Welcome to the 5th Annual Women & Children’s Health Research Institute Research Day!

The past year has been an exciting one for WCHRI and I am thrilled to see this excitement continue at our 5th annual Research Day. This year, we will continue to shine the spotlight on our trainees, with increased oral presentations and poster viewing time scheduled. Out of nearly 300 registrants, 135 abstracts have been submitted. Of those, most are from trainees: 13 postdoctoral fellows, 22 residents or subspecialty residents, 25 PhD students, 29 Masters and 30 undergraduate students. The quality of abstracts are excellent, making the selection of oral presentations challenging. We have, in fact, doubled the number of oral presentations this year, from 24 to 48 trainees, allowing our young researchers a greater opportunity to present their results to an audience.

We start the morning with three concurrent seminar sessions. Two of these streams are professional development seminars featuring thirty minute talks followed by a fifteen minute discussion. We encourage you to actively participate by expressing your ideas, questions and comments. The third stream showcases the research outcomes and impacts from the WCHRI supported 2009 Emerging Team grants.

We are also excited this year to have a renowned international Keynote Speaker, Dr. Susan Ozanne. Dr. Ozanne, from the University of Cambridge, will be discussing the relationship between poor fetal growth and subsequent risk of diseases such as type 2 diabetes, cardiovascular disease and the metabolic syndrome in her talk “Early Nutrition and Long Term Health—Does Mum Hold the Key?”

Our day will close with an appetizer & wine session during which we will announce the winners of the poster and oral presentations. We will all have the opportunity to network, socialize and support our trainees. As part of the WCHRI community, we invite you to take the opportunity to meet, mingle and learn more about your colleagues and their research. We hope that you will find the day interesting and informative, as well as an opportunity to have some fun.

Please remember to mark your calendar for next year’s WCHRI Research Day, which is scheduled for November 6, 2013.

We would like to thank everyone who helped make this year’s Research Day possible!

Enjoy the day!

Dr. Sandy Davidge
Director, Women & Children’s Health Research Institute
WCHRI Overview

The Women & Children’s Health Research Institute supports groundbreaking multidisciplinary and transdisciplinary research through research support, grant competitions, ongoing research funding, professional development and expert resources.

Our membership is made up of over 300 leading researchers, clinician-scientists, academics, health-care professionals, trainees and service providers from academic and community settings. All bring valuable perspectives to the issue of women and children’s health.

WCHRI was founded in 2006 as a shared vision of the University of Alberta and Alberta Health Services, with core funding from the Stollery Children’s Hospital Foundation and the Royal Alexandra Hospital Foundation. Through the contributions of both Foundations, WCHRI has been able to support the research, training and development activities of investigators from a wide range of clinical and academic disciplines.

Vision
Improved outcomes for women and children through health research

Mission
WCHRI seeks to effect meaningful health outcomes through cutting-edge transdisciplinary research

Goals
• To facilitate basic and applied health research activities focused on women and children’s health
• To encourage collaborative and translational research within the university and outside (community, industry, national/international institutions)
• To promote training in health research with focus on women and children
• To provide a unified team approach for facilitating communication and establishing representation to the public, granting agencies and authorities
• To ultimately translate this knowledge to provide the best clinical practice guidelines

WCHRI promotes a full spectrum of biomedical, clinical and translational research through three resources:

Research Support
Endowed and Research Chairs, start up funds, partnerships, Research Day

Research Grants
Operating grants, emerging team grants, graduate studentships, resident trainee projects, trainee travel funds, summer studentships, scientific knowledge exchange programs

Core Resources
Supports basic, clinical and community-based research activities

Please view the PDF on your WCHRI flash drive for a comprehensive overview of WCHRI’s last six years.
About Our Funders

The Stollery Children’s Hospital Foundation

The Stollery Children’s Hospital Foundation is dedicated to raising funds for specialized equipment, sub-specialty medical education to train the best of the best researchers, to pave the way to the discovery of new treatments or cures for child health issues, and specialized programs that improve patient and family outcomes at the Stollery Children’s Hospital.

The Foundation recognizes the tremendous impact that research has on disease prevention, treatment and improved health outcomes which is why they provide exceptional support in WCHRI’s mission to conduct leading-edge research on children’s and women’s health.

For more information on the Foundation and ways to support the Stollery Children’s Hospital, visit www.stollerykids.com.

The Royal Alexandra Hospital Foundation

The Royal Alexandra Hospital Foundation inspires community support for their healthcare facilities. The Foundation empowers compassionate, leading-edge patient care through research, education, technology and facility enhancements. They provide support for the Lois Hole Hospital for Women and a growing number of specialized centres of healthcare located at the Royal Alexandra Campus.

The Foundation places a strong focus on research and innovation and is committed to supporting and promoting the ongoing work of researchers through WCHRI.

For more information on the Foundation and ways to support the Lois Hole Hospital for Women, visit www.royalalex.org.
## Agenda at a Glance

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:00</td>
<td>Registration / Poster Set-up / Breakfast - Foyer</td>
</tr>
<tr>
<td>07:45</td>
<td>Welcome - Dr. Sandy Davidge - Saskatchewan / Manitoba Room</td>
</tr>
<tr>
<td>08:00</td>
<td>Seminars&lt;br&gt;Turner Valley Room&lt;br&gt;Navigating a Successful Career Path in the Current Health Research Environment&lt;br&gt;Dr. Ryan Perry, AIHS&lt;br&gt;Creating Value from Innovation - Biotech and Industry Opportunities&lt;br&gt;Dr. Randy Yatschoff, TEC Edmonton</td>
</tr>
<tr>
<td>08:30</td>
<td>Seminars Chairroom&lt;br&gt;Developing your Knowledge Translation Plan: Tools and Resources&lt;br&gt;Ms. Tatjana Alvadj-Korenic, UAlberta&lt;br&gt;The Ethical Researcher: A Relational Ethics Perspective&lt;br&gt;Dr. Wendy Austin, UAlberta</td>
</tr>
<tr>
<td>09:30</td>
<td>Emerging Team Presentations&lt;br&gt;Leduc Room&lt;br&gt;Pediatric Weight Management: Advancing the Evidence in Family-Centered Care&lt;br&gt;Dr. Geoff Ball&lt;br&gt;Maternity Experiences of Newcomers to the Prairies: A Secondary Analysis of Canadian Maternity Experiences Survey&lt;br&gt;Drs. Bev O’Brien and Jalal Safipour&lt;br&gt;Improved Diagnosis and Management of Pediatric Respiratory Diseases using Metabolomic Analysis of Urine&lt;br&gt;Dr. Darryl Adamko&lt;br&gt;Mindfulness Based Stress Reduction: A Non-Pharmacological Approach to Support Youth with Mental Health Concerns&lt;br&gt;Drs. Sunita Vohra, Jessica Van Vliet and Anthony Singhal&lt;br&gt;Sweet Moms - Exploring the Effects of Sugar Intake during Pregnancy&lt;br&gt;Dr. Rhonda Bell</td>
</tr>
<tr>
<td>10:00</td>
<td>Poster Viewing / Break - British Columbia / Alberta / Yukon Room</td>
</tr>
<tr>
<td>10:00</td>
<td>Oral Presentations&lt;br&gt;Early Development&lt;br&gt;Turner Valley Room</td>
</tr>
<tr>
<td>11:00</td>
<td>Oral Presentations&lt;br&gt;Health Quality of Children &amp; Families&lt;br&gt;Leduc Room</td>
</tr>
<tr>
<td>12:00</td>
<td>Oral Presentations&lt;br&gt;Child Health&lt;br&gt;Chairman Room</td>
</tr>
<tr>
<td>12:00</td>
<td>Lunch &amp; Keynote Speaker Dr. Susan Ozanne - University of Cambridge&lt;br&gt;Early Nutrition and Long-term Health - Does Mum Hold the Key? Saskatchewan / Manitoba Room</td>
</tr>
<tr>
<td>13:30</td>
<td>Poster Viewing - British Columbia / Alberta / Yukon Room</td>
</tr>
<tr>
<td>15:00</td>
<td>Oral Presentations&lt;br&gt;Women’s Health&lt;br&gt;Turner Valley Room</td>
</tr>
<tr>
<td>15:00</td>
<td>Oral Presentations&lt;br&gt;Newborn Outcomes &amp; Health&lt;br&gt;Leduc Room</td>
</tr>
<tr>
<td>17:00</td>
<td>Oral Presentations&lt;br&gt;Pediatric Trainee Research Competition&lt;br&gt;Chairman Room</td>
</tr>
<tr>
<td>17:00</td>
<td>Poster Viewing with beer, wine and appetizers - British Columbia / Alberta / Yukon Room</td>
</tr>
<tr>
<td>17:30</td>
<td>Awards &amp; Wrap-up - British Columbia / Alberta / Yukon Room</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Detailed Agenda of Events

Poster Set-up & Breakfast - Foyer
07:00 – 07:45

Welcome - Saskatchewan / Manitoba Room
Dr. Sandy Davidge, Director, WCHRI
07:45 – 08:00

Seminars – Turner Valley Room
08:00 – 09:30

08:00 – 08:45  -  Turner Valley Room
Navigating a Successful Career Path in the Current Health Research Environment
Dr. Ryan Perry, Alberta Innovates-Health Solutions

The health research and innovation environment is continually changing and this poses challenges to trainees looking to build careers in the health-based knowledge industry. Individuals with advanced degrees in fields such as science, engineering, medicine, finance and economics are an essential component for development of the high-quality workforce needed to meet the growing demand for high-skilled people. To be successful in this environment requires an understanding of the available opportunities and resources and preparation in order to take full advantage of these opportunities and resources when they become available. This presentation addresses the current career environment for health research and innovation trainees, the opportunities available through Alberta Innovates – Health Solutions to support career and professional development, and highlights some key considerations in order to take full advantage of the available opportunities and resources to navigate a successful career path in the current health research and innovation environment.

08:45 – 09:30  -  Turner Valley Room
Creating Value from Innovation – Biotech and Industry Opportunities
Dr. Randy Yatscoff, TEC Edmonton

Increased emphasis is being placed on knowledge translation by grant funders. It is through this translation that new and innovative ideas, services and products are introduced. Alberta has a well developed innovation system which facilitates the knowledge translation in the province. This innovation results in the establishment of new small and medium sized enterprises (SMEs) which are one of the major drivers for economic development. This leads to increased diversification of the economy and an improved quality of life for Albertans and the population at large.

Seminars – Chairman Room
08:00 – 09:30

08:00 – 08:45  -  Chairman Room
Developing Your Knowledge Translation Plan: Tools and Resources
Ms. Tatjana Alvadj-Korenic, UAlberta

The seminar will highlight some of the recent knowledge translation planning tools and resources available to researchers. Key elements of knowledge translation plans will be examined and discussed.

08:45 – 09:30  -  Chairman Room
The Ethical Researcher: A Relational Ethics Perspective
Dr. Wendy Austin, UAlberta

In this presentation, the claim will be made that research ethics guidelines and review, while necessary and helpful, are not sufficient to ensure that health research is conducted ethically.
Attention needs to be paid to the qualities of the ethical researcher. Perusal of the history of health research raises, far too often, the question: what were they thinking? In the past, some blatantly unethical studies have taken place despite existing research ethics guidelines and official oversight. The challenges of contemporary health research are only becoming more complex, as are its competitive aspects. It is important that we not only address hindrances to ethical research, but that we envision ways to educate and support researchers in ethical action. A relational ethics perspective will be taken in exploring these issues.

Emerging Team Presentations - Leduc Room
08:00 – 09:30

08:00 – 08:18  -  Leduc Room
Pediatric Weight Management: Advancing the Evidence in Family-Centered Care
Dr. Geoff Ball

Childhood obesity is more common today than ever before. This is a concern because obesity is associated with a number of physical and emotional health risks. In addition, most children with obesity grow up to become adults with obesity, which is when chronic diseases such as type 2 diabetes, cardiovascular disease, and cancer are likely to develop. Very little health services research is currently being done in Canada to learn about how we can provide health care in the best possible way to help children with obesity and their families to become healthier. Our team grant, which included three separate and inter-related studies, was designed to increase our understanding of childhood obesity in order to help health care professionals provide better care to children with obesity and their families. The studies included:

Study 1: An integrative review of the literature to gain an understanding of the communication and rapport between parents of children with obesity and health care professionals.

Study 2: A qualitative study that included interviews of 8 – 12 year old children with obesity and their parents before, during, and after a weight management intervention designed for parents.

Study 3: A clinical trial to compare the effectiveness of two weight management interventions for parents of 8 – 12 year old children with obesity.

Collectively, data from these studies are being used to inform the development of the first nation-wide study in Canada for managing childhood obesity.

08:18 – 08:36  -  Leduc Room
Maternity Experiences of Newcomers to the Prairies: A Secondary Analysis of Canadian Maternity Experiences Survey
Dr. Bev O’Brien

Quantitative analyses using MES data.

For women residing in one of the prairie provinces, the maternity experiences of newcomers living in Canada for 10 or fewer years (n=140) were compared with those of Canadian born women (=1137). Data was part of the Maternity Experiences Survey (2008) and the sample size was insufficient for bootstrap weighting so proportions were calculated using Chi Square (95% CI).

Newcomer women were more likely to be older, married and more educated but their incomes were likely to be lower. There were no differences between groups in their ability to access maternity services, with all women reporting high levels of access. Newcomers were less satisfied with the amount of information provided to them regarding
a variety of important topics. Finally, they were also more likely to be placed in stirrups for birth and to have an assisted birth, either with forceps or by C-section.

**Dr. Jalal Safipour**
Although evidence suggests that immigrant women have difficulty utilizing maternity care services, little knowledge exists on how factors such as ethnic group, English-language skills, or cultural norms, intersect and influence maternal outcomes.

**Purpose:** To increase our understanding of how maternity services can better enable immigrant/minority women to have positive maternity experiences. In particular, we will deconstruct the ways in which exclusion, cultural norms and preferences, language and communication difficulties and socioeconomic and gendered disadvantage inter-relate.

**Methodology:** The study design utilized a mixed methodological approach. Phase I incorporated secondary analysis of Maternity Experiences Survey (2009) data, specifically women’s views regarding quality of maternity services. Phase II was a qualitative investigation, using Focused Ethnography by interviewing immigrant women, health professionals, social and policy makers, immigrant advocates and community representatives in Edmonton and Brooks (75 interviews, 4 FGIs). Phase III was a meta-synthesis of existing evidence on maternity care and immigrant women.

**Findings and Implications:** The findings show that immigrant women in the study were generally very satisfied with the medical aspects of their maternity care. Issues such as the lack of antenatal and postpartum social support tended to negatively shape their experiences. Communication difficulties were the most frequently mentioned challenges for health care professionals, for example, the inability to gain informed consent from patients without English language skills. Many of the resettlement issues (e.g. social isolation and depression) noted by social services providers intersect to produce negative maternal outcomes. Cultural differences were identified as contributing to barriers to health care access, which can lead to feelings of discrimination and dissatisfaction. The relevant barriers included: lack of culturally adequate food, lack of cultural competence, differences of maternity practice and communication problems because of lack of shared meaning and understanding. The implications of our research are that for optimal physical and mental maternal health of immigrant women, a holistic approach is required. Thus, targeted interventions to improve maternal outcomes must involve input from health care professionals, social service providers and immigrant communities.

---

**08:36 – 08:54  -  Leduc Room**

**Improved Diagnosis and Management of Pediatric Respiratory Diseases using Metabolomic Analysis of Urine**

**Dr. Darryl Adamko**

In children, problems with breathing are the leading causes of illness and often hospitalization. Diseases like asthma cause children to cough and wheeze, miss time at school and reduce their exercise and activities. Children may come to hospital as a result of these breathing problems. Asthma is the most common disease in children. Another breathing disease seen mostly in babies is called bronchiolitis. Bronchiolitis is one of the leading diseases for hospital expenses, and it is often confused with asthma. Each disease requires different treatment. These breathing problems can affect the toddler or child’s life so much that sleep, behaviour, and the ability to learn are affected. Another breathing problem that occurs only during sleep is called obstructive sleep apnea. While all children at some point snore at night, we are learning that too many have either narrowing async.
or blockage of their airways at night leading to poor brain development and injury to other body organs. Diagnosing these diseases in children is more difficult than in adults. Further, the delay in diagnosis is more serious in children because it may affect a child’s ability to learn and grow. It also makes the parents’ life more stressful as these families often have to come to clinics and hospitals.

We have been developing a new way to measure changes in the body related to airway diseases, which uses a simple urine test. Our work in asthma is the most advanced and we are excited by the results. We think that we can tell whether a child with asthma has different urine compared to children without asthma. We also have followed children with asthma to look for metabolites which suggest impending exacerbation. We have samples from babies with bronchiolitis, however, we need more babies without bronchiolitis to confirm our promising results. In addition, we have nearly completed our collection of urine samples from children with snoring to see if we can figure out which children have obstructive sleep apnea easily by a sample of urine. This urine test will be easy for the children and still at least as accurate as the more difficult test we have now. Overall our team is dedicated to improving the health of children by developing a new way to diagnose airway diseases. Since these diseases are the leading threats to child health and their families in our community, this project has the potential to have a major impact on improving child health.

08:54 – 09:12  -  Leduc Room
Mindfulness Based Stress Reduction: A Non-Pharmacological Approach to Support Youth with Mental Health Concerns
Drs. Sunita Vohra, Jessica Van Vliet and Anthony Singhal

The purpose of this study is to develop and conduct a pilot mixed-methods randomized clinical trial, combining clinical outcomes, qualitative interviews, and neuroimaging (electroencephalography, event-related potential and functional magnetic resonance imaging) to assess the impact of mindfulness-based stress reduction on high risk youth with mental health disorders.
Over the past several decades there has been a dramatic increase in the consumption of sugar both in North America and globally. In this context, “sugar” refers to extrinsic, or free, sugars and includes all monosaccharides (usually glucose and fructose) and disaccharides (usually sucrose) added to foods by the manufacturer, cook or consumer; a small amount of free sugars in the diet are naturally occurring such as in honey and syrups. Studies in male and non-pregnant female rodents consistently demonstrate that diets high in fructose promote body weight gain along with derangements in glucose homeostasis, lipid metabolism, vascular responsiveness (hypertension) and cataracts. Pregnant women and their offspring have not been extensively studied regarding the effects of sugar or fructose consumption. The Sweet Moms team undertook a series of studies in rodents and humans to examine this relationship more thoroughly. The team members working in animal models tested the hypothesis that high fructose intake prior to and during pregnancy contributes to abnormalities in vascular function and plasma lipid profiles during pregnancy, adversely impacts placental development, promotes maternal weight gain in pregnancy and has adverse, lasting health effects on the offspring. The team members working with humans conducted a cross sectional study to examine the relationship between dietary sugar intake and pregnancy outcomes. They also conducted a qualitative study to better understand why women increase their sugar intake during pregnancy. Animal studies indicated that high dietary fructose intake in pregnancy has multiple adverse effects on maternal adiposity, metabolic control, placental structure and offspring adiposity in later life. Human studies resulted in a simple dietary questionnaire to collect data on sugar intake, established strong working relationships within Edmonton to recruit pregnant women, and suggest that pregnant women increase their sugar intake in pregnancy to “balance” many of the physiological and social shifts that they experience in pregnancy. These results will all be helpful in moving toward a thorough understanding of the effects of high sugar intake during pregnancy and novel ways to help women moderate their intake to optimize pregnancy outcomes.
## Oral Presentations – Early Development
### Turner Valley Room
### 10:00 – 12:00

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Position</th>
<th>Mentor</th>
<th>Abstract Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tara Stach</td>
<td>MSc Student</td>
<td>Ordan Lehmann</td>
<td>Identification of the Superior Ocular Fissure &amp; characterization of its molecular genetics</td>
</tr>
<tr>
<td>2</td>
<td>Jamie Zagozewski</td>
<td>PhD Student</td>
<td>David Eisenstat</td>
<td>Transcriptional regulation of the Retinoblastoma family member p107 by Dlx Homeobox genes during central nervous system development</td>
</tr>
<tr>
<td>3</td>
<td>Antoinette Nguyen</td>
<td>MSc Student</td>
<td>Jerome Yager</td>
<td>Dietary supplementation with broccoli sprouts for pregnant rats will provide neuroprotection against neurobehavioural deficits and brain injury induced by the fetal inflammatory response</td>
</tr>
<tr>
<td>4</td>
<td>Surya Madabattula</td>
<td>Undergraduate Student</td>
<td>Francois Bolduc</td>
<td>Spastin and Atlastin-1 are responsible for proper locomotion in Drosophila Melanogaster</td>
</tr>
<tr>
<td>5</td>
<td>Lori Sacrey</td>
<td>Postdoctoral Fellow</td>
<td>Ian Q. Whishaw</td>
<td>Development of reaching and grasping in infancy</td>
</tr>
<tr>
<td>6</td>
<td>Stephane Bourque</td>
<td>Postdoctoral Fellow</td>
<td>Sandra Davidge</td>
<td>Endothelial colony forming cells derived from pregnancies complicated by intrauterine growth restriction are rarified and have reduced vasculogenic capacity</td>
</tr>
<tr>
<td>7</td>
<td>Ensaf Almomani</td>
<td>PhD Student</td>
<td>Emmanuelle Cordat</td>
<td>Adaptor protein 1 complexes regulate intracellular trafficking of the Kidney anion exchanger 1 in Epithelial cells</td>
</tr>
<tr>
<td>8</td>
<td>Nathan Chu</td>
<td>Undergraduate Student</td>
<td>Gregory Funk</td>
<td>Signaling cascades that mediate the actions of ATP in Neonatal Brainstem Inspiratory rhythm generating networks</td>
</tr>
</tbody>
</table>

*Full abstracts are located by number in the pages following this program.*
### Oral Presentations – Health Quality of Children and Families

**Leduc Room**  
10:00 – 12:00

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Position</th>
<th>Mentor</th>
<th>Abstract Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Sana Ishaque</td>
<td></td>
<td>Sunita Vohra</td>
<td>Individualized health related quality of life measures for children: A systematic review</td>
</tr>
<tr>
<td>10</td>
<td>Satvinder Ghotra</td>
<td>MSc Student</td>
<td>Jerome Yager</td>
<td>Health related quality of life of Pediatric Stroke survivors</td>
</tr>
<tr>
<td>11</td>
<td>Kennedy Denys</td>
<td>MSc Student</td>
<td>Carmen Rasmussen</td>
<td>Quality of life and family stress in children with prenatal alcohol exposure and Fetal Alcohol Spectrum Disorder</td>
</tr>
<tr>
<td>12</td>
<td>Katherine Wyper</td>
<td>PhD Student</td>
<td>Ronald Roesch</td>
<td>The relation between stressful life events and adverse outcomes in justice-involved youth with Fetal Alcohol Spectrum Disorder</td>
</tr>
<tr>
<td>13</td>
<td>Tracy Durksen</td>
<td>PhD Student</td>
<td>Laura Templeton</td>
<td>Exploring community support worker case notes for experiences of low-income transitional Aboriginal families</td>
</tr>
<tr>
<td>14</td>
<td>Kathy O’Leary</td>
<td></td>
<td>David Johnson</td>
<td>Understanding implementation processes of clinical pathways and clinical practice guidelines in pediatric contexts</td>
</tr>
<tr>
<td>15</td>
<td>Rachel Flynn</td>
<td></td>
<td>David Johnson</td>
<td>Evaluating the implementation of a clinical pathway for the management of childhood asthma: a mixed methods study</td>
</tr>
<tr>
<td>16</td>
<td>Lisa Hartling</td>
<td>Assistant Professor</td>
<td>n/a</td>
<td>A randomized controlled trial of music to reduce pain and anxiety in the pediatric emergency department</td>
</tr>
</tbody>
</table>

*Full abstracts are located by number in the pages following this program.*
<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Position</th>
<th>Mentor</th>
<th>Abstract Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Yahya Fiteih</td>
<td>MSc Student</td>
<td>Shairaz Baksh</td>
<td>Drug discovery targets for Inflammatory Bowel Disease</td>
</tr>
<tr>
<td>18</td>
<td>Daniel Zimmerman</td>
<td>PhD Student</td>
<td>Eytan Wine</td>
<td>IL-1β moderates Citrobacter Rodentium infection in Inflammasome-Deficient NALP3 knockout mice</td>
</tr>
<tr>
<td>19</td>
<td>Diya Shi</td>
<td>Undergraduate Student</td>
<td>Sandra Wiebe</td>
<td>Development of the neural correlates of self-regulation from early to middle childhood</td>
</tr>
<tr>
<td>20</td>
<td>Sarah Treit</td>
<td>Undergraduate Student</td>
<td>Christian Beaulieu</td>
<td>Children and adolescents with Fetal Alcohol Spectrum Disorders undergo less developmental cortical thinning</td>
</tr>
<tr>
<td>21</td>
<td>Desiree Machado</td>
<td>Subspecialty Resident</td>
<td>Lori J West</td>
<td>Heart transplantation in early infancy: waitlist mortality on a low-density population area</td>
</tr>
<tr>
<td>22</td>
<td>Edythe Tham</td>
<td>Associate Professor</td>
<td>Nee Khoo</td>
<td>A longitudinal study of ventricular contractile function in Hypoplastic Left Heart Syndrome prior to Fontan</td>
</tr>
<tr>
<td>23</td>
<td>Jesus Serrano</td>
<td>PhD Student</td>
<td>Alvaro Osornio-Vargas</td>
<td>Profiling industrial chemical emissions by industrial sector and toxic potential. Where in Canada are mother, infant and child relevant toxicants emitted?</td>
</tr>
<tr>
<td>24</td>
<td>Dana Olstad</td>
<td>PhD Student</td>
<td>Linda McCargar</td>
<td>Improving recreational facility food environments: Private and public sector roles</td>
</tr>
</tbody>
</table>

Full abstracts are located by number in the pages following this program.
Over twenty years ago, epidemiological studies revealed that there was a relationship between poor fetal growth and subsequent risk of diseases such as type 2 diabetes, cardiovascular disease and the metabolic syndrome. The detrimental effects of being born small for gestational age were subsequently shown to be exaggerated by accelerated postnatal growth. In terms of obesity, rapid postnatal growth, independent of growth in utero increases risk of increased adiposity. Studies of identical twins, individuals who were in utero during periods of famine, randomized interventions of altered neonatal nutrition and animal models have provided strong evidence that the early environment plays an important role in mediating these relationships. Early nutrition is one such important environmental factor. The concept of early life programming is therefore widely accepted. However the mechanisms underlying such a process are only starting to emerge. These include: (1) Permanent structural changes in an organ due to exposure to suboptimal levels of essential hormones or nutrients during a critical period of development leading to permanent changes in tissue function (2) Persistent alterations in epigenetic modifications such as DNA methylation and histone modifications leading to changes in gene expression. (3) Permanent effects on regulation of cellular ageing through increases in oxidative stress and mitochondrial dysfunction leading to DNA damage and telomere shortening. Further understanding of these processes will enable the development of preventative and intervention strategies to combat the burden of common diseases such as type 2 diabetes, obesity and the metabolic syndrome.

