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IR RESIDENT SEARCH

RESEARCH SHOWCASE & AWARDS

EXTEND YOUR RESEARCH IMPACT

ABSTRACTS | 2023

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A Message From The Associate Dean of PGME and The Vice-Dean of Research

Dear Colleagues,

Welcome to the 2023 Resident Research Day.

This day has grown to be a very important event in the University of Saskatchewan College of Medicine research calendar to celebrate the research endeavors of our medical residents and the positive impact of Resident Research.

This year, we have poster presentations from two different research categories, Clinical and What Works/Initiative.

We are delighted to acknowledge an exceptional dedication and work of residents, mentors, adjudicators and all who facilitated medical resident research programs.

We wish all those in our college yet another unforgettable research experience!

With warm regards,



Dr. Anurag Saxena
MD, M.Ed, MBA, FRCPC, FCAP, CHE, CCPE

A handwritten signature in black ink that reads "A. Saxena".



Dr. Marek Radomski
MD, PhD, DSc, MPAL, FCAHS

A handwritten signature in black ink that reads "Marek Radomski".

CLINICAL PROJECTS



Pramath Kakodkar

Validation of Next-Generation Sequencing (NGS) Based Chimerism Testing for Accurate Detection and Monitoring of Engraftment in Hematopoietic Stem Cell Transplantation

Allogenic hematopoietic stem cell transplantation (allo-HSCT) is a life-saving treatment for various hematological disorders. The success of allo-HSCT is dependent on the engraftment of donor cells and the subsequent reconstitution with elimination of recipient cells monitored through chimerism testing. Next-generation sequencing (NGS) has emerged as a powerful tool for chimerism testing, providing high sensitivity and specificity compared to convention methods. Validation of NGS based chimerism testing is crucial prior to clinical implementation.

We aimed to validate the performance of the first NGS-based chimerism testing in Canada for accurate detection and monitoring of engraftment in allo-HSCT patients. The NGS based chimerism (AlloSeq-HCT) testing panel targeted 202 informative single nucleotide polymorphisms and evaluated analytical performance: linearity, precision, sensitivity, specificity, accuracy, and reproducibility. We compared the performance of our NGS assay with conventional short tandem repeat (STR) assay.

Our NGS chimerism monitoring assay has a high limit of detection of 0.3% for minor alleles with an analytical specificity of 99.9%. The concordance between NGS-based and STR-based chimerism monitoring is near 100%. We further validated on clinical samples from allo-HSCT patients using unfractionated whole blood, and enriched CD3+ subset which showed a concordance of 0.95, and 0.96 respectively. Our NGS assay system accuracy achieved a concordance of 98.6% when compared to the blinded external quality control STR samples from American Society of Histocompatibility and Immunogenetic accredited labs. The reproducibility series showed near 100% concordance with respect to inter-assay, inter-tech, inter-instrument, and AlloSeq-HCT software versions.

In conclusion, our study provides robust validation of NGS-based chimerism testing for accurate detection and monitoring of engraftment in HSCT patients. This implementation of NGS-based chimerism testing will streamline our high volume transplant services and improve the clinical outcomes in allo-HSCT patients by enabling earlier detection of relapse and guiding timely interventions.



Clinical Projects

Natasha Gattey

Accelerated Resolution Therapy to Treat Children and Adolescents with Psychiatric Symptoms

Background

There is empirical evidence for use of Accelerated Resolution Therapy (ART) in adult populations for treating post-traumatic stress disorder and anecdotal evidence for relieving symptoms of various psychiatric conditions. However, research on ART in youth is limited. Our study aimed to characterize the psychiatric profile of youth who received ART, identify potential barriers to ART, and gain insights into the use of standardized psychiatric scales to evaluate the effectiveness of ART.

Methods

We performed a retrospective medical chart review on child and adolescent psychiatric outpatients seen at Royal University Hospital (2017-2021). Ninety-five ART patients and 95 non-ART patients were matched on primary diagnosis from the electronic medical record (EMR). Data was analyzed using descriptive analysis, independent t-test and chi square tests for group comparisons.

Results

The ART population was significantly older (mean age= 17.7 ± 2.9 years vs. 15.3 ± 3.1 years) and included more female (85% vs. 64%) than the non-ART group. The most common reasons for ART were sexual assault (22%) and anxiety (21%) in females, and household dysfunction (23%) and anxiety (15%) in males. ART was effective in 75% of patients. Barriers to receiving ART were reported in 22% and these were largely those who did not find ART effective and were identified as having poor engagement. Only 31% of patients completed rating scales prior to ART.

Conclusion

ART is highly effective in treating psychiatric symptoms in youth. There is a need to apply standardized scales to measure patient outcomes and evaluate ART effectiveness.

Acknowledgements: Special thanks to Candace LaPointe (Mental Health & Addictions Services, Saskatchewan Health Authority) and Adrian Teare (University of Saskatchewan M.D. Candidate, Class of 2024) for assisting with data collection.

