September 2014

Department of Pediatrics Research Report

University of Saskatchewan

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Image of Interest

Screenshot examples of an iOS application (PInGo; Pain Information on the Go), a mobile device diary for recording pediatric pain in near real-time. The application was developed by Dr. Susan Tupper, former Department of Pediatrics post-doctoral research fellow and currently Coordinator Integrated Pain Strategy and Research, Saskatoon Health Region and Flavio Ishii, currently Programmer Analyst, ICT Web Applications, University of Saskatchewan.

Rural Hospital of Massinga, Mozambique. Photo credit, Ryan Meili, 2014.

Advocating for the World's Children:

Pediatric Global Health Research at the University of Saskatchewan

Dr. Mahli Brindamour

In a few months, the target date of 2015 for reaching the Millenium Development Goals (MDGs) will arrive. These eight goals aim to eradicate extreme poverty and hunger, achieve universal primary education, promote gender equality and empower women, reduce child mortality, improve maternal health, combat HIV/AIDS, malaria and other diseases, and ensure environmental sustainability, as well as global partnership for development. Global health research has been key in addressing the MDGs and simple interventions both locally and in developing countries have resulted in tremendous improvements.

The College of Medicine's most recent long-term initiative, the CIDA-funded Training for Health Renewal Program, has recently celebrated its closure after more than 15 years of collaborative work on training a rural Mozambican health care workforce.

Dr. Ron Siemens has been working with a Mozambican/Canadian team in a community-based participatory research project through a partnership with the Universidade Lúrio, located in Nampula, a northern province of Mozambique. This team is now tackling the problem of maternal and neonatal mortality in Marrere, Mozambique.

The College of Medicine also has working relationships with Mozambique, Uganda, Vietnam and Nicaragua, through the Making the Links (MTL) program. This unique Global Health Certificate exposes students to models of practice in underserved areas and also includes placements for medical students in inner city Saskatoon and in Northern Saskatchewan. Pediatric residents have had the opportunity to be involved in MTL both in Mozambique and through their participation in the student-run SWITCH clinic in inner city Saskatoon.

The Student Initiative for Immigrant and Refugee Health, aiming at improving access to health care for Saskatoon newcomers and involving first and second year medical students, has been successful both in addressing some of the challenges that are facing immigrants and refugees, but also in engaging future physicians early in their careers to focus on decreasing inequities leading to poorer health outcomes. This reminds us that global health is not restricted to other countries, and that when we work with underserved populations in Canada we are contributing to greater global health equity, and better health for all.

Dr. Brindamour is a Saskatoon Pediatrician

This issue of The Pediatric Research Report is sponsored by The Children's Health Research Trust Fund (P4 for more info.)

Congratulations!

Dr. Darryl Adamko, Pediatrics

Dr. Adamko received an **Establishment Grant** from the **Saskatchewan Health Research Foundation (SHRF)** for his project entitled:

"Metabolomic Analysis of Urine: Improving the Diagnosis of Airway Disease"

Dr. Ron Siemens, Pediatrics

Dr. Siemens has been invited to submit a full proposal to the **Global Health Research Initiative** for his project entitled:

"Alert Community In Action: Integrated Home To Hospital Maternal-Newborn Care Using Tradition, Technology, and Training in Marrere, Mozambique"

Featured Child Health Researcher

Dr. Marta Erlandson

Dr. Marta Erlandson joined the faculty of Kinesiology in January 2014 as an Assistant Professor. She obtained her MSc. in 2007 and PhD. in 2010 from the University of Saskatchewan. Dr. Erlandson's research is in the area of lifelong musculoskeletal health. For her graduate work, Dr. Erlandson examined the effect of recreational gymnastics participation on bone development in children 4-10 years of age. She found that children participating in low-level gymnastics, approximately an hour a week, had better bone density and strength than children participating in other recreational sports. If this benefit is maintained into adulthood it could reduce the risk of osteoporosis and related fracture later in life.

After finishing her graduate research in Saskatchewan, Dr. Erlandson went on to complete a postdoctoral fellowship in the Osteoporosis and Women's Health Program at the University Health Network, University of Toronto, where she examined the potential of novel imaging tools to capture muscle and bone parameters and how they change with age.