Dr. Susan Ozanne is a British Heart Senior Fellow and Reader in Developmental Endocrinology in the Institute of Metabolic Science Metabolic Research Laboratories at the University of Cambridge. She is also a Fellow of Churchill College, Cambridge, U.K. She obtained a first class honours degree in Biochemistry from the University of Edinburgh, Scotland in 1990. She then went to Christ’s College at the University of Cambridge where she obtained her PhD in 1994. Before being appointed to her current post she was a Diabetes U.K. R.D. Lawrence Fellow, a Wellcome Trust Career Development Fellow and a British Heart Foundation Lecturer.

Her research interests are focused on understanding the mechanistic basis of the relationship between suboptimal early nutrition and growth and risk of diseases such as type 2 diabetes, obesity and cardiovascular disease in later life. Initially her work was directed towards understanding how under-nutrition during fetal life influenced long-term health but has now expanded to include studying the link between maternal over-nutrition and obesity on the long-term health of her offspring. Her group works on animal models of early dietary manipulation as well as on biopsy material from low birth weight humans. Dr. Ozanne is the author of over 100 peer-reviewed full papers on the early origins of health and disease and is a member of the council of the Society for the Developmental Origins of Health and Disease.
Poster Viewing (and Judging) - British Columbia / Alberta / Yukon Room
13:30 – 15:00

Oral Presentations – Women’s Health
Turner Valley Room
15:00 – 17:00

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Position</th>
<th>Mentor</th>
<th>Abstract Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>Petrus Kruger</td>
<td>Resident</td>
<td>Tarek Motan</td>
<td>The impact of elevated Progesterone levels during the late Follicular phase of IVF/ICSI cycles on clinical pregnancy rates</td>
</tr>
<tr>
<td>26</td>
<td>Michelle Lacasse</td>
<td>Resident</td>
<td>Sue Chandra</td>
<td>Interpregnancy interval and the risk of adverse perinatal outcomes</td>
</tr>
<tr>
<td>27</td>
<td>Joanna Stanley</td>
<td>Postdoctoral Fellow</td>
<td>Philip Baker</td>
<td>Effect of maternal obesity in a mouse model of Preeclampsia</td>
</tr>
<tr>
<td>28</td>
<td>Fatheema Begum</td>
<td></td>
<td>Rhonda Bell</td>
<td>Fat mass accretion and distribution during pregnancy and early postpartum</td>
</tr>
<tr>
<td>29</td>
<td>Aleida Song</td>
<td>Undergraduate Student</td>
<td>Rhonda Bell</td>
<td>High fructose intake during pregnancy influences fructose concentrations in amniotic fluid and placenta weight in rats</td>
</tr>
<tr>
<td>30</td>
<td>Halima Al-Hashemi</td>
<td>Postdoctoral Fellow</td>
<td>Lisa Hornberger</td>
<td>Intrauterine exposure to maternal Diabetes is associated with increased aortic stiffness in early infancy</td>
</tr>
<tr>
<td>31</td>
<td>Raie Bekele</td>
<td>PhD Student</td>
<td>David Brindley</td>
<td>Increased expression of Multidrug Resistance Protein (MRP-1) and Phospholipase D activation by Tamoxifen induces Tamoxifen resistance in breast cancer</td>
</tr>
<tr>
<td>32</td>
<td>Nubia Zepeda</td>
<td>MSc Student</td>
<td>YangXin Fu</td>
<td>Understanding the effect of Notch Inhibition on Ovarian Cancer stem cells</td>
</tr>
</tbody>
</table>

Full abstracts are located by number in the pages following this program.
### Oral Presentations – Newborn Outcomes & Health
**Leduc Room**  
**15:00 – 17:00**

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Position</th>
<th>Mentor</th>
<th>Abstract Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>Moses Fung</td>
<td>Undergraduate Student</td>
<td>Bernard Thebaud</td>
<td>Endothelial Progenitor cells repair experimental lung damage through a paracrine activity</td>
</tr>
<tr>
<td>34</td>
<td>Ying Ling</td>
<td>Undergraduate Student</td>
<td>Catherine Field</td>
<td>Regulatory B cells in humans: identifying the regulatory capacity and Interleukin-10 production of regulatory B cell phenotypes</td>
</tr>
<tr>
<td>35</td>
<td>Esme Dijke</td>
<td>Postdoctoral Fellow</td>
<td>Lori West</td>
<td>Expansion of highly suppressive FOXP3+ regulatory T cells from pediatric thymic tissue</td>
</tr>
<tr>
<td>36</td>
<td>Kim Derkatz</td>
<td>MSc Student</td>
<td>Lori West</td>
<td>CD27+IgM+ B cells containing ABO-antibody-secreting cells have increased expression of the inhibitory molecule CD22 in infants: A role in B-cell tolerance after ABOi infant heart transplantation?</td>
</tr>
<tr>
<td>37</td>
<td>Erin Lewis</td>
<td>MSc Student</td>
<td>Catherine Field</td>
<td>Maternal Phosphatidylcholine intake during suckling improves the immune response of the offspring</td>
</tr>
<tr>
<td>38</td>
<td>Osama Abo Alrob</td>
<td>PhD Student</td>
<td>Gary Lopaschuk</td>
<td>Role of lysine acetylation in the maturation of energy metabolism in the newborn heart</td>
</tr>
<tr>
<td>39</td>
<td>Chodchanok Vijarnsorn</td>
<td>Postdoctoral Fellow</td>
<td>Jeffrey Smallhorn</td>
<td>Increased common valve tenting height at initial echocardiogram is a risk factor for progression to severe Atrioventricular valve regurgitation in single ventricles with unbalanced Atrioventricular septal defect</td>
</tr>
<tr>
<td>40</td>
<td>Akiko Hirose</td>
<td>Clinical Fellow</td>
<td>Lisa Hornberger</td>
<td>Influence of preterm delivery on maturational changes in Left Ventricular Myocardial function</td>
</tr>
</tbody>
</table>

*Full abstracts are located by number in the pages following this program.*
Oral Presentations – Pediatric Trainee Research Competition
Chairman Room
15:00 – 17:00

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Position</th>
<th>Mentor</th>
<th>Abstract Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>John Neilson</td>
<td>Subspecialty Resident</td>
<td>Lawrence Richer</td>
<td>Autonomic Instability in Chronic Headache (AICH)</td>
</tr>
<tr>
<td>42</td>
<td>Paul Doughty</td>
<td>Subspecialty Resident</td>
<td>Charlene Robertson</td>
<td>The predictors of and impact of positive blood culture sepsis after cardiac surgery in young infants.</td>
</tr>
<tr>
<td>43</td>
<td>Juliana VanderPluym</td>
<td>Subspecialty Resident</td>
<td>Hanna Kolski</td>
<td>Pediatric Myasthenia: Results of the Canadian Paediatric Surveillance Program (CPSP)</td>
</tr>
<tr>
<td>44</td>
<td>Laura Weingarten</td>
<td>Subspecialty Resident</td>
<td>Amanda Newton</td>
<td>Children’s Satisfaction with Pain Management in the Pediatric Emergency Department.</td>
</tr>
<tr>
<td>45</td>
<td>Mariam Hanna</td>
<td>Subspecialty Resident</td>
<td>Chloe Joynt</td>
<td>Internet Use for Obtaining Medical Information by Parents in a Neonatal Intensive Care Unit (NICU)</td>
</tr>
<tr>
<td>46</td>
<td>Sadia Nakhuda</td>
<td>Subspecialty Resident</td>
<td>Mia Lang</td>
<td>Family-Centred Care in General Pediatric Clinical Teaching Units</td>
</tr>
</tbody>
</table>

Full abstracts are located by number in the pages following this program.

Poster Viewing with beer, wine and appetizers
British Columbia / Alberta / Yukon Room
17:00 – 17:30

Awards & Wrap-up
British Columbia / Alberta / Yukon Room
17:30 – 18:00
Poster Presentations - British Columbia / Alberta / Yukon Room

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Abstract Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>Shinya Ugaki</td>
<td>Comparison of modified single patch and two-patch repair of complete Atrioventricular Septal Defect</td>
</tr>
<tr>
<td>48</td>
<td>William Tong Li</td>
<td>Do rapid response teams improve Neonatal Acuity – A retrospective chart review?</td>
</tr>
<tr>
<td>49</td>
<td>Lesley Brennan</td>
<td>Postpartum vascular function in an animal model of preeclampsia</td>
</tr>
<tr>
<td>50</td>
<td>Alicia Pawlowski</td>
<td>Maternal early life trauma and wheeze in young children: Could there be an association?</td>
</tr>
<tr>
<td>51</td>
<td>Linda Mahgoub</td>
<td>Pulmonary Vein Stenosis in ex-premature infants</td>
</tr>
<tr>
<td>52</td>
<td>Todd Radostits</td>
<td>Identifying genetic markers for risk of Thrombosis in pediatric cancer patients: multicentre Canadian study</td>
</tr>
<tr>
<td>53</td>
<td>Ahmed El-Sehemy</td>
<td>The role of GUCY1B3 in Epithelial Ovarian cancer chemotherapy resistance</td>
</tr>
<tr>
<td>54</td>
<td>Rouzbeh Ghahreman</td>
<td>Approaching hidden issues: Building a partnership with the Alberta Association of the Deaf (AAD)</td>
</tr>
<tr>
<td>55</td>
<td>Danielle Arseneau</td>
<td>Exploring the experiences of using iPads for data collection in a pan-Canadian study</td>
</tr>
<tr>
<td>56</td>
<td>Manoj Kumar</td>
<td>Is Epidural Analgesia in labor associated with respiratory distress in term and near-term neonates– A case-control study</td>
</tr>
<tr>
<td>57</td>
<td>Lauren Albrecht</td>
<td>Mixed methods data collection in general emergency departments using iPads: experiences from Translating Emergency Knowledge for Kids (TREKK)</td>
</tr>
<tr>
<td>58</td>
<td>Christen Klinger</td>
<td>Comparative genomic analysis of multi-subunit tethering complexes reveals patterns within the Apicomplexa and across Eukaryotes</td>
</tr>
<tr>
<td>59</td>
<td>Joel Strautman</td>
<td>The study of Hereditary Spastic Paraplegia using Drosophila genetics</td>
</tr>
<tr>
<td>60</td>
<td>Jocelyn Lai</td>
<td>Long-term followup of Antenatal UPJ obstruction</td>
</tr>
<tr>
<td>61</td>
<td>Jihong Lian</td>
<td>Ces3/TGH deficiency protects mice from diet induced Hepatic Steatosis</td>
</tr>
<tr>
<td>62</td>
<td>Jean Trines</td>
<td>Effectiveness of prenatal screening for Congenital Heart Disease in the province of Alberta</td>
</tr>
<tr>
<td>63</td>
<td>Hai Chuan Yu</td>
<td>Overexpression of GUCY1B3 reduces chemosensitivity to Carboplatin and increases proliferation of Ovarian Cancer cells</td>
</tr>
<tr>
<td>64</td>
<td>Nikki Nosworthy</td>
<td>Community-Based Research partnerships: Keeping the right people at the table</td>
</tr>
<tr>
<td>65</td>
<td>Rami Abou Zeinab</td>
<td>The role of Ubiquitin lysine chains in Pirh2 Self and P53 Ubiquitination</td>
</tr>
<tr>
<td>66</td>
<td>Mandy Archibald</td>
<td>Mapping the waters: A scoping review of the use of visual arts in pediatric populations with medical conditions</td>
</tr>
<tr>
<td>67</td>
<td>Jolene Medynski</td>
<td>Acute pain in hospitalized chronically ill children</td>
</tr>
<tr>
<td>#</td>
<td>Name</td>
<td>Abstract Title</td>
</tr>
<tr>
<td>----</td>
<td>--------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>68</td>
<td>Candace Necyk</td>
<td>Study of Natural health product Adverse Reactions (SONAR): Active surveillance in community pharmacies</td>
</tr>
<tr>
<td>69</td>
<td>Baljit Khamba</td>
<td>The safety of Homoepathy: A systematic review</td>
</tr>
<tr>
<td>70</td>
<td>Paula Holinski</td>
<td>A preliminary description of the severity of illness and hospital outcomes of pediatric Severe Sepsis in pediatric intensive care units in Alberta</td>
</tr>
<tr>
<td>71</td>
<td>Samana Ali</td>
<td>Systematic review of RCTs of prebiotics for prevention of Necrotizing Enterocolitis in preterm infants</td>
</tr>
<tr>
<td>72</td>
<td>Rose Kalu</td>
<td>Maternal body mass index and infant birth weight</td>
</tr>
<tr>
<td>73</td>
<td>Bethany Ostrowerka</td>
<td>First trimester fetal Echocardiography in the assessment of fetal cardiac structure</td>
</tr>
<tr>
<td>74</td>
<td>Liliane Zorzela</td>
<td>PRISMA harms extension</td>
</tr>
<tr>
<td>75</td>
<td>Melissa Daniels</td>
<td>The use of participatory research principles to explore knowledge translation for a qualitative pediatric weight management study</td>
</tr>
<tr>
<td>76</td>
<td>Ross Ballantyne</td>
<td>Texting Teens in Transition: The use of social networking in clinical intervention research</td>
</tr>
<tr>
<td>77</td>
<td>Daniel Chambers</td>
<td>Dysregulation of AKT pathway proteins in a Drosophila Melanogaster model of Fragile X</td>
</tr>
<tr>
<td>78</td>
<td>Andre Isaac</td>
<td>Pediatric sand aspiration with use of Extracorporeal Membrane oxygenation</td>
</tr>
<tr>
<td>79</td>
<td>Annette Kratochvil</td>
<td>Antibody-mediated rejection in a mouse model of ABO-incompatible infant heart transplantation</td>
</tr>
<tr>
<td>80</td>
<td>Anastasia Kutt</td>
<td>Assessment of the Complementary and Alternative Medicine (CAM)-stream of IntD410, an Interprofessional Education course at the University of Alberta, to change the beliefs of health sciences students towards CAM and IPE</td>
</tr>
<tr>
<td>81</td>
<td>Krista Gray</td>
<td>Learning about the parent perspective on probiotics and infant health</td>
</tr>
<tr>
<td>82</td>
<td>Mona Alasmi</td>
<td>Gastrectomy in a teenager with Diffuse Hereditary Gastric Carcinoma</td>
</tr>
<tr>
<td>83</td>
<td>Dawn Danielson</td>
<td>A survey of primary care providers’ level of comfort and understanding of newborn metabolic screening in Alberta</td>
</tr>
<tr>
<td>84</td>
<td>Victoria Todhunter</td>
<td>Sleep studies in the Neonatal Intensive Care Unit: A 10 year review</td>
</tr>
<tr>
<td>85</td>
<td>Natasha Fillmore</td>
<td>Energy metabolism of bone marrow Mesenchymal stem cells</td>
</tr>
<tr>
<td>86</td>
<td>Vishaal Rajani</td>
<td>Contributions of ATP signaling to the Perinatal Hypoxic Ventilatory response</td>
</tr>
<tr>
<td>87</td>
<td>Laura Reyes</td>
<td>Exercise as a therapeutic approach for Fetal-programmed Cardiovascular Dysfunction</td>
</tr>
<tr>
<td>88</td>
<td>Tamara Dorfman</td>
<td>A systematic review of instruments for scoring physiological and behavioural cues of pain, non-pain related distress, and adequacy of analgesia and sedation in pediatric mechanically ventilated patients</td>
</tr>
<tr>
<td>#</td>
<td>Name</td>
<td>Abstract Title</td>
</tr>
<tr>
<td>----</td>
<td>-----------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>89</td>
<td>Daniel Kerage</td>
<td>Sphingosine 1-phosphate (S1P)-induced endothelial permeability causes leakage of circulating constrictors generating increased vascular tone</td>
</tr>
<tr>
<td>90</td>
<td>Harmanpreet Kaur</td>
<td>Effect of plasmid loaded βFGF and low intensity pulsed ultrasound on the Mandibular Condylar growth</td>
</tr>
<tr>
<td>91</td>
<td>Nicole Dahl</td>
<td>Leading the way for children and families: A scoping review of the patient navigator role in Canadian pediatric settings</td>
</tr>
<tr>
<td>92</td>
<td>Muhammad Zafar Hydrie</td>
<td>Systematic review to identify core outcomes for pediatric research in Diabetes</td>
</tr>
<tr>
<td>93</td>
<td>Lesley Thomas</td>
<td>Lysine Acetylation impairs cardiac insulin signaling in diet-induced obese mice</td>
</tr>
<tr>
<td>94</td>
<td>Gonzalo Garcia Guerra</td>
<td>Safe administration of Milrinone infusion</td>
</tr>
<tr>
<td>95</td>
<td>Elena Arutyunova</td>
<td>Structural basis for lactoferrin recognition by Neisseria Meningitidis</td>
</tr>
<tr>
<td>96</td>
<td>Timothy Colen</td>
<td>Non-invasive assessment of right heart and pulmonary vascular coupling in children with Pulmonary Hypertensive Vascular Disease: A simultaneous Echocardiographic and Catheterization study</td>
</tr>
<tr>
<td>97</td>
<td>Abeer Alzaben</td>
<td>Vitamin D/K and calcium intake and bone health in children who have undergone liver transplantation</td>
</tr>
<tr>
<td>98</td>
<td>Cecilia Llambias</td>
<td>Hippotherapy: Motivating children with Autism to participate in purposeful activities</td>
</tr>
<tr>
<td>99</td>
<td>Yael Mansour</td>
<td>Exposure of E. coli LF82 bacteria to 5-Aminosalicylic Acid (5-ASA) does not inhibit bacteria-induced barrier disruption</td>
</tr>
<tr>
<td>100</td>
<td>Sarah Aziz</td>
<td>Prenatal resveratrol treatment fails to prevent the development of hypertension in the spontaneously hypertensive rat</td>
</tr>
<tr>
<td>101</td>
<td>Yong Zhang</td>
<td>Microglia do not attenuate the opioid-induced depression of preBötzinger inspiratory rhythm in vitro via a TLR4-independent pathway</td>
</tr>
<tr>
<td>102</td>
<td>Gaurav Nagar</td>
<td>To conduct a systematic review of the diagnostic accuracy of TcB devices measuring Transcutaneous Bilirubin in the preterm infants</td>
</tr>
<tr>
<td>103</td>
<td>Priya Jaggi</td>
<td>Validation of a questionnaire, specifically designed for the identification of pediatric environmental risk factors</td>
</tr>
<tr>
<td>104</td>
<td>Michelle Casey</td>
<td>Developmental regulation of expression of the Homeobox gene Nkx2.2 and Chemokine receptor Cxcr4 by Dlx transcription factors</td>
</tr>
<tr>
<td>105</td>
<td>Amr Abdelradi</td>
<td>Evaluation and quantification of morphological differences in the esophageal mucosa of Eosinophilic Esophagitis, Reflux Esophagitis, and control patients using a transmission electron microscope</td>
</tr>
<tr>
<td>106</td>
<td>Aldrich Leung</td>
<td>Intestinal permeability in children with Eosinophilic Esophagitis and Gastroesophageal Reflux Disease</td>
</tr>
<tr>
<td>#</td>
<td>Name</td>
<td>Abstract Title</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>107</td>
<td>Ganesh Venkatraman</td>
<td>Lysophosphatidate causes Breast Cancer Chemo-resistance through Phospholipase D activation and increased expression of multi-drug transporters</td>
</tr>
<tr>
<td>108</td>
<td>Menaka Sivakumar</td>
<td>Cardio-respiratory function of school age children born as extremely low birth weight infants with BPD or without BPD</td>
</tr>
<tr>
<td>109</td>
<td>Orysya Svystun</td>
<td>Localization and ubiquitination of the Modulator of Apoptosis-1 (MOAP-1)</td>
</tr>
<tr>
<td>110</td>
<td>Basak Sahin</td>
<td>Use of siRNA and polymeric carriers in treatment of childhood lymphoma</td>
</tr>
<tr>
<td>111</td>
<td>Eric Chalmers</td>
<td>A system for use in researching ideal brace treatment dosage for Scoliosis</td>
</tr>
<tr>
<td>112</td>
<td>Katrina Kully-Martens</td>
<td>Service utilization patterns among children and adolescents with Prenatal Alcohol exposure and Fetal Alcohol Spectrum Disorder</td>
</tr>
<tr>
<td>113</td>
<td>Salima Punja</td>
<td>Rhodiola Rosea for mental and physical fatigue in nurses on shift work: A randomized controlled trial</td>
</tr>
<tr>
<td>114</td>
<td>Kristie DeHaan</td>
<td>Developing new criteria for review of sleep studies in children under 2 years of age</td>
</tr>
<tr>
<td>115</td>
<td>Manjula Gowrishankar</td>
<td>Serum Cystatin C measurement predicts renal function in children with solid organ transplants</td>
</tr>
<tr>
<td>116</td>
<td>Grayson Beecher</td>
<td>Genes linked to Autism regulate normal social interaction in Drosophila</td>
</tr>
<tr>
<td>117</td>
<td>Matthew Benson</td>
<td>Defining the molecular basis of Microphthalmia, Anophthalmia, and Coloboma</td>
</tr>
<tr>
<td>118</td>
<td>Darren Hutchinson</td>
<td>Utility of Fetal Echocardiography in the evaluation and treatment of Fetal Anemia</td>
</tr>
<tr>
<td>119</td>
<td>Mordechai Slae</td>
<td>Role of environmental factors in childhood Eosinophilic Esophagitis</td>
</tr>
<tr>
<td>120</td>
<td>Dana MacIntyre</td>
<td>Post-discharge, body composition and growth factors in preterm infants with differing growth patterns: A pilot study</td>
</tr>
<tr>
<td>121</td>
<td>Angela Coppola</td>
<td>The path to “Nehiyawiyisín:” Co-developing a memorandum of understanding for a school-university partnership</td>
</tr>
<tr>
<td>122</td>
<td>Jennifer Stanfel</td>
<td>Estrogen-induced vasodilation in uterine arteries is effected in part through S1P3 receptors to Sphingosine-1-Phosphate and increases in late pregnancy</td>
</tr>
<tr>
<td>123</td>
<td>Viane Faily</td>
<td>Development and use of food frequency questionnaire Choline database to estimate Choline intake prior to pregnancy in the APrON Cohort</td>
</tr>
<tr>
<td>124</td>
<td>Aisha Baig</td>
<td>New insights into an old drug: investigating the effects of 5-ASA on the Inflammasome-Mediated Epithelial cell extrusion</td>
</tr>
<tr>
<td>125</td>
<td>Deenaz Zaidi</td>
<td>Intestinal epithelial cell extrusion in Pediatric Inflammatory Bowel Diseases (IBD): a key to unravelling disease prognosis and pathogenesis</td>
</tr>
<tr>
<td>126</td>
<td>Emily Chan</td>
<td>Development of a Canadian socioeconomic index for children</td>
</tr>
<tr>
<td>127</td>
<td>Abul Kalam Azad</td>
<td>CCDC3: A novel regulator of Endothelial signaling</td>
</tr>
<tr>
<td>#</td>
<td>Name</td>
<td>Abstract Title</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>128</td>
<td>Sandra Hodgetts</td>
<td>Parents’ and professionals perspectives on Autism services in Alberta</td>
</tr>
<tr>
<td>129</td>
<td>Stephanie Patricia Kowal</td>
<td>Collaborating for health protection information: A Community-Based Research Project to develop vaccination information for new immigrant populations in Edmonton</td>
</tr>
<tr>
<td>130</td>
<td>Marilyn Gordon</td>
<td>Linking inflammation and cancer: A novel role for the Tumor Suppressor RASSF1A</td>
</tr>
<tr>
<td>131</td>
<td>Amber Savage</td>
<td>The well-being of Canadian youth with and without learning difficulties</td>
</tr>
<tr>
<td>132</td>
<td>Angie Ip</td>
<td>Factors influencing ASD screening by community paediatricians: A Mixed methods study - Phase one</td>
</tr>
<tr>
<td>133</td>
<td>Devika Dixit</td>
<td>Attitudes and feelings about hand hygiene among pediatric residents</td>
</tr>
<tr>
<td>134</td>
<td>Gary Galante</td>
<td>Pericardial effusion after open heart surgery in the paediatric population: Incidence, risk factors, and outcomes</td>
</tr>
</tbody>
</table>

*Full abstracts are located by number in the pages following this program.*
Abstract #: 1
Submitter: Tara Stach
Title: **Identification of the Superior Ocular Fissure & characterization of its molecular genetics**
Authors: Jakub Famulski, Andrew Waskiewicz, Ordan Lehmann
Presenter: Tara Stach
Affiliations: University of Alberta
Category: Preconception Pregnancy Birth Early Beginnings
Investigation Type: Quantitative Research

INTRODUCTION:
The closure of fissures during development is common to multiple tissues (neural tube, palate), including the eye. Although the failure of fissure closure has profound consequences (e.g. spina bifida), the precise mechanisms involved remain incompletely defined. The eye’s accessibility to detailed phenotypes makes it an ideal organ to use as a model, with potential that progress may provide insight in other tissues. Although an inferior fissure is well-recognized (required for migration of multi-potent stem cells that form vasculature and other structures), we have identified a novel superior ocular fissure in both patients and zebrafish.

