9 (12.7%) to PATH, 36 (50.7%) declined randomization and were included in the PRO cohort and 19 (26.8%) patients were referred directly to PATH during the 18-month study period. Surgical intervention included 25 general Surgery (35.2%), 5 hepatobiliary (7.0%), 2 orthopedic (2.8%), 13 otolaryngology (18.3%), 11 gynecology (15.5%), 5 urology (7.0%), and10 thoracic (14.1%) operations. There was no difference in time spent at home between the randomized groups. Comparing the PRO to RETRO groups, patients in the RETRO group spent more time at home at 6 months ($p = 0.01$). This difference was maintained when combining all patients who underwent PATH assessment compared to straight to surgery ($p = 0.037$).

Conclusions: Frail patients undergoing cancer surgery who are involved in a shared-decision making process may benefit from a more individualized informed consent process and as a result, spend more time at home following cancer surgery compared to the SOC.

SESSION II

ABSTRACT #13

MISSED OPPORTUNITIES FOR SURVEILLANCE: INCIDENCE OF PRIOR ANEURYSM IN PATIENTS PRESENTING WITH RUPTURED ABDOMINAL AORTIC ANEURYSM

Coyle, K.M., Knight, D., Abdelmasih, M., Smith, M., Gill, H.L., McDonald, J., Power, A., Mordhorst, A., Lee, M., Casey, P., & Jessula, S.

Kassandra Coyle – Resident – Vascular Surgery

Objectives: Rupture of abdominal aortic aneurysms (AAA) remains a significant cause of mortality. Early identification and surveillance are critical for reducing rupture risk. Nova Scotia offers a unique setting to examine rAAA patterns due to its centralized referral and treatment system. This study aimed to determine the proportion of patients presenting with rAAAs who had prior evidence of an aneurysm and whether they were known to or followed by the vascular service prior to rupture.

Methods: We performed a retrospective cohort study of all patients who presented to Nova Scotia Health with a rAAA between 2013-2025. Patients were excluded if they lacked a Nova Scotia health card, died before operative management, or had rupture secondary to a non-primary aneurysm. Statistical analyses were conducted using STATA.

Results: Among the 167 included patients, 92 underwent open repair and 75 underwent endovascular repair. The median age was 73 (IQR 67-79), and 33 patients (19.76%) were female. Prior imaging was identified in 52 patients (31.1%). Fourteen of these patients were not previously known to vascular surgery (8.38% of the entire cohort). Among patients not known to vascular surgery, there was a median interval of 5.02 years (IQR 1.04-8.8) between aneurysm identification and rupture. Transthoracic echocardiography was available prior to rupture in 38 patients (22.8%), of whom 8 had an aortic root diameter greater than 4.0 cm, representing 4.8% of the total cohort.

Conclusions: Nearly one-third of patients presenting with rAAA had prior imaging evidence of an aneurysm, with a substantial proportion not under vascular surveillance. These findings highlight opportunities to improve documentation, reporting of incidental aneurysms and referral pathways, which may reduce preventable aneurysm rupture. Additionally, the presence of an enlarged aortic root on transthoracic echocardiography may represent a potential indicator for further aortic screening to evaluate for concomitant AAA, warranting prospective investigation.

SESSION II

ABSTRACT #14

FUNCTIONAL AND ONCOLOGIC OUTCOMES AFTER TRANSORAL LASER AND ROBOTIC SURGERY FOR OROPHARYNGEAL CARCINOMA

Francis, G., MacKay, C., & Rigby, M.

Gizelle Francis – Resident – Otolaryngology

Objectives: 1. Identify early and long-term oncologic outcomes between patients undergoing TLM and TORS for OPC, 2. Identify clinical and treatment-related factors that influence functional recovery and quality-of-life following TLM and TORS, 3. Describe pros and cons of both TORS and TLM as surgical techniques for OPC.

Introduction: Transoral laser microsurgery (TLM) and transoral robotic surgery (TORS) have emerged as minimally invasive techniques for the management of oropharyngeal carcinoma (OPC), aiming to optimize oncologic control while preserving function. The goal of this study is to compare oncologic and functional outcomes of TLM and TORS.

Methods: A retrospective chart review was conducted on 296 patients with OPC who underwent TLM or TORS at a single centre academic teaching hospital between 2015 and 2024. Demographics and surgical outcomes were compared among the treatment modalities using Fisher's exact test for categorical variables and t-tests for continuous variables. Two-year overall survival (OS), disease-specific survival (DSS), and disease-free survival (DFS) were calculated using Kaplan-Meier survival curves. Functional outcomes were measured using proxy variables such as gastric tube placement (G tube), bleeding, and need for tracheostomy.

Results: The mean patient age was 61.1 years and 78.7% were male. Tracheostomy ($p=0.037$) and overall bleeding rates ($p< 0.001$) were significantly higher in TORS group, while there was no significant difference in G tubes. There were no statistically significant differences in OS ($p=0.7$), DSS ($p=0.54$), DFS ($p=0.84$) between modalities.

Conclusion: Both TLM and TORS demonstrated excellent oncologic outcomes, with 2-year OS, DSS, and DFS exceeding 90% and comparable between groups. G tube placement rates were comparable between groups. Postoperative bleeding and tracheostomy rates were significantly higher in the TORS group. These findings reinforce that both TLM and TORS are effective minimally invasive approaches for OPC; however, in our study TORS was associated with higher rates of post-operative complications.