Dr. Erlandson's current research focuses on child and adolescent growth and development and the influence physical activity and inactivity have on this process during growth as well as on health and fitness outcomes later in life. Dr. Erlandson is currently designing a randomized control trial to investigate the impact of a school-based physical activity intervention that loads the upper and lower limbs, based on a recreational gymnastics loading model, on musculoskeletal development across the pubertal growth period in boys and girls. She is also working with the Division of Pediatric Cardiology to design a physical activity program for children with congenital heart defects in the hopes of decreasing their anxiety around physical activity participation and increasing their confidence and rates of physical activity participation. Additionally, Dr. Erlandson is involved with a CIHR funded team grant studying the relationship between juvenile arthritis and physical activity (The LEAP Study - Linking Exercise, Arthritis, and Pathophysiology) for which she is examining bone and muscle parameters in this population.

Dr. Erlandson enjoys teaching undergraduate and graduate students about the physical growth and development of children and the impact activity, sport, and inactivity has on this process. She is passionate about training graduate students in the area and hopes that her research will positively impact the health of Saskatchewan children. Dr. Erlandson can be contacted at marta.erlandson@usask.ca

Dr. Erlandson is an Assistant Professor in the College of Kinesiology

Coming Events

SEPT MON **29** — The Arthritis Society: Erase the Pain Forum "The Four P's of Arthritis Pain Management", presented by Dr. Susan Tupper. "Pain Research Trends in Arthritis", presented by Dr. Tracy Wilson-Gerwing. 6:30-8 pm, Rusty Macdonald Library Auditorium, Lawson Civic Centre

OCT THU **2** — Dr. Marta Erlandson, Pediatric Grand Rounds Guest Speaker. "Building a Bone Bank: Can we make children indestructible?" 11 am-12 pm, East Lecture Theatre, Rm G763, Royal University Hospital

OCT FRI **10** — Dr. Alex Levin, Opthamology Grand Rounds Guest Speaker. "Top Tips for Managing Pediatric Uveitis", 7-8 am, Rependa Auditorium, Saskatoon City Hospital. "Eye Signs of Life Threatening Pediatric Systemic Disease", "Top Tips for Managing Pediatric Glaucoma", and "Opthamology Ethics", 8-10 am, Rependa Auditorium, Saskatoon City Hospital

OCT THU **16** — VEOIBD 2014 Webcast presentation on "Very Early Onset Inflammatory Bowel Disease" 9 am-5 pm EST, Hospital for Sick Children, or participate via live webcast. Register at http://www.cvent.com/d/x4qv6c

OCT WED **29** — "Reporting on Animal Trials: Towards a Higher Standard", presented by Dr. Hugh Townsend. 11-11:45 am, NRC-PBI building, Rm #2

NOV THU **20** — "PANDAS: Pediatric Autoimmune Neuropsychiatric Disorders [Associated with Streptococcal Infection]: A Family's Journey". Pediatric Grand Rounds, 11 am–12 pm, East Lecture Theatre, Rm G763, Royal University Hospital

APR THU **16** — Child Health Trainee Research Day 11am-2:30 pm Location TBA

Message from the Dean

Dr. Preston Smith, Dean of The College of Medicine

On June 1, 2014 I took the helm at the University of Saskatchewan's College of Medicine. My job, as I understand it, is to help write history for our college – a new chapter for health-care education and research. In a province known as the birthplace of Medicare, this is a monumental task.

The U of S has outlined very ambitious goals for our College of Medicine: be number one in medical education; be a sought-after destination for faculty from around the world; capitalize on our One Health approach and build our connections to the world class facilities at the U of S such as the Canadian Light Source Synchrotron and VIDO-InterVac. The time is now for our College of Medicine to take our rightful place as the flagship college at the U of S and become the foundation for a thriving provincial health system in Saskatchewan. Together, we're going to make this happen.