This research is funded by the Alfred G. Molstad Trust through the Intramural Awards via the Department of Psychiatry



Clinical Projects

Nicole Pendleton

Assessment of lesion severity in a Mouse Model of Intracerebral Hemorrhage

Objectives

Intracerebral hemorrhage (ICH) is caused by the rupture of a blood vessel, resulting in bleeding into the brain. This type of stroke accounts for 12-15% of all strokes and is the most fatal type of stroke (40% mortality rate). ICH stroke presents a greater burden to survivors as 90% of ICH survivors have some degree of disability. Currently, there are no effective, proven treatments for these patients that provide good outcomes. Because of the poor patient outcomes, there is a clear need for identifying new treatments as well as establishing the efficacy of existing treatments. Mice are suitable models for studying human stroke because their brains share similar neuroanatomy and cerebrovascular structures. Mice also have the same clotting cascade and subsequent mechanism of brain damage as humans.

Methods

Using previously described techniques we aim to establish a mouse model of ICH at the University of Saskatchewan. We will anesthetize them using isoflurane, and while anesthetized we will make a midline incision to access the bregma, using described coordination we will mark and drill a burr hole. Then with the help of a navigation system we will instill collagenase to create the desired ICH. We observed them at a 1- 24-, 48- and 72hr mark post-stroke and scored for neurological deficits.

Results

We currently have conducted 23 model trials. We have data on mice at 1-, 24, and 72 hr post stroke. We have observed and begun to analyze a lesion area that can be seen in H&E stained sections, which corresponds to areas of hemorrhage, as seen in unstained sections and adjacent sections imaged with Fourier Transform Infrared (FTIR) imaging.

Conclusions

We have successfully established a mouse model of ICH at the University of Saskatchewan. We are currently conducting histology and synchrotron imaging of the established models.



Clinical Projects

Eva Liu

Chronic Subdural Hematoma Drainage under Local vs. General Anesthesia: Systematic Review and Meta-analysis

Background: Chronic subdural hematoma (CSDH) is one of the most encountered conditions seen in neurosurgery. Although mainstay treatment of cSDH has been burr hole drainage, no consensus yet exists on optimal anesthetic technique for surgical treatment between general (GA) and local (LA) anesthesia.

Method: A search was conducted in MEDLINE (1946 to November 11, 2022), Embase (1974 to November 11, 2022), and PubMed (up to November 11, 2022). We followed the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines to systematically screen studies.

Results: Our literature search identified 521 studies, out of which 20 were included. There were a total of 1750 patients in the LA group and 699 patients in the GA group. Our meta-analysis found that the LA group had significant shorter operative time (mean difference -29.28 minutes, $p < 0.0001$), length of admission (Mean difference -1.58 days, 95% CI = -2.40 to -0.76 days, $p = 0.0002$), and postoperative complications rate (odds ratio 0.38, 95% CI = 0.25 to 0.59, $p < 0.0001$) compared to GA. There was no significant difference between the two groups in revision rate (odds ratio 2.71, 95% CI 0.89 to 8.25, $p = 0.08$) and mortality rate (odds ratio 1.23, 95% CI 0.63 to 2.43, $p = 0.55$).

Conclusion: In this meta-analysis, LA shows benefits in shorter operative time, shorter admission length, and fewer postoperative complications. This makes local anesthesia a less invasive alternative to general anesthesia especially in elderly patients.



Clinical Projects

Breanne Paul

Evaluation of iloprost treatment in Saskatchewan: A retrospective chart review of frostbite care at Royal University Hospital

INTRODUCTION: Frostbite injuries are caused by cold-induced cell death and secondary reperfusion injury caused a local inflammatory cascade and tissue ischemia.¹ Iloprost is a prostacyclin analogue that has been shown in previous Canadian retrospective chart reviews to reduce amputation rates related to frostbite injury.^{1,2} An iloprost protocol was introduced in Saskatchewan for the treatment of grade 2-4 frostbite in November 2022.

METHODS: A retrospective chart review of patients diagnosed with grade 1-4 frostbite injuries was performed for patients presenting to the Royal University Hospital (Saskatoon, SK) from July 1, 2017, to February 15, 2023. Charts were identified by triage complaints or final diagnosis relating to frostbite or hypothermia (n = 225). Descriptive statistics were recorded both before and after implementation of the protocol.

RESULTS: The total number of patients seen for frostbite was 132 (113 before introducing the protocol, 19 after). The grade and distribution of extremities were similar before and after introducing the protocol. Of the 686 digits treated for frostbite before the protocol, 41 were amputated. 162 digits were treated after protocol introduction with 11 amputated. After protocol implementation, all treatment interventions increased except TPA administration (0.9% to 0%): active rewarming (4.4% to 15.8%), ibuprofen (24.8% to 42.1%), heparin (2.7% to 15.8%), aloe vera (5.3% to 31.6%), and iloprost (3.5% to 26.3%). Substance use (25.6%, 68.4%) and homelessness (8.8%, 10.5%) were the two most common circumstances leading to the frostbite injury before and after the protocol was introduced.