SESSION II

ABSTRACT #15

VIDEO-BASED ASSESSMENT OF SURGICAL SKILL IN ORTHOPAEDIC SURGERY: EXTERNAL REVIEWER VALIDATION AND EVALUATOR BIAS

Haley Glazebrook, MPH, Jillian McNally, MD, David Wilson, MD, MSc, FRCSC, Emma E. Jones, BScH, Neyousha Shahisavandi, MPH, Caroline King, PhD, Chad Coles, MD, FRCSC, and Raymond Andrew Glennie, MD, MSc, FRCSC

Haley Glazebrook – Medical Student – Orthopaedics

Introduction: Assessment of surgical skills is a critical component of orthopaedic residency training, ensuring that trainees achieve competency for independent practice. Current evaluation models are largely observational in clinical settings on rotational basis. High-fidelity simulated cadaveric surgeries provide a controlled environment to assess performance without patient risk, while video recording enables standardized, anonymized and remote evaluation by multiple reviewers.

Objectives: (1) To compare external versus internal (home program) evaluations of a unique de-identified OSCE and (2) Assess whether there are any gender/racial biases with altered videos.

Methods: One experienced surgeon and three trainees (PGY-4, PGY-3, PGY-2) performed open reduction and internal fixation of both bone forearm and talus fractures. Procedures were recorded, edited for optimal viewing, and shortened to ~18 minutes to highlight critical steps. Videos were anonymized and voice-over narration from a female and an Arabic-speaking male were added. Videos were distributed to orthopaedic surgeons nationwide. Performance was evaluated using three scores OSCE, OSATS and O-SCORE**.**

Results: Across all assessments (O-SCORE**,** S-OSCE**,** OSATS), video-based evaluations distinguished novice and expert surgeons, while differentiation between mid-level residents was less pronounced, comparable to the internal evaluation conducted with 17 local surgeons. At the practice-ready surgeon level, scoring remained consistent regardless of whether videos featured female, or Arabic-speaker voiceover, however, greater variability in scores was observed among junior trainees.

Conclusion: Video-based assessment of simulated orthopaedic surgeries enables consistent evaluation of surgical skill across multiple institutions. These results support its feasibility and generalizability as a standardized tool for assessing resident's surgical competency and readiness for independent practice.

SESSION II

ABSTRACT #16

PRELIMINARY ANALYSIS OF NEURAL ACTIVITY IN PATIENTS WITH DRUG-RESISTANT EPILEPSY USING THE PERCEPT™ NEUROSTIMULATOR

Imtiaz, H, Klassen, A., Friedman, A., Weise, L.

Hamza Imtiaz – Graduate Student – Neurosurgery

Objectives: Deep brain stimulation (DBS) is used in drug-resistant epilepsy (DRE) when surgical resection is deemed unfeasible. Newer DBS devices enable simultaneous stimulation and recording of local field potentials (LFP), allowing for the development of potential closed-loop DBS algorithms. Few studies have characterized such signal in a limited pool of patients, and broader characterization remains limited. Here, we present a preliminary analysis of signals from six patients with DRE.

Methods: Retrospective data from the Medtronic Percept PC neurostimulator from patients with DRE were analyzed. Timeline LFP data were plotted as continuous time-series plots and aligned to 24-hour cycles to assess circadian patterns. Polar plots were created to highlight peak LFP timing. Event PSDs (n=373) were normalized and averaged by hemisphere, and median power frequency (MPF) was compared across hemispheres and event types. Continuous BrainSense recordings were plotted in time and frequency domain and visualized as spectrograms.

Results: Median power frequency (MPF) was lower during seizure events compared to non-seizure events, with significant hemispheric asymmetry across several patients. There were consistent circadian trends in chronic LFP recordings in 3 out of 5 patients, with peaks in LFP activity occurring in the early morning hours in all three of those patients.

Conclusion: This study characterizes DBS data collected from 6 patients with DRE. These results could aid in the development of closed-loop DBS systems that provide stimulation based on real-time patient specific neural signals.

SESSION II

ABSTRACT #17

ENVIRONMENTAL AND ECONOMIC IMPACT ASSESSMENT OF CAPE BRETON THORACIC SURGERY CLINIC

Leathead, F., Alsrayheen, E., Fuentes, Y., Johnson, G., Wallace, A., Ednie, A., Mujoomdar, A., Plourde, M., Darling, G., Giles, S. & French D.

Felix Leathead – Resident – Thoracic Surgery

We wanted to evaluate the Cape Breton Thoracic Surgery Clinic's (CBTSC) environmental and economic impacts, after its establishment in 2022 to provide closer care to the community.

A retrospective review of prospective collected data was conducted for patients seen in the CBTSC in 2023. The median CO_2 emissions and patients' cost of transportation to CBTSC were compared to those for the same cohort if they had to travel to the QEII. The distance to CBTSC and QEII, the CO_2 emissions, and the cost of travel were computed for each patient using their home postal code and a geographic information system. A federal database was used to measure the average fuel consumption (10.03 L/100km) and CO_2 emissions of a 2018 vehicle (235.20 g/km)[2]. A provincial database was used to determine the average fuel price for 2023 (163.88 cents/L)[3].

A total of 266 patients were enrolled, with 249 (93.6%) providing sufficient data. The median CO_2 emissions per patient journeying to the CBTSC were 10.9 [IQR: 7.1 – 28.4] kg, contrasting with 192.9 [IQR: 188.2 – 203.7] kg (p-value < 0.001) if they had travelled to the QEII. The median reduction in emissions per patient was 182.0 kg (94.3%) of CO_2. The median transportation cost per patient travelling to the CBTSC was $7.6 [IQR: 5.0 – 19.8], compared to $134.7 [IQR: 131.4 – 145.6] (p-value < 0.001) for travel to the QEII, resulting in a median cost reduction per patient of $127.1 (94.4%). Including the 28 trips made from surgeons travelling to the CBTSC from Halifax in 2023, the total CO_2 emissions from the surgeons' trips was 5,295 kg, summing up the CO_2 emissions reduction to 49,563 kg (80.33%).

Outreach surgery clinics decrease the economic toll of transportation on patients as well as reducing the overall carbon footprint of surgical care.