RESULTS:
We have identified the presence of a superior ocular fissure in both human patients presenting with coloboma and in the developing zebrafish eye, indicating an evolutionarily conserved functionality. Restricted expression of genes responsible for retinoic acid metabolism (aldh1a2, aldha13, cyp1b1) to the areas of the superior and inferior fissures during eye development has led us to suspect a role for retinoic acid in the closure of ocular fissures. We have found that the knock-down of cyp1b1 by splice-blocking morpholinos results in an increase in the presence and severity of ocular fissures, and that supplementation of zebrafish coloboma models with Vitamin A during development provides a rescue to these phenotypes. In addition, the expression boundaries of the forkhead box transcription factors foxg1 (nasal retina) and foxd1 (temporal retina) that are established early to control the projection of retinal axons, correspond with the locations of the superior and inferior fissures, and inhibition of foxd1 results in superior fissure duplication and displacement, while inhibition of foxg1 results in a spectrum of ocular phenotypes (e.g. coloboma and unilateral anophthalmia), suggesting a role for both genes in fissure development.

CONCLUSIONS:
Retinoic acid, the active derivative of Vitamin A, appears to play a role in ocular fissure closure, suggesting that Vitamin A supplementation could be a preventative therapeutic for coloboma.
INTRODUCTION:
The Dlx family of homeobox genes are critical for vertebrate neuronal differentiation, survival and migration during forebrain and retinal development. To further understand genetic regulation of neural differentiation and migration by Dlx genes, we examined transcriptional regulation of p107 during development of the murine forebrain and retina. We hypothesized that DLX2 directly occupies the p107 promoter and activates p107 expression during central nervous system development.

METHODS:
Chromatin immunoprecipitation and gel shift assays were utilized to identify interactions between DLX2 at the p107 promoter in situ and specific binding, respectively. Quantitative real-time PCR and immunofluorescence analysis using Dlx1/Dlx2 double knockout murine tissue, and reporter gene assays determine functional consequence of DLX occupation at the p107 promoter. Mutation of putative DLX2 homeodomain binding sites in p107 promoter identified critical DLX2 binding sites.

RESULTS:
DLX2 occupies the p107 promoter in situ in both the developing forebrain and retina and binds directly to p107 in vitro. In the absence of Dlx/Dlx2, we observe reduction in p107 expression. DLX2 binding to the p107 promoter significantly activates p107 expression in vitro. DLX2 binding sites within two p107 promoter regions have been identified as critical for both activation of and direct binding to p107 in vitro.

CONCLUSIONS:
DLX2 binds to the promoter of p107 in situ and in vitro, resulting in the activation of p107 expression in the developing central nervous system. Future studies will confirm the relevance of DLX2-p107 interactions in vivo through crossing a p107 reporter mouse into a Dlx1/Dlx2 null background. Additionally, we will determine the functional significance of Dlx expression in postnatal forebrain and retina through characterization of Dlx2 conditional knockout mice. This study will identify molecular mechanisms, which define a role for Dlx in regulation of neuronal differentiation, survival and migration through regulation of the cell cycle.
Title: Dietary supplementation with broccoli sprouts for pregnant rats will provide neuroprotection against neurobehavioural deficits and brain injury induced by the fetal inflammatory response

Authors: Antoinette Nguyen, Edward Armstrong, Ashley Bahry, Jennifer Corrigan, Jerome Yager

Presenter: Antoinette Nguyen

Affiliations: University of Alberta

Category: Child Youth Development | Preconception Pregnancy Birth Early Beginnings

INTRODUCTION:
Maternal infection and inflammation result in a fetal inflammatory response. Fetal inflammation increases pro-inflammatory cytokines and oxidative stress, epidemiologically shown to increase the risk of cerebral palsy and developmental disability two to four-fold. Currently, no therapies are available for the prevention of these disorders. Studies have identified broccoli sprouts (BrSp) as a potent phase II enzyme inducer. BrSp contain high concentrations of compounds that enhance endogenous antioxidant system and prevents the initiation of inflammation. Our objectives are to (1) develop a model of fetal inflammation, and (2) determine whether BrSp dietary supplementation during pregnancy is able to prevent fetal brain injury and neurobehavioral deficits.

METHODS:
To induce fetal inflammation, the endotoxin lipopolysaccharide (LPS) was administered via intraperitoneal injections to pregnant rats. Dried BrSp are fed from the third trimester until weaning. The experiment consists of four groups: i) saline; ii) LPS; iii) saline + BrSp; and iv) LPS + BrSp. Newborn rat pups underwent a battery of neurological reflex testing and were later euthanized for histology, ELISA, and western blot analyses.

RESULTS:
Our study shows that birth weights of pups born from LPS injected dams weigh significantly < pups from control dams. Birth weight values of the LPS groups indicate intrauterine growth restriction. Several neurobehavioral reflexes were significantly delayed in the LPS group, suggesting LPS causes a developmental lag. BrSp supplementation was able to reverse the developmental lag in some of these reflexes to levels comparable to controls.

CONCLUSIONS:
Our results indicate that BrSp supplementation improved the developmental lag seen in the LPS group, in some reflexes. BrSp supplementation during pregnancy may have a protective effect against developmental disability caused by infection and inflammation. The recognized safety of BrSp may provide an innovative and safe approach that can translate rapidly from the laboratory to clinical trials.
INTRODUCTION:
Hereditary Spastic Paraplegia (HSP) is a group of rare inherited neurodegenerative disorders clinically characterized by progressive weakness and spasticity of the lower limbs. HSP results from the disruption of axonal transport near the distal parts of neurons and could start at an early age. Two of the most common causes of HSP are mutations in the genes Spastin (spast) and Atlastin (Atl-1), which are known to interact and are both required for proper axonal morphology. It is not clear how these genes lead to HSP. Here, we validated novel genetic tools in Drosophila to study the motor defects resulting from mutations in the fly orthologs of the genes involved in HSP.

METHODS:
Flies hypomorphic for the mRNA product of these genes were generated by activating an RNAi response against these genes using the UAS GAL-4 system. This system allows a transgene of interest to be expressed in a specific pattern. As such, flies hypermorphic for the mRNA product of these genes were also generated. The locomotion of both Spast and Atl-1 RNAi lines, driven by the UAS GAL-4 system, along with appropriate controls, was tested using a climbing assay. In short, flies were placed in a graduated cylinder and, after starting from the bottom, the proportion of flies, which climbed above the 17.5 cm mark, was recorded over a period of two minutes.

RESULTS:
For both Spast and Atl-1 RNAi expressing flies, < 20% crossed the 17.5 cm line in 2 minutes whereas, more than 80% of all of the controls were able to cross the same line in the allotted time. On the other hand, only flies overexpressing SPAST showed a significant reduction in climbing ability with approximately 20% crossing the 17.5 cm line in 2 minutes. Overexpression of Atl-1 did not have an effect on locomotion with greater than 80% of flies crossing the line in the allotted time which was similar to the controls.

CONCLUSIONS:
This suggests that, as is the case in humans, the genes Spast and Atl-1 are responsible for proper locomotion in D. melanogaster and thus are two of the major genes responsible for HSP.
INTRODUCTION:
The reach-to-eat movement is a natural act in which an object or food item is grasped and brought to the mouth. It is one of the earliest forelimb behaviors displayed by human infants, who bring almost all grasped objects to the mouth, and is used daily by adults. In adults, there is a tight coupling between visual attention and the advance phase of the reach-to-eat movement. The target is visually engaged just as hand advance is initiated and visually disengaged just as the target is grasped. This coupling of vision and hand advance suggests that advance is mediated by visual attention and withdrawal by somatosensation. The present study examined when the tight coupling between visual attention and the advance phase of the movement develops in infancy.

METHODS:
In a longitudinal study, eight infants, aged six months to twelve months, and twenty adults reached for familiar inanimate objects and food items. Visual gaze, hand movement, and hand accuracy were measured using frame-by-frame video scoring and 2D kinematic analysis.

RESULTS:
The study found that the youngest infants (six to eight months) visually engaged the target well before initiating a reaching movement and continued to fixate on the target after it was grasped and as it was brought to the mouth. Between ten and twelve months of age, infants began to visually engage the target just as the reaching movement was initiated and visually disengage the target as it was grasped, as did the adults. Over the same developmental time period, the infants developed rotatory hand shaping movements, precision grasping, and improved targeting accuracy both for grasping the object and placing it into the mouth.

CONCLUSIONS:
The results suggest that visual guidance of advance and somatosensory guidance of withdrawal develop together and in concert with hand movement ability and skill.
INTRODUCTION:
Endothelial colony forming cells (ECFC) are a subset of bone-marrow derived endothelial progenitor cells (EPC) involved in fetal and adult neovascularisation, angiogenesis, and may play role in endothelial repair. Alterations in EPC functionality may represent a significant risk factor for long-term cardiovascular disease. Intrauterine growth restriction (IUGR) is a pregnancy complication in which the fetus fails to reach its genetically predetermined growth potential, and is associated with neonatal and long-term morbidity and mortality. We hypothesized that fetal ECFCs derived from pregnancies complicated by IUGR would exhibit altered vasculogenic potential.

METHODS:
Umbilical cord blood from human uncomplicated and IUGR pregnancies were collected at delivery. ECFCs were counted by flow cytometry using discriminators: 7AAD-/CD31bright/CD45-/KDR+/CD34+. Cord-blood ECFCs were propagated from single cell cultures, and their vasculogenic capacity investigated by implantation into artificial tissue blocks (with adipose derived stem cells) into adult immuno-deficient (NOD/SCID) mice. A subset of ECFC was also retrovirally transduced to express EGFP (EGFP-ECFC) or LacZ (LacZ-ECFC) to confirm their role in neovascularisation.

RESULTS:
(1) Single cell cultures of ECFCs confirmed their progenitor phenotype. (2) ECFC numbers, as a percentage of mononuclear cells, were 67% lower in IUGR cord blood compared to controls (P=0.002), and exhibited a 71% longer doubling time (P=0.01), which indicates a slower proliferation rate. (3) Implantation of artificial tissue blocks containing ECFCs into NOD/SCID mice demonstrated their capacity for de-novo vessel formation (100%, n=22), and systemic perfusion with vascular casting compounds confirmed patency of newly formed vasculature. (4) Blood vessel formation was reduced in collagen implants populated with IUGR-derived ECFCs.

CONCLUSIONS:
These early findings suggest that ECFCs derived from IUGR cord blood have intrinsic functional alterations, resulting in diminished vasculogenic potential.
Adaptor protein 1 complexes regulate intracellular trafficking of the Kidney anion exchanger 1 in Epithelial cells

INTRODUCTION:
Distal renal tubular acidosis (dRTA) can be caused by mutations in the gene encoding the anion exchanger 1 (AE1) and is characterized by defective urinary acidification, metabolic acidosis, and renal stones. AE1 is expressed at the basolateral membrane of type A intercalated cells in the renal cortical collecting duct (kAE1). Two dRTA mutations result in the carboxyl-terminal truncation of kAE1; in one case, the protein trafficked in a nonpolarized way in epithelial cells. A recent yeast two-hybrid assay showed that the carboxyl-terminal cytosolic domain of AE1 interacts with adaptor protein complex 1 (AP-1A) subunit μ1A (mu-1A; Sawasdee N, Junking M, Ngaojanlar P, Sukomon N, Ungsupravate D, Limjindaporn T, Akkarapatumwong V, Noisakran S, Yenchitsomanus PT. Biochem Biophys Res Commun 401: 85–91, 2010).

METHODS:
Here, we show the interaction between kAE1 and mu-1A and B in vitro by reciprocal coimmunoprecipitation in epithelial cells and in vivo by coimmunoprecipitation from mouse kidney extract.

RESULTS:
When endogenous mu-1A (and to a lesser extent mu-1B) was reduced, kAE1 protein was unable to traffic to the plasma membrane and was rapidly degraded via a lysosomal pathway. Expression of either small interfering RNA-resistant mu-1A or mu-1B stabilized kAE1 in these cells. We also show that newly synthesized kAE1 does not traffic through recycling endosomes to the plasma membrane, suggesting that AP-1B, located in recycling endosomes, is not primarily involved in trafficking of newly synthesized kAE1 when AP-1A is present in the cells.

CONCLUSIONS:
Our data demonstrate that AP-1A regulates processing of the basolateral, polytopic membrane protein kAE1 to the cell surface and that both AP-1A and B adaptor complexes are required for normal kAE1 trafficking.
INTRODUCTION:
The preBötzing complex (preBötC) in the brainstem has a fundamental role in generating breathing rhythm. During hypoxia (low oxygen), ventilation first increases but then falls. In newborn and especially premature mammals, the secondary fall is very large and life-threatening, which accounts for the great clinical interest in identifying underlying mechanisms. ATP is released in the preBötC during hypoxia where it appears to offset the magnitude of this secondary fall in ventilation by activating the P2Y1 subtype of P2 receptor (R). Pharmacological data with imperfectly selective antagonists suggest that P2Y1Rs act through protein kinase C (PKC).

METHODS:
To further test the involvement of PKC in the P2Y1R-mediated frequency increase, the P2Y1R agonist, MRS2365 (10 sec, 100 µM), and the PKC activator, phorbol 12-myristate 13-acetate (PMA, 10 sec, 500 nM) were injected into the preBötC of medullary slices that generate an inspiratory-related rhythm in vitro. Effects on inspiratory frequency were measured by recording activity from cranial nerve XII.

RESULTS:
MRS2365 and PMA had virtually identical effects on peak frequency (2.20±0.16 vs 2.27±0.16-fold), but the MRS2365 effect lasted almost 3 times longer than that of PMA (357±43 vs 115±23 sec; n=5; p=0.017). To further test whether MRS2365 acts through PKC, we performed an occlusion experiment. We maximally-activated PKC by injecting PMA (100 µM, 60 sec) followed immediately by MRS2365 (100 µM, 10 sec). If P2Y1Rs act solely through PKC, preactivation of PKC with PMA should block (occlude) the ability of MRS2365 to increase frequency. Preapplication of PMA significantly reduced the MRS2365-evoked frequency increase from 2.32±0.24 to 1.97±0.19-fold (n=9, p=0.009); i.e. an ~20% occlusion.

CONCLUSIONS:
These data first confirm that activation of PKC increases the frequency of preBötC inspiratory networks. However, the relatively weak occlusion of MRS2365 effects by PMA also suggests that the P2Y1R mediated frequency increase is mediated only in part by the activation of PKC; a number of other downstream signalling cascades likely contribute.
INTRODUCTION:
Health related quality of life (HRQL) of children is an essential outcome of patient-centered pediatric research. HRQL is a multidimensional concept and its measurement is challenging. Individualized HRQL (iHRQL) measures propose a measurement approach where patients can nominate and then score important aspects of their life from own perspective. The objective of this paper was to identify all available pediatric iHRQL measure(s), and to assess reporting of psychometric properties in studies where HRQL was primary outcome.

METHODS:
We searched six common databases from inception to March-April 2011. English language studies of any design including any children < or equal to 18 years were included if they reported validation or use of an iHRQL measure.

RESULTS:
We identified 68 studies reporting on use or validation of eight iHRQL measures in children or mixed (adult and pediatric) population. Five disease-specific and three generic measures were identified. Included studies reported 27 unique definitions of HRQL. The majority of the primary outcome studies did not report relevant references to support their choice of outcome measures.

CONCLUSIONS:
Reported HRQL definitions were heterogeneous, and the majority of studies did not report relevant references of prior validation. Further assessment of their reported psychometric properties is needed before they can be recommended for pediatric use.
INTRODUCTION:
The incidence of pediatric stroke has risen to >3.0/100,000; equal to childhood cancer. Neurological deficits ranging from mild to severe, in both motor and cognitive spheres are witnessed in 70-75% of survivors of pediatric stroke and clearly may influence their health related quality of life (HRQL).

METHODS:
A cross sectional study at the Stollery Children’s Hospital. Parents of children diagnosed with pediatric arterial ischemic stroke since January 2003 were approached for participation. Inclusion criteria: (1) age >2 years at the time of follow up, (2) at least 1 year follow up after childhood stroke, and (3) at least 2 years follow up after perinatal stroke. Exclusion criteria: underlying genetic syndromes. HRQL was evaluated using self-report (5-18 years) and proxy report (2-18 years) versions of the Pediatric Quality of Life Inventory (PedsQL 4.0).

RESULTS:
Fifty-two children were enrolled. Median age at the onset of stroke was 0 days (IQ range: 0-48.5 days). Mean age at assessment and time elapsed since stroke was 6.35 (SD: 4.33) and 4.94 (SD: 3.04) years respectively. Forty-two (81%) kids had neurological deficits, with 22 (42%) of children reporting severe deficits. Lower overall HRQL scores were reported in both parent-proxy (p=0.001) and self-report (p=0.002) forms compared to the reference normal population. Parents expressed concerns in both physical (p=0.001) and psychosocial (=0.001) domains of HRQL. Although children didn’t express significant concerns in the emotional and social functioning domains, physical (0.038) and school functioning (p=0.001) was reported to be significantly impaired. Moderate to large effect sizes were expressed across multiple domains indicating the clinical significance of the observations drawn.

CONCLUSIONS:
Both parents and children identify HRQL of their children to be lower than controls. However, parents differ in their assessment of HRQL deficiencies compared to their children’s self-report. The findings have direct implications regarding our approach to the cognitive and psycho-social well being of the parents and children with stroke.
INTRODUCTION:
An area largely ignored in the literature is the quality of life of children with Fetal Alcohol Spectrum Disorder (FASD), and children with Prenatal Alcohol Exposure (PAE) who were exposed but do not qualify for a diagnosis. The primary goal of this study was to measure the quality of life of children with PAE and FASD and the impact of the disability on the family. A secondary goal was to compare results to those gathered from healthy children and to create and compare the profiles of strengths and deficits for each group (PAE, FASD, controls).

METHODS:
Participants (aged 6-16) included 39 children with FASD, 21 with PAE, and a comparison group of 29 healthy controls. Children and caregivers completed the PedsQL, which measures quality of life related physical, emotional, social, and school functioning, as well as a supplementary Cognitive Functioning Scale. Caregivers completed the LAQ-G which measures the impact of childhood disability on the family across six domains: communication, mobility, self-care, domestic life, interpersonal interactions and relationships, and community and social life.

RESULTS:
Results show that children with FASD and PAE have lower quality of life than healthy controls. While children with FASD had lower quality of life than the PAE group, the PAE group was significantly impaired compared to the healthy control group. The impact of the disability on the family was found to be significantly higher in the PAE and FASD groups compared to the healthy control group. We will discuss the profile of deficits on each scale, highlighting areas of functioning most severely impacted across each group. We will review individual areas of strength and deficit for each group.

CONCLUSIONS:
This research has significant implications for the health of children with PAE and FASD and their families, and will inform the development of appropriate services and supports. Identifying the unique needs of the families of children with PAE and FASD will ultimately inform service and resource allocation to assist families in specific areas of need.
INTRODUCTION:
Individuals with FASD experience neurobehavioural difficulties and a range of serious adverse life outcomes (AOs) including justice-involvement and victimization. Prenatal alcohol exposure increases vulnerability to stress, and stressful life events (SLEs) influence outcomes such as substance use and violence. Despite high rates of stress, victimization, and criminal behaviour in individuals with FASD, the relationship between these factors is unclear. This research explored the rates of AOs and SLEs, and their interrelationship in justice-involved youth with FASD, with three research questions: 1) Do youth with and without FASD differ in rates of SLEs or AOs? 2) How are SLEs related to AOs in youth with FASD? and 3) Do SLEs or AOs relate to future recidivism in youth with FASD?

METHODS:
100 young offenders (50 with FASD, 50 without) aged 12 to 23 years (M = 17.53, SD = 1.59, 81% male) completed questionnaires and an interview as part of a larger battery. The Stressful Urban Life Events Scale (SULES) was used to measure SLEs, and AOs (i.e., victimization, mental health problems, inappropriate sexual behaviour, school/employment problems, substance use, confinement, recidivism) were measured using self-report and a review of clinical and legal records.

RESULTS:
FASD and Comparison groups did not differ significantly on SLEs. In terms of AOs, youth with FASD had significantly higher rates of mental health problems and victimization, and twice as many youth with FASD had problems with sexual behaviour. RQ2. Victimization was significantly related to life transitions. RQ3. Recidivism at 6 months follow-up correlated significantly with baseline employment problems, and was highly related to exposure to violence in youth with FASD.

CONCLUSIONS:
Youth with FASD may be especially vulnerable to victimization. Helping to achieve stability in day-to-day functioning and steady employment may be particularly important in reducing risk in this population.
Abstract #: 13
Submitter: Tracy Durksen
Title: Exploring community support worker case notes for experiences of low-income transitional Aboriginal families
Authors: Tracy Durksen
Presenter: Tracy Durksen
Affiliations: University of Alberta
Category: Womens Health
Investigation Type: Community-Based Research

INTRODUCTION:
Practitioners and policymakers, charged with providing the best health and social services to vulnerable populations, are concerned about the stresses experienced by Aboriginal families as they transition from more isolated communities to an urban centre. This WCHRI Science Shop project was a natural next step for Families First Edmonton (FFE) as it compliments the information uncovered in a previous report on the social determinants of health for Edmonton’s low-income Aboriginal families with children. This presentation highlights the experiences of Aboriginal families in transition (a subset of the 1,279 families that participated in the FFE study), as recorded in community support workers’ notes.

METHODS:
In response to the training interests of Aboriginal Supports in Human Resources (ASHR), the following research question was posed: What can we learn from the FFE case notes about how community support workers facilitate the transition to Edmonton for Aboriginal families who originate from more isolated communities? To answer this question, we identified case notes with evidence of Aboriginal families (N = 19) transitioning between their traditional home and urban Edmonton. To ensure accurate interpretation of the case notes, content analysis was conducted in consultation with ASHR.

RESULTS:
Regardless of the amount of time spent living in Edmonton, these Aboriginal families (from 16 different communities) experienced similar transitional challenges. The case notes revealed how families, while working with a community support worker, tackled barriers relating to housing, food, family issues, transportation, and social isolation. Practical help provided by community support workers for Aboriginal families in transition also emerged from the case notes.