CONCLUSION: This project is part of a larger project studying amputation rates after iloprost treatment in Saskatchewan, and is ongoing. This current chart review demonstrates that treatment uptake increased after implementation of a frostbite protocol in the emergency department. Additionally, we have also documented that frostbite treatment in Saskatoon is significantly impacted by social factors and social determinants of health.



Aiya Amery

Addition of anal encirclement to perineal proctosigmoidectomy: a retrospective review

Rectal prolapse, is a benign but debilitating condition that disproportionately affects elderly women (9:1). There are countless operations and combinations described, but no standard approach. Although associated with higher recurrence, perineal approaches are preferred in elderly and high-risk patients. Perineal rectosigmoidectomy (Altemeier) and anal encirclement (Thiersch) are two well-tolerated perineal approaches. However, both have with recurrence rates upwards of 50%. We hypothesize that there will be a reduction in recurrence of rectal prolapse by combining these approaches.

This was a single institution, retrospective analysis from July 2017-October 2022. Patients >18 years of age with a rectal prolapse who underwent an operation with either an Altemeier or Altemeier +Thiersch were included. Variables were analyzed using Pearson's Chi-squared Test or Man Whitney-U Test as appropriate. Repeated measurement ANOVA was used to compare changes. A p-value of <0.05 was considered significant. All data was analyzed using SPSS v.28 (IBM Corp, Armonk, NY). Recurrence was the primary outcome measured. Secondary outcomes were operative time, length of hospital stay, and complications.

Twenty-three patients underwent an Altemeier, and twenty-one patients underwent Altemeier + Thiersch. The two groups had similar demographics (Table 1). Patients who received the combined procedure had a lower rate (9.5%) of recurrent rectal prolapse, despite a higher proportion of them having had a previous prolapse procedure than the Altemeier group alone (34.8%). This reduction in the recurrence incidence was statistically significant, p 0.023 (Table 1). The two groups had no statistical difference in the average OR time. The average hospital stay for patients who underwent the combined procedure was 2.3 days less (p 0.031). There were five complications in the Altemeier group compared to the combined group; however, this difference was not statistically significant (Table 2).

The combination of an Altemeier + Thiersch reduces the risk of rectal prolapse recurrence more than an Altemeier alone. It is safe and effective in patients with previous failed prolapse procedures.



Clinical Projects

Nicole Labine

The Use of Sentinel Lymph Node Biopsy in Prophylactic Mastectomy: A retrospective Cohort Study

The role of a prophylactic mastectomy is to reduce the risk of developing breast cancer, especially in high-risk patients. The risk of finding an incidental occult malignancy is estimated to be 4-6%. In addition, a sentinel lymph node biopsy (SLNB) is performed during breast cancer surgery to obtain staging information and guide adjuvant treatments, as it cannot be performed afterward. There is variation in practice patterns among surgeons regarding the completion of SLNB at the time of prophylactic mastectomy.

This project aims to determine the rate of occult disease in patients undergoing a prophylactic mastectomy and determine the underlying characteristics and risk factors of patients with occult malignancy, including preoperative imaging.

These aims will be achieved via a retrospective chart review of health record data of all patients who have undergone a prophylactic mastectomy from 2011 to 2021 at the Saskatoon Breast Health Center. Additionally, the rates of prophylactic mastectomy and SLNB in correspondence with our local practice patterns have been determined. In addition, the incidence of both occult disease in prophylactic mastectomies and positive SLNB in patients with occult disease will be analyzed. This research will inform the care of future patients who can avoid undergoing a sentinel lymph node biopsy and its associated complications, including lymphedema, mobility, and sensory loss.



Clinical Projects

Nolan Hunka

Enhancing bowel adaptation: Using an intestinal organoid model

Rationale: Human small intestinal organoids (hSIO) re-create the physiology and architecture of the intestinal organ system and allow unique insight to human gut pathology and development. In clinical practice, human breast milk (HBM) is protective against many neonatal and pediatric diseases, but the cellular intestinal response to HBM is poorly understood. We hypothesize that HBM can enhance bowel adaptation by upregulating key nutritional transporters within hSIO.

Methods: From human embryonic stem cell lines, we will establish and verify a hSIO culture system and introduce HBM to this model. qPCR, Western blotting, and transporter assays will be used to compare levels of specific genes known to be involved in nutrient absorption and molecular intestinal transport proteins (FABPpm, FATP4, SR-BI, NPC1L1). These levels will be statistically compared with control groups grown in standard culture and passaging conditions, as well as common neonatal formula (Enfamil A+).

Results: Our first measurable outcome will be the establishment of a stable hSIO model grown from human stem cell lines. Secondly, we will use qPCR to determine if human breast milk upregulates nutrient transporter mRNA. Thirdly, we will examine the resultant proteins and function using Western blot and transporter assays.

Conclusion: hSIO are a powerful tool to further scientific understanding of gut development. By demonstrating differences in functional transporter genes dependent on exposure to HBM, our model provides utility in investigating further clinical applications beyond breast milk. This model will facilitate further investigation of human disease, developmental processes, and markers of bowel adaptation.