SESSION II

ABSTRACT #18

COMPARING PROSPECTIVE COLORECTAL CANCER OUTCOMES IN NOVA SCOTIA WITH AN INTERNATIONAL BENCHAMARK

Muradov, J.1, MacDonald, L., Li, T., Hannedige, D., Swansburg, JE., Courish, MK., Neumann, K., Knapp, G., Drohan, A., Johnson, P., Kenyon, C., McFadgen, H., Spence, RT.

Jamil Muradov – Medical Student – General Surgery

Objectives: Colorectal cancer (CRC) incidence rates in Nova Scotia are among highest nationwide. This study aimed to establish a robust data infrastructure, consistent with the International Consortium for Health Outcomes Measurement (ICHOM), to assess colorectal cancer outcomes in Nova Scotia across a tertiary care center and regional sites.

Methods: A prospective colorectal cancer outcomes database was developed consistent with ICHOM standards. Data was collected at both a tertiary referral centre and regional hospitals within the healthcare network at the baseline and during follow-ups for up to 12 months following treatment. Risk-adjusted outcomes from a pilot subcohort were compared with international benchmark data from the Dutch Institute for Clinical Auditing (DICA).

Results: Across ~620 recruited patients (mean age: ~69 y.o.), ~78% and ~22% presented with colon and rectal cancer, respectively. Common primary colonic tumor sites were the sigmoid colon (20%), caecum (19%) and ascending colon (15%).

The tertiary center managed substantially more rectal cancers (40% vs ~10% across regional sites) and stage 4 disease in both colon (9.5% vs ~3–8% regionally) and rectal cancer (4.7% vs 0–1% regionally). Tumor-related complications were somewhat less common at the tertiary care center (39% vs ~46–54% at regional sites). Descriptively, the NS tertiary center had longer treatment wait times than DICA but demonstrated lower complication and mortality rates. In 2024, QEII showed fewer 90-day complications for both colon (8.1% vs 13.0%) and rectal cancer (14.7% vs 19.4%), as well as lower 90-day mortality for both disease sites compared with DICA.

Conclusions: Using a collaborative approach, we have generated the first comprehensive, risk-adjusted, patient-centered CRC outcomes dataset in Nova Scotia, enabling international benchmarking and informing a scalable provincial CRC quality-improvement framework.

SESSION II

ABSTRACT #19

LONGITUDINAL PERIPHERAL BLOOD IMMUNE PROFILING TO MONITOR DISEASE PROGRESSION IN GLIOBLASTOMA

Westhaver, Lauren P., Roy, Jeremy W., Weeks, Adrienne C.

Lauren Westhaver – Post Doc – Neurosurgery

Objectives: Establish peripheral immune profiling in glioblastoma (high-grade glioma; GB) Explore immune biomarkers that differentiate GB from healthy controls (HC) and non-GB metastases, and pseudoprogression (Ps) from true GB progression.

Methods: We developed two 28-parameter flow cytometry panels to profile peripheral immune phenotypes across GB clinical course. These enable assessment of immune populations, including CD4 and CD8 T cells, B cells, natural killer (NK) cells, dendritic cells (DCs), and myeloid-derived suppressor cells (MDSCs).

Results: We established a longitudinal biobank of GB patient samples and initiated profiling across HC, GB, and non-GB metastatic disease. Immune profiling distinguished pre-surgical GB (A) samples from HC, including reduced CD8 effector memory T cells in A (4.3±0.5%; mean ± SEM, n=37) vs HC (9.8±1.6%; mean ± SEM, n=20), depleted DCs (1.3±0.2% vs 4.0±0.5%) and expanded intermediate monocyte populations (7.8±0.9% vs 1.8±0.3%). CD40 expression on MDSCs was increased in A (23.8±3.3%) compared to HC (2.8±0.7%). Preliminary univariate analysis suggests that CD4 T regulatory cell percentage at time of diagnosis may predict PFS (p=0.05). HC was differentiated from GB at progression, including increased CD4 T regulatory cells in progression (2.7±0.3%, n=22) vs HC (1.7±0.1%). Immune profiling further differentiated non-GB metastases (Met) from HC, characterized by expanded monocyte populations in Met (51.2±5.1%, n=8) vs HC (34.0±2.6%), particularly intermediate monocytes (13.4±2.7% vs 1.8±0.3%), and increased CD39 expression on CD8 T cells (119.4±17.5 MFI vs 50.0±3.1 MFI). Preliminarily, GB progression and Ps were differentiated by elevated CD39 expression in CD8+T cells in progression (4.5 +/- 0.9 %, mean +/- SEM) compared to Ps (1.4 +/- 0.3 %, n=8). Similarly, CD39 was elevated in progression (4.0 +/- 0.7 %) vs Ps (1.4 +/- 0.2 %) in NK cells.

Conclusions: Peripheral blood immune profiling represents a minimally invasive approach to improve diagnostic accuracy in GB and patient quality of life.

SESSION III

ABSTRACT #20

SAFETY AND OUTCOMES OF DEEP BRAIN STIMULATION FOR DYSTONIA IN YOUNG CHILDREN EXCLUDED FROM THE FDA HUMANITARIAN DEVICE EXEMPTION: ANALYSIS OF THE CHILD-DBS REGISTRY

Jung, S.*, Molot-Toker, S.*, Dinger, T., Balachandar, A., Taha, B., Mithani, K., Breitbart, S., Huynh, M., Kisteroff, K., Sriharan, S., Vogt, L., LeBlanc-Millar, A., Ebrahimi-Fakhari, D., Yang, K., Ruppert-Gomez, M., Stone, S., Northam, W., Gadgil, N., Raskin, J., Weil, A., Hadjinicolaou, A., Meijer, I., Fasano, A., Gorodetsky, C., Ibrahim, G.

