UNIVERSITY OF SASKATCHEWAN

Department of Pediatrics Research Report

March 2021

SASKKIDS PEDIATRICS

spring SASKATCHEWAN PEDIATRIC RESEARCH AND INNOVATION GROUP

Inside This Issue

Improving care through training and research: How Dr. Daspal and the NICU team are ensuring the best care for patients in Saskatchewan.

The Neonatal Intensive Care Unit (NICU) is located at the Jim Pattison Children's Hospital (JPCH) along with all pediatric subspecialties and general pediatrics. The Division of neonatology includes six full time neonatologists, one part-time neonatologist, five clinical assistants, and five neonatal nurse practitioners. This team works collaboratively demonstrating a strong commitment to the education of residents as well as to the rapidly expanding research program. The research interests of the neonatologists are diverse and include both locally driven research questions as well national and international collaborations.

Dr. Sibasis Daspal is the Medical Director of the NICU at JPCH. He is also the physician lead for the Neonatal Point of Care Lung Ultrasound program in Saskatchewan. Point-of-care ultrasound (POCUS) is transforming the way care is provided in the NICU. There are many applications for POCUS in the NICU

Photo of JPCH NICU Neonatologists: Left to right Drs. Strueby, Givelichian, Nosherwan & Daspal. Submitted by NICU.

such as, "the evaluation and serial monitoring of common pulmonary diseases, hemodynamic instability, patent ductus arteriosus (PDA), persistent pulmonary hypertension of the newborn (PPHN), necrotizing enterocolitis (NEC), and intraventricular hemorrhage (IVH), among others. Procedural applications include vascular access, endotracheal intubation, lumbar puncture, and fluid drainage". Miller LE, Stoller JZ, Fraga MV, 2020 . A recent study by Fadel et al in 2020 identified the use of POCUS in the NICU across 13 Canadian NICUs. This cross-sectional survey identified that most sites use POCUS in regular clinical practice and that portable ultrasound machines were readily accessible. Of the many uses for POCUS is the targeted assessment of patent ductus arteriosus (PDA) and persistent pulmonary hypertension (PPHN). POCUS skills are taught to trainees at six of the 13 sites however a structured program exists only at two sites. This leads to two unsurprising conclusions of this study: major barriers to POCUS are a structured training program and a lack of trained personnel. Among the sites that do offer a training program, Saskatchewan is truly fortunate to have Dr. Daspal who leads the POCUS training program to a multidisciplinary team including other physicians, trainees, neonatal nurse practitioners, clinical assistants and the Neonatal Transport team.

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At JPCH, bedside lung ultrasounds are used to assist surfactant administration, detection of pneumothorax interventions, weaning/optimization of respiratory support, and detection of lung fluid. The first clinical research study (completed in 2019) aimed to assess reliability and validity of lung ultrasound (LUS) for exogenous surfactant distribution. Common practice at neonatal intensive care units is to assess adequacy of surfactant distribution by patient' clinical response and radiological studies. Bedside LUS allows for monitoring surfactant distribution and making necessary adjustments during the procedure at the bedside, decreasing the need for repeated X-rays post surfactant therapy.

Another research query by Dr. Daspal and his NICU team is how Lung Ultrasound guided treatment improves respiratory illness in newborns. One of these studies is 'Bedside Lung Ultrasound as a Predictor of The Extubation Readiness In Preterm Infants'. This study run by **Drs. Veronica Samedi** (Neonatal Hospitalist at JPCH), Sibasis Daspal, and Kaarthigeyan Kalaniti asked the question: Does lung ultrasonography predict the successful extubation in preterm ventilated infants? The study was recently completed, and the results will be published in the next few months.