CONCLUSIONS:
Through the use of a community-based research approach this project produced rigorous analyses guided by culturally specific community consultations. This study extends beyond the identification of barriers and promotes conversations about how social workers can provide the best support for transitional Aboriginal families.
INTRODUCTION:
Canada is among the most prosperous nations in the world, yet the health and wellness outcomes of Canadian children are surprisingly poor. There is some evidence to suggest that these poor health outcomes are partly due to clinical practice variation, which can stem from failure to apply the best available research evidence in clinical practice, otherwise known as knowledge translation (KT). Surprisingly, clinical practice variation, even for common acute paediatric conditions, is pervasive. Clinical practice variation results in unnecessary medical treatments, increased suffering, and increased health care costs. This study focuses on improving health outcomes for common paediatric acute health concerns by evaluating strategies that improve knowledge translation and reduce clinical practice variation.

METHODS:
Using a multiple case study design, qualitative and quantitative data were collected from four Emergency Departments in western Canada. Data sources included: 1) pre- and post-implementation focus group data from multidisciplinary health care professionals, 2) individual interviews with the local champions, KT intervention providers and unit/site leaders/managers, 3) Alberta Context Tool (ACT) survey data, and 4) aggregated patient outcome data. Qualitative and quantitative data were systematically triangulated and matrices built to do cross-case comparison.

RESULTS:
Barriers to successful implementation of the pathway and guideline involved lack of awareness of the individuality of the sites in terms of personnel, physical aspects and the established processes on the units. Among the facilitators to adoption of the CPG/CP were strong leadership, in the form of a champion of the practice change, ease of use of the CPG/CP, adequate resources, and being comfortable with a dynamic environment.

CONCLUSIONS:
This study generates new knowledge about the potential causal mechanisms and factors which shape implementation. Future studies will track the impact of the CPG/CPs implementation on children’s health outcome, and health care costs.
Abstract #: 15
Submitter: Rachel Flynn
Title: Evaluating the implementation of a clinical pathway for the management of childhood asthma: a mixed methods study
Authors: Shannon Scott, Heather Sharpe, Rachel Flynn, David Johnson
Presenter: Rachel Flynn
Affiliations: UA
Category: Child Youth Development
Investigation Type: Quantitative Research|Qualitative Research

INTRODUCTION:
Asthma is the most common chronic childhood illness in North America. While there is extremely good evidence regarding how to manage the disease, a significant proportion of patients do not receive optimum therapy. Clinical variation continues to be pervasive within pediatric care in Canada, resulting in unnecessary medical treatments and suboptimum child health outcomes. This disparity is often referred to as the ‘evidence-practice gap’. Effective knowledge translation (KT) research aims to decrease clinical variation by ensuring that the best available research evidence informs pediatric health care. One approach to close this ‘gap’ is the development of clinical practice guidelines (CPGs) and clinical pathways (CPs). CPGs and CPs have been recognised as strategies to facilitate research implementation; yet, little is known about the factors that shape the implementation process.

METHODS:
The purpose of this research was to evaluate the process of transfer of a CP for the management of childhood asthma into clinical practice and identify the casual mechanisms and effect modifiers that shape the CP implementation process. This study occurred in 12 emergency departments across the Calgary Health Region. Data was collected through pre and post implementation focus groups, individual interviews and a paper based survey, with a total of 81 participants.

ANALYSIS: Qualitative analysis used a constant comparative approach guided by the Ottawa Model of Research Use. Descriptive statistics were formed from quantitative analysis using SPSS.

RESULTS:
Facilitators to implementation of the CP were: Strong leadership, in the form of a champion role, effective dissemination strategies and positive change. Barriers to implementation of the CP were: lack of awareness, environmental factors, resistance to change and the innovation itself.

CONCLUSION:
This study aids in understanding the factors that dictate the successful implementation of evidence based research, reduce the ‘evidence-practice’ gap in pediatrics and ultimately optimize pediatric patient care.
BACKGROUND:
Distraction is a common approach to manage pain and distress. A systematic review provided preliminary evidence that music is effective in reducing pain and distress among pediatric patients, although evidence was sparse for some clinical settings and procedures.

METHODS:
Forty-two children ages 3 to 11 years were randomized to receive music or standard care while undergoing intravenous placement in the pediatric emergency department. Primary outcome of behavioral distress was assessed blinded using the Observed Scale of Behavioral Distress–Revised. Secondary outcomes included child-reported pain, heart rate, parent and provider satisfaction, ease of performing the procedure, and parent anxiety. Groups were compared using Mann Whitney or Fisher's exact tests and multiple linear regression.

RESULTS:
We found no significant difference in our primary outcome of change in behavioral distress from pre-procedure to immediately after the procedure; however, when we removed from the analysis the children who had no distress during the procedure, we found a significant difference favoring the music group (p=0.048). We found a significant difference in change in self-reported pain scores: pain in the standard care group increased while pain stayed the same in the music group (p=0.04). Overall, parents’ satisfaction with management of children’s pain was greater in the music group (p=0.07): 76% of parents (music) vs. 52% (standard care) were very satisfied with the management of their child’s pain. Providers reported that it was easier to perform the procedure (p=0.03): 76% (music) vs. 38% (standard care) reported that the procedure was very easy to perform. Providers were more satisfied with the IV start in the music (86% very satisfied) compared with the standard care group (48%) (p=0.02).

CONCLUSIONS:
Music appears to have a positive impact on pain and distress for children undergoing intravenous placement. Positive benefits were also observed for the parents and healthcare providers.
INTRODUCTION:
Inflammatory bowel diseases (IBD) (Ulcerative colitis and Crohn’s Disease) are chronic intestinal diseases characterized by inflammation of the gastrointestinal area resulting in abdominal pain, chronic diarrhea and weight loss. The Ras association domain family 1A (RASSF1A) is a tumour suppressor protein that has a novel role in tumor necrosis factor alpha (TNF) signaling, restricting NFkB activity, intestinal inflammation and repair following inflammation-induced damage. Rassf1a-/- knockout mice have decreased survival and exacerbated colitis following inflammation-induced injury in a dextran sodium sulphate (DSS) model of colitis. Furthermore, we have also identified an abnormal and novel tyrosine phosphorylation of Yes associated protein (pY-YAP) in the colons from DSS-treated Rassf1a-/- mice that results in increased apoptosis. The use of protein tyrosine kinase inhibitors, such as Imatinib (Gleevec), to inhibit tyrosine phosphorylation of YAP may be a novel therapeutic approach to restrict abnormal pY-YAP signaling that will result in decreased intestinal cell death, enhanced intestinal repair and greater recovery from inflammation-induced injury.

METHODS:
A mouse model of colitis induced by addition of 3% DSS in the drinking water for 7 days was utilized. This was followed by recovery with regular water. Gleevec was added at (60µg/g body weight) injected intraperitoneally twice at day 3 and day 6 following DSS addition.

RESULTS:
The survival rate of DSS-treated Rassf1a-/+ animals increased from 80% when Gleevec is injected into the mice. There was a significant decrease in disease severity and symptoms following DSS-induced injury.

CONCLUSIONS:
Gleevec may be an interesting therapeutic approach for IBD to aid in increased recovery following intestinal inflammation injury.

FUNDING: WCHRI, CFI, Stollery Children’s Hospital Foundation/Hair Massacre Fund.
INTRODUCTION:
Citrobacter rodentium is a mouse gut pathogen used to create a murine model for human Inflammatory Bowel Diseases with similar pathological changes. NALP3 is a key inflammasome protein which regulates inflammatory responses. Recent work has shown that NALP3 knockout mice (NALP3-/-) suffer a more severe disease course in C. rodentium infection than wild type (WT) mice. A proposed major endpoint of inflammasome activity is the production of the potent antimicrobial cytokine interleukin (IL)1β. In this study we investigated whether injection of IL-1β could rescue NALP3-/- mice during C. rodentium infection.

METHODS:
Groups containing NALP3-/- and WT mice (C57BL/6 background) were assembled. Two groups were inoculated with C. rodentium by orogastric gavage and one control group was left uninfected. Infected mice received an intraperitoneal injection every other day, one group with PBS and the other with recombinant IL-1β. All mice were euthanized 6 days post infection. Gut tissue samples were collected and subjected to immunofluorescent microscopy, sectioning, and various types of staining. Bacterial/Mouse DNA was extracted from the colon samples and analyzed by quantitative real-time PCR to quantify total bacterial 16s rDNA and the C. rodentium specific gene espB in each sample.

RESULTS:
In the PBS injection group, NALP3-/- colon samples contained significantly more C. rodentium espB DNA than the colons from WT mice. Colon tissue samples from NALP3-/- mice injected with IL-1β contained a similar amount of C. rodentium DNA to the PBS injected WT mice. This “rescue” of NALP3-/- mice by IL-1β injection was confirmed by colony counting and by gut tissue immunofluorescence from each group.

CONCLUSIONS:
IL-1β is capable of at least partial rescue of NALP3-/- mice with increased bacterial colonization to a WT phenotype during C. rodentium infection. This supports the idea that IL-1β production is an important endpoint of inflammasome function and protects mice from bacterial infection.
INTRODUCTION:
Self-regulation encompasses the processes involved in controlling cognition, behaviour, and emotions. Children with poor self-regulation are at higher risk for later substance abuse, obesity, and externalizing behaviour problems. The goal of this project is to better understand how the neural bases of self-regulation develop from early to middle childhood, an important transitional period.

METHODS:
The project examines the age-related differences in self-regulation and its neural correlates using event-related potentials (ERPs). Two age groups, 4-5 and 7-8 year old children, completed a computerized delay-frustration Flanker task designed to elicit mild frustration by delaying feedback on a subset of trials. While children completed this task, we recorded the encephalogram (EEG), small voltage fluctuations at the scalp. EEG was then averaged across trials and time-locked to stimulus onset to extract ERPs related to processing and task performance. Participants also completed measures of working memory and general cognitive ability. Their parents completed a set of questionnaires on parenting style, family background, and their child’s behaviour and temperament.

RESULTS:
Preliminary analyses of task performance showed that older children were more accurate and responded more quickly. Younger children performed more poorly early in the task but showed more improvement in speed and accuracy across task blocks. To examine frustration in response to delayed feedback we examined the number of button presses during the delay. Across age groups, there were gender differences in button-pressing, with boys displaying a substantially higher rate of presses. ERP analyses revealed differences as a function of cognitive demands for N2 and P3 amplitudes in the older age group and latencies in the younger age group.

CONCLUSIONS:
These findings, though preliminary, confirm that this period of childhood is marked by substantial change. It will be important to further examine the interplay between electrophysiological response to frustration and behavioural measures of self-regulation during childhood.
Abstract #: 20  
Submitter: Sarah Treit  
Title: **Children and adolescents with Fetal Alcohol Spectrum Disorders undergo less developmental cortical thinning**  
Authors: Sarah Treit, Dongming Zhou, Catherine Lebel, Carmen Rasmussen, Gail Andrew, Christian Beaulieu  
Presenter: Sarah Treit  
Affiliations: University of Alberta  
Category: Mental Health Addictions  
Investigation Type: Quantitative Research  

INTRODUCTION:  
Pre-natal alcohol exposure impairs brain development, resulting in a range of physical, cognitive and behavioural deficits known as fetal alcohol spectrum disorders (FASD). Thickness of the outer grey matter cortex of the brain follows an inverted U-shaped trajectory during childhood (peaking at ~8 years), in concert with underlying cellular processes that refine neural networks. Cortical thickness abnormalities are observed in FASD, though cross-sectional design of previous studies limits conclusions about cortical development with age in FASD.

METHODS:  
11 children with an FASD and 21 controls (ages 5-15) underwent 2-3 MRI scans each (2-4 years apart) on a 1.5T scanner. High resolution (1x1x1 mm3) T1 weighted images were acquired and processed to calculate cortical thickness for 39 areas per hemisphere. Changes with age and by group (FASD versus control) were determined for each area using a linear mixed-model, controlling for whole brain volume, gender, and handedness.

RESULTS:  
Cortical thickness was reduced FASD vs controls, though differences were more apparent at younger (~9 yrs) than older ages (~12 yrs). Longitudinally, controls underwent cortical thinning with age, as expected, across 94% of cortical regions; whereas only 22% of cortical regions thinned significantly with age in FASD. Significant age-by-group interactions were noted for total mean cortical thickness (p=0.02) as well as ~1/3 of sub-regions, indicating a steeper slope of cortical thinning in controls and relatively less change in the FASD group.

CONCLUSIONS:  
This is the first longitudinal study of cortical thickness development in FASD, revealing relatively less change during childhood and adolescence than controls; suggesting delayed development in the FASD group. Prenatal alcohol exposure has been shown to impair synaptic plasticity in animal models, and may inhibit the pattern of synaptic pruning that normally drives developmental cortical thinning during adolescence. Abnormal synaptic pruning can result in aberrant neural networks, and may underlie deficits in cognition observed in FASD.
INTRODUCTION:
Prolonged waitlist time impacts survival before and after heart transplantation (HTx). Intentional cross-ABO transplant plays a significant role ameliorating the odds of receiving a heart. We analyzed outcomes of patients on waitlist and post heart transplant aged below 3 months in a low population density region of western Canada.

METHODS:
Retrospective review of patients listed below age of 90 days from 2006 to 2011, to determine waitlist mortality, outcomes after HTx and factors that could potentially impact survival.

RESULTS:
Twenty-seven patients were listed during the study period. Congenital heart disease was the predominant diagnosis in 20 patients (74%), with cardiomyopathy, myocarditis and others in the remaining 7. Twelve patients (44%) died or were delisted due to clinical deterioration after a median of 32 days (from 7 to 127 days); one was removed after 112 days due to clinical improvement. HTx was performed in 14 (52%) patients after a median waitlist of 51 days (from 2 to 215 days). Mortality in 14 patients who required extra-corporeal life support (ECLS) pre-HTx (9 were successfully bridged to transplant while 5 died on waitlist) was not different from patients without ECLS (p=0.61) but time to death on the waitlist trended to be shorter (p=0.09). In the transplanted group, 7 patients (50%) received an ABO-compatible (ABOc) heart, with 3 post-Tx deaths. The remaining 7 cases received an ABO-incompatible (ABOi) graft and are alive. ABOc patients waited median 51 days compared to 49 days for ABOi Tx (p=0.53). Patient death was not associated with prematurity (p=0.61) or birth weight below 2.5kg (p=0.71). Cumulative survival post-listing was 42%.

CONCLUSION:
Outcomes of HTx in early childhood are promising however high waitlist mortality has a negative impact on overall results. Despite alternative strategies such as ECLS and ABOi HTx, waitlist mortality in western Canada exceeds rates reported from higher population density areas and is higher than that reported in any other age group. Further actions to improve organ availability and allocation are required.
INTRODUCTION:
The long term prognosis in hypoplastic left heart syndrome (HLHS) is limited by progressive ventricular dysfunction. We assessed changes in HLHS ventricular function across staged palliative surgeries using speckle tracking echocardiography (STE).

METHODS:
Twenty HLHS patients who survived to pre-Fontan surgery assessment were prospectively studied. Two-dimensional echocardiograms were performed at: 1) pre-Norwood (6±7 days), 2) pre-BCPA (bidirectional cavo-pulmonary anastomosis, 5±2 months), and 3) pre-Fontan (2.6±0.6 years) stages. STE measured global and segmental 4-chamber longitudinal and basal circumferential strain, strain rate (SR), post systolic strain index (PSSi=[peak strain-peak systolic strain]/peak strain), rotation, myocardial dyssynchrony index (MDI=standard deviation of time to peak strain in 12 segments), and longitudinal:circumferential strain ratio. Differences across the 3 stages were analysed using 1-way ANOVA for repeated measures with post hoc testing.

RESULTS:
Both longitudinal and circumferential SR were decreased at pre-BCPA and pre-Fontan when compared to pre-Norwood (p=0.0001). Rotation also declined after the pre-Norwood stage (p=0.02). PSSi was greatest at pre-BCPA stage (longitudinal, p=0.0002; circumferential, p=0.03). Although global strain had no detectable change between stages, longitudinal:circumferential strain ratio decreased between pre-Norwood and pre-BCPA (p=0.01). Interestingly, MDI was significantly greater at pre-Norwood compared to pre-Fontan (p=0.02). Fractional area change was unchanged across the stages.

CONCLUSIONS:
Ventricular ejection appears to be preserved in HLHS patients who survived to pre-Fontan assessment. However, at the pre-BCPA assessment, there was a detrimental change in ventricular contractility, coupled with an increase in PSSi, a potential marker of myocardial ischemia. Whether this is a single RV adaptive process to chronic afterload or evidence of subtle RV decline, remains unclear. Except for PSSi, recovery in the ventricular functional parameters was not observed at pre-Fontan, despite volume unloading at BCPA.
INTRODUCTION:
Pollution Release and Transfer Registries (PRTR) from various countries around the world, provide a wealth of information on environmental pollution with potential for assessing pollutions’ impact on human health. Existing registries’ data report emitting facilities location, industrial sector, name and amounts of chemicals released but lack information on the toxicity associated with the released chemicals. Our objective was to explore the national and provincial trends and profiles of chemicals released across the country per industrial sector according to their known effects and their toxic potential, on infants and children.

METHODS:
We worked with databases from the National Pollutant Release Inventory (NPRI) 2002-2010, (http://www.ec.gc.ca/inrp-npri/) and Scorecard (http://scorecard.goodguide.com/). Yearly data from NPRI were extracted by province and type of industrial sector according to the North American Industry Classification System (NAICS). Descriptive statistical profiles presented patterns by province-industry. Potential health hazards information of toxic chemicals according to Scorecard were added by linking both databases with CAS-NUMBERs, using 12 predefined groups of health-hazards (e.g. carcinogens, developmental).

RESULTS:
Nationally, 97% of the total chemical releases were released into air, and the top 3 chemical-emitting sectors –Manufacturing, Mining and Utilities – accounted for 98% of these emissions. The top ten chemicals released by these 3 sectors were associated with the following health hazards: respiratory, neurotoxic, carcinogenic, reproductive, developmental, and cardiovascular. Profiles by province show variation in main sector activities.

CONCLUSIONS:
Characterising industrial emission/toxic potential by province could be a first step to link specific chemical exposures with specific health outcomes, especially when there are geographical differences in the distribution of health outcomes, e.g. adverse birth outcomes. Profiling chemicals can contribute to future research and policy changes that will improve Canadian maternal/child health.
INTRODUCTION:
The Alberta Nutrition Guidelines for Children and Youth (ANGCY) are voluntary government-issued guidelines intended to assist facilities to create environments that support healthy dietary behaviours among children. The purpose of this study was to examine the barriers and facilitators to adopting and implementing the ANGCY in recreational facilities, and to assess the impact of their implementation on the quality of the food environment.

METHODS:
We used mixed methods within an exploratory multiple case study to examine factors that influenced adoption and implementation of the ANGCY and the nature of the food environment within three cases: an adopter, a semi-adopter and a non-adopter of the ANGCY. Qualitative data were generated via interviews, observations, and document reviews. Four quantitative measures were used to assess food environment quality.

RESULTS:
Implementing the ANGCY improved some aspects of the food environment, however the proportion of healthy items remained low in all facilities. The keys to adoption and implementation of nutrition guidelines in recreational facilities related to the managers’ nutrition-related knowledge, beliefs and perceptions, as these shaped his decisions and actions. The manager, however, could not accomplish adoption and implementation alone. Intersectoral linkages with schools and formal, health promoting partnerships with industry were also important for adoption and implementation to occur.

CONCLUSIONS:
The keys to adoption and implementation of nutrition guidelines in recreational facilities relate to the manager and the presence of intersectoral linkages and partnerships. The current environmental context does not, however, support widespread, voluntary adoption of the sale of primarily healthy foods in recreational facilities, and therefore government regulation may be required.
Abstract #: 25  
Submitter: Petrus Kruger  
Title: The impact of elevated Progesterone levels during the late Follicular phase of IVF/ICSI cycles on clinical pregnancy rates  
Authors: Tarek Motan, Tarek Motan  
Presenter: Petrus Kruger  
Affiliations: UA  
Category: Womens Health  
Investigation Type: Quantitative Research

INTRODUCTION:  
To determine the impact of elevated serum progesterone levels during the late follicular phase of IVF/ICSI cycles on clinical pregnancy rates.

METHODS:  
We included all couples who completed an IVF/ICSI cycle at an academic fertility centre in 2010. The charts of all subjects meeting inclusion criteria were scrutinised and data extracted. Serum progesterone was measured on the day of hCG trigger, 36 hours prior to oocyte retrieval. A regression model was used to determine a serum progesterone value above which pregnancy rates were infrequent. Comparisons were made between the 2 groups on all known predictors of clinical pregnancy. Cycle management was done by attending physicians with no decisions influenced by the progesterone levels. Clinical pregnancy was defined as an ongoing pregnancy after 20 weeks. Group comparisons were made using Fisher’s exact test (dichotomous) and ANOVA (continuous).

RESULTS:  
In 2010 a total of 184 IVF/ICSI cycles were eligible for inclusion. The regression model indicated that pregnancies were less frequent above serum progesterone of 6.5nmol/L (2.0ng/mL). Group-1 (6.5nmol/L) had 29 subjects. Pregnancy rates by follicular progesterone level was (95% CI): Grp-1: 38.71% (31.00-46.86); Grp-2: 20.69 (7.99-39.72); OR 2.42 (0.93-6.29); P equals 0.04. No differences between groups were found in demographic data: age, parity, BMI, smoking, cycle length, day-3 FSH & estradiol, or fertility diagnoses. No differences were found in stimulation data: ICSI, agonist/antagonist, rFSH/HMG, gonadotropin total dose, follicles equal or greater then 18mm, oocyte number, and number of embryos transferred. A highly significant difference was found in peak estradiol: Grp-1: 8625.51 nmol/L (SD: 4672.21); Grp-2: 12390.57 nmol/L (SD: 10930.01); P less then 0.01.
INTRODUCTION:
In a large meta analysis short interpregnancy intervals (IPI’s) have been associated with adverse perinatal outcomes. There is a lack of published data confirming that this association applies to Canadian populations.

OBJECTIVE:
To determine whether short IPI’s are associated with an increased risk of adverse perinatal outcomes.

METHODS:
A population based study of women with two consecutive births from 1999 to 2007 was conducted using a linked dataset from the Alberta Perinatal Health Program Database and Alberta Health and Wellness. Patients with multiple pregnancies or congenital anomalies were excluded. Primary outcomes assessed were preterm birth, very preterm birth, low birthweight (LBW), small for gestational age (SGA) and large for gestational age (LGA). Logistic regression, controlling for confounding factors, was used to estimate the odds ratios (OR) and 95% confidence intervals for IPI and each of these perinatal outcomes. Short IPI was defined as 0-5 and 6-11 months. Long IPI’s were 24-59 and ≥ 60 months.

RESULTS:
Overall, 46,301 women met the study criteria. Short IPIs of 0-5 months were associated with an increased risk of preterm birth OR= 1.43 [1.23 ,1.66] , LBW OR=1.55 [1.28,1.88 ], and SGA OR= 1.33 [1.12,1.57] and a decreased risk for LGA OR= 0.87[0.77,0.99]. The risk of preterm delivery, LBW and SGA were also significantly increased in women with long IPI’s.

CONCLUSIONS:
Both short and long IPIs are associated with a significantly increased risk of certain adverse perinatal outcomes. These results may inform how we counsel patients regarding birth spacing and nutrient supplementation.
INTRODUCTION:
Pregnant mice deficient in the enzyme catechol-O-methyl transferase (COMT-/-) display a preeclampsia-like phenotype and deliver growth-restricted fetuses. Obesity, which is associated with vascular dysfunction, is an important risk factor for both preeclampsia and alterations in fetal growth. We hypothesize that maternal obesity will induce uterine artery dysfunction and impair uteroplacental perfusion, therefore exacerbating the signs of preeclampsia/fetal growth restriction observed in COMT-/- mice.

METHODS:
COMT-/- and control (C57Bl6/J) mice received a high-fat diet (60% kcals from fat) or normal chow (4% kcals from fat) for 8 weeks prior to mating. Blood pressure (BP) was assessed at gestational day 10.5 and 17.5. Uterine artery Doppler waveforms were assessed at day 17.5 of gestation. At day 18.5 of gestation pup and placental growth was assessed.

RESULTS:
COMT-/- mice which had been fed a high fat diet showed a significant increase in systolic BP at day 10.5 of gestation compared with lean controls (137 +/- 2 vs. 127 +/- 3 mmHg; p<0.05). Consumption of a high fat diet had a significant effect on both maximum and minimum uterine artery blood flow velocity (p<0.05). Uterine artery maximum blood flow velocity was significantly decreased in obese COMT-/- mice compared with their lean controls (408 +/- 62 vs. 659 +/- 22 mm/s; p<0.05). Maternal consumption of a high fat diet had a significant effect on both pup weight and abdominal circumference (p<0.01). Pup weight was reduced in both obese C57Bl6/J mice compared with lean controls (0.86 +/- 0.02 vs. 1.10 +/- 0.04g; p<0.01) as well as obese COMT-/- mice compared with lean controls (0.89 +/- 0.06 vs. 1.04 +/- 0.01; p<0.05).