Suna Jung – Resident – Neurosurgery

Objectives: In the United States, deep brain stimulation (DBS) is accessible to children with dystonia who are 7 years and older through a Food and Drug Administration Humanitarian Device Exemption (HDE). In this study, we describe the safety, feasibility, and outcomes of DBS in children with dystonia under 7 years old who are excluded from the HDE.

Methods: Data were collected through the Child & Youth CompreHensIve Longitudinal Database of DBS (CHILD-DBS), a prospective registry of pediatric DBS from five North American tertiary pediatric hospitals, between February 2015 and December 2025. Participants under the age of 7 years who underwent DBS, targeting the globus pallidus internus for the treatment of dystonia, were included. Demographics, operative details, outcomes, and complications were analysed.

Results: Twelve children underwent 14 DBS surgeries with a mean follow-up of 2.66 years (0.50–10.85 years). The mean age and weight were 4.72 years (2.96–6.83 years) and 16.5 kg (9.3–30.8 kg), respectively. Half had prior intensive care unit admissions for status dystonicus, and 9 surgeries (64.3%) were performed urgently. Three children had transgression of stereotactic frame pins beyond the inner table of the skull, while four others had wound complications requiring surgical interventions. No patients experienced neurologic sequelae. Overall, this cohort experienced 40.1% reduction in the Burke-Fahn-Marsden movement subscale at 6 months postoperatively ($p<0.05$), which persisted to 12 months. In addition, all 8 children who underwent urgent DBS surgery for status dystonicus had resolution of status dystonicus and were discharged from hospital. Three children died due to their underlying conditions greater than 6 months from their surgeries.

Conclusions: DBS has demonstrable benefits in children under the age of 7 years with severe refractory dystonia, albeit with higher surgical risks compared to older children. Further research is warranted to better inform treatment decisions and regulatory oversight.

SESSION III

ABSTRACT #21

UPDATED RESULTS – A NOVA SCOTIA-BASED TOTAL NEOADJUVANT TREATMENT STUDY: ASSESSING SUCCESS OF IMPLEMENTATION AND OUTCOMES DATA ASSOCIATED WITH A PROVINCIALLY STANDARDIZED ALGORITHM FOR THE TREATMENT OF LOCALLY ADVANCED RECTAL CANCER

Georgescu I., Lamond N., Patel N., Cwajna W., Johnson PM., Knapp G., Spence R., Gala-Lopez B., Drohan A., and Neumann

Ilinca Georgescu – Resident – General Surgery

BACKGROUND: Total neoadjuvant therapy (TNT) involves administration of all systemic treatment upfront of surgery and has shown improvement in disease-free survival and organ-preservation. Treatment regimens vary - with no standardized approach or benchmarks for success. In an attempt to standardize the use of TNT across Ns an algorithm featuring two regimens, induction OPRA and consolidation OPRA, has now been endorsed. The purpose of this study is to measure the success of implementing X this new provincial algorithm.

METHODS: Consecutive patients age >18, diagnosed with locally advanced rectal cancer who were offered TNT in Nova Scotia between March 2023 - 2026 were enrolled. Data on patient, disease, and treatment factors were collected. Success of implementation was measured in 2 domains by setting a target of >75% rate of presentation at multidisciplinary rounds; and completion rates of ≥ 90% for radiotherapy and ≥ 80% for chemotherapy. Complete clinical response (CCR) and organ preservation represented clinical outcomes of interest.

RESULTS: 122 patients were enrolled, 102 of whom completed all treatments. At diagnosis, 52% had T4 disease, 72.1% had positive node status, and sphincter involvement and threatened margins were suspected in 29.7% and 49.1% of cases. 62.7% underwent consolidation, while 37.3% underwent induction protocol. 73% of the patients were presented in multidisciplinary rounds. Radiation showed higher completion rates in the consolidation protocol compared to the induction group (98.4% vs 89.5%), and higher completion rates of chemotherapy was seen in the induction protocol compared to consolidation (86.8% vs 68.7%). CCR rate was 29.4% overall (35.9% with consolidation vs. 18.4% with induction protocol), with an overall organ preservation rate of 23.5%.

CONCLUSION: TNT implementation in Nova Scotia has met moderate success with respect to compliance and completion rate. CCR was highest in the consolidation group, which is consistent with published literature, however organ preservation rates fall well below globally reported averages.

SESSION III

ABSTRACT #22

GENETIC GLOMERULAR PODOCYTOPATHIES: DEVELOPING A GENETIC MODEL TO UNDERSTAND STEROID-RESISTANT NEPHROTIC SYNDROME (SRNS) AND FOCAL SEGMENTAL GLOMERULOSCLEROSIS (FSGS)

Stevens, N. & Fawcett, J P.

Noah Stevens – Undergrad Student – Medical Sciences

Objectives: Recently we have shown that an isoform of NOS1AP is implicated in SRNS. Whether NOS1AP mutations leading to albuminuria is the result of kidney cells lacking NOS1APc remains to be determined. This study sought to determine NOS1APc's distribution within the nephron across development and whether specifically ablating NOS1APc in podocytes leads to albuminuria. We hypothesized that NOS1APc is expressed in podocytes and tubular epithelium and is required for maintaining nephron integrity and preventing albuminuria.

Methods: To determine NOS1APc localization within the kidney, E18, P30, and adult rodent kidneys were sectioned and immunohistochemically stained using a NOS1APc-specific antibody alongside markers for proximal tubules, collecting ducts, and podocytes. To assess functional consequences of NOS1APc loss, we generated conditional mutant mice lacking either all NOS1AP isoforms or NOS1APc alone specifically in podocytes. Mouse urine was assessed for albuminuria via SDS-PAGE followed by Coomassie Blue staining.