(Note this is a basic science research project in progress)



Clinical Projects

Anulika Nwakaeze

Improving the communication of fasting guidelines for pediatric day surgeries: a prospective cohort study.

Background: Caregivers of pediatric patients are provided with preoperative fasting instructions to reduce the risk of pulmonary aspiration. Previous research suggests that this information is poorly understood, leading to low rates of adherence. The communication of preoperative fasting information can be improved to facilitate better understanding and adherence. Minimal research on the communication of fasting guidelines has been conducted in the pediatric population and is an area that warrants further investigation. The primary objective of this study is to improve the understanding of fasting instructions in pediatric day surgeries.

Methods: The research design is a prospective cohort study assessing caregiver understanding of preoperative fasting instructions before and after introduction of our novel education tool. We aim to sample $n = 100$ caregivers of healthy pediatric patients scheduled for elective day surgery. Inclusion criteria are caregivers of 1-12 year-old pediatric day surgery patients of ASA I/II classification. Caregivers of patients with complex nutritional needs will be excluded from the study. The outcome will be assessed via a 10-question multiple-choice test. A dependent samples t-test will assess for statistical difference ($p < 0.05$) between groups.

Anticipated Results: We expect that following the introduction of our novel education tool, there will be a statistically significant improvement in assessment scores, reflecting an increased understanding of preoperative fasting among caregivers of pediatric patients.

Discussion: The literature shows that providing caregivers with written education materials increases the perception of the importance of fasting, with improved understanding and adherence to guidelines. We hope to demonstrate that our novel education tool can easily be utilized to improve understanding of fasting guidelines at our institution. Future research will be needed to determine whether improved adherence rates can lead to a reduction in surgical delays and cancellations due to poor understanding of fasting instructions.

Abbreviations: ASA = American Society of Anesthesiologists.



Clinical Projects

Donovon Johnson

Effects of antipsychotic medications on neural tissue using brain organoid models

Introduction: Brain organoids are a promising tool for studying drug effects on the human brain, but their use in psychiatric research is still in its early stages.

Methods: We tested the feasibility of this approach for future studies by exposing a male brain organoid to 20 micro mols of clozapine for one week. Clozapine's effects on biomarkers such as 5HT-2A, 5HT-2C, CB1R, CNP, DRD2, DRD4, MDR1, NET, NeuN, Nestin, TH, TPH2, and TUBB3 were investigated.

Results: Our findings showed a reduction in the expression of 5HT-2A and NeuN while increasing the expression of 5HT-2C, CNP, NET, Nestin, MDR1, and TUBB3. The expression of CB1R, DRD2, DRD4, TH, and TPH2 changed only slightly.

Conclusion: Despite the small sample size, this study serves as proof of concept for this study design, justifying further research using this method.



Joanna Lioutas

What are patient's usage and knowledge of intrauterine devices and attitudes towards contraceptive discussions in an urban, academic family practice?

Background: Long-acting reversible contraceptives (LARCs), including the hormonal and copper intrauterine devices (IUDs), are the most effective forms of birth control at preventing pregnancy; nevertheless, LARCs are not widely used. Effective contraception can help to reduce unintended pregnancy and associated adverse outcomes and healthcare costs.

Question(s): The goal of this survey was to identify the contraceptive methods used by patients aged 14-51 years old at the Family Medicine Unit, as well as assess their knowledge surrounding IUDs, and their attitudes towards contraceptive discussions with their family physician.

Methodology: A cross-sectional survey was completed between May and December 2022 by patients of the Family Medicine Unit in Regina who were born with a uterus and were 14 to 51 years old.

Results: The survey was completed by 106 participants. The most common method of contraception used was the hormonal IUD (n=34, 32.1%). The most common reason for current contraception was wanting to prevent pregnancy (n=50, 64.1%). Of those using contraception, 93.3% reported that they were satisfied with their current method (n=70). When comparing IUDs to other methods of contraception, satisfaction was similar (n=39, 95.1% vs. n=30, 83.3%, p=.137). Almost all study participants were aware of the IUD (n=104, 99%), with 64.8% (n=68) having had an IUD counselling appointment. There was no statistically significant difference in IUD knowledge scores based on method of contraception or correlation with age.

Discussion: IUD uptake in our population was significantly higher than the national estimate (38.7% vs. 4.3%). This is likely due to a highly knowledgeable patient population and their positive contraceptive counselling experiences. In contrast to other studies, cost and misconceptions were not identified as significant barriers.

Conclusions: This study illustrated high IUD uptake and knowledge of IUDs amongst study participants, as well as overall positive attitudes toward contraceptive discussions with their family physician.



Clinical Projects

Kasia Zubkow

Disease activity following the cessation of dimethyl fumarate in multiple sclerosis patients

OBJECTIVE

To determine clinical and radiologic disease activity in patients with relapsing-remitting multiple sclerosis (RRMS) following the discontinuation of dimethyl fumarate (DMF) and to correlate disease activity with absolute lymphocyte count (ALC).