Success means we will have delivered on our mandate as described in The Way Forward. The College of Medicine will educate outstanding clinical practitioners, discover new knowledge and deliver improved patient outcomes. Our success will be synonymous with the success of Saskatchewan. Specifically with respect to research, we have outlined the strategic directions for our college over the next five years and identified strategies that will enable us to achieve three key objectives for our research work: **1. Increase the research intensiveness of the CoM through the development of interdisciplinary research and fostering of a team science approach, 2. Have the CoM take its place among our peers in the U15, 3. Deliver improved health outcomes for the people of Saskatchewan by ensuring research findings are translated into enhanced health care delivery.**

By 2020, the College of Medicine governance structures will enable provincial leadership, interprofessional education and interdisciplinary research. Our successful model of distributed medical education will be supported with a fully integrated network of educators and researchers across Saskatchewan, and our presence in those communities will have a positive impact on patient care. We will be national leaders and champions for Aboriginal Health, and we will remain true to our values of social accountability, already envied across the country. We will be truly research-intensive, thriving in a culture of team science and working to deliver nearly half of the university's research funding. Our accreditation concerns will be a footnote instead of a focus, because we will have shifted to a culture of rigorous internal review and continuous improvement of our curriculum.

We will proudly tell our stories of success and our reputation will make Saskatchewan proud. In 2020, the College of Medicine will have a new history.

Recent Child Health Publications from U of S Faculty

• Bally JM, Holtslander L, Duggleby W, Wright K, Thomas R, Spurr S, Mpofu C. **Understanding parental experiences through their narratives of restitution, chaos, and quest: Improving care for families experiencing childhood cancer**. J Fam Nurs. 2014;20:287-312.

• Berard R, et al., including Rosenberg AM. **Description of active joint count trajectories in juvenile idiopathic arthritis.** J Rheumatol. 2014, Epub ahead of print.

•Chu LM, Rennie DC, Cockcroft DW, Pahwa P, Dosman J, Hagel L, Karunanayake C, Pickett W, Lawson JA. **Prevalence and determinants of atopy and allergic diseases among school-age children in rural Saskatchewan, Canada.** Ann Allergy Asthma Immunol. 2014, Epub ahead of print.

• Duckham RL, Baxter-Jones AD, Johnston JD, Vatanparast H, Cooper D, Kontulainen S. **Does physical activity in adolescence have site-specific and sex-specific benefits on young adult bone size, content, and estimated strength?** J Bone Miner Res. 2014;29:479-86.

• Dyck RF, Jiang Y, Osgood ND. **The long-term risks of end stage renal disease and mortality among First Nations and non-First Nations people with youth-onset diabetes.** Can J Diabetes. 2014;38:237-243.

• Engler-Stringer R, Le H, Gerrard A, Muhajarine N. **The community and consumer food environment and children's diet: a systematic review.** BMC Public Health. 2014;14:522.

• Gamble JJ, McKay WP, Wang AF, Yip KA, O'Brien JM, Plewes CE. **Three-finger tracheal palpation to guide endotracheal tube depth in children.** Paediatr Anaesth. 2014;24:1050-1055.

• Shiff NJ, et al. **Validation of administrative health data for the pediatric population: a scoping review.** BMC Health Services Research. 2014;14:236.

• Shiff NJ, et al. **Chronic inflammatory arthritis prevalence estimates for children and adolescents in three Canadian provinces.** Rheumatol Int. 2014, Epub ahead of print.

• Wiebe S, et al., including Rosenberg AM. **Understanding refraction contrast using a comparison of absorption and refraction computed tomographic techniques.** J Inst. 2013;8.

Recent Child Health Presentations at Scientific Meetings from U of S Faculty

• Clatney L, Thiessen H, Kimber C, Baerg K. **Patient and family care experience program: partnering with our future providers to build a patient- and family-centred culture.** 35th Annual Scientific Meeting of the Canadian Pain Society, 2014, May 20-23, Quebec City, QC.

• Prahalad S, Cobb MMC, Sudman M, Hinks A, Pichavant M, Ponder L, Reed AM, Wallace C, Becker ML, Yeung RS, Rosenberg AM, Punaro MG, Mellins ED, Nelson JL, Videm V, Rygg M, Nordal E, Brown MA, Cutler D, Bohnsack JF, Thomson W, Thompson SD, Lagefeld CD. **The Autoimmune genetic architecture of childhood onset rheumatoid arthritis.** Pediatric Rheumatology Symposium, 2014, Apr 3-6, Orlando, FL.

• Rumsey D, Resaei E, Karunanayake C, Oen K, Rosenberg AM, Shiff N. **Predicting progression from oligoarticular to polyarticular juvenile arthritis.** Pediatric Rheumatology Symposium, 2014, Apr 3-6, Orlando, FL.