Results: Localization studies revealed that early in the postnatal period, NOS1APc is highly expressed in podocytes, proximal tubules, and collecting ducts. In adult mice, however, NOS1APc is highly localized to basal membranes of collecting duct epithelium, and glomerular podocytes. Mice with podocyte-specific deletion of all NOS1AP isoforms showed significant albuminuria, while mice with podocyte-specific deletions of NOS1APc alone failed to develop significant albuminuria.

Conclusions: These findings indicate that NOS1APc is broadly expressed in podocytes and tubular epithelium, with a developmental change in expression. Moreover, mice with podocyte-specific deletions of NOS1APc do not exhibit significant increase in albuminuria, unlike NOS1APc$^{-/-}$ mice. In contrast, mice lacking all NOS1AP isoforms in podocytes show significant albuminuria, suggesting that the NOS1APc isoform is not essential for maintaining integrity in mature podocytes, and other isoforms likely contribute to development.

SESSION III

ABSTRACT #23

TEMPORAL TRENDS AND SITE-LEVEL VARIATION IN SURGICAL MANAGEMENT OF DEGENERATIVE SPONDYLOLISTHESIS

Emmanuel Egwuatu, Chris Bailey, Raj Rampersaud, Charles Fisher, Andrew Glennie
Emmanuel Egwuatu – Medical Student – Orthopaedics

Objective: To evaluate temporal trends and inter-site variation in fusion versus decompression alone across academic Canadian centers and to compare 12-month patient-reported outcomes between surgical approaches.
Methods: Prospective cohort analysis of patients enrolled in the CSORN LDS study across five academic sites. Inclusion: radiographic LDS with neurogenic claudication or radiculopathy ± back pain, refractory to ≥6 weeks nonoperative care, undergoing posterior decompression ± fusion. Exclusions: tumor, isthmic spondylolisthesis, fracture, prior lumbar surgery (except remote discectomy), concomitant cervical/thoracic myelopathy. Baseline demographics, radiographic measures (including DSIC stability grade), procedural data, and outcomes (ODI, numeric rating scales for back/leg pain, PHQ-9) were collected. Fusion rate trends by year and site were assessed using linear regression (adjusted for site-specific confounders). Patient-reported outcomes at 12 months were compared by site and multivariable linear regression evaluated associations of surgical approach and year with 12-month outcomes, adjusting for baseline scores and covariates.
Results: Four hundred and ninety-two patients (2016–2022) were enrolled.
Significant baseline inter-site differences existed in age, BMI, activity, smoking, symptom duration, comorbidities, DSIC grading, and preoperative pain/ODI. Overall fusion rates declined but remained the predominant strategy at four of five sites. At 12 months, site-level differences in pain and ODI persisted (sites 3–5 had greater improvements vs site 1). Multivariable analyses showed fusion was not independently associated with greater 12-month improvement in ODI, back pain, or leg pain (all $p > 0.05$). Higher baseline pain predicted greater improvement.
Conclusions: Among academic centers, fusion for LDS declined modestly over the study period but remained common. Fusion did not confer superior 12-month patient-reported outcomes after adjustment. Substantial inter-site variability in practice and outcomes highlights the need for standardized assessment and knowledge translation to align surgical decision-making with current evidence.

SESSION III

ABSTRACT #24

IMPACT OF MULTI-LEVEL EDUCATIONAL INTERVENTIONS ON BREAST CANCER CARE UPTAKE IN ILE-IFE: APPLYING THE WHO GLOBAL BREAST CANCER INITIATIVE FRAMEWORK.

Olalekan Olasehinde, Gregory Knapp, Funmilola Wuraola, Adewale Aderounmu, Israel Owoade, Adedayo Lawal, Anya Romanoff, Peter T Kingham, Adewale Adisa, Olusegun Isaac Alatise.
Olalekan Olasehinde – Clinical Fellow – Global Surgery

Background: Breast cancer is a leading cause of cancer mortality in Nigeria, with poor outcomes driven by late presentation, delayed diagnosis, and limited access to treatment. Guided by the World Health Organization (WHO) three-pillar implementation framework, this study evaluated the impact of multi-level interventions on breast cancer care across the care continuum.
Methods: A multi-layer interventional study was conducted at Obafemi Awolowo University Teaching Hospital and affiliated Primary Health Centers. For Objective 1, pre-test, post-test, and 3-month assessments of knowledge and screening uptake were conducted among eligible women of two out-patient clinics after providing opportunistic education in both clinics and screening recommendation at the intervention clinic while the other served as the control. Pre and post education knowledge of breast cancer was assessed in both clinics while breast cancer screening uptake was compared between the clinics. Objective 2 involved Community Health Worker (CHW) education and patient navigation training with knowledge assessments, referral pattern analysis, timeline comparisons with matched controls, and qualitative feedback. Objective 3 compared treatment initiation among patients receiving enhanced counselling (nurse and survivor led) with matched controls.
Results: Among 207 women, knowledge improved significantly in both clinics ($p<0.001$). Screening uptake was higher in the intervention clinic (clinical breast examination 99% vs 9.6%; mammography 14.6% vs 1%; $p<0.001$). Ninety-one CHWs showed sustained knowledge gains at 6 months ($p<0.001$). Of 24 navigated patients, 10 required biopsy and 6 were malignant. Navigated patients had shorter median symptom-to-presentation interval and shorter primary-tertiary-interval compared to controls (74.5 vs 237 days; $p=0.0009$ and 2 vs 34.5 days, $p = 0.045$ respectively).
Among 44 confirmed cases, treatment initiation was higher with enhanced counselling (78.9% vs 57.9%; $p=0.048$). Counselling and age ≥60 predicted treatment uptake.
Conclusion: Integrated, WHO-guided interventions improved knowledge, screening uptake, referral efficiency, and treatment initiation, demonstrating scalable strategies for resource-limited settings.