BACKGROUND

Lymphopenia is a potential adverse effect with DMF, a disease modifying therapy (DMT) for RRMS patients. Following DMF cessation, a washout period prior to initiating an alternate DMT may be instigated to permit ALC to recover and to reduce the risk of overlapping drug effects between sequential medications. During this interlude between DMTs, our multidisciplinary clinic observed preliminary evidence of increased MS disease activity, defined by new lesions on brain and spinal cord MRI or clinical relapses. Though the phenomena of ‘rebound syndrome’ and disease reactivation have been well characterized in MS patients following discontinuation of drug-modifying therapies fingolimod and natalizumab, to our knowledge, similar larger-scale analyses have not been conducted following DMF cessation.

METHODS

Through a retrospective chart review of DMF-exposed RRMS patients in our centre, we aim to i) quantify disease activity following DMF discontinuation (the frequency of relapses and extent of disease by MRI), and ii) correlate these findings to patient characteristics and ALC to elucidate risk factors for elevated rates and severity of post-DMF disease activity.

RESULTS

Data collection is in progress and preliminary results, which show early findings of an increased risk of disease activity following DMF cessation, will be available by June 2023.

CONCLUSIONS

This study aims to explore RRMS disease activity in the post-DMF period so as to further our understanding of optimal time spent without disease-modifying therapy following DMF discontinuation. Overall, this information has the potential to guide management in patients with persistent DMF-induced lymphopenia and may ultimately encourage more timely commencement of alternate DMTs to prevent the risk of severe relapse, new MRI lesions, and accrual of disability.



Clinical Projects

Kristen Marciniuk

Non-Awake vs Awake Placement of Spinal Cord Stimulators in Canada.

Background: Spinal cord stimulation (SCS) is a common therapeutic approach for treating intractable chronic pain. A key factor determining SCS efficacy is lead positioning to generate paresthesias in areas of perceived pain. There are two distinct approaches to confirming appropriate coverage. 1) Sedative anesthesia with local anesthetic and intraoperative patient reporting of pain coverage. 2) General anesthesia and intraoperative neurophysiological mapping using compound muscle action potentials (CMAP) or somatosensory evoked potential (SSEP) collisions. Placement guided by neuromonitoring decreases OR times, produces more accurate placement with better pain coverage, and generates less excess paresthesias and adverse events. We aim to determine the prevalence of non-awake SCS placement with neuromonitoring in Canada, given the demonstrated benefits, and to identify possible barriers to implementation.

Methods: A structured questionnaire was designed to assess procedures for SCS implantation in centres across Canada. The survey was distributed via email to members of the Canadian Neuromodulation Society.

Results: 14 responses were received. 36% perform SCS implantation asleep with neuromonitoring where 75% utilize CMAPs and 25% utilize SSEP collisions. While 93% are at centres where neurophysiologists are used for other procedures, only 71% report having access to a neurophysiologist. Barriers to utilizing neurophysiologist assisted lead placement include familiarity with the awake procedure, and lack of access and awareness.

Conclusion: This survey provides a comprehensive summary of SCS implantation practice patterns in Canada. Although asleep SCS implantation with neuromonitoring is faster and results in more accurate placement while avoiding downsides of the awake procedure, this protocol has yet to be implemented at many centers in Canada. Barriers to incorporation into medical practice include the shortage of clinical neurophysiologists in Canada and physician specific factors that influence the response to changing clinical practice.



Clinical Projects

Mohammadreza Pourhaj

Reasons for withholding tissue Plasminogen Activator (tPA) administration during the COVID-19 pandemic at a tertiary stroke centre.

Background: Stroke is a leading cause of death and disability worldwide, including Canada. Treatments for stroke are time dependent and IV tPA for acute ischemic stroke decreases the chance of disability at 90 days if given within 4.5 hours of symptom onset (1, 2). The onset of the Covid-19 pandemic was initially associated with a decrease in acute stroke treatment with thrombolysis across North America (3, 4). These decreases seemed transient, with a rebound in numbers seen in other provinces across Canada as widespread lockdown orders were lifted (3). However, a rebound in thrombolysis was not seen at Royal University Hospital (RUH) in Saskatoon, Saskatchewan during the same period. We will analyze documented reasons why thrombolysis was withheld.

Methods: We conducted a retrospective chart review of adult patients with ischemic strokes presenting within 4.5 hours of symptom onset to the RUH from March 2019 –January 2021. We received a waiver of consent from the Research Ethics Board.

Results: 128 patients met the inclusion criteria. Statistical analysis is ongoing.

Conclusion: Initial results suggest that there are similar reasons for withholding tPA before and after the Covid-19 pandemic. The main reasons include rapidly resolving/resolved symptoms and a documented tPA exclusion criterion.



Clinical Projects

Nicholas Jette

Testing the pressure

During cholecystectomy (removal of the gallbladder), the cystic duct, which connects the gallbladder to the biliary tree is ligated. This ligation is necessary to ensure that bile produced from the liver does not enter the abdominal cavity via a patent cystic duct. The typical pressure of the biliary system is 5-10 cm H₂O and of the various closure devices available to close the cystic duct, the relative low pressure demands of the biliary system leaves selection of closure device to surgeon preference.