• Wilson-Gerwing T, Rosenberg AM. **High mobility group box 1 and receptor for advanced glycation end productds protein levels in young adult rats with arthritis compared to juvenile rats with arthritis.** American Pain Society, 2014, Apr 30-May 3, Tampa, FL.

• Tupper S, Rosenberg A, Stinson J, Baerg K. **Physical activity prescribing by community paediatricians for children with chronic pain: A vignette based study.** 91st Annual Meeting of the Canadian Paediatric Society, 2014, June 25-28, Montreal, QC.

A New Approach to the Quantification of Motor Function

Dr. Jonathan Norton

Objective assessment of motor function using neurophysiological approaches has been a challenge for many years, especially in children. For centuries reflexes have been used to investigate the control of movement. However, reflexes perturb the ongoing movement, and study the effect of the perturbation rather than the movement itself. Reflexes may also be difficult to elicit, or painful (or at least disruptive) for the participant. Analysis of electromyographic (EMG) activity recorded during a movement can prove informative, in particular regarding the relative timing of various muscle contractions. The classic triphasic pattern of muscle activation in a movement has been well studied in a number of muscles and shown with electrodes placed on the skin overlaying the muscles. This placement of electrodes on the skin overlying a muscle can be accomplished with relatively little skin preparation and little discomfort (it is akin to the placement of EKG electrodes).

With the development of easy access to modern signal processing, approaches have enabled more information to be gained from the EMG signal than previously. Performing cross-correlation in the frequency domain, an approach known as coherence, examines the similarity between two signals. Typically the numbers are very low, the maximum coherence is given a value of 1 (equivalent to complete similarity at that frequency) and in practice coherence is rarely seen above 0.1. The frequency bands are given the same names as those in EEG, the beta band being between 15-30Hz. Coherence in the beta band represents the common cortical input to a pair of muscles, or two portions of a muscle. Changes in neurological function, such as following a spinal cord injury, are mirrored in changes in beta band coherence. In a previous study we have been able to show that changes in function are correlated with changes in coherence in the beta band. In a separate study we showed that by altering the excitability of the motor cortex through electrical stimulation the amount of beta band coherence during a task can be either increased or decreased.
Coherence around the 10-15Hz region arises, at least in part, from the spinal cord and the neural circuits located within the spinal cord. These may be hyperactive in spasticity and distinct coherence patterns are seen in individuals with spasticity after spinal cord injuries.

This is a valuable addition to our assessment of motor function in children, and also in much wider populations. For instance we are working on this with colleagues from the WCVM. I am very interested in collaborating with colleagues on this approach, and especially on exploring the potential of these approaches in new conditions.

Dr. Norton is an Assistant Professor in the Department of Surgery, Division of Neurosurgery

Research Project Opportunities

SUPERVISORS LOOKING FOR TRAINEES

- **"Relationship between vitamin D levels and inflammation"**

Study format: Database analysis. Contact: Dr. Alan Rosenberg, alan.rosenberg@usask.ca

- **"Usability and utility of a pediatric discharge pain management chart"**

Study format: Semi-structured interview and questionnaire. Contact: Dr. Susan Tupper, Coordinator Integrated Pain Strategy and Research, SHR, 306-715-8315, susan.tupper@usask.ca

- **"Survey of Kawasaki Disease awareness among Saskatchewan physicians"**

Study format: Survey. Contact: Dr. Alan Rosenberg, alan.rosenberg@usask.ca

TRAINEES LOOKING FOR SUPERVISORS

A Pediatric R2 resident is interested in examining the prevalence of e-cigarette use among youth in Saskatchewan. If you are a faculty member interested and willing to supervise, please contact erin.loose@usask.ca.

contact us

For more information about The Department of Pediatrics Research, SPRING, or to contribute content to The Department of Pediatrics Research Report, please contact:

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Online version of newsletter:
www.medicine.usask.ca/pediatrics/research/newsletter

Deadline for submissions for the next Research Report is November 8, 2014!

spring
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Children's Health Research TRUST FUND

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 partner in helping advance research in the Department of Pediatrics.

For further information about the CHRTF:
http://www.medicine.usask.ca/pediatrics/research/CHRTF

To **Donate** to the CHRTF:
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