SESSION III

ABSTRACT #25

COST-EFFICIENCY ANALYSIS OF OFFICE-BASED ENDOSCOPIC BIOPSIES FOR LARYNGOPHARYNGEAL LESIONS

Brennan, H., Patel, D., Hogg, T., MacKay, C., Greenan, M., Brown, T.

Hannah Brennan – Resident – Otolaryngology

Objective: Office-based biopsies (OBB) are an effective technique for pathologically diagnosing laryngopharyngeal lesions. The increasing use of this less invasive biopsy method highlights the need for a cost analysis in comparison to operating room based biopsies.

Methods: A retrospective analysis of biopsies for laryngopharyngeal lesions performed at a single center, between April 1, 2013 to March 31, 2022. Variables recorded included if the procedure was conducted as an outpatient or inpatient, length of stay in hospital and the location of the biopsy as in-office, operating room or operating room after in-office. A case costing accounting method was employed to identify the direct and indirect cost variables.

Results: 969 biopsies of lesions in the larynx, base of tongue or hypopharynx were included in the review. 806 (83.2%) biopsies were performed as outpatient procedures and 162 (16.7%) biopsies were completed as inpatient. The total average cost of outpatient OBB ($224 CAD) was significantly lower than the outpatient operating room biopsy total average cost ($2,309 CAD), with a 90.3% relative cost savings ($2,085 CAD). Inpatient biopsies were associated with higher cost compared to outpatient. The majority of the inpatient biopsies were performed in the operating room and had a total average cost of $5,069 CAD.

Conclusion: This is the largest and first Canadian study evaluating cost efficient of OBBs for laryngopharyngeal lesions compared to biopsies conducted in the operating room. Our findings highlight the cost efficacy of OBBs.

SESSION III

ABSTRACT #26

BETTER CARE SOONER: ASSESSING EFFICIENCY AND RESIDENT EDUCATIONAL VALUE OF DEDICATED PLASTIC SURGERY TRAUMA CLINICS

Zeitouni, C., McCurdy, T., Williams, J., Wheelock, M., Krauss, E.

Camille Zeitouni – Resident – Plastic Surgery

Objectives: The Division of Plastic Surgery implemented dedicated twice-weekly trauma clinics in 2025 to manage increasing plastic surgery trauma referrals. These clinics addressed mainly ambulatory hand and facial trauma. Our quality improvement study evaluated whether centralizing trauma referrals improved timeliness of care, while assessing the impact on resident education, workflow, and provider satisfaction.

Method: Part 1 consisted of a retrospective chart review of all plastics trauma referrals during the three months immediately before and after clinic implementation. Outcomes included time from referral to consultation, consultation to surgery, and referral to surgery. Diagnosis, procedure type and location (main OR vs. procedure room) were also collected. Part 2 involved an anonymous survey distributed to all plastics residents and staff. The survey included Likert-scale questions to assess perceptions of workflow, efficiency, and educational value. Open-ended free-text questions were used to capture nuanced feedback on the strengths and challenges of the model. All quantitative data were analyzed using descriptive statistics.

Results: 1,185 trauma referrals were analyzed over six months, of which 22.2% required procedural intervention. The most common diagnoses were hand fractures, upper extremity lacerations, and facial fractures. Frequent procedures included closed reduction with percutaneous pinning and upper extremity laceration repair. Significant reductions were observed in time from referral to consultation (11.8 → 5.4 days), consultation to surgery (3.9 → 1.4 days), and referral to surgery (11.4 → 5.7 days) (all $p<0.05$). Survey responses demonstrated strong agreement that the model improved workflow predictability, interprofessional communication, safety of care, and educational value from enhanced supervision and feedback opportunities.

Conclusions: Dedicated trauma clinics significantly improved care efficiency, reducing delays from referral-to-surgery, while enhancing provider satisfaction, interprofessional communication, and resident education. These findings support the model as an effective and sustainable approach to ambulatory plastic surgery trauma care, offering dual benefits for patient outcomes and surgical training.

SESSION III

ABSTRACT #27

HIGH-EXCHANGE ULTRAFILTRATION TO ENHANCE RECOVERY AFTER PEDIATRIC CARDIAC SURGERY: THE ULTRA RANDOMIZED CONTROLLED TRIAL

Joel David Bierer MD, Roger Stanzel PhD CPC, Mark Henderson CPC, Kristina Krmpotic MD MSc, Pantelis Andreou PhD, Jean S. Marshall PhD, John Sapp MD and David Horne MD

Joel Bierer – Resident – Cardiac Surgery

Objectives: Pediatric cardiac surgery with cardiopulmonary bypass (CPB) is associated with systemic inflammation that can prolong post-operative recovery. The objective of this trial was to determine whether continuous high-exchange ultrafiltration has a clinical immunomodulatory effect compared to continuous low-exchange ultrafiltration.

Methods: ULTRA (NCT04920643) was a randomized, double-blind, parallel-group trial at a single Canadian pediatric cardiac surgery center. Pediatric patients less than 15kg undergoing cardiac surgery with CPB were randomly allocated to high-exchange (H-SBUF, 60 ml/kg/hr effluent extraction) or low-exchange (L-SBUF, 6 ml/kg/hr effluent extraction) subzero-balance ultrafiltration, administered continuously during CPB. The primary outcome was peak post-operative vasoactive-ventilation-renal (VVR) score. Secondary outcomes included clinical outcomes and health care utilization metrics. Arterial blood samples were collected pre- and post-CPB to measure fold changes [95% CI] in 39 inflammatory mediators.