The most common reason to require cholecystectomy is the presence of symptomatic gallbladder stones. These stones most commonly reside within the gallbladder (cholelithiasis) but can be found in the common bile duct (which connects the liver to the duodenum). When stones are present in the common bile duct, (known as choledocolithiasis), endoscopic retrograde cholangiopancreatography (ERCP) is utilized to extricate these stones. The ERCP procedure generates pressures in excess of 150 cm H₂O, and for this reason many surgeons are reluctant to test the competency of the cystic duct closure.

Here, we tested the competency of common cystic duct closure devices on a series of pig cystic ducts. We show the superiority of certain closure devices over others and that the high pressures generated by ERCP do not exceed the competency of certain closure devices.

WHAT WORKS/INITIATIVES PROJECTS



Hiba Rahman

Bridging the Gap: A Pocket Resource to Assist Students' Transition into Their Psychiatry Clerkship

Background

Transitioning to clerkship is the most challenging time for medical students. Consequently, students appreciate formal, structured information during rotations. We aimed to evaluate the effectiveness of a Psychiatry Information Card (PIC), designed for 3rd-year medical students entering their psychiatry rotation in Saskatoon.

Methods

This is a quasi-experimental study conducted among seven cohorts of 3-year medical students (cohort 1-3: control (no card) group and cohort 4-7: experimental (card) group, estimated $n=59$). Students completed an online survey that covers demographics, knowledge, and comfort in psychiatric care at the start and end of rotation. Pre-post comparison formed the basis of the analysis. At the time of this presentation, data was collected for cohorts 1-5 ($n=39$).

Results

Fifty-six percent of the study sample was female and there was no gender difference between the two study groups. There were significant improvements in the overall knowledge score (3.2 to 4.8 in control and 2.9 to 4.9 in the experimental group; $p\text{-values}<0.05$) and comfort score (19.3 to 35.0 in control and 18.7 to 34.5 in the experimental group; $p\text{-values}<0.05$). The improvement in comfort was comparable in both groups while improvement in knowledge was larger in the experimental than in the control group. After controlling for gender and pre-rotation score, there was no significant difference between the two groups in post-rotation knowledge and comfort score. The study is currently in progress.

Conclusions

Clerkship is an essential part of medical training and although it can be daunting, it is a necessary component of training. Our study shows that an information card can aid in learning during clerkship.

Acknowledgments

This work was supported by the University of Saskatchewan Department of Psychiatry Intramural Award.



Emily Li

Improving Serious Illness and End of Life Conversations between Resident Doctors and Internal Medicine Patients.

Serious, complex, or end of life illnesses are defined as having one or multiple conditions that could be life-limiting in the foreseeable future with either the high risk of recurrent hospitalizations or the patient's loss ability to function as independently out of hospital. Good communication between doctors and patients is very important in delivering high quality health care that aligns with patients' values and preserves patients' quality of life. On the modern-day medicine ward, however, relevant conversations to discuss values, convey prognosis, and ultimately guide the approach to care can be infrequent, and may occur too late. The mismatch between the medical team's perception of the situation and the patient's understanding can lead to poor end of life care and planning. This, in turn, can lead to unnecessary investigations or interventions, contributing to patient suffering and more burden on our health care system.

Previous studies have identified multiple barriers that prevent doctors and patients from engaging in important discussions about end-of-life care. Among those barriers, many doctors feel they are inadequately trained or lack skills to deliver these difficult conversations. As part of an initiative to improve these conversations, Ariadne Labs at Harvard developed the "Serious Illness Conversation Guide (SICG). This is a guide to help physicians to deliver these difficult conversations using patient-tested language.

As part of our QI project, we hope to improve proficiency and comfort of internal medicine residents towards serious illness conversations. We arranged a workshop for residents to practice using the SICG in small groups with coaching from a staff facilitator. Residents will take turns role-playing as patient or physician, following pre-defined patient scenario scripts. Measurement of impact of the intervention will take place through pre- and post-workshop surveys, which will help to assess the local barriers to conducting serious illness conversations in Saskatchewan.



Melanie Elhafid

Educating Future Physicians for Francophone Official Language Minority Communities in Canada: A Case Study

BACKGROUND: In Canada, over 1 million Francophone Canadians live in official language minority communities (OLMC) outside of Québec. Healthcare availability in French is often limited or absent, leading to reduced access and quality of care. To address this health inequity, one effective strategy is training Francophone/Francophile medical students at Anglophone faculties of medicine in medical French. Our purpose is to understand what drives the development of skills required to respond to the needs of OLMCs, and how the Association of Faculties of Medicine of Canada's program FrancoDoc has affected student perceptions of the former. In analyzing these phenomena, we can better support their professional development towards this goal in the next chapter of FrancoDoc.

METHODS: A qualitative case study using constructivist grounded theory and an exploratory approach. Semi-structured interviews were conducted with twelve medical students involved in FrancoDoc. Interviews were transcribed and analyzed using a constant comparative approach until saturation of concepts was attained.

RESULTS: Four main themes prevailed during data analysis supported by quotes from all participants: factors facilitating French language learning; barriers to French language learning; broader issues shaping the provision of linguistically-appropriate health care; and specific recommendations to improve health care education in the interest of better preparing learners to provide care to OLMCs.

CONCLUSION: Our needs and motivations analysis has allowed us to propose concrete adjuncts to Anglophone faculties of medicine, making them better positioned to deliver on their mission of social accountability to Francophone patients and OLMCs.



Amrik Randhawa

Intestinal Ultrasound - Envisioning a New Future for Crohn's Disease Management

Intestinal ultrasound (IUS) is used in Europe to assist in IBD management. This practice remains in its infancy in Canada. Assessment of disease activity in IUS is comparable in sensitivity and specificity to MRI or CT. IUS visualizes signs of disease activity such as luminal disease, vascularity, fistulas/strictures, and abscesses.

Patient JW was a 19 M who presented with 6-month of non-bloody diarrhea and weight loss. Colonoscopy found aphthous ulcers throughout the rectum, sigmoid, descending colon, and transverse colon. The ascending colon and cecum demonstrated erythema, friability, nodularity, and thickened mucosa. The terminal ileum (TI) had severe inflammatory changes, and JW was diagnosed with Crohn's ileocolitis. After initial prednisone treatment, he was started on azathioprine maintenance therapy. At 8-month follow-up JW was asymptomatic with decreasing CRP. One-year follow-up IUS demonstrated RLQ free fluid and a potential fistula. Submucosal edema, vascularization and increased wall thickness were imaged in the TI. These IUS findings provided objective markers of disease activity while JW was bridged to biologic therapy. 3 months later JW's stools were formed with no urgency. IUS re-assessment determined that TI inflammation was decreased. However, signs of disease activity in the cecum prompted laboratory testing. A fecal calprotectin of 16 mcg/g and decreasing CRP provided reassurance. Follow-up IUS was planned in spring 2023.

On initial follow-up JW appeared clinically in remission, however signs of active disease on IUS after a year helped inform therapy. IUS offers objective information on disease progression as an adjunctive tool to therapy, while reducing the cost or radiation exposure from CT and other imaging. It provides information on deeper structures, such as free fluid or wall stratification, than the more invasive colonoscopy. Establishing a universal approach to IUS and improving accessibility to educational materials are the next steps toward incorporating it as a standard of care.



Amanda Oro

Improving the Quality of POCUS Use by IM Residents - Focus on Image Archiving

Purpose: A key component of a successful Point of Care Ultrasound (POCUS) program is image archiving which facilitates image review and feedback. Internal Medicine (IM) residents use POCUS for procedures and clinical assessment, but few residents archive their images. This quality improvement initiative was developed to increase the number of POCUS images archived by IM residents. Our goals were to have >75% of all non-procedural scans performed by PGY1 IM residents saved and to have > 50% of PGY1 IM residents save at least one scan over the study period.

Methods: This Quality Improvement project was conducted on a clinical teaching unit (CTU) with approval from the IM Training Program. Three Plan-Do-Study-Act (PDSA) cycles were carried out over the academic year including: a presentation to PGY1 IM residents highlighting how and why to save POCUS images, the creation and distribution of educational resources for use during clinical work, and finally contacting residents who have not saved scans and asking them to identify barriers they have faced. Outcomes include percentage of non-procedural scans saved by PGY1 IM residents and rate of image archiving amongst these trainees. Data was collected from the creation of an ultrasound sign out sheet located on department machines.

Results: Over 36 weeks, 38 non-procedural scans were performed by PGY1 IM residents on our CTU. The percentage of scans saved was 47%. At least one scan was saved by 75% of residents who used the ultrasound machine.

Conclusion: Prior to this project we have estimated that <10% of all scans performed on our CTU were saved. Though not yet at target, we were able to increase the number of non-procedural scans saved by PGY1 IM residents as well as the number of residents saving scans.



Shubham Sharma

The Curious Case of Miss A

We present the case of a previously healthy 30-year-old female that presented with fever, malaise, diarrhea and generalized maculopapular rash following a recent mild COVID-19 infection and subsequent COVID-19 Pfizer vaccine booster dose. She had hypotension, tachycardia, tachypnea, and fever. Bloodwork revealed elevated neutrophils, liver enzymes and inflammatory markers, along with acute kidney injury and myocardial injury. Echocardiogram showed a small pericardial effusion, mildly reduced EF, and thickened mitral valve leaflets without vegetations. Workup for rheumatologic, hematologic, and infectious diseases was unremarkable. The patient was ultimately diagnosed with MIS-A secondary to a recent COVID-19 infection.

COVID-19 is a respiratory disease caused by SARS-CoV-2 infection and can result in a dysregulated inflammatory response. Multisystem inflammatory syndrome in children (MIS-C) has been described in pediatric patients with COVID-19 and its presentation has been likened to Kawasaki disease. An equivalent presentation in adults (MIS-A) is a rare but severe complication following COVID-19.

This patient was started on prednisone and concurrent treatment with tocilizumab was considered, however this was not initiated given medication supply issues and the patient's dramatic response to the oral steroids. Alternatively, concurrent IVIG treatment was considered based on the approach described in the limited MIS-A case reports, however this was declined by the patient for personal reasons. Nonetheless, the patient's clinical picture improved drastically after initiation of prednisone, with her vital signs normalizing the very next day and improvement in laboratory values following soon thereafter.

We describe a case where a patient developed MIS-A following COVID-19 infection and subsequent COVID-19 vaccine booster in close succession. This patient then went on to be successfully treated with good clinical and biochemical response using steroids alone. Corticosteroids are the cornerstone of MIS-A management, but IVIG and tocilizumab have also been used successfully for treatment.



Robin Manaloor

Implementation of a Novel Multidisciplinary Preoperative Assessment Pathway: Virtually There

Virtual care is not new to medical systems, yet adoption has been slow by the medical community. The goal of this project is to develop a virtual multidisciplinary preoperative assessment pathway for Saskatchewan patients. Objectives include 1) Systematically assess needs, barriers, and facilitators to implementing virtual multidisciplinary preoperative assessments; 2) Develop and pilot a multidisciplinary preoperative assessment implementation process; 3) Evaluate the feasibility of multidisciplinary virtual care by measuring the proportion of virtual preoperative assessments that did not require additional in-person consultation; and 4) Measure outcomes including: patient/provider satisfaction, travel distance saved, works hours missed for appointment, and technological access/literacy.

We planned an effectiveness-implementation hybrid design guided by the Promoting Action on Research Implementation in Health Services (PARIHS) Framework and evidence-based implementation strategies from the Expert Recommendations for Implementation Change (ERIC). This understanding will inform the design of an evidence-based implementation strategy for effective multidisciplinary preoperative assessment. Eligible participants for this study include stakeholders in multidisciplinary preoperative assessment, including patients, caregivers, physicians, registered nurses, allied health care professionals, schedulers, information technologists, and preassessment clinic support staff. Limited snowball sampling was used to interview 18 key-informants from each of three broad groups: 1) patients and caregivers, 2) clinicians/healthcare providers, and 3) decision-makers. Transcripts were coded and analyzed using deductive thematic analysis with the aim of exploring the lived experiences and perspectives of the identified stakeholders pertaining to virtual preoperative assessment.

Multidisciplinary preoperative assessment is essential to minimize intraoperative and postoperative complications. The process allows optimization of medical co-morbidities, management of medications prior to surgery, appropriate planning of postoperative medical care, reduction of patient anxiety through discussing perioperative plans, and support of informed decision making. Further studies are needed to assess the provincial and national impact of virtual preoperative assessment pathways.



Madison Rajchyba

Can Video Priming Improve Patient's Informed Consent for Resuscitation Goals?

BACKGROUND:

It is well studied that using video decision tools to aid in the discussion of advanced care directives results in better understanding of code status orders in seriously ill patients. However, there are no studies on healthy populations, defined as not having a serious illness or a planned high-risk surgery. We propose that using a video decision making tool will improve informed consent.

RESEARCH QUESTION:

Does using a video decision making tool over The Advance Care Planning Canada (ACPC) initiative's Advanced Care Planning Workbook, better educate healthy, middle-aged, Saskatchewan persons to have informed consent for their code status?

METHODS/METHODOLOGY:

Ideally, 100 participants aged 50-74y who are relatively healthy will read through the ACPC's Advanced Care Planning Workbook then participate in a pre-survey, followed by watching the video decision making tool and a post-survey. The surveys will contain both closed and open-ended questions. The closed ended questions will be analyzed with McNemar's and paired t-tests, while the open-ended questions will be analyzed with a thematic analysis approach. Ethics will be approved by the University of Saskatchewan's Behavioural Research Ethics Board and Operational Approval from the Saskatchewan Health Authority (SHA) will be required. The primary outcome will be assessing participant knowledge of resuscitative measures, outcomes, and prognostications. The secondary will be participant's preferences for their code status and if it changes post-video intervention.

RESULTS/FINDINGS:

We expect the video decision making tool will increase patient's knowledge of resuscitations and options for medical care. We expect patients will change their code status to less intervention.

CONCLUSIONS:

We expect the video decision making tool will improve informed consent of code status discussions because patients will have a better understanding of the levels of medical care and the components involved in each. Patients code status choices will, hopefully, better coincide with their goals and values.



Amanda Rissling

Online Gambling in Saskatchewan

The legalization of online gambling in Saskatchewan in 2022 has sparked significant interest amongst the public health and medical communities. In this presentation, Public Health & Preventive Medicine resident, Amanda Rissling, will share her project work that was presented

at the Saskatchewan Medical Association's Representative Assembly in May 2023. She will provide a review of the current context, including some of the unique risks of gambling within an online environment, the complexities of diagnosis and treatment of problematic gambling, and some of the public health-related recommendations that support safer online gambling. The intention of this project is to support further efforts to migrate legislation and regulation towards a public health approach.



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