CONCLUSIONS:
Maternal obesity in COMT-/- mice was associated with increased systolic BP and reduced uterine artery blood flow velocity and fetal growth restriction. These data suggest that impaired uteroplacental perfusion exacerbates the signs of preeclampsia in this model, specifically the crucial cardiovascular adaptations which occur in a healthy pregnancy.
INTRODUCTION:
Higher pre-pregnancy body mass index (BMI) and excessive gestational weight gain (GWG) are associated with greater risks of complications during antenatal and perinatal periods. Adherence to GWG recommendations is important for optimal pregnancy outcomes; however, the composition of GWG and its implications on maternal-infant health are not yet well understood. Women with different pre-pregnancy BMIs enter pregnancy with different levels of fat stores. It is unclear whether changes in gestational weight are primarily caused by changes in fat mass, fat-free mass, water retention or a combination of these, and whether differences in pre-pregnancy BMI influence composition of weight gain.

OBJECTIVE:
To describe fat mass accretion and distribution during pregnancy and early postpartum among women with different pre-pregnancy BMI.

METHODS:
Data on maternal weight and fat mass were collected 2-3 times during pregnancy and once at postpartum from 600 women recruited in a prospective longitudinal cohort, Alberta Pregnancy Outcomes and Nutrition study. Differences in fat mass accretion, retention and distribution among women with different pre-pregnancy BMI were tested using one-way ANOVA or Kruskal Wallis non parametric tests as appropriate. Longitudinal changes in fat mass during pregnancy and postpartum by pre-pregnancy BMI were tested using multivariate linear mixed model analysis.

RESULTS:
Compared to normal-weight women, overweight women gained similar amount of fat mass; while obese women gained less total fat mass, had a slower rate of fat accretion in late pregnancy and lost less fat mass at postpartum. Women with high BMI also retained higher amount of subscapular fat mass and had higher waist circumference at postpartum than women with a normal BMI.

CONCLUSIONS:
Obesity is inversely associated with fat mass accretion during pregnancy; both overweight and obese women are more likely to selectively retain higher adiposity in truncal and abdominal regions, thus further exaggerating their risk of central adiposity at postpartum.
INTRODUCTION:
In previous study, we observed glucose intolerance and insulin resistance during pregnancy based on an oral glucose tolerance test, but effects of fructose intake on the feto-placental unit are not well established. The objective of this study was to examine the effects of fructose intake prior to and during pregnancy on metabolites in the amniotic fluid and the ratio between placental and fetal weight.

METHODS:
Female rats received either a 10% fructose or tap water for 3 weeks prior to and during pregnancy. Pregnant rats were euthanized on gestational day 20. Maternal blood was drawn, and plasma was separated and stored at -20°C until analyzed for glucose and fructose. Amniotic fluid samples were obtained from 3 randomly selected feto-placental units/dam, frozen, and analyzed for glucose and fructose as above (F: n=10; CONT: n=5 dams). All placentae and pups were excised from the uterus, weighed (F: n=15; CONT: n=16 dams), and gender was recorded for all pups. The placenta:fetus weight ratio (wt:wt) was calculated.

RESULTS:
Plasma levels of glucose and fructose of pregnant rat dams did not differ between F and CONT. Amniotic fluid fructose concentration was higher in female vs. male fetuses of F dams (F-female: 8.70±1.23 umol/L; F-male: 6.22±1.13 umol/L, P=0.0335) and higher in F-female vs. CONT-female fetuses (CONT-female: 5.47±0.52 umol/L, P=0.0335), but not different from CONT-male fetuses (CONT-male: 6.72±0.32 umol/L). Placental weights from F dams were lower than CONT dams (0.47±0.07 g vs. 0.55±0.15 g, P=0.012). Fetal weights and the placenta:fetus weight ratio did not differ between F and CONT dams.

CONCLUSIONS:
Such changes may contribute to metabolic programming, particularly among female offspring. Future studies will examine morphological and functional characteristics of the placenta and follow the metabolic profiles of the female offspring across their lifespan.
INTRODUCTION:
Infants of mothers with diabetes (IDM), the most common complication of pregnancy, have an increased risk of adult cardiovascular disease (CVD). Although the etiology and timing of onset of the cardiovascular changes remain unclear, recent studies have shown that IDM have increased aortic intimal-medial thickness in early infancy, which may be an early feature of CVD. Experimental models also suggest the intrauterine diabetic environment structurally and functionally alter the aorta of affected offspring. We sought to determine if there is increased aortic stiffness, a feature of CVD in adults with diabetes, in IDM.

METHODS:
Diabetic pregnancies were recruited prospectively to examine the role of diabetes in fetal cardiovascular programming. For this aspect of the study, their infants were evaluated at 3-6 weeks by echocardiography for assessment of aortic stiffness and the findings were compared to those of healthy infants from uncomplicated pregnancies. The pulse wave velocity (PWV) was calculated as \( \frac{D}{T_2-T_1} \); where D was the distance of blood flow through the arch; T1, the time measured from QRS to onset of ascending and T2, the onset of descending aortic systolic flow.

RESULTS:
Twenty-five maternal-infant pairs were assessed: 7 IDMs and 18 controls. No statistical difference was observed in age at exam, BSA and systolic blood pressure between IDMs and controls. Hemoglobin A1C (HbA1) of the diabetic mothers during pregnancy ranged from 6 to 10.3 (mean 7.1±1.2). Aortic PWV were significantly higher among IDMs compared to control (mean 5.6±1.5M/s vs 3.7 ± 1.2M/s respectively, p=0.008). IDM PWV in this small cohort tended to correlate positively with maternal HbA1C (r=0.59, p=0.068).

CONCLUSIONS:
IDM have evidence of increased aortic stiffness in early infancy, which may relate to maternal glycemic control. Whether the aortic stiffness persists later in life and contributes to adult CVD is not clear.
INTRODUCTION:
Estrogen receptor (ERα) positive breast cancers are treated with Tamoxifen, but 40% of patients develop resistance and relapse. Tamoxifen could diminish its own therapeutic action by stimulating an estrogen receptor, GPR30. We studied this in relation to phospholipase D (PLD) activation and expression of the multi-drug resistance protein (MRP-1). PLD activation produces phosphatidate, which binds downstream targets such as sphingosine kinase-1 leading to the formation sphingosine 1-phosphate (S1P). MRP-1 is implicated in chemo-resistance through stimulating the export of 1) chemotherapeutic drugs 2) 4-hydroxynonenal (4HNE), a toxic product formed in oxidative stress and 3) S1P, which promotes cell survival. We hypothesize that tamoxifen-induced oxidative stress activates PLD and increases MRP-1 expression.

METHODS:
The viability of ERα-positive MCF-7 breast cancer cells was measured by MTT reduction. PLD activation was assayed using a transphosphatidylation reaction.

RESULTS:
Tamoxifen-resistant MCF-7 cells had increased expression of MRP-1 compared to control cells. Tamoxifen, 4-hydroxytamoxifen (4HT) and N-desmethyltamoxifen, increased PLD activation. Tamoxifen-resistant cells express similar levels of PLD protein to control cells, but they show greater PLD activation. This is related to higher levels of protein–tyrosine phosphorylation. PLD activation did not depend on ERα or GPR30 since 17β-estradiol and the specific GPR30 agonist, G1, do not activate PLD. Inhibiting PLD2 sensitized resistant MCF-7 to 4HT-induced death. Tamoxifen increased the conjugation of 4HNE with proteins indicating higher oxidative stress. The antioxidant, N-acetylcysteine, decreased PLD activation by tamoxifen confirming the involvement of oxidative stress.

CONCLUSIONS:
Tamoxifen causes oxidative stress, which contributes to breast cancer cell death. However, oxidative stress activates PLD, which counteracts tamoxifen action by activating survival pathways. This result provide a rationale for determining if blocking PLD2 activity improves the efficacy of tamoxifen therapy in a mouse model of breast cancer.
INTRODUCTION:
Diagnosis at advanced stages of epithelial ovarian cancer, combined with ineffective current therapies to induce a cure contribute to the recurrence and chemoresistance displayed by the disease. Cancer stem cells (CSCs) represent a subgroup of cancer cells within a tumor that possesses the capacity to self-renew, and give rise to heterogenous lineages of cells to repopulate a tumor. CSCs are found in several human malignancies and may play a role in treatment resistance and eventual remission. Notch inhibitors can be used to target and reduce CSCs in several cancers. Whether Notch is required for the phenotype of ovarian CSCs remains unknown. We predict that Notch signaling is crucial in maintaining the phenotypes of ovarian CSCs and that blocking of Notch may be an efficacious therapeutic approach to target ovarian CSCs.

METHODS:
SKOV3 were seeded into ultra-low attachment plates and cultured in sphere culture medium. Cells were cultured in the presence of DAPT (a γ-secretase inhibitor) to inhibit Notch activation or an equal volume of DMSO (vehicle control) for 7 days. Single-cell suspensions were prepared by digestion with Trypsin/EDTA and mechanical dissociation with a pipette and filtered. To establish stable expression of dominant negative MAML (dnMAML) in OVCAR3 cells, high-titre lentivirus was used for infection of cells.

RESULTS:
Our data show that SKOV3, OVCAR3 and A2780S cells form spheres in sphere culture medium. Interestingly, the mRNA expression of Notch3 (a Notch receptor) and HES1 (a direct Notch target gene), but not Notch1 (a Notch receptor), is elevated in SKOV3 spheres when compared with monolayer cultures. Inhibition of Notch by DAPT reduces sphere formation of SKOV3 cells by 34% and reduces cell numbers in the spheres by 46%. Moreover, blocking Notch signaling with dnMAML reduces sphere formation of OVCAR3 cells by 37%. We will confirm these results in A2780S cells, and continue further research using primary cells and in vivo models.

CONCLUSIONS:
The results from this project will indicate whether blocking Notch will be an effective strategy to target ovarian CSCs.
INTRODUCTION:
Bronchopulmonary dysplasia (BPD), the chronic lung disease of prematurity, currently lacks an effective treatment. Arrested alveolar growth and disrupted vasculogenesis are the histological hallmarks of BPD. Evidence suggests that pro-angiogenic factors promote alveolar growth and regeneration. Accordingly, we showed that endothelial colony forming cells (ECFCs), a recently identified vascular progenitor cell type with self-renewal and clonogenic potential, exist in the developing lung and promotes lung repair. Increasing evidence suggests that stem cells exert their therapeutic potential through a paracrine effect. We hypothesized that cell-free conditioned media from human cord blood derived ECFCs prevents lung injury in an experimental O2-induced BPD model in newborn rats.

METHODS:
All procedures were approved by the animal welfare committee. To test the therapeutic potential of ECFCs, we generated ECFC conditioned media (CdM) by treating confluent human-umbilical cord blood ECFC cultures with serum free DMEM for 24 hrs.

RESULTS:
In vitro, ECFC CdM significantly restored the endothelial network forming ability of hyperoxia exposed fetal human lung ECFCs on matrigel and improved wound closure of fetal rat alveolar type II cells cultured as a monolayer. In vivo, daily 1 µL/g body weight intraperitoneal ECFC CdM injections in Sprague Dawley rats exposed to hyperoxia from postnatal day (P) 1 to P14 significantly preserved alveolar development as assessed by lung morphometry at P21. Furthermore, ECFC CdM therapy significantly attenuated pulmonary hypertension, a major complication of severe BPD, as assessed by improved pulmonary artery acceleration time and decreased right ventricular hypertrophy.

CONCLUSIONS:
Our findings suggest that ECFCs prevent lung injury and pulmonary hypertension through a paracrine effect. This may lead to novel therapies for chronic lung diseases characterized by impaired alveolar growth.
INTRODUCTION:
In mice, CD1d+CD5+ B cells have regulatory properties associated with interleukin-10 (IL-10) production. In humans, this phenotype is up to 10 times more frequent in infants than in adults. Infants show better heart transplant outcomes than older recipients, including acceptance of ABO-incompatible grafts. However, they also show increased severity of infections with polysaccharide-encapsulated bacteria. We hypothesize that CD1d+CD5+ B cells contribute to the altered immune response during infancy, particularly towards polysaccharides including ABO-antigens and bacteria capsules.

METHODS:
CD1d+CD5+ B cells were FACS-sorted from pediatric splenocytes and cultured parallel to non-CD1d+CD5+ B cells using T-dependent (α-IgM+CD40L) and T–independent (CpG) B cell stimuli to measure IL-10 in supernatants by ELISA. The regulatory impact of CD1d+CD5+ B cells on other cells was assessed through proliferation of CFSE-stained 1) peripheral blood mononuclear cells (PBMCoriginal), 2) PBMC to which CD1d+CD5+ B cells were added to double the original proportion (PBMCdouble), and 3) PBMC from which CD1d+CD5+ B cells were depleted (PBMCdepleted) after stimulation with B cell stimuli or T cell stimuli (α-CD3+CD28).

RESULTS:
When stimulated with α-IgM+CD40L, IL-10 levels were seen in CD1d+CD5+ B cells but not in non-CD1d+CD5+ B cells. However, presence of IL-10 was also seen in non-CD1d+CD5+ B cells when stimulated with CpG. When stimulated with α-IgM+CD40L, the median frequency of dividing B cells was 27% higher in absence of CD1d+CD5+ B cells compared to the original proportion (P=0.081). A similar trend was seen in all B cell stimulation conditions. In contrast, both absence and double proportion of CD1d+CD5+ B cells had little effect on T cell proliferation.

CONCLUSIONS:
These results indicate that CD1d+CD5+ B cells in humans may inhibit the proliferation of B cells. Evidence of IL-10 production in non-CD1d+CD5+ B cells suggests the existence of further phenotypes of regulatory B cells in humans. Analyses of these further phenotypes of IL-10 producing cells and age related differences are underway.
INTRODUCTION:
Infant heart transplant (HTx) recipients have better graft survival than older HTx patients. Nonetheless, due to lifelong therapy, these infants carry a heavy immunosuppressive burden, resulting in severe morbidities from adverse drug effects. Cellular therapy using regulatory T cells (Tregs) to suppress graft-directed immune responses would greatly benefit these infants. A major challenge, however, is generating a large quantity of stable, highly suppressive Tregs. Infants undergoing HTx usually have thymectomy to gain adequate exposure of the retrosternal operative field. We investigated the use of explanted thymuses as a source for isolation and expansion of highly suppressive FOXP3+ Tregs.

METHODS:
Thymuses (n=6) were obtained from thymectomy during pediatric cardiac surgery and thymocytes were recovered through mechanical dissociation. FOXP3+ cells were isolated by automated magnetic cell separation of CD4+CD25+CD127- thymocytes. Cells were expanded for two weeks with anti-CD3, IL-2, rapamycin and CD32+ L cells. FOXP3 and intracellular cytokine staining was performed to define characteristics of expanded cells. Their suppressive capacity was determined by co-culturing these cells with PKH-labeled anti-CD3/CD28-stimulated peripheral blood mononuclear cells and analyzing proliferative responses by flow cytometry.

RESULTS:
FOXP3+ cell frequency within the total thymocyte population ranged from 2.2 to 7.6%. Isolated CD4+CD25+CD127- cell populations were 59–81% positive for FOXP3. After two weeks of culture, we observed a 4 to 43-fold expansion of CD4+CD25+CD127- cells with over 95% viability. The expanded CD4+CD25+CD127- cells were FOXP3high and produced no cytokines. Furthermore, expanded CD4+CD25+CD127-FOXP3high cells were highly potent suppressors, efficiently suppressing proliferating PBMC even at a 1:20 ratio of Tregs:PBMC.

CONCLUSIONS:
We showed that highly suppressive FOXP3+ Tregs can be expanded from CD4+CD25+CD127- T cells isolated from pediatric thymic tissue, indicating that explanted thymuses are a potential source for isolation and expansion of Tregs for cellular therapy.
INTRODUCTION:
Immune immaturity allows ABO-incompatible heart transplantation (ABOi HTx) to be performed safely in infants and results in B-cell tolerance to donor ABO antigens (ags). ABO antibodies are thought to arise in a T-independent (TI) manner; TI B-cell activation is inhibited by binding of the B-cell co-receptor CD22 with sialic acids leading to B-cell tolerance. Due to a generally reduced immune response to TI-ags in early childhood, we hypothesized a role for CD22 during infancy. In this study we performed phenotypic and functional assays to assess CD22 expression on various B-cell subsets, and the presence of ABO ag-specific IgM antibody-secreting cells (ASC).

METHODS:
Human splenocytes were isolated from donors (n=41; ages 4 days-74 years). Flow analysis was done to quantify expression levels of CD22, CD27, CD38, IgM and IgG on CD19+ B cells. CD27+IgM+ B cells and CD27-IgM+ B cells were isolated from human splenocytes (n=5) by magnetic cell sorting, labelled with proliferation dye and stimulated with CpG plus IL-2,10,15. After a week, CD22 expression was examined by flow and frequency of ABO ag-specific ASC detected by ELISPOT.

RESULTS:
Differences were observed when comparing median fluorescence intensity (MFI) of CD22 amongst various B-cell subsets (p is < 0.001). Post testing revealed that CD27+IgM+ B cells had higher expression (p is < 0.001) than other subsets. Furthermore, the MFI of CD22 on the CD27+IgM+ B cells was inversely correlated with age (p equals 0.001), with infant samples having the highest level of CD22, and expression decreasing with increasing age. After culture, down-regulated CD22 expression was observed in proliferating CD27+IgM+ B cells. ELISPOT analysis showed that the majority of ABO ag-specific ASC were derived from CD27+IgM+ B-cells.

CONCLUSIONS:
Increased CD22 expression on CD27+IgM+ B-cells, which includes ABO ag-specific ASC precursors, may cause infant B cells to be more susceptible to down-regulation of B cell signaling leading to inactivation. CD22 may therefore play an inhibitory role in infant immune responses to ABO ags in after ABOi HTx.
Abstract #: 37
Submitter: Erin Lewis
Title: Maternal Phosphatidylcholine intake during suckling improves the immune response of the offspring
Authors: Erin Lewis, Jonathan Curtis, Rene Jacobs, Catherine Field
Presenter: Erin Lewis
Affiliations: UA
Category: Child Youth Development|Preconception Pregnancy Birth Early Beginnings
Investigation Type: Quantitative Research

INTRODUCTION:
Choline is an essential nutrient for the normal function of most rapidly growing cells; yet few studies have explored its role during immune system development. Free choline and phosphatidylcholine (PC) are the most abundant forms of choline in the diet and breast milk, which are metabolized differently and may have different metabolic effects. The objective of this research was to examine the effect of feeding different forms of choline during suckling on development and ability of immune cells to respond in the offspring.

METHODS:
After giving birth, Sprague-Dawley dams were fed 1 of 3 high fat, isocaloric diets, differing only in amount and form choline; 0.5 g/kg free choline (HC, n=5), 1 g/kg free choline (C, n=5) or 1.2 g/kg PC (PC, n=5). At 3 weeks, the suckled pups from each dam were killed and splenocytes isolated to measure the type of cells (including maturation and activation) using flow cytometry and the ability of cells to produce cytokines (by ELISA) ex vivo after stimulation.

RESULTS:
Compared to the HC pups, the PC and C pups had higher proportions of activated helper T cells (CD4+CD71+). The PC pups had a higher proportion (56%) of activated cytotoxic T cells (CD8+CD71+) compared to the C pups. When splenocytes were stimulated with the polyclonal T cell mitogen ConA, cells from the PC pups produced significantly more IL-2 (69%), IL-6 (163%), IL-10 (69%) and IFN-γ (95%), compared to the C pups. After stimulation with the bacterial antigen LPS, cells from the PC pups produced significantly more IL-6 (110%), IL-10 (54%) and TNF-α (43%), compared to the C pups.

CONCLUSIONS:
These findings suggest that the form of choline in maternal diet during a critical period has an important immunomodulatory role in the development and function of the infant’s immune system. These findings also suggest that providing choline as PC in the maternal diet during suckling results in a more mature T cell population (higher presence of CD71+ cells) and higher production of cytokines after an immune challenge in the offspring.
INTRODUCTION:
Dramatic cardiac developmental changes in energy metabolism occur in neonate, with a shift from glycolytic to mitochondrial oxidative metabolism occurring shortly after birth. Lysine acetylation has recently been identified as a potentially important pathway involved in the control of energy metabolism. We therefore investigated the role of changes in protein acetylation in the maturational changes in energy metabolism of the newborn rabbit heart.

METHODS:
One-day and 21-day old rabbit hearts were perfused with Krebs-Henseleit solution (2.5 mM Ca2+, 5 mM glucose, 0.4 mM palmitate, 3% albumin, 0.5 mM lactate and 100 μU/mL insulin) to measure glycolysis, glucose oxidation, and fatty acid oxidation. At the end of the perfusion, hearts were immediately frozen in liquid N2 and processed for acetylation status.

RESULTS:
Overall myocardial acetylation levels decreased significantly in 21-day vs 1-day old rabbit hearts. Expression of the deacetylase Sirtuin (SIRT) 3 was significantly higher (266%, p < 0.05) in 21-day vs 1-day old rabbits, while SIRT 1 and SIRT 6 expression did not change. A ~600% increase in fatty acid oxidation and 140% increase in overall oxidative metabolism was seen in 21-day vs 1-day old hearts, which was accompanied by a decreased acetylation of the fatty acid oxidation enzyme long chain acyl CoA dehydrogenase, a decreased acetylation of PGC-1α (a key transcription factor involved in mitochondrial biogenesis), and a decrease acetylation of the TCA cycle enzyme, isocitrate dehydrogenase. Acetylation of the glycolytic enzyme hexokinase I was also decreased, while the acetylation of Akt increased; scenarios consistent with the decrease in glycolytic activity seen in 21-day vs. 1-day old hearts.

CONCLUSIONS:
Lysine acetylation may play important role in the dramatic maturational changes in energy metabolism in the neonatal heart, by altering the deacetylation of key enzymes of mitochondrial oxidative metabolism and glycolysis.
INTRODUCTION:
The majority of unbalanced atrioventricular septal defect (UAVSD) cases undergo single ventricle palliation. Associated significant atrioventricular valve regurgitation (AVVR) results in increased morbidity and mortality. Our initial observations indicate that abnormal leaflet tethering may be one important mechanism of AVVR. Our hypothesis is that abnormal leaflet tethering is responsible for progressive AVVR in some patients with UAVSD.

METHODS:
We retrospectively reviewed the initial and pre-Glenn echocardiograms of 46 consecutive patients. Patients were deemed to have severe AVVR if the sum of vena contracta to valve ratio is > 0.33. We measured tenting height, annular to leaflet angle, valve annulus and combined atrial area, indexing to patient size where appropriate. Univariate and multivariate analysis of variables to predict progression of AVVR was performed.

RESULTS:
Within the cohort, 24 patients had minimal AVVR (group A) and 22 severe AVVR at mean follow-up of 3.3 ± 2.4 years. The mortality reported of 6%. Ten patients required valve surgery. Of 22 with severe AVVR at follow-up, 9 exhibited severe AVVR at initial presentation and at follow-up (group B), whilst 13 had minimal AVVR at presentation but developed severe AVVR at their pre-Glenn echocardiogram (group C). Both group B and C at their initial echocardiogram had greater tenting height and indexed atrial area compared to Group A. Multivariate analysis of group C identified initial echocardiogram absolute tenting height > 6mm (OR 6.6 (1.1-39.0), p=0.03) and indexed atrial area > 27.5cm/m² (OR 5.7 (1.3-24.3), p=0.01) as independent predictors of subsequent severe AVVR.

CONCLUSIONS:
Severe AVVR in UAVSD is common and surgical intervention is frequent. Greater common valve tenting height and atrial size at the initial echocardiogram independently predicts subsequent severe AVVR. These indices may be useful in the management and decision process in UAVSD.
INTRODUCTION:
Investigations on fetal myocardium and cardiac function suggest progressive maturation from a stiff ventricle to a more compliant heart. Premature birth interrupts this process with an earlier transition to the postnatal circulation. Myocardium functional maturation in preterm infants remains unclear. We investigate its evolution using echocardiographic cardiac function of the left ventricle from 28 days of age to near term in infants born prematurely at < 30 weeks gestational age (GA).

METHODS:
We prospectively enrolled preterm infants (PI, n=30) at 28 days of age (GA 27.38±1.29 weeks) who were clinically stable (5 on oxygen, 14 on CPAP and oxygen, none ventilated and 3 had tiny patent ductus arteriosus). After excluding structural pathology, cardiac function assessment included M-mode, pulsed and tissue Doppler (TDI) evaluations with comparison made to 30 healthy term infants of similar ages (28±6.7 days, p=NS). In 16 preterm infant, follow up echocardiogram was performed near term (Corrected GA 38.5±2.37 weeks).