Results: A total of 104 patients were enrolled and randomly assigned to H-SBUF (n=52) or L-SBUF (n=52) with similar preoperative and intraoperative characteristics. All patients completed follow-up, and there were no operative mortalities. The primary outcome of peak VVR was 26.9 (2.1 – 77.9) in the H-SBUF group versus 27.8 (0.8 – 76.7) in the L-SBUF group with a median difference [95% CI] of 1.2 [-8.2 – 5.1] (p=0.67). There was no difference in acute kidney injury, low cardiac output syndrome, ventilation time, inotrope use time, ICU LOS or hospital LOS (p>0.05). The H-SBUF group showed a larger increase in IL-1α (p=0.02), P-selectin ($p=5.0\times10^{-4}$), and VCAM-1 (p=0.03) during CPB, whereas all other inflammatory mediators did not differ between groups (Figure 1).

Conclusions: Among infants and children undergoing congenital cardiac surgery with CPB, continuous high-exchange SBUF did not reduce the peak VVR when compared to a continuous low-exchange SBUF. There was no difference in secondary clinical outcomes, and the immunologic profiles of key inflammatory mediators were broadly similar across groups.

SESSION III

ABSTRACT #28

EARLY AIRWAY EPITHELIAL RESPONSES TO PM2.5: IMPLICATIONS FOR ENVIRONMENTALLY DRIVEN LUNG CANCER RISK

Mendoza Montealegre, I., Salsman, J., Maksym, G., Dellaire G., & Wallace, A.

Isabella Mendoza – Graduate Student – Thoracic Surgery

Objectives: Lung cancer risk has historically been attributed primarily to tobacco exposure; however, a growing proportion of cases occur in individuals without a smoking history, where the relevant exposure is not a behavioral risk factor, but the air they breathe. Exposure to fine particulate matter (PM2.5) is a major risk factor for lung cancer, yet the early epithelial events linking environmental exposure to carcinogenesis remain poorly defined. Emerging evidence suggests that PM2.5 promotes tumorigenesis through chronic inflammation and cellular stress rather than direct mutagenesis. We aimed to characterize early airway epithelial responses to PM2.5, with a focus on cell-type-specific interactions and inflammatory signaling.

Methods: Differentiated human small airway epithelial cells cultured at an air–liquid interface (ALI) were exposed to PM2.5 under controlled conditions. High-resolution imaging assessed particle–cell interactions and spatial distribution, while oxidative stress and NF-κB (p65) activation were evaluated using fluorescence-based assays and immunofluorescence.

Results: Particle interactions were heterogeneous across epithelial populations, with preferential association observed in basal and club cells, key progenitor populations involved in airway repair. PM2.5 deposition resulted in localized clustering at the cell surface, suggesting the formation of microenvironments with increased effective dose. Exposure induced sustained oxidative stress and NF-κB activation, consistent with a pro-inflammatory epithelial state.

Conclusions: PM2.5 exposure selectively perturbs progenitor epithelial cell populations and induces chronic oxidative stress and inflammatory signaling, supporting a model in which particulate exposure creates a microenvironment permissive for early tumorigenic processes. These results provide biologic insight into environmentally driven carcinogenesis and help bridge the gap between epidemiologic association and mechanistic understanding. Collectively, this work challenges us to rethink lung cancer risk beyond smoking history, with implications for screening, prevention, and how we counsel the growing population of never-smokers at risk.

SESSION III

ABSTRACT #29

IS THE COBRA-OS® 4 FRENCH AORTIC OCCLUSION DEVICE FEASIBLE FOR PARTIAL REBOA?

Adam Power, Asha Parekh, Samuel Jessula, Joao Rezende-Neto, **Gracious Kasheke**, Laura J Moore

Gracious Kasheke – Medical Student – Vascular Surgery

Objectives: Noncompressible torso hemorrhage remains a leading cause of preventable trauma deaths. Partial resuscitative endovascular balloon occlusion of the aorta (pREBOA) may improve outcomes by attenuating distal hemorrhage while mitigating ischemic/reperfusion injury associated with complete occlusion. However, evidence of precise and prolonged distal pressure control with conventional balloons is limited. The COBRA-OS® 4 French (Fr) aortic occlusion catheter has demonstrated promising volume-dependent distal pressure titration. This study evaluated the COBRA-OS® 4 Fr catheter for pREBOA control.

Methods: The device titration window was characterized in non-hemorrhagic pulsatile (*in vitro*) and aortic porcine *(in vivo*) models. Parallel *in vitro* and *in vivo* hemorrhagic models (40% blood volume loss *in vivo*) assessed the durability of distal aortic pressure control at a target of 20 mmHg for 3 hours.

Results: In vitro, COBRA-OS® 4 Fr enabled linear distal pressure titration from 0 to 20 mmHg at a deflation volume of 1.2 ± 0.1 mL. Continued deflation maintained linear control until 3.3 ± 0.1 mL, at which point distal and proximal pressures equalized. *In vivo*, a deflation volume of 1.1 ± 0.2 mL achieved a distal aortic pressure of 20 mmHg, and 3.7 ± 0.3 mL restored proximal–distal equivalence. A distal pressure of 20 mmHg was sustained for 3 hours in both *in vitro* and *in vivo* hemorrhagic models with a set-and-forget strategy. Balloon deformation, leak, or device failure was not detected. Furthermore, no cardiac arrhythmias nor cardiac ischemic signs were observed during pREBOA in the *in vivo* hemorrhagic model.

Conclusions: The COBRA-OS® 4 Fr device enabled precise, stable partial aortic occlusion in this preclinical model. This study provides the first demonstration of a 4 Fr REBOA catheter achieving prolonged, controlled partial occlusion in a large-animal hemorrhagic shock model, supporting the feasibility of COBRA-OS® for pREBOA.

SESSION III

ABSTRACT #30

DECREASING WAIT TIMES IN NOVA SCOTIA: A PILOT MULTI-DISCIPLINARY ORTHOPAEDIC ROTATOR CUFF ASSESSMENT PATHWAY

Patel, H., Decker, A Ferguson, D., Trenholm, A.