Another study titled, 'Examination of diaphragmatic thickness and excursion of pre-term and term infants through utilization of ultrasound imaging' led by Dr. Daspal and medical student Malshi Karunatilake will conduct a sonographic assessment of diaphragmatic thickness and excursion and DTF in two groups of newborns, term (37+weeks) and preterm (32+-36+6 weeks) infants, using 2D and M-mode ultrasound imaging with the goal of determining reference values. The study findings will provide an initial step towards determining reference values of diaphragmatic thickness and excursion for future studies. Ultimately, these studies will help develop criteria for extubation readiness, thereby reducing risk of adverse outcomes of prolonged intubation such as ventilator induced diaphragmatic dysfunction (VIDD).

Current research at JPCH NICU

JPCH (Local)	Provincial	National
Point of care ultrasound i) Lung ultrasonography as a bedside tool to assess exogenous surfactant distribution ii) Lung Ultrasound as a Predictor of the Extubation Readiness in Preterm Infants iii) Bedside US as a diagnostic tool for air leak in neonates. iv) Patent ductus arteriosus in premature infants v) Delivery room Resuscitation **Gut perfusion with doppler and NIRS** i) Splanchnic Oxygenation Measurement with Near- Infra Spectroscopy (NIRS) as a Predictor of Feeding Tolerance in Extremely Preterm Newborns Receiving Fortified Feeding ii) Intestinal blood flow by Doppler ultrasound: the impact of fortification and prediction of feeding intolerance in extremely preterm neonates (DUSFI) **HIE and cerebral perfusion** (NICU -PICU collaboration) **Quality improvement (QI) and safety** i) Admission Laboratory Testing on Umbilical Cord Blood for NICU patients ii) Virtual technologies and telemedicine in NICU iii) Cost- benefits of newborn screening for SCID **Oxygen reduction test - EPIQ CNN**	**Provincial premature labour and delivery care pathway -** The goal is to develop the provincial pathway to support delivery and stabilization of preterm baby under 33 weeks gestation in peripheral health facilities **QI and safety** i) Neonatal feeding: fortification and growth – collaboration with dietitians Saskatoon/Regina	**IMPACT** **MiCARE**

Dr. Asma Nosherwan is a neonatologist at JPCH and the lead for both the Quality Improvement and Morbidity and Mortality programs. She is also the resident education and training lead. Beyond her clinical and teaching responsibilities she is also overseeing two ultrasound studies. The first one asked the question: Is a single dose of 20 mg/kg of ibuprofen effective in closing a hemodynamically significant patent ductus arteriosus (PDA)? For this study, neonates presenting to the NICU with a hemodynamically significant PDA, defined through echocardiogram measures, will be given a standard oral dose of 20 mg/kg of ibuprofen, followed by two 10 mg/kg doses within 24-hour intervals. An echocardiogram will be performed after the first ibuprofen dose to monitor closure rates of the PDA. This study will lead to a better understanding of whether or not a patient may need further doses of treatment or surgical ligation of the PDA. Another study is looking at the detection of heart rate using ultrasound in the delivery room resuscitation.

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Department of Pediatrics

Virtual Child Health Research Trainee Day

Please join us on **Thursday April 15th, 2021** for this research symposium featuring presentations from residents, graduate students, post-doctoral fellows, and undergraduate students engaged in child health research at USask.

This year we welcome Keynote speaker, **Dr. Hugh O'Brodovich**

who will present,

Discovery, scholarship and innovation to improve the health of children

Hugh O'Brodovich, MD FRCP(C) is the Arline and Pete Harman Professor of Pediatrics (Emeritus) at the Stanford School of Medicine (https://profiles.stanford.edu/hugh-obrodovich). He was the Chair of Pediatrics at Stanford University from 2008 through 2016 during which time he led the creation of Stanford University's Child Health Research Institute and served as its inaugural director. Previously, he was the Chair of Paediatrics at the University of Toronto and SickKids' Paediatrician-in-Chief. His laboratory investigated how the lung's airspaces become fluid filled (pulmonary edema) and how airspace fluid is cleared under physiologic (fetal lung liquid at birth) and pathophysiologic (pulmonary edema) conditions. Most recent research involved population-based studies to discover genetic factors that influence the development of bronchopulmonary dysplasia. He was elected as a Fellow of both the Canadian Academy of Health Sciences and the American Association for the Advancement of Science.

Register Today!

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Coming Events

April 15	Department of Pediatrics' Child Health Research Trainee Day
April 1	Pediatric Grand Rounds – Sean Polreis
April 7	Understanding Learning Health Systems: What they are, how they apply to Saskatchewan and why Patient Partners need to be engaged. – SCPOR - Drs. Gary Groot and Jenny Basran
April 8	Pediatric Grand Rounds – Dr. Katie Felton
April 22	Pediatric Grand Rounds – Drs. Mark Inman & Kathleen Moolman
May 6	Life and Health Sciences Research Expo
May 6	Pediatric Grand Rounds – Dr. Gitangali Mansukhani
May 20	Pediatric Grand Rounds – Dr. David Burnett

Join ARA Today by downloading the Enrollment Form or by contacting Brittany Walch

Affiliated Research Alliance (ARA) supports, connects and highlights the work of researchers conducting patient-oriented research (POR) in Saskatchewan. SCPOR is striving to have all researchers engaged in POR in Saskatchewan as part of the new alliance. Members of the ARA will be featured on SCPOR's website where their research expertise, POR projects and publications will be highlighted. Members will be informed of POR events, training and conferences, and will have opportunities to network and collaborate with patients, the health system, decision makers, and other researchers in the province. In addition, members will have access to reduced fees with SCPOR's partner labs the Clinical Trial Support Unit and the Social Science Research Lab, as well as access to free services with the Clinical Research Support Unit.

Resident Research Spotlight – Incidence of Eating Disorders During COVID-19

Drs. Astrid Lang and **Netusha Thevaranjan** (Left to right in photo) are postgraduate year 1 residents in the Department of Pediatrics. Dr. Lang received her BSc in Nutrition in 2013 from the University of Saskatchewan and practiced as a registered dietitian until she returned to school to complete her MD in 2020. Dr. Thevaranjan completed her BSc in Life Sciences in 2014 from McMaster University. She went on to complete a MSc in Immunology from McMaster University and a MD from the University of Limerick in Ireland. Astrid's background in nutrition and previous work as a pediatric dietitian has given her great interest in pursuing gastroenterology and researching gut health, weight/growth outcomes and chronic diseases.

Netusha's research interest is child health and how healthcare providers can work towards ensuring children live happy and healthy lives. Throughout her Master's degree, she learned to be curious and ask questions in order to dive into research projects, with hope of supporting patients. She hopes to continue this curious nature throughout her career in pediatrics.

Drs. Lang and Thevaranjan's research interests crossed paths on their recent study with Assistant Professor of General Pediatrics at USask, **Dr. Ayisha Kurji** entitled, "Incidence of Eating Disorders During COVID-19". Across Canada there has been a pronounced increase in pediatric eating disorders during the COVID-19 pandemic. This has been featured in several national news articles.

At JPCH, this was noticed by Dr. Kurji early on, and residents were consistently seeing eating disorder patients admitted to the ward which is usually uncommon. Together Drs. Kurji, Lang, and Thevaranjan wanted to ascertain whether there was an increase in referrals to the ED clinic during COVID. They wanted to determine whether the patients were more likely to be hospitalized and identify overall triggers.

This retrospective study compared referrals and admissions during the six-month period after the onset of lockdown, March 15-Sept 15 2020, compared to the same time in 2019. They collected data on both outpatient referrals to Dr. Kurji's ED clinic as well as inpatient and psychiatric admissions for eating disorders. They are currently finishing data collection and analysis.

In the News!

For more information about Covid and eating disorders Check out **Dr. Ayisha Kurji's** media interviews

- ✓ Sask. pediatrician worried about rising number of patients with eating disorders, **The Star Phoenix**
- ✓ Pandemic leads to 'dramatic increase' in youth needing treatment for eating disorders, Sask. doctors say, **CBC News**
- ✓ Kids struggling with mental health during pandemic, pediatrician says, **CBC National News**
- ✓ 'It's devastating, heartbreaking': Saskatoon doctor witnesses spike in teens with eating disorders, **CTV News**

This research will benefit children as it increases awareness and recognition of the psychological toll the pandemic has had on children and youth. It may lead to earlier recognition and intervention of these cases thereby ensuring appropriate care is available for patients. This research can be used to advocate for increased supports as well as increase awareness of eating disorders to the public. Stay tuned for the results!

Thankyou Drs. Lang and Thevaranjan for your contribution to this article. They would also like to acknowledge Dr. Ayisha Kurji and Dr. Oluwafemi Oluwole

The Participators - Enter the Study

In recognition of International Childhood Cancer Day on February 15, 2021, N2 launched the new pediatric clinical trials video officially, The Participators - Enter the Study. N2 would like to give a big thank you for all the hard work from the Clinical Trials Education and Awareness (CTEA) N2 Committee who spearheaded the development of the video. Click on the picture to check out the video! For more information down load this FACT SHEET

What is the Purpose of the Video?

- The purpose of the short, animated video, The Participators/Les Super Participants – Enter the Study, is to introduce children to clinical trials in a simple yet engaging way. Both English and French versions are available.
- Targeted at a young audience, the video explains common terms and language used in clinical trials, as well as explains how you sign up for research, and how research can help children all over the world.

Who Can Use the Video?

- Any research group or clinicians can share this video! The video doesn't focus on any particular disease or disorder, but is kept general so it can be used by as many pediatric research and clinical groups as possible.

If you use the video, please let us know. Also, if you share the video on social media platforms, please tag your posts so we can see!

Facebook: @n2networkofnetworks
Twitter: @N2Canada
LinkedIn: @N2 Network of Networks
#TheParticipators #LesSuperParticipants

…NICU continued from pg. 2

Ultrasound applications create a unique opportunity to make fast clinical decisions. Quoting Dr. Samedi, "It is like a magic wand that opens the view to the human body without radiation, pain, and within a minimal timeframe." As a research tool that offers real-time interpretation of data on a significant number of patients, ultrasound is efficient in both its application and resulting data collection by requiring minimal staff.

Dr. Daspal and the team at JPCH NICU not only teach clinical skills to medical professionals but also open horizons for researchers. As the old proverb goes, "If you give a man a fish, you feed him for a day; if you teach a man to fish, you feed him for a lifetime." The residents, medical students, and staff at JPCH are fortunate to have this type of hands-on training that leads to improved health outcomes for patients in Saskatchewan.

This figure is from Lee, L., DeCara, J.M. Point-of-Care Ultrasound. Curr Cardiol Rep 22, 149 (2020).
Point-of-care ultrasound (POCUS) machines. Modern POCUS systems can be attached to a cart for easy of movement and portability (A), carried in laptop-sized housing (B), attached to a tablet (C), or even a cell phone (D)

Thank you to Drs. Daspal, Samedi, and Nosherwan for providing content for this article. For more information please check out their online research profiles:
Dr. Veronica Samedi Dr. Sibasis Daspal
Dr. Asma Nosherwan

2021 January - March Publications

○ Biondi MJ, Garnett L, Bello A, Funk D, Poliquin PG, Jones S, Tierney K, Tran K, Kozak RA, Leung A, Grolla A, Nakamura C, Soule G, Ranadheera C, Hagan M, Dhaliwal A, Kobasa D, Falzarano D, Bovendo HF, Feldmann H, Kesselman M, **Hansen G**, Gren J, Mortimer T, Racine T, Deschambault Y, Edmonds J, Aminian S, Saurette R, Allan M, Rondeau L, Huynh J, Hadder S, Press C, DeGraff C, Kucas S, Kubay J, Azanarsky K, Cook BWM, Hancock BJ, Kumar A, Soni R, Schantz D, McKitrick J, Warner B, Griffin BD, Qiu X, Kobinger GP, Safronetz D, Wood H, R Stein D, Cutts T, Pickering B, Kenny J, Theriault S, Menec L, Vendramelli R, Higgins S, Banadyga L, Liu G, Rahim MN, Kasloff S, Sloan A, He S, Tailor N, Albietz A, Wong G, Gray M, Feldmann F, Marzi A, Risi G, Strong JE. Characterization of Ebola Virus Risk to Bedside Providers in an Intensive Care Environment. Microorganisms. 2021 Feb 26;9(3):498.

○**Davis TK**, Bryant KA, Rodean J, Richardson T, Selvarangan R, Qin X, Neu A, Warady BA. Variability in Culture-Negative Peritonitis Rates in Pediatric Peritoneal Dialysis Programs in the United States. Clin J Am Soc Nephrol. 2021 Feb 8;16(2):233-240.

○**Ehman D**, **Mugarab Samedi V**, Kalaniti K, **Daspal S**. Neonatal *Escherichia coli* infection in twins: clinical spectrum and management dilemma. BMJ Case Rep. 2021 Jan 27;14(1):e238470.

○**Emery, J. D., Samedi, V. M.,** & **Bingham, W.** T. (2021). Paralytic ileus in the neonate as a rare complication of maternal methadone treatment-a case report. Oxford medical case reports, 2021(3)

○Gunton A, **Hansen G**, Schellenberg KL. Photovoice as a Participatory Research Tool in Amyotrophic Lateral Sclerosis. J Neuromuscul Dis. 2021;8(1):91-99.

○**Inman M**, Kyle BD, Lyon ME. Contribution of Glucose Meter Error to Misclassification of Neonatal Glycemic Status. JAMA Pediatr. 2021 Jan 19.

○**Jariwala MP**, Laxer RM. NETosis in Rheumatic Diseases. Curr Rheumatol Rep. 2021 Jan 28;23(2):9.

○Khamis MM, **Adamko DJ**, El-Aneed A. Strategies and challenges in method development and validation for the absolute quantification of endogenous biomarker metabolites using liquid chromatography – tandem mass spectrometry. Mass Spectrom Rev. 2021 Jan;40(1):31-52

○Melamed N, Murphy K, Barrett J, Asztalos E, McDonald SD, Yoon EW, Shah PS; **Canadian Neonatal Network (CNN)**, Canadian Preterm Birth Network (CPTBN) Investigators. Benefit of antenatal corticosteroids by year of birth among preterm infants in Canada during 2003-2017: a population-based cohort study. BJOG. 2021 Feb;128(3):521-531

○Phillips NL, Widjaja E, Speechley K, Ferro M, Connolly M, Major P, Gallagher A, Ramachandrannair R, Almubarak S, **Hasal S**, Andrade A, Xu Q, Leung E, Snead OC 3rd, Smith ML. Longitudinal changes in emotional functioning following pediatric resective epilepsy surgery: 2-Year follow-up. Epilepsy Behav. 2021 Jan;114(Pt A):107585.

○Rios JD, Shah PS, Beltempo M, Louis D, Mukerji A, Premji S, Shah V, Lee SK, Pechlivanoglou P; Canadian Preterm Birth Network Investigators; **Canadian Neonatal Network Investigators**. Costs of Neonatal Intensive Care for Canadian Infants with Preterm Birth. J Pediatr. 2021 Feb;229:161-167.e12.

○Yusuf, K., **Samedi, V**. Human Tail. Journal of Pediatrics and Child Health. 2021 Mar.

The Children's Health Research Trust Fund (CHRTF) was established in 1983 to help raise funds to support child health research at the University of Saskatchewan. As all donated funds are endowed, the CHRTF has continued to grow to become an important part in helping advance research in the Department of Pediatrics. For further information about the CHRTF and to donate:
https://donate.usask.ca/online/chrtf.php

Children's Health Research TRUST FUND

Our Partners:
The Jim Pattison Children's Hospital has historically provided strong support for child health research in Saskatchewan. The recent $50 million donation from Jim Pattison allows for a steady stream of revenue to help meet research and programming needs for generations to come. Groundbreaking opportunities for pediatric researchers in Saskatchewan are on the horizon!

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Contact us
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