RESULTS:
Compared to healthy controls, PI at 28 days had decreased peak mitral valve (MV) E wave velocity, E/A ratio, annular e’ velocity, e’/a’ ratio, and increased MV E/e’. No significant difference was found in fractional shortening and ejection fraction between PI and controls. No echocardiographic difference was found between PI on CPAP and those without CPAP. Although PI at 28 days had higher heart rates (HR) compared to control (161±15 vs. 142±15 bpm), no significant linear relationship existed between HR and MV E, E/A, e’, e’/a’, E/e’. Follow up assessment of PI near term, MV e’/a’ and E/e’ remained abnormal compared to controls.

CONCLUSIONS:
Clinically stable preterm infants at 28 days of postnatal life have normal left ventricular systolic function but altered diastolic properties. These LV diastolic abnormalities persist despite nearing term. This suggests premature infants not only start life with immature myocardium, there also appears to be delay in continued maturation of the the myocardium during postnatal life.
INTRODUCTION:
Migraine is a debilitating problem in children. A better understanding of migraine progression and the identification of clinical markers of progression would be beneficial. Orthostatic intolerance (OI) refers to symptoms on standing that are relieved by recumbence. OI and migraine may be symptoms of decreased cerebral perfusion. Disturbance of the autonomic nervous system in migraine patients is known but not well understood. Children with chronic daily headache often report symptoms of fatigue and orthostatic intolerance.

METHODS:
Children aged 8 to 17 years with migraine were enrolled. Primary outcome measures were migraine frequency and presence of OI. Additional outcomes include the pediatric migraine disability assessment (PedMIDAS). Autonomic testing was done for the presence of orthostatic hypotension, orthostatic tachycardia and the high and low frequency of R-R variability with tilt table, response to deep breathing, and valsalva maneuver as predictors of OI.

RESULTS:
6 males and 6 females, aged 10 to 17 were recruited. 10 of 12 patients arranged for autonomic testing. 5 completed testing, 1 was not tested and 4 were “no shows”. Each of the patients experienced at least one symptom consistent with decreased cerebral blood flow. Syncopal events ranged from 0 to 7 per month, with presyncopal events ranging from 0 to 15 per month. PedMIDAS scores ranged from 3 to 235. 1 patient with frequent migraines did have a syncopal event due to postural hypotension, and 2 patients were diagnosed with OI. PedMIDAS scores for these patients were 3 of the 4 highest. Detailed analysis of the other markers of autonomic function is pending.

CONCLUSIONS:
Statistical analysis of the results is pending. PedMIDAS scores did not appear to directly correlate with frequency of migraine headache, but did appear to be a trend towards higher pedMIDAS scores and diagnosis of OI. The data suggests these symptoms increase in frequency in relation to each other. However, recruitment was low, with high dropout rates and no shows. The data is insufficiently powered to have statistically significant results.
INTRODUCTION:
Sepsis is a common complication in young infants having congenital heart disease surgery. It is unknown what effects a peri-operative blood stream infection has on outcome. Our objective was to determine the mortality and neurodevelopmental outcome after a peri-operative blood stream infection, and predictors for peri-operative blood stream infection.

METHODS:
All consecutive infants of sepsis were determined by multiple regression analyses.

RESULTS:
Of 613 patients, 377 (62%) were male, 196 (32%) had surgery at age (5.7%) pre-op [14 (2.3%) GNB, 21 (3.4%) GPC]; 96/613 (15.7%) post-op [39 (6.4%) GNB, 54 (8.8%) GPC, 3 (0.5%) Candida]; and 122/613 (19.9%) overall. Independent predictors of peri-operative sepsis are age at surgery l outcomes examined, including delay on general adaptive composite score at 2 years and 4 years; delay on verbal, performance, and full-scale intelligence quotient at 4 years; and score on verbal, performance, and full-scale intelligence quotient as continuous outcomes. The FSIQ with peri-operative sepsis was 83.4 (18.4) and without perioperative sepsis was 92.0 (18.6), mean difference 8.6 (95% CI for difference 3.8-13.4).

CONCLUSIONS:
There is a significant association between positive blood culture sepsis and neurodevelopmental outcomes in young infants having surgery for congenital heart disease.
INTRODUCTION:
Pediatric myasthenia (PM) can be classified into three categories: autoimmune myasthenia gravis (MG), congenital myasthenic syndromes (CMS) and transient neonatal myasthenia gravis. PM is much rarer than the adult version of this condition and patients are frequently symptomatic for years before the specific diagnosis is made. With few dedicated publications on PM due to its rarity, the objective of this study was to prospectively evaluate the incidence, clinical features and treatment trends of PM in Canada.

METHODS:
Through established CPSP methodology, pediatric specialists were anonymously surveyed on a monthly basis for cases of PM using a standardized clinical questionnaire containing de-identified data. Inclusion criteria were: Any child < 18 years old with at least one of the following: a) fluctuating ptosis or extraocular weakness; b) skeletal muscle weakness or fatigue AND c) any of the following supportive tests: clinical response to acetylcholinesterase inhibitor, positive acetylcholine receptor or muscle-specific kinase antibodies, abnormal slow repetitive nerve stimulation or single fiber EMG.

RESULTS:
In two years of surveillance, 57 confirmed cases were reported. There were 34 generalized and 18 ocular reports of acquired PM plus 5 congenital myasthenic syndrome cases. There were 14 incident cases in 2010 and 6 in 2011: generalized (n=13) and ocular (n=7). Age of onset ranged from birth to 17 (median = 10) years for the generalized form compared to 18 months to 11 (median=3.5) years for the ocular subtype. Positive acetylcholine receptor titres were found in 22/33 (67%) generalized cases and 8/18 (44%) ocular patients. Of patients started on pyridostigmine, improvement was noted in 33/33 (100%) generalized cases and 15/17 (88%) ocular cases.

CONCLUSIONS:
This study represents the largest descriptive series of PM in North America and provides valuable information about clinical characteristics. A high index of suspicion is important, even in seronegative patients, for this treatable disease. Children generally respond promptly to readily available therapies.
INTRODUCTION:
Pain accounts for nearly 80% of emergency department (ED) visits and is the most common reason for seeking healthcare. The World Health Organization considers pain treatment a fundamental human right. Although children most accurately report their own pain, most studies ask third parties such as physicians, nurses or caregivers how well a child’s pain has been managed. This project examines the child’s experience with pain management in the ED.

METHODS:
This prospective, descriptive, cross-sectional survey will recruit a total of 100 children aged 7-17 from the Stollery Children’s Hospital ED. Research assistants administer a survey that includes the validated Child Total Quality Pain Management Questionnaire. Anonymized data is managed with a REDCap database. Data collection will be completed during the fall of 2012.

PRELIMINARY RESULTS:
Seventy eight eligible children have been recruited to date; 37 are female and 41 are male. The average age is 12.6 years old (range 7-16). Most children had injuries of the upper and lower limbs (n=24 and 21, respectively). Other presenting problems included head/neck (n=15), abdominal (n=8) and other types of pain (n=10). Average maximum pain was 78.8 and the average interval improvement in pain was 45.3 on a 100 mm pain scale. The average pain at discharge was 33.5 on a 100 mm pain scale. Forty percent of children were ‘very happy’ with their pain management, 53% were ‘happy’, and 7% were ‘unhappy’ or ‘very unhappy’. Eighty seven percent of children would want the same medicine if they experienced similar pain again.

CONCLUSIONS:
Children present with and continue to experience significant pain in the ED. Although many children have significant pain upon discharge, most report a high degree of satisfaction with their pain management. The relationship between satisfaction and pain management should be explored further, as our study implies that children’s satisfaction does not necessarily correlate with adequate analgesia.
INTRODUCTION:
Parents of critically ill newborns receive vast amounts of health information about their child. Parental motivation for Internet use for medical information in the NICU is unknown.

OBJECTIVE:
To identify parental motivation for Internet use in the tertiary level NICU and to relate this with confidence in the medical team.

METHODS:
335 anonymous questionnaires were distributed to parents in tertiary level NICUs (November to May 2012). Data collected included parental and baby demographics, Internet use, motivations for Internet use and confidence in the medical team. Data was analyzed using SPSS 20.0.

RESULTS:
The survey response rate was 42%. Approximately 2/3 of parents use the Internet to search for medical information on their baby, 87% trust the information they found but only 24% inform the medical team. Of parents who use the Internet for health information, 92% are confident in the medical team and feel they received good information about their baby’s health prior to Internet use. In determining reasons for searching medical information, 79% of parents sought to supplement existing knowledge, 8% lacked trust in the medical team, and 13% searched equally due lack of trust and to supplement their knowledge. Lack of confidence in the health care team was correlated (p less than 0.05) with parental Internet use motivated by lack of communication and trust. Duration of daily Internet use is correlated with reasons for Internet use. The most common site for finding information was a Google “top 5” site (31%), only 28% reference a medically supported site. 98% indicated ongoing interest in using the Internet for their baby’s health information.

CONCLUSIONS:
The majority of parents use the Internet for to further their medical knowledge, however, nearly 20% of parents search for health information due to medical system mistrust or communication deficiency. Internet search engines are guiding parents’ medical reading. Continued efforts are needed to ensure effective communication of medical information and to support parental Internet use in making informed health care decisions.
INTRODUCTION:
Family centered care (FCC) is an approach to health care that shapes health care policies, programs, facility design, and day-to-day interactions among patients, families, physicians, and other health care professionals. In 2010 a survey on FCC was conducted at the Stollery Children’s Hospital and it was recommended to repeat that study within 2 years.

METHODS:
Two different versions of a validated FCC survey were used: one for health care providers, and one for families. The questionnaires were based on the MPOC-20; the Measure of Processes of Care (MPOC-20) which is a 20-item, well-validated and reliable self-report measure of parents’ perceptions of the extent to which the services they and their child receives is family centered; the MPOC SP 27 was used for health care professionals. The educational intervention (EI) was designed to be a brief presentation on FCC principles delivered to small groups of health care providers.

RESULTS:
23 families and 52 staff members (residents and nurses) completed the survey. 82% of the families strongly believed that the people who worked with their child helped them feel competent as a parent; staff members gave a similar response. Only 23% of the families and 28% of the staff felt that there was some written information provided about child’s therapy and progress. 57% of the staff members believe strongly that they let parents choose when and how much information they want to receive about their child and 56% of the families had similar response. 60% of the families believe that they were provided opportunities to make decisions about their child’s treatment and 83% of them felt that they were provide a caring atmosphere during their stay in the hospital. The educational intervention (EI) is currently in progress and the post EI survey will be administered over the next few months.

CONCLUSIONS:
Some elements of FCC are practiced effectively at the Stollery but there is a clear need for more written information. The results of the post EI survey (ongoing data collection) may determine if the EI was an effective tool to improve FCC practices on CTU.
OBJECTIVES:
We compared the outcomes of modified single-patch and two-patch surgical repair of complete atrioventricular septal defect (CAVSD) on the left ventricular outflow tract (LVOT) diameter and the left atrioventricular valve (LAVV) coaptation.

METHODS:
We reviewed retrospectively postoperative two-dimensional echocardiograms of all CAVSD patients who underwent modified single-patch or two-patch repair between 2005 and 2011. We measured leaflet coaptation length of the LAVV in the apical 4 chamber view. The LVOT was measured in the long axis view.

RESULTS:
Fifty-one patients underwent CAVSD repair at median age 4 months (1-9 months) (single-patch n=29, two-patch n=22). The images from 46 echocardiograms were adequate for analysis. Modified single-patch repair required significantly shorter bypass (92.1±21.1 vs. 149.6±37.2 minutes, \( p < 0.001 \)) and ischemic time (62.6±14.1 vs. 104.8±28.6 minutes, \( p < 0.001 \)) than two-patch repair. Indexed coaptation length of septal and lateral leaflets was not different between single-patch and two-patch (3.1±2.3 vs. 4.1±3.1 mm/m², \( p = 0.25 \), 2.3±2.3 vs. 3.3±3.0 mm/m², \( p = 0.21 \)). Indexed LVOT diameter was not different in both groups (26.1±5.2 vs. 28.5±7.1 mm/m², \( p = 0.22 \)). There was no hospital or late death during the median follow-up of 35 months (1-69 months). Five patients were re-operated after single-patch repair (3 residual ventricular septal defect (VSD) and LAVV regurgitation, 1 residual VSD, 1 pacemaker implantation). After two-patch repair 1 patient required reoperation for a residual VSD and right atrioventricular valve regurgitation (\( p = 0.22 \)).

CONCLUSIONS:
The modified single-patch repair was performed with significantly shorter bypass time and myocardial ischemic time. Post-operative LVOT diameter and LAVV leaflet coaptation length were not significantly different between techniques.
INTRODUCTION:
Approximately 20% of newborn infants require assistance at birth. Rapid response teams with specific resuscitation-stabilization skills have been shown to improve paediatric outcomes. However, no study has evaluated the impact of a resuscitation-stabilization-triage (RST) team on neonatal acuity. In 2010 the Royal Alexandra Hospital (RAH) introduced an RST-team for delivery room care. The aim of this study is to compare the effect of the RST-team on acuity and morbidity in preterm babies before and after RST implementation.

METHODS:
Outcomes of all inborn newborns < 33 weeks gestational age (GA) admitted to the RAH NICU were eligible for inclusion. We assessed the Canadian Neonatal Network database for 2008, 2009 & 2011 and compared acuity scores (SNAPII), stability scores (TRIPS), therapeutic intensity scores (NTISS), and neonatal morbidities before (2008 & 2009) and after RST (2011) implementation. Results were stratified into 25 to 28 and 29 to 32 weeks GA. Continuous variables were compared using t-test and dichotomous variables were compared using Chi-square analysis.

RESULTS:
A total of 961 newborn infants were identified. We found no significant difference in mean SNAP-II score in either GA group. However, newborns in the post-RST period had a significant decrease in mean TRIPS score at admission (16.4 vs. 19.6, p.05) and at 12 hours (12.3 vs. 16.8, p.005) in the 25 to 28, but not 29 to 32, weeks GA group. The mean NTISS score at day 1 (13.5 to 16.2 p.0001) and day 3 (12.3 to 14.3 p.0001) increased for all newborns in the post-RST period. In addition, less hypotension in the 29 to 32 weeks GA group was observed. No differences in neonatal morbidities during the hospital stay were observed.

CONCLUSIONS:
Implementation of an RST-team did not change acuity (SNAPII). However, it significantly improved stability (TRIPS) in newborns at 25 to 28 weeks gestation on admission and at 12 hours of age.
INTRODUCTION:
Preeclampsia is a common disorder of human pregnancy diagnosed by the onset of hypertension and proteinuria after the 20th week of gestation and associated with endothelial dysfunction. Importantly, women with preeclampsia are at a greater risk for cardiovascular disease later in life. We have previously shown that lectin-like oxidized low density lipoprotein (oxLDL) and its receptor (LOX-1), are increased in the vasculature of women with preeclampsia. LOX-1 contributes to oxidative stress, which may result in reduced bioavailability of nitric oxide (NO) and increased endothelin (ET-1)-mediated vasoconstriction. Furthermore, ET-1 induces LOX-1 expression, encouraging the maintenance of oxidative stress. We hypothesize that changes in vascular function persist following a preeclamptic pregnancy, contributing to increased cardiovascular risk.

METHODS:
The postpartum vascular effects of preeclamptic-like symptoms were assessed in a rat model of reduced utero-placental perfusion pressure (RUPP), in which restrictive clips are placed around the abdominal aorta and ovarian arteries during pregnancy, reducing utero-placental blood flow. Sham-operated rats were used as controls. At 1 month postpartum, vascular function was analyzed by wire myography. Phenylephrine (PE)-induced vasoconstriction and methylcholine (MCh)-induced vasodilation were assessed in thoracic aorta and mesenteric arteries.

RESULTS:
Preliminary analyses of RUPP (n=3) and Sham (n=4) animals at 1 month postpartum show no difference in relaxation or constriction in the thoracic aorta. Constriction with PE in mesenteric arteries was also unchanged. At low doses of MCh (10-8 M), reduced relaxation was observed in mesenteric arteries from RUPP compared to Sham rats (31.7 ± 5.6% vs 63.7 ± 6.7%, p is < 0.05).

CONCLUSIONS:
Our data suggest that vascular function largely recovers in our RUPP model. Deficits in relaxation in resistance arteries may indicate an underlying phenotype which further manifests under the stress of ageing. Future studies will focus on vascular function beyond 1 month postpartum.
INTRODUCTION:
Chronic trauma can program an abnormal stress reaction in children, resulting in lifelong difficulties with stress management and poor health outcomes linked to changes in the immune system. At the same time, maternal stress during pregnancy and the postpartum period has been linked to a number of diseases in childhood, including wheeze and asthma. Given the potential for her own maltreatment in childhood to shape a mother’s later response to stress during pregnancy, it seems plausible that children may demonstrate inheritance of their mother’s childhood trauma through their own health issues.

METHODS:
The Community Perinatal Care (CPC) Study of Calgary provides extensive data on 791 mothers, 7.7% of whom have children with wheezing disorders at age 3. In order to investigate how past maternal maltreatment might be associated with wheeze in young children, a number of questionnaires within the CPC study were used to measure past maternal trauma. These will later be used in logistic regression models, adjusted for relevant confounding factors, to determine their association with the development of childhood wheeze.

RESULTS:
2.4% of Calgary women report experiencing physical abuse and 2.7% report sexual exploitation before the age of 6. Emotional maltreatment was measured in multiple forms, including those in which women were both the direct and indirect victims. For instance, 9.7% of women reported that they were bullied or harassed on a regular basis before age 6. As an example of indirect trauma, a sizable 4.8% of women report their parents had violent arguments before their sixth year. To be tested further, results from preliminary univariate analysis showed that women with parents who had violent arguments were more likely to have a child with a chronic breathing condition (p-value: 0.07).

CONCLUSIONS:
Calgary women appear to be within Canadian norms in their experience of childhood maltreatment and childhood wheeze. Initial univariate analyses suggest a mother’s experience of chronic psychological trauma in childhood might increase the likelihood of her offspring suffering from wheeze.
INTRODUCTION:
Pulmonary vein stenosis (PVS) is a rare disorder that may occur as an isolated lesion or in association with congenital heart defects. It can be acquired following cardiac surgery or interventions around the pulmonary veins. However, a group of ex-premature infants who develop PVS has been identified, although, the etiology and association with prematurity remains poorly understood.

METHODS:
We reviewed all available clinical and laboratory data in patients with a diagnosis of pulmonary vein stenosis. We excluded patients with total anomalous pulmonary venous drainage, atrial isomerism and gestational age >35 weeks.

RESULTS:
We identified 11 patients with pulmonary vein stenosis, 8 were male, median gestational age was 27 weeks (25w-34w), median birth weight was 860g (432g-2100g), and 3 patients were of twin pregnancies whose twin siblings were unaffected.

Most patients were diagnosed with chronic lung disease and needed significant respiratory support after birth. In 9/11 initial neonatal echocardiograms did not report abnormal pulmonary vein flow. The median age at diagnosis was 5 months (3m-2y) the diagnosis was most often made by or suspected by echocardiography because of apparent worsening of chronic lung disease. 8/11 patients underwent CT scan or MRI. The left pulmonary vein was the most commonly stenosed (91%) and all patients underwent a suture-less surgical repair. Median survival after pulmonary vein surgery was 6 months (range 4 to 10). In 7/11 PVS recurred and 4/11 patients died.

CONCLUSIONS:
Pulmonary vein stenosis should be considered if an ex-premature baby has late deterioration of chronic lung disease or evidence of pulmonary hypertension by echocardiogram. Further imaging by CT scan or MRI may be required to complete the diagnosis. Pulmonary vein stenosis appears to develop postnatally but the etiology remains unknown. The response to surgery and late recurrence appear to be similar to pulmonary vein stenosis in infants born at term.
INTRODUCTION:
Clinical observation has indicated that 30% of pediatric cancer patients develop thrombosis. Our goal was to identify genetic differences between pediatric cancer patients that develop thrombosis, and those that do not, in order to determine markers that can be used to identify children who are at increased risk of thrombosis. Determining these markers is important as pediatric cancer patients do not currently receive primary prophylaxis with anticoagulation to prevent thrombosis, due to the increased risk of bleeding. Identifying children at risk for developing thrombosis would allow targeting anticoagulation to only children at risk for thrombosis, so as to not put children at risk for bleeding if they do not require anticoagulation. Our research focused on Thrombin-Activated Fibrinolysis Inhibitor (TAFI) which is a carboxypeptidase that is an inhibitor of fibrinolysis. Increased levels of TAFI decrease fibrinolysis, thereby creating a prothrombotic condition.

METHODS:
Genotyping of TAFI was done by allele specific primer extension on the Bio-plex platform to identify single-nucleotide polymorphisms (SNPs) within the TAFI gene between two populations of pediatric cancer patients, those who developed thrombosis (cases) and those who did not develop thrombosis (controls), in order to determine if these SNPs on the TAFI gene are markers for increased risk for thrombosis in pediatric patients.

RESULTS:
Thirteen SNPs of interest: rs3742266, rs17067700, rs2181617, rs2404965, rs17844025, rs11620308, rs1326400, rs9562637, rs17844078, rs17844129, rs11574991, rs1926447, and rs2274381 were identified.

CONCLUSIONS:
Although a trend was observed, there was not a statistically significant difference between the two populations. Study may be underpowered to obtain a statistically significant result.
INTRODUCTION:
Epithelial ovarian cancer (EOC) comprises approximately 90% of ovarian cancers. 75% of EOCs are diagnosed at advanced stages and current chemotherapy regimens are ineffective against advanced EOC due to chemoresistance. Nitric oxide (NO) generated by tumor, stromal and endothelial cells plays a multifaceted role in tumor biology. Many physiological functions of NO are mediated by its intracellular receptor soluble guanylyl cyclase (sGC), comprised of an α subunit and a β subunit (GUCY1B3). We previously observed elevated GUCY1B3 expression in EOC, which led us to investigate the functional role of GUCY1B3 in the biology of EOC.

METHODS:
Expression of GUCY1B3 in and OVCA429 (EOC cell line) cells was stably knocked down by a lentivirus-delivered short hairpin (sh)RNA that targets human GUCY1B3 (shGUCY1B3). shRandom expresses a scramble sequence and was used as a control. Reduced expression of GUCY1B3 in OVCA429/shGUCY1B3 cells was confirmed by immunoblotting. The effect of GUCY1B3 knockdown on carboplatin cytotoxicity was determined by the neutral red uptake assay. Molecular events associated with carboplatin-induced cell death were also determined by immunoblotting. We conducted a microarray analysis to identify the signalling pathways and genes that are responsive to carboplatin treatment and/or GUCY1B3 knockdown.

RESULTS:
The neutral red uptake assay showed that OVCA429/shGUCY1B3 cells are more sensitive to carboplatin treatment compared to shRandom control cells. In keeping with the cytotoxicity data, immunoblotting showed that carboplatin-induced cleavage of PARP, an indication of apoptotic cell death, was more pronounced in shGUCY1B3 knockdown cells compared to their respective shRandom controls. The most promising candidates in the microarray results were selected for detailed mechanistic studies.

CONCLUSIONS:
Our data demonstrates that knockdown of GUCY1B3 sensitizes EOC cells to carboplatin treatment, suggesting that targeting of GUCY1B3 in combination with carboplatin treatment is a potential therapeutic strategy to treat EOC.
INTRODUCTION:
The Alberta Association of the Deaf (AAD) advocates for rights for all Deaf Albertans, including equal access to social services, education, and employment. The purpose of this awarded research project is to collaborate with Deaf members of the Alberta Association of the Deaf (AAD) by using Community-Based Research (CBR) to explore current issues related to experiences of Deaf students in educational settings in Alberta.

METHODS:
The research study employs a community-based research (CBR) approach. In June 2012, the Alberta Association of the Deaf (AAD) was approached to engage in a CBR partnership and, through that process, dialogue about the current issues that AAD is facing in relation to Deaf children’s/students’ well-being and their sense of belonging in educational settings in Alberta. The objective of this research was to initiate a community-based research partnership with the Alberta Association of the Deaf (AAD) in Edmonton in order to explore the following research question: What are the issues that the Alberta Association of the Deaf (AAD) is currently facing in regard to Deaf children/students, their well-being and sense of belonging in educational settings in Alberta?

RESULTS:
Following are topics identified as being of mutual interest for both the researcher and members of the AAD to explore more deeply in the future:
1) Lack of literacy development
2) Relationship between the Alberta Association of the Deaf (AAD) and the education system
3) Limitation of understanding
4) Lack of voice to express thoughts and opinions
5) Limitation of access to Deaf role models/adults

CONCLUSIONS:
The community-based research (CBR) approach encourages Deaf members to learn and reflect more about these topics and allows them as a Deaf community to voice their concerns in a safe and trusted research environment. CBR is most certainly a viable approach to take in research related to Deaf education.
INTRODUCTION:
Canadian children requiring emergency care are primarily treated in general emergency departments (EDs). Evidence shows that as many as 40% of children cared for in general EDs do not receive evidence-based treatments, and up to 20% of these children receive a treatment which has been shown to provide no benefit or in some cases even harm. Translating Emergency Knowledge for Kids (TREKK) is an initiative aimed at improving the outcomes of children cared for in all Canadian EDs by ensuring the use of the latest research in pediatric emergency care. TREKK aims to achieve this through a multi-faceted, longitudinal study, funded by the Networks of Centres for Excellence- Knowledge Mobilization (S. Scott, Network Investigator; T. Klassen, Network Director). Dr. Shannon Scott and her research team will lead the first stage—the “needs assessment” which will be accomplished using a specifically developed iPad application (app).

RESEARCH QUESTION: What are the experiences of research nurses conducting a national study using iPads as a medium for data collection?

METHODS:
Strategic recruitment of EDs across Canada through a network-based model has yielded a sample of 36 general EDs, spanning 9 provinces and 1 territory for the TREKK initiative. Data collection will be accomplished using iPads to assess the health information needs and knowledge mobilization preferences of health care professionals and consumers. The iPad app allows for simultaneous data collection in multiple sites using camera, voice memo and diary features to document knowledge needs throughout the ED experience.

An online survey has been created to gain insight into the data collectors’ experiences of using this new technology in order to assess the efficacy and feasibility of iPads as a medium for data collection. Descriptive analysis of the data will yield important information regarding the potential use of the iPads for future large, multi-site studies.

RESULTS:
Data collection is on-going and results will be presented once gathered.
INTRODUCTION:
Epidural analgesia has become the commonest mode for providing pain relief in labor, with a combination of bupivacaine (a local anaesthetic) and fentanyl (an opioid) most often used in practice. It is generally perceived that the use of opioids via this route is unlikely to cause respiratory effects in the newborn as the drug is contained at the site of administration. However, pharmokinetic studies have shown that opioids diffuse freely from the epidural space into the maternal blood and across the placenta. We hypothesize that the opioids transferred to neonates from their mothers receiving epidural analgesia in labor, could be associated with the development of respiratory distress in immediate neonatal period.

METHODS:
Case-control study. Subjects were singleton infants born at Caritas hospital sites in Edmonton from January 2006 to December 2010. Cases were neonates >=34 weeks gestation, who developed respiratory distress within 24 hours of life requiring supplemental oxygen >=2 hours and/or positive pressure ventilation in the NICU. Controls were gestation and site matched neonates who did not develop any respiratory distress within the same period. Subjects with major congenital malformations, culture proven sepsis, or born by elective caesarean section were excluded. Exposure to epidural analgesia will be obtained through delivery records. The sample size was based on the following desired parameters: ɑ-error 0.05, power 80%, ratio of cases to controls 1:1 and minimum odds ratio(OR) of 2.

RESULTS:
We enrolled 206 cases and 206 matched controls. Exposure to epidural analgesia was present in 146 (70.8%) cases as compared to 131 (63.6%) of the controls [unadjusted OR 1.43, (95% confidence interval 0.94 to 2.16], p = 0.11]. The association between exposure to maternal epidural analgesia and respiratory distress in baby was significant upon adjustment for confounders [adjusted OR 1.78, (95% confidence interval 1.08 to 2.95], p = 0.02].

CONCLUSIONS:
Neonates exposed to maternal epidural analgesia in labor, were more likely to develop respiratory distress in immediate neonatal period.
Mixed methods data collection in general emergency departments using ipads: experiences from Translating Emergency Knowledge for Kids (TREKK)

INTRODUCTION:
In Canada, the majority of children requiring emergency care are treated in general emergency departments (EDs). Evidence shows that up to 40% of children treated in general EDs do not receive treatments for which clear evidence exists and up to 20% of these children receive a treatment that has been shown to provide no benefit or even causes harm. The Translating Emergency Knowledge for Kids (TREKK) project is aimed at ensuring the latest research in pediatric emergency medicine is applied in general EDs.

METHODS:
In the first phase of TREKK, we have partnered with 35 general EDs across Canada to determine knowledge needs and preferences of ED health care providers and parents seeking care for children in the general EDs. In this mixed methods study, healthcare professionals and parents will complete electronic surveys via a custom iPad ‘app.’ This process is currently underway. SPSS will be used to analyze questionnaire data. Sites will also be purposively sampled to participate in qualitative data collection. The camera, video, notes, and voice memo iPad functions will be used to document the general ED experiences of both populations and serve as prompts during individual interviews, which will be analyzed thematically.

RESULTS:
The creation of the data collection tools, the electronic platform, and attending to research ethics boards/operational approval boards has been a complex and labour intensive processes. We believe novel technology increases participant engagement and enhances large scale data collection; however, in our experience, it was necessary to rethink traditional approaches to research coordination and administration.

CONCLUSIONS:
We intend to share lessons learned from the first phase of the TREKK initiative.
INTRODUCTION:
The Apicomplexa are a group of unicellular parasites that negatively impact the global state of human health and economic growth. Central to their role as obligate intracellular parasites are a set of specialized secretory organelles, which mediate all stages of host cell invasion and egress. Biogenesis and proper function of these organelles is dependent on delivery of protein and lipid components via the membrane trafficking system, yet the mechanisms underpinning such processes in these organisms remain largely unknown. One set of potentially key components are the multi-subunit tethering complexes (MTCs). Prompted by the results of previous studies indicating a sparse pattern of conservation of several membrane trafficking factors within the Apicomplexa compared to other Eukaryotic groups, we undertook homology searching for MTC components in twelve Apicomplexan genomes, as well as the genomes of two Ciliates, one Stramenopile, and one Rhizarian.

METHODS:
All homology searching was carried out using the BLAST algorithm. Hidden Markov Models were constructed and used in a second set of searches with the HMMer program to identify divergent homologs. Phylogenetic analysis was performed using the PhyML, RAxML, and MrBayes programs.

RESULTS:
We observed excellent conservation of the VpsC core of the HOPS and CORVET complexes, as well as the core TRAPP subunits, but sparse conservation of TRAPPII, COG, Dsl1, and HOPS and CORVET specific subunits. Strikingly, we failed to identify any subunits of the Exocyst complex in all twelve Apicomplexan genomes, as well as the Dinoflagellate Perkinsus marinus. A more broad comparative genomic analysis revealed evidence for an ancient origin of the CORVET subunit Vps8 and the recently described Tca17, and, together with phylogenetic reconstruction, suggests the CORVET subunit Vps3 is a fungal specific duplication of Vps39.

CONCLUSIONS:
MTC subunit loss in the Apicomplexa is widespread and follows distinct patterns, suggestive of an underlying biological mechanism.
INTRODUCTION:
Hereditary Spastic Paraplegia (HSP) represents a diverse group of inherited neurodegenerative disorders in which the predominant clinical characteristics are progressive weakness and spasticity of the legs. HSP can solely affect locomotion, or also impact cognitive development and seizure activity. There is currently no known cure for HSP, due largely to the lack of understanding of how the numerous genes implicated in HSP contribute to neuronal degeneration. Two of the most frequent causes of pure HSP are due to mutations in the genes atlastin-1 (SPG3A) and spastin (SPG4)—estimated to account for 10% and 40% of pure autosomal dominant HSP, respectively. Importantly, several of the HSP-associated genes, including spastin and atlastin, are highly evolutionarily conserved between humans and the fruit fly Drosophila melanogaster. Drosophila spastin null mutants have been shown to exhibit locomotor defects that mimic the motor weaknesses observed in HSP patients, but it remains unclear how the behaviour evolves with aging.

METHODS:
We tested Drosophila mutants for spastin (spastin10-12 and spastin17-7) and atlastin (atl2) at different days post-eclosion (i.e., 1 and 5 days) to assess their motor performance. We used a well-established climbing assay, where the time taken for 30 flies to climb 17.5 cm is recorded over 2 minutes. Statistical analysis was performed using Student’s t-test.

RESULTS:
We observed a decrease in the rate of climbing for the atlastin heterozygous flies.

CONCLUSIONS:
Our results show that disruption of the atlastin gene in Drosophila causes a measurable motor deficit. Future experiments will include the assessment of motor performance at later days post-eclosion (e.g., 10 days) as well as the use of flies with differing genetic backgrounds. We will also employ various imaging techniques such as confocal and immunofluorescent microscopy to visualize the evolution of pathological changes as the disease progresses.
INTRODUCTION:
Ureteropelvic junction (UPJ) obstruction is a common urologic condition detected antenatally. Children are born without symptoms and despite a significant delay in drainage few children go on to require surgery. The purpose of this study was to identify a cohort of children diagnosed antenatally with UPJ obstruction and describe the outcomes in order to help guide management.

METHODS:
We reviewed all children who presented with urologic conditions antenatally between July 2005 to Jan 2009. Children with UPJ obstruction were identified based on a MAG3 renal scan demonstrating a delay in drainage and absence of ureteral dilation. Patient data collected included gender, sidedness, differential function, and coexistent medical conditions. Outcomes recorded included urinary tract infections, pain, hypertension, change in differential function, time to decreased function, surgical interventions, and complications.

RESULTS:
217 children presented with urologic problems antenatally and 41 of these children had UPJ obstruction. The mean number of follow appointments was 2.9 and mean follow-up was 27.6 months. Out of the 41 children diagnosed with UPJ obstruction, 13 (31.7%) required surgery including 12 pyeloplasties. In the children who experienced a deterioration in function, the mean time to change in function was 13.7 months and the UPJ obstructions of 10 children were resolved following surgery. Of those children who underwent a pyelopasty, 11 children experienced improvement or resolution of their UPJ obstruction and 1 child remained unchanged. There were no surgical complications.

CONCLUSIONS:
Children diagnosed antenatally with UPJ obstruction do very well. In this contemporary cohort only 31.7% required surgery, primarily for a decrease in function. Children recovered the function well and therefore observation in this patient cohort is quite reasonable. Given that most children deteriorated around 13.7 months renal scans could be performed 12 months apart. This study will help guide physicians with respect to monitoring children with UPJ obstruction.
INTRODUCTION:
Nonalcoholic fatty liver disease (NAFLD) refers to a wide spectrum of liver disease ranging from fatty liver (steatosis) to nonalcoholic steatohepatitis (NASH). NAFLD is strongly associated with obesity and insulin resistance. Carboxylesterase 3/triacylglycerol hydrolase (Ces3/TGH) has been shown to participate in adipose tissue basal lipolysis and hepatic VLDL assembly. Our previous research demonstrated that Ces3/TGH global knockout (KO) mice showed improved insulin sensitivity and reduced VLDL lipids without liver steatosis on chow diet. In this work, we investigated the effect of Ces3/TGH deficiency on hepatic steatosis and insulin sensitivity when challenged with high fat diet.

METHODS:
We fed Ces3/TGH KO and wild type (WT) mice with high-fat (60% kcal/fat, HF) diet for 16 weeks. White adipose tissue (WAT) and liver were investigated and hepatic lipogenesis and insulin sensitivity were analyzed. To specifically study the effect of hepatic Ces3/TGH deficiency on diet induced steatosis, and Ces3/TGH role in cholesterol metabolism, we fed liver-specific Ces3/TGH KO (L-TGH KO) mice with high-fat, high-cholesterol Western-type (42% kcal/fat, 0.2% cholesterol, WT) diet for 2 weeks. Lipid metabolism in liver was investigated afterwards.

RESULTS:
Ces3/TGH global KO mice showed augmented WAT without changing body weight. In the liver, reduced liver weight as well as triacylglycerol (TG) and cholesteryl ester (CE), decreased de novo lipogenesis, and improved insulin sensitivity were detected in mice lacking Ces3/TGH on HF diet. In L-TGH KO mice on WT diet, while the protective effect against hepatic TG accumulation was still observed, there was no difference in liver CE and free cholesterol levels between L-TGH KO and control TGH-Lox mice.

CONCLUSIONS:
Ces3/TGH global KO mice were protected from HF diet induced steatosis mainly through reduced de novo lipogenesis and improved hepatic insulin sensitivity. L-TGH KO mice fed with WT diet showed decreased hepatic TG but not CE and FC contents, which suggested that Ces3/TGH does not play a crucial role in liver cholesterol metabolism.
INTRODUCTION:
Congenital heart disease (CHD) may be associated with significant mortality and morbidity. Neonates diagnosed prenatally with some forms of CHD have better outcomes. The proportion of neonates in Canada having severe CHD that is detected prenatally is unknown. We sought to determine the proportion of fetuses detected prenatally, define risk factors for missed prenatal diagnoses and evaluate the impact of a prenatal diagnosis on postnatal outcomes.

METHODS:
A retrospective chart review was conducted on infants born in Alberta with CHD requiring surgical or catheter intervention (p=0.003), higher PaO2 levels (p=0.008) and more frequent use of prostaglandins (p=0.001). Among infants who underwent surgery within 15 days of age, those with a prenatal diagnosis had higher preductal O2 saturations (p=0.04), fewer days to admission (p=0.03), less requirement for intubation (p=0.004) and atrioseptostomy (p=0.04) and less frequent use of inotropes (p=0.001) than those diagnosed postnatally. Among the 188 prenatally detected subjects, there were 47 (25%) pregnancy terminations. This proportion increased to 49% (47/96) when only those fetuses with CHD detected before 24 weeks were considered.

CONCLUSIONS
Only 50% of fetuses with severe CHD were detected in the prenatal period. Prenatal detection improved clinical outcomes for children born with severe CHD. The timing of prenatal detection impacted the parental decision to terminate the pregnancy. The likelihood of prenatal detection was decreased among lesions having a normal 4 chamber view on ultrasound suggesting a need for improved screening to identify conotruncal abnormalities. The likelihood of prenatal detection was also influenced by residential region indicating heterogeneity in healthcare delivery within Alberta.
INTRODUCTION:
Advanced ovarian cancer is marked by increased chemoresistance, which renders chemotherapy ineffective. Thus, there is a need to identify signalling pathways contributing to the chemoresistance of ovarian cancer as potential therapeutic targets. Soluble guanylyl cyclase (sGC) is the intracellular receptor of Nitric Oxide (NO). Our previous data reveal an overexpression of GUCY1B3, the β subunit of sGC, in human ovarian cancer. Knockdown of GUCY1B3 reduces growth of ovarian cancer cells and renders them more sensitive to treatment with carboplatin (a therapeutic agent). Interestingly, carboplatin treatment greatly decreases GUCY1B3 expression in ovarian cancer cells. We hypothesize that the down-regulation of GUCY1B3 is critical in carboplatin-induced apoptosis of ovarian cancer cells.

GOALS
(1) To examine how carboplatin treatment downregulates GUCY1B3 in ovarian cancer cells and (2) to determine the effect of GUCY1B3 overexpression on the proliferation and chemosensitivity of ovarian cancer cells.

METHODS:
OVCA429 and OVCAR3 cells (ovarian cancer cell lines) were treated with carboplatin and tested via Western blotting and real-time RT-PCR to examine GUCY1B3 expression. OVCA429 cells were transduced with MSCVpac/hGUCY1B3 or MSCVpac/vector to determine the effect of GUCY1B3 overexpression on proliferation and chemosensitivity via growth curve, neutral red assay, and Western blotting.

RESULTS:
Carboplatin treatment of OVCA429 and OVCAR3 cells led to decreased GUCY1B3 expression at protein and RNA levels. OVCA429/hGUCY1B3 cells showed increased proliferation over vector cells and reduced sensitivity to carboplatin treatment. Overexpression of GUCY1B3 delayed the carboplatin-induced cleavage of PARP [Poly (ADP-ribose) polymerase] and thus the onset of apoptosis, suggesting a mechanism of reduced chemosensitivity.

CONCLUSIONS:
(1) Carboplatin treatment downregulates GUCY1B3 expression at protein and RNA levels. (2) GUCY1B3 overexpression promotes proliferation of ovarian cancer cells. (3) Overexpression of GUCY1B3 decreases sensitivity of ovarian cancer cells to carboplatin treatment.
INTRODUCTION:
Some research has shown that approaching research with a well-established and trusting partnership is a vital source for teaching, research, and practice (Johnson Butterfield & Soska, 2005). Yet, research on how to sustain a partnership is still in infancy and warrants further attention. The purpose of my poster is to show a model of sustaining a positive successful partnership for an early childhood development project. Project description: The Early Child Development (ECD) mapping initiative, funded by the Ministry of Education, has developed a five-year initiative for collecting Early Development Instrument (EDI; Offord & Janus, 1999) data across the province of Alberta. The EDI is a population measurement tool, completed by kindergarten teachers, that measures early development and school readiness across five domains and shared with communities across Alberta to gauge early childhood development. The Multicultural Health Brokers Co-operative (MCHB), an immigrant and refugee health serving agency, approached CUP with significant concerns about parent engagement in providing informed consent and the cultural relevance of the EDI for describing diverse ethnocultural children’s development. As a result, a partnership was developed to assess the cultural utility of the EDI.

METHODS:
This community-based partnership development model is developed from: (a) an extensive interdisciplinary review of partnership development literature, and (b) experience developing and sustaining a partnership for an early childhood development project.

RESULTS:
The key activities that emerged from the model are knowledge sharing, project coordination, policy/social change, building capacity, community engagement, community connection, funding allocations, mutual benefit, and stakeholder meetings. The foundation of the model is made up of transparency, buy-in of partners, availability of partners, history of partnership, interest in topic, interpersonal characteristics, community-based principles, and a shared vision. Conclusions and lessons will be discussed.
INTRODUCTION:
Pirh2, a p53 inducible gene E3 ligase, is proposed to be a main regulator of p53 proteins fine tuning the DNA damage. A negative feedback loop between Pirh2 and p53 exists where under unstressed conditions Pirh2 induces p53 ubiquitination followed by proteosomal degradation. In case of cellular stress when the activity of p53 is needed, Pirh2 is self ubiquitinated hence releasing p53 continuous repression. Interestingly among all E3 ligases, Pirh2 is the only one to be over-expressed in many human tumors. This over-expression might cause a disruption in the substrate fate post ubiquitination. In ubiquitination, lysine chains determine the substrate fate. For example K48 lysine is known to induce proteosomal degradation; this is not the case for K63. In this study we aim to reveal the role of lysine chains in Pirh2 self and p53 ubiquitination.

METHODS:
Ubiquitin mutant constructs were designed by manipulating the lysine residues through single/multiple mutations at specific positions where lysine residues were mutated to arginine. Using these constructs and in comparison to WT-Ub, we tested Pirh2 in-vitro ubiquitination activity.

RESULTS:
K63R and K48R ubiquitin constructs that had respectively the lysine residues at position 36 and 48 mutated to arginine, did not affect Pirh2 self-ubiquitination minimizing the impact of ubiquitin mutations. However, KO, which had all lysine residues mutated to arginine, showed total inhibition of Pirh2 self-ubiquitination confirming the importance of lysine residues in ubiquitination. Interestingly, Pirh2 self-ubiquitination showed no differences in the presence or absence of p53 proteins indicating that p53 presence does not alter the self-ubiquitination process. Concerning Pirh2-p53 ubiquitination, K48 was found to be critical for E3 ubiquitin ligase activity because K48R and not K36R showed defective ubiquitination. All results were confirmed by quantifying ubiquitin.

CONCLUSIONS
Our data added knowledge to the Pirh2 ubiquitination mechanism that can resolve the constant over-expression of Pirh2 proteins hence maximizing p53 response to DNA damage.
Mapping the waters: A scoping review of the use of visual arts in pediatric populations with medical conditions

INTRODUCTION:
Visual art is a powerful and expressive communicative tool with utility in pediatric settings. We undertook a scoping review to understand how visual arts (e.g. drawing, painting) are used in pediatric populations with medical conditions.

METHODS:
CINAHL, SCOPUS and PubMed were searched (2000-2011). We used systematic methods for study selection and data extraction. We conducted a descriptive analysis and categorized studies according to the purpose of the artistic intervention.

RESULTS:
Of 1767 articles retrieved, 16 articles met the inclusion criteria. Art was most commonly used with the pediatric conditions of autism and post-traumatic stress disorder. Findings illuminate the use of visual art as a mechanism to facilitate or reduce specific child attributes (e.g., self-efficacy, self-concept, communication), and to facilitate understanding through communication or assessment.

CONCLUSIONS:
This review provides information about the uses of visual art in pediatric populations with health conditions, as well as gaps in existing research.
INTRODUCTION:
An exploration and analysis of hospitalized children’s experience of acute pain, when diagnosed with a chronic illness through the use of an integrative review and secondary data analysis.

METHODS:
The integrative review summarized and critically assessed the literature focusing on chronically ill children’s experiences while in hospital with acute pain and its associated measurement and assessments. The secondary data analysis utilized the CIHR Team in Children’s Pain - Canadian Pediatric Pain Research (CPPR) database interpreted current practices related to painful procedures (acute pain) inflicted upon chronically ill children in acute care environments across Canada.

RESULTS:
This review contributes to the overall knowledge and understanding of acute pain in chronically ill children, with the potential of decreasing the overall mismanagement of pain in children. It was found that 35.7% of hospitalized Canadian children had a chronic diagnosis. These children were found to receive an increased number of painful procedures in a 24 hour period, yet they did not receive an increase in assessment of their pain. Chronically ill Canadian children where found to experience a painful procedure 86% of the time while in hospital, yet only 68% of these received a pain assessment.

CONCLUSIONS:
The results of this study have potential to aid in facilitating health practitioner’s pain research use by informing clinical, administrative and policy decision making. This study helps to promote improved quality of life in children with chronic illness experiencing acute pain by clearly stating current practices in Canadian hospitals.
INTRODUCTION:
To investigate the adverse event rates associated with natural health product (NHP) use, prescription drug use and concurrent NHPs-drug use through active surveillance in community pharmacies.

METHODS:
Participating pharmacists and pharmacy technicians screened consecutive individuals picking up prescription medications about (i) NHP use, (ii) prescription medication use and (iii) concurrent NHP/prescription medication use in the previous one month and (iv) the presence of potential adverse events. If a potential adverse event was identified and the patient provided written consent, a research pharmacist conducted a guided telephone interview to gather additional, detailed information on the adverse event and medical history of the patient after obtaining additional verbal consent.

RESULTS:
Over a total of 105 pharmacy weeks, 1119 patients were screened, of which 409 reported taking prescription drugs only (36%; 95% CI: 33.7%-39.4%), 41 reported taking NHPs only (3.7%; 95% CI: 2.6%-4.8%) and 656 reported taking NHPs and prescription medication concurrently (58.6%; 95% CI: 55.7% to 61.5%). A total of 58 patients reported a possible AE, which represents 0.98% (95% CI: 0.03% to 1.93%) of those taking prescription medications only, 9.8% of those taking NHPs only (95% CI: 0.7% to 18.9%) and 7.5% of those taking NHPs and prescription medications concurrently (95%CI: 5.48% to 9.52%).

CONCLUSIONS:
Compared to passive surveillance, this study found active surveillance to markedly improve NHP adverse event reporting rates. Active surveillance offers improved quantity and quality of adverse event data, allowing for meaningful adjudication to assess potential adverse reactions caused by NHPs.
INTRODUCTION:
Homeopathy is based on a theory that disease can be treated by a highly diluted version of substances that produce similar symptoms in healthy people. Despite the scientific controversy that exists, homeopathy is commonly used by both adults and children. In the US, homeopathy is used by nearly 4 million adults and 1 million children every year. There is an assumption that since homeopathic remedies are extremely dilute, they are safe.

OBJECTIVE:
To systematically review adverse events associated with homeopathy in adults and children.

METHODS:
A search strategy was developed in conjunction with a health research librarian and applied in eight databases (Medline, Embase, CINAHL, AMED, Cochrane Database of Systematic Reviews, Cochrane Central Registry of Controlled Trials, Alt HealthWatch, CAM-Quest). Identified references were assessed for inclusion by two reviewers and the data extracted.

RESULTS:
A total of 4187 references were identified by the search. Screening of titles and abstracts resulted in 590 potentially included references, of which 134 have been included, 365 excluded, and 91 are pending review. Data extraction is ongoing; thus far 65 RCTs and 6 case reports have been extracted. A total of 10/71 papers extracted did not report if any harms occurred; 20/71 papers report no harms occurred; and 41/71 papers report some harm(s). Examples of reported harms include moderate harms: acute otitis media, dermatitis and severe harms: influenza, acute tonsillitis, dermatitis and baboon syndrome. Most papers that list harms do not report on seriousness or duration of adverse event(s) or patient outcome.

CONCLUSIONS:
Homeopathy is commonly used, making assessment of its safety a priority. Preliminary analysis shows that reporting quality of adverse events is poor, challenging assessment of causality.
BACKGROUND:
Despite improvements to sepsis-associated mortality, severe sepsis remains a significant cause of mortality and morbidity. We aim to describe patients admitted to PICU with severe sepsis in Alberta.

METHODS:
A prospective observational cohort of consecutive PICU patients (at Stollery and ACH) meeting the following inclusion criteria were enrolled: evidence of systemic inflammatory response syndrome, suspected or proven bacterial or fungal infection, and antibiotics ordered for suspected or proven infection. Patients were excluded if they were not expected to survive 24 hours, palliative care, or had severe sepsis >48 hours. Demographics, variables related to course of illness and outcomes were collected on days 1, 3-4, and 7.

RESULTS:
Preliminary results for 83 patients are included. 54/83 (65%) have >1 co-morbidity; the most common include cardiovascular, respiratory, or neuromuscular disease. The most common sites for infection are pneumonia (64%), bacteremia (16%), and meningitis (12%). The most common antibiotics used are beta-lactams, vancomycin, and macrolides. Antibiotics took a mean of 2.3-3.7 hr to order and 3.3-5.2 hr to begin infusing. Generally, course of illness, as shown by laboratory results and PELOD scores, improved over time. The majority were treated with vasopressors (59%) and ventilation (66%), with fewer requiring renal replacement therapy (12%) or extracorporeal life support (11%). Average PICU stay after inclusion was 12.1 (SD 14.1) days, with 7.5 (9.3) ventilator days; these outcomes did not correlate with day1 WBC, platelet count, PELOD, or lactate, and only weakly with PRISM III (r=0.32, p=0.006). Overall survival for this preliminary group is very high (98%). Long-term neurologic outcomes are not yet available.

CONCLUSIONS:
These preliminary results provide a description of patients admitted to PICU with severe sepsis in Alberta, and confirm the high severity of illness. Clinical information was poorly predictive of outcomes. Examining novel predictors of outcomes, including metabolomics, is the next step in this research program.
INTRODUCTION:
Necrotizing enterocolitis or NEC is an important cause of mortality and serious morbidity in preterm infants. Prebiotics are specific oligosaccharides which have been shown to promote proliferation of beneficial bacteria in gut. This systematic review aims to review the literature to investigate the role of prebiotics in the prevention of NEC in preterm infants.

METHODS:
Electronic databases CSDR-DARE, MEDLINE, CINAHL, EMBASE, Scopus, Web of science were searched from the date of inception to March 27, 2012. Additional citations were retrieved from the bibliography of the selected articles, Google scholar and abstracts of conference proceedings. The eligible studies were RCTs or quasi-RCTs enrolling inpatient preterm infants that compared use of Prebiotics (any dose and duration) with control (placebo/no treatment) for the outcomes of NEC (stage 2 of Bell’s classification, perforation and any stage), growth and any other potentially beneficial effect or serious side effects. Two independent reviewers extracted the data and assessed the risk of bias in included studies. Discrepancies were resolved with consensus.

RESULTS:
14 studies fulfilled the inclusion criteria. Two RCT reported on NEC stage 2 and above and showed no significant difference between the groups. There was no difference noted in the growth parameters [(weight and length-(3 studies); head growth (2 studies)]. There was a trend towards higher stool frequency (one study) and higher Bifidobacterium count in stool (2 studies) in the Prebiotic group.

CONCLUSIONS:
Current data is insufficient to recommend the use of Prebiotics in preterm infants for prevention of NEC. Larger well conducted randomized trails with NEC as primary outcome of interest are needed.
INTRODUCTION:
Over the past three decades, the incidence of maternal overweight and obesity has substantially increased in Canada. Maternal obesity during pregnancy, independently and through association with type 2 diabetes, is a risk factor for childhood obesity. The medical consequences of prenatal maternal obesity and high infant birth weights have immediate adverse outcomes for offspring, such as stillbirth, macrosomia, meconium aspiration and shoulder dystocia. Later life risks include hypertension, type 2 diabetes, cardiovascular diseases and depression. Recently, it has also been observed that overweight and normal weight individuals have different communities of intestinal microflora (“commensal microbes or good bacteria”). Our goal is to determine the association between maternal overweight or obese status during pregnancy and infant birth weight.

METHODS:
This was a descriptive analysis of women-infant dyads at the Winnipeg site of the CHILD (Canadian Healthy Infant Longitudinal Development) pregnancy cohort. Maternal overweight status pre pregnancy was determined from height and weight measurements obtained in the prenatal history section of the birth chart, while the birth weight of the infants was extracted from the hospital birth record. Maternal overweight was categorized as a BMI of 25 to 29.9, while BMIs >= 30 were classified as obese. High birth was defined as birth weight >= 4000g.

RESULTS:
Of the 124 women in the CHILD study, 50% were normal weight, 27% were overweight and 23% were obese. Gestational diabetes was found in 4% of women. While a correlation between maternal pregnancy weight status and birth weight was not observed, a greater proportion (17%) of infants were born with high birth to obese women than to normal or overweight women (13% or 6%).

CONCLUSIONS:
This preliminary data points to the potential long term health consequence of prenatal maternal obesity because the tendency towards high birth weight in infants born to obese mothers could indicate an elevated risk of childhood obesity. This will provide new and valuable evidence to health practitioners and mothers.
INTRODUCTION:
The efficacy of fetal echocardiography (FE) in the prenatal diagnosis of congenital heart disease (CHD) is well recognized. However, its utility as a modality to diagnose CHD in the first trimester is still being explored. The purpose of this study was to evaluate the functionality of FE in assessing fetal cardiac structures in the first trimester.

METHODS:
As part of a larger, prospective study, 407 studies were performed. Each patient underwent at least FE scan prior to, and one FE post, 14 weeks of gestation. Transabdominal FE was performed in all patients, while transvaginal FE was utilized in 21 scans (4.7%). Each study was reviewed to assess the visibility of intracardiac anatomy. Comments on the imaging of specific cardiac structures were collected and classified as either confirmation or absence of visualization, and if confirmation of visualization, structurally normal or abnormal. Studies with no reference to a specific structure were documented.

RESULTS:
In FE performed at a gestational age < or equal to 10 weeks, four symmetrical, cardiac chambers could be visualized in 48.7% of scans. Similar visualization was possible in 93.7% of studies at gestational ages from 10+1 to 14 weeks, and 98.4% of studies at a gestational age of greater than 14 weeks. At a gestational age of < or equal to 10 weeks, the presence of two, crossing outflow tracts could be visualized in 25.6% of FEs. Similar visualization was possible in 89.1% of FEs at gestational ages between 10+1 to 14 weeks, and 96.4% of FEs at a gestational age of greater than 14 weeks. Similar trends in the visualization of semilunar valves, aortic and ductal arches, and cardiac solitus, were observed. Within the context of the study, structural cardiac abnormalities were identified in 9 scans (2.2%), at a mean gestational age of 17.1 weeks.

CONCLUSIONS:
This study demonstrates that FE has utility in the visualization of intracardiac anatomy in early gestation, even < 10 weeks. As gestational age increases, so does the functionality of FE in the visualization of fetal cardiac anatomy.
INTRODUCTION:
A balanced assessment of interventions requires analysis of benefits and harms. Systematic reviews (SRs) of harms can provide valuable information to help describe adverse events, but they are hampered by lack of standardized methods to report these events. Developed to address suboptimal reporting in SRs, the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) statement has mainly focused on efficacy and not on harms. A systematic review undertaken by our team has identified major gaps in reporting in systematic reviews of adverse events, necessitating the need for a new guideline, The PRISMA Harms Extension.

METHODS:
A modified Delphi process was used. An initial checklist of potential items to be reported in a SR of adverse events was developed. The first phase of the Delphi process was online, such that 40 potential checklist items were sent to an international group of experts in systematic reviews, guideline development and epidemiology. The experts voted the relevance of each item on a Likert scale from 1 to 10. After the second round, items voted 8 or higher by more than 70% of respondents were kept. Items voted 5 or less by more than 50% of respondents were removed, and those that were indeterminate were carried forward for the next Delphi phase: the in-person consensus meeting. At this meeting, an invited group of relevant experts discussed and decided the final list of checklist items that should be kept in the guideline.

RESULTS:
The online Delphi originated significant agreement among participants. Out of the 40 items scored twice by 72 participants, one item was voted ‘excluded’ and 7 items received indeterminate votes. The consensus meeting had 25 worldwide experts in guideline development and systematic reviews. After two full day discussions on the relevance of items, it was decided that 5 items should be mandatory and 14 items should be considered recommended when reporting harms in systematic reviews.

CONCLUSIONS:
The ultimate goal of this guideline development is to improve quality of reporting in systematic reviews.
INTRODUCTION:
The current project consists of two parts.
Part 1: Many families of obese children fail to initiate weight management care or discontinue care after it is initiated. For the current project, data analysis was completed for a larger, multi-site, qualitative study. The study aims to explore factors involved in families’ decisions to initiate, continue, or discontinue weight management care.

Part 2: Researchers are increasingly engaging in active knowledge translation (KT) efforts, and KT is becoming a routine requirement from funders. The potential for using participatory research principles to obtain knowledge users' perspectives on KT and to ultimately enhance the existing KT plan for the current qualitative study was explored.

METHODS:
Part 1: Obese children/ youth and parents from weight management centres in Edmonton, Hamilton, Montreal, and Vancouver participated in individual interviews to explore factors that contribute to families’ decisions to initiate, continue, and discontinue weight management care. A coding framework, previously developed during the analysis of data from the Edmonton site, was used to analyze data from Vancouver and Hamilton.
Part 2: A focus group was conducted with clinicians from the Edmonton site (Pediatric Centre for Weight and Health) to obtain ideas for knowledge translation, and a literature review was conducted relevant to using participatory research principles in knowledge translation endeavours.

RESULTS:
Part 1: Findings from interviews at the Vancouver and Hamilton sites were organized into factors related to logistical issues (e.g., travel to the site), health services delivery (e.g., relationships with clinicians), and child/ parent factors (e.g., motivating influences).

Part 2: Service providers discussed challenges with judging the quality of research studies, hesitancy with using research findings that have not yet been incorporated into best practice standards, and mentioned that it is desirable for clinics to have a culture where research is valued. It was difficult for service providers to suggest specific KT methods for the current project.
INTRODUCTION:
Advances in the care of children with congenital heart disease (CHD) have enabled many to survive to adulthood. As these survivors prepare to move to adult cardiology care, it is important for them to become independent advocates for their own health. Rapidly evolving methods of communication employed by teens creates the need for communication approaches in a delivery system that will be well received. The purpose of this pilot project was to assess the uptake and nature of texting in the follow-up phase of an intervention study.

METHODS:
In the week following a sixty minute clinic-based intervention to prepare adolescents for transition to adult care, the participants were given the choice between email, phone or texting contact. The purpose of the interaction was for the teen to ask further questions and for the nurse to elicit data regarding intervention effectiveness.

RESULTS:
Eighteen of the twenty-four teens who participated in the intervention study indicated a preference for follow-up by texting; among these, contact by texting occurred for sixteen. A range of topics were addressed including the teens informing the nurse whether or not the transition-based “health passport” they jointly created during the intervention was in their wallet and with whom they had shared their passport. Teens asked questions about a variety of health promotion issues, including tattoos, energy drinks, and contraception. The nurse within this interaction posed questions, provided information and affirmation, and gave advice.

CONCLUSIONS:
Texting had good uptake among adolescent participants. The advantages of texting included ease of contact and documentation of the interaction. Information provided in bite-sized pieces through texting was consistent with teens’ networking-saturated lives. Drawbacks to this method of follow up were the lack of in-depth conversation, potential for participant distraction, and the possibility of texting as a privilege being taken away from the teen. Implementing strategies to address these drawbacks is a priority in the next stage of this innovative research.
INTRODUCTION:
Intellectual disability (ID) represents a group of disorders in which the development of intelligence and memory is impaired. Fragile X (FX) syndrome is the most common genetic cause of ID. FX is caused by mutations in Fragile X Mental Retardation-1 (FMR1) which results in a lack of the Fragile X mental retardation protein (FMRP). FMRP inhibits protein translation, and thus in FX, the level of overall protein synthesis is elevated in the brain. It has been found that a major regulator of protein synthesis, the AKT pathway, is dysregulated in mammalian models of FX. This pathway regulates downstream effectors such as GSK3 and p70s6k, which are positive regulators of translation. The fruit fly (Drosophila melanogaster) has a FMR1 orthologue (dfmr1), and flies mutant for this gene have memory and social interaction defects similar to those found in FX patients. Thus, we predict that the AKT pathway generally, and GSK3 and p70s6k specifically, are also dysregulated in FX flies.

METHODS:
We performed western blot analysis on adult Drosophila heads from one to three day old wild type and dfmr1 mutant flies, in order to assess the expression levels of two downstream targets of the AKT pathway, GSK3 and p70s6k. We quantified band intensities using imageJ, and statistical comparisons between bands from wild-type and dfmr1 mutants were performed using Student’s t-test.

RESULTS:
We show that expression levels of two AKT targets in FX flies are higher than WT controls. Both GSK3 and p70s6k are found to have higher expression levels within the heads of Drosophila FX mutants.

CONCLUSIONS:
Our findings show that, at least two effectors of the AKT pathway, GSK3 and p70s6k, are upregulated in the heads of FX flies. Higher levels of GSK3 and p70s6k are predicted to lead to higher levels of protein synthesis, which is consistent with what is normally observed in Fragile X syndrome. These results are also consistent with what is seen in other models, for example in mouse models these proteins are also dysregulated.
Abstract #: 78
Submitter: Andre Isaac
Title: Pediatric sand aspiration with use of Extracorporeal Membrane oxygenation
Authors: Andre Isaac, Atsushi Kawaguchi, Daniel Garros, Hamdy El-Hakim
Presenter: Andre Isaac
Affiliations: UA
Category: Child Youth Development
Investigation Type: Qualitative Research

INTRODUCTION:
Sand aspiration is an uncommon but potentially lethal injury. In the pediatrics, aspiration of sand is important to recognize in cases of near drowning and burial. Injury can vary from moderate respiratory distress requiring supplemental oxygen, to complete airway obstruction resulting in global cerebral asphyxia. Due to the rarity of occurrence in infants and children, clear diagnostic and treatment recommendations have not been established.

METHODS:
A MEDLINE search including EMBASE and Cochrane Library for articles published in English using the MeSH terms “child” “infant”, “sand,” and “aspiration” was used to conduct a comprehensive literature review. The case presented was compared to previous cases of sand aspiration including clinical presentation, diagnosis, and management.

RESULTS:
There have been only ten reports of pediatric sand aspiration in the medical literature since its first description in 1962. Mechanisms have included accidental burial, near-drowning incidents, and deliberate sand ingestion. Diagnostic and treatment modalities varied widely, as have clinical outcomes, from full recovery with no sequelae, to death. We present a case of severe sand aspiration in a ten-year-old boy caused by an accidental burial. The diagnostic findings and treatment strategies employed are also presented. This is the first case in the medical literature of the use of extracorporeal membrane oxygenation (ECMO) for the treatment of sand aspiration.

CONCLUSIONS:
Sand aspiration is a potentially life-threatening injury and can have varied clinical presentations. The diagnosis is based on recognition from history, as well as typical radiologic findings. Treatment should can involve pulmonary toilet and/or bronchoscopy with therapeutic lavage. Prompt bronchoscopy and removal of foreign material is a common denominator for successful management in severe cases. ECMO is an effective and potentially life-saving measure in the treatment of severe cases of sand aspiration, particularly in patients requiring high ventilatory pressures and the need for support during repeated bronchoscopies.
INTRODUCTION:
Our group demonstrated that infant ABO-incompatible heart transplantation results in development of immune tolerance to the donor-specific ABO antigen(s). With our collaborators Drs. D’Apice and Cowan, we recently developed mice transgenic for the expression of A- and H-glycosyltransferases (AH-Tg, C57/Bl6 (B6) background). By lectin staining AH-Tg mice express the blood group A-antigen on the vascular endothelium of solid organs including the heart. Human blood group A to O heart transplantation can be approximated using AH-Tg mice as donors and B6 wild-type (WT) mice as recipients. This model will allow detailed study of mechanisms of B cell tolerance, antibody-mediated rejection (AMR), and accommodation. Herein we sought to characterize ‘natural’ and induced anti-A antibody titre in WT mice and its binding to A-expressing AH-Tg hearts, and to investigate AMR following transplantation of AH-Tg heart grafts into WT mice with high anti-A titre. We hypothesize that serum from WT mice with anti-A titre will bind to AH-Tg hearts, and that AH-Tg heart grafts will undergo AMR following transplantation into WT recipients with high anti-A titre.

METHODS:
Young WT mice were induced to express high anti-A titres by injection of blood group A red blood cells. Serum from WT and AH-Tg mice of different ages was assessed for anti-A antibody titre using a hemagglutination assay. Binding of anti-A serum to AH-Tg hearts was determined by immunohistochemistry (IHC).

RESULTS:
We identified a trend of increased anti-A titre in WT mice with age (n=108). No AH-Tg mice had detectable anti-A titre (n=19). Serum from older WT mice with natural anti-A titre or from younger A-antigen sensitized WT mice bound to AH-Tg but not WT hearts.

CONCLUSIONS:
This study provides insight into the development of anti-A titre in WT mice and confirms the detection of A-antigen on AH-Tg hearts by serum anti-A antibodies. Studies are ongoing to examine AMR following transplantation of AH-Tg hearts into WT mice with high anti-A titre.
Assessment of the Complementary and Alternative Medicine (CAM)-stream of IntD410, an Interprofessional Education course at the University of Alberta, to change the beliefs of health sciences students towards CAM and IPE

INTRODUCTION:
Complementary and Alternative Medicine (CAM) is commonly used in Canada by women in children, making it an important health issue for future clinicians to have knowledge about. At the University of Alberta, 'IntD410 Interprofessional Health Team Development' is a mandatory 30 hour interprofessional education (IPE) course for undergraduate learners in health sciences programs, designed to develop team skills. In 2011, specialty streams were developed to provide learners with health based examples to work through together. Would a CAM stream of an IPE class (IntD410) be an effective way to teach health sciences students about CAM and IPE?

METHODS:
The CAM-stream of IntD410 was developed in Fall 2011 with interprofessional faculty and included: (i) didactic lectures; (ii) large group learning provided by CAM providers; (iii) small team work, solving 4 case studies (including a boy and a single mother), and (iv) the CAM Fair, for a hands on learning experience. The CAM-stream was piloted in Winter 2012 to 71 students. Questionnaires measuring attitudes and beliefs towards CAM (CHBQ), interdisciplinary education perception (IEPS), and interprofessional learning (RIPLS) were administered at the beginning and end of the 10 week course to three groups of students - the CAM stream, the Continuing Care stream, and a class following the regular IntD 410 curriculum. Reflective feedback was obtained from the CAM-stream students throughout the course.

RESULTS:
Final reflections revealed that the students in the CAM stream felt more comfortable evaluating CAM practices, and recognized the value in collaboration. Statistical analysis of the CAM-stream's pre/post CHBQ tests indicated that their beliefs towards CAM increased significantly, but there was no difference between groups. On the RIPLS scale, the CAM-stream's difference in means increased the most, whereas the other groups decreased indicating that the students in the CAM stream were more supportive of interprofessional learning.

CONCLUSIONS:
The CAM-stream of IntD410 was an effective means to teach health sciences about CAM and IPE concurrently.
INTRODUCTION:
Probiotics have a reputation of providing positive health effects to infants. They are touted to promote a healthy microbiota, and prevent development of allergies and asthma in childhood. We sought to assess parents’ knowledge and risk assessment of probiotics to determine if recommended use for the treatment or prevention of allergies and asthma in infants is a feasible option.

METHODS:
An internet-based survey was distributed to 1300 participants of the Alberta Pregnancy Outcomes and Nutrition (APrON) study, who had children two years of age or younger. Parents’ knowledge and opinion of the safety and necessity of probiotics for themselves and their infant were questioned. Respondents also reported on their use of probiotics, and demographic variables.

RESULTS:
413 parents responded to the survey. General knowledge of probiotics was high, with 98% of parents having heard of probiotics and 91% having used probiotics themselves. Only half of the parents had given their infant a probiotic product. Most respondents had heard about using probiotics through the TV, internet, or newspaper. Parents mostly defined probiotics as “good bacteria” and “bacteria that help your digestive system”. Specifically, most believed probiotics could alter a person’s microbiota with beneficial effects. When asked if probiotic products are safe to give to their baby, 57% agreed or strongly agreed while 38% were unsure of the safety. When ranking safety of health products, probiotics came second to organic leafy green vegetables and above multivitamins, homeopathic remedies and antibiotics.

CONCLUSIONS:
Parents had a general understanding of what probiotics are and felt comfortable consuming them. Regarding infants, parents were less informed about probiotics but still felt they were a low risk, natural health product. With media being the most influential source for information, there is high potential to improve parent education about probiotic use for infants. The results indicate that parents are open to the idea of using probiotics to benefit health, but may need clarification when it comes to infants specifically.
INTRODUCTION:
Diffuse hereditary gastric carcinoma is an autosomal dominant inherited form of gastric cancer characterized by a germline mutation of the CDH1 gene, which encodes for the E-cadherin adhesion protein. Median age at diagnosis has been reported to be 38 years-old and many advocate prophylactic total gastrectomy for these patients as serial endoscopies may not be a reliable screening tool. We describe a 15 year-old girl who underwent total gastrectomy following a diagnosis of diffuse hereditary gastric carcinoma based on endoscopic screening.

METHODS:
A previously healthy 15 year-old girl was seen for endoscopic screening of gastric carcinoma. Her mother was diagnosed at the age of 32 years-old with metastatic disease and had passed away. Her maternal grand-mother had also died from the same condition in her late thirties while a maternal aunt had undergone a gastrectomy and was still alive. A distant cousin had died from metastatic disease at the age of 18 years. Both the mother and grand-mother were known to have a mutation in the E-cadherin (CDH1) gene, however the maternal aunt was negative for the mutation. The mutation status for our patient was unknown at presentation.

RESULTS:
Patient’s endoscopic macroscopic examination was found to be normal. Biopsies of the stomach were taken for E-Cadherin analysis. Histology revealed one biopsy with a signet ring cell adenocarcinoma within the superficial lamina propria. A chest, abdomen and pelvis computer tomography scan was performed and showed no abnormality. After discussion with adult gastroenterology, surgery and oncology the patient underwent a total gastrectomy with esophagojejunostomy and enterosotomy. Her post-operative course was complicated by an esophagojejunostomy leak and intraabdominal subphrenic abscess. She was discharged 48 days following her initial surgery.

CONCLUSIONS:
Hereditary diffuse gastric cancer is uncommonly described in children. Endoscopic screening has limitations however should be considered in children with a strong family history. Although gastrectomy is curative it is associated with its inherent risks.
INTRODUCTION:
Inborn errors of metabolism (IEM) refers to a diverse group of conditions in which the normal biochemical processes of the body are disturbed resulting in the build up of toxic metabolites or the paucity of necessary products. IEM are collectively common and many present in the neonatal period. If left undiagnosed, they lead to irreversible damage.

In Alberta, the current screening guidelines test for 17 different disorders. Data from 2007-2010, reveal 150,532 samples collected with 2881 abnormal results. Of these, 596 were critically abnormal, while the vast majority fell within the borderline category.

Once a result has been flagged as positive, a system is in place to alert the primary care providers with the next steps to take to establish the diagnosis, as well as provide information regarding the signs and symptoms of the specific condition. However, there is much confusion with regard to these result, their implications for the child/family, as well as a lack of general knowledge regarding the various disorders. This project seeks to understand the current level of comfort and understanding of the primary care providers dealing with NMS in Alberta. Subsequently a targeted educational strategy will be developed to improve the comfort and knowledge base of the primary care providers, ultimately improving care for children and their families in Alberta.

METHODS:
This study was designed as a survey questionnaire. It will be distributed by SurveyMonkey following a faxed written invitation to participate. Participation will be entirely voluntary and anonymous. The survey will also collect demographic data necessary for the subsequent development of the targeted educational strategy. Approval was obtained from HREB prior to undertaking the study. The BioStats Consulting group will provide statistical analysis.

ANTICIPATED RESULTS:
Our study is currently underway. No similar study has been undertaken in Canada. We anticipate similar results to the US study, which demonstrates fewer than 50% of primary care providers are comfortable with their current level of knowledge related to NMS.
INTRODUCTION:
Recording physiological measures from infants such as heart rate and oxygen saturation in different activity states is used to determine readiness for discharge from the neonatal intensive care units (NICU). Previous studies have failed to demonstrate use of these recordings in predicting adverse health outcomes. Testing results in delayed discharge and further investigations increase costs and burden infants and their families. This study aims