Harshal Patel – Medical Student – Orthopaedics

Objectives: The current upper extremity (UE) orthopedic wait times for rotator cuff (RC) pathology assessment in Nova Scotia are unsustainable. This project assesses the efficacy of utilizing non-surgical health care professionals (NSHCP) via an alternative pathway to conservatively manage and triage these referrals.

Methods: Priority 3-4 RC referrals were prospectively collected over a 1-year period for 2 orthopedic surgeons and compared to a 1-year historical cohort of surgical RC referrals. Exclusion criteria consisted of all non-RC referrals. The primary outcome was adjusted Wait 1 time (referral or pathway start to consult). Secondary outcomes included adjusted redirection wait (referral or pathway start to redirection), NSHCP wait (redirection to consult), and operative "hit rate" (consult proportion requiring surgery). Time-to-event analysis used Log-rank test with Holm-Sidak correction (alpha=0.05).

Results: In total, 299 referrals were compared to 127 baseline surgical referrals. Over the study period, 54 (surgeon 1) and 245 (surgeon 2) referrals were redirected, with 43 and 203 assessed by NSHCP, respectively. Adjusted Wait 1 were shorter than baseline for both surgeons (Surgeon 1: $p=0.030$, 90^{th} percentile: 98 versus 368 days; Surgeon 2: $p=0.771$, 90^{th} percentile: 162 versus 368 days) Adjusted redirection waits were significantly shorter for both surgeons compared to NSHCP waits (Surgeon 1: $p=0.016$, 90^{th} percentiles: 34 versus 64 days; Surgeon 2: $p<0.0001$, 90^{th} percentiles: 81 versus 91 days). Operative "hit rates" were 4.7% for surgeon 1 and 0% for surgeon 2.

Conclusions: This pathway efficiently offloaded non-surgical referrals from UE orthopedic waitlists while maintaining reasonable accuracy. Thus far, 120 new consultation hours were saved for these surgeons by redirecting 240 non-operative referrals to NSHCPs, shortening other referral waits. Pathway Wait 1 times were better aligned with target priority 3 and 4 wait times. This pilot program demonstrates opportunity for a standardized non-surgical RC pathway in Nova Scotia.

3D SPOTLIGHT: DEPARTMENT OF SURGERY RESPRESENTATIVE

ABSTRACT #31

PEDIATRIC FFP-FREE CARDIOPULMONARY BYPASS PRIME SOLUTION QI INITIATIVE

Duffy, R., Bierer, J., Deshaies, C., Kiberd, M., Moulton, D., Conrad, D., & Horne, D.

Regan Duffy – Undergrad Student – Cardiac Surgery

Objectives: Fresh frozen plasma (FFP), commonly used in pediatric cardiopulmonary bypass (CPB) prime, contains high complement concentrations that may contribute to complement activation and systemic inflammatory response syndrome (SIRS). We describe the IWK "FFP-free CPB-prime" quality improvement initiative to minimize complement driven SIRS.

Methods: Quarterly multidisciplinary meetings involving cardiac surgery, anesthesiology, perfusion, hematopathology, peri-operative nurses and blood bank began in June 2025. After expert input, group discussion reached consensus on initiative. Meeting 1 (M1) identified risks associated with removing FFP and discussed replacement fluids, monitoring requirements, and mitigation strategies. Meeting 2 (M2; September 2025) finalized replacement fluid, drafted version 1 mitigation protocol for weight-based phased roll-out. Meeting 3 (M3; January 2026) reviewed phase 1 systemwide protocol compliance, blood product derivative dosing and activated phase 2. Osmolality is checked on all FFP-free prime patients.

Results: Risks identified in M1: 1) difficulty achieving goal anti-coagulation (AT III present in FFP), 2) osmolarity/oncotic prime solution differences, 3) post-operative bleeding (factor dilutional coagulopathy). M2 identified 5% Human serum Albumin (HSA) replacement for FFP (normal oncotic pressure). Quarterly Phased roll out stages agreed upon: 1) immediate for patients 6-8kg ("safe group" system logistics & mitigation protocol), 2) 4-6kg (intermediate risk), 3) <4kg (high risk). M3 confirmed system readiness, activated phase 2, and added dosing for blood derivatives (version 2). Osmolality is normal in FFP-free prime (mean 289 mOsm/kg [285–293]). One of eight patients had post-operative bleeding. Protocol version3 increased blood derivative doses.

Conclusion: Early phase implementation supports FFP-free CPB prime feasibility, but ongoing safety monitoring continues with phased rollout.

3D Disciplines: Divisions of pediatric cardiac surgery, pediatric anesthesiology, pediatric hematopathology, perfusion, peri-operative nursing & blood bank staff.

3D Findings: Our recent findings support removing FFP from cardiopulmonary bypass prime to minimize FFP-complement transfer to patients. No protocols exist in literature to perform this safely. In June 2025, an IWK cardiac surgery quality Improvement team (cardiac surgery, perfusion, anesthesiology, hematopathology, blood bank, peri-operative nurses) was established and meets quarterly. The "IWK Cardiac Surgery FFP-free transition protocol" was developed, distributed to stakeholders and subsequent in-person sessions confirmed practice changes throughout the peri-operative environment.

It outlines: 1) a phased safety rollout by decreasing weight cohorts, 2) adjustments including pre-operative testing (lab, nurses and surgeons), prime modifications (bloodbank & perfusion), anti-coagulation monitoring/dosing and recombinant blood product management (hematopathology & anesthesiology). Phase two is underway, with six patients safely transitioned to FFP-free prime. Meetings continue for safety review and progression to next phases. Anti-coagulation and bleeding outcomes will be investigated using propensity matched cohort comparisons, followed by future RCT to investigate inflammatory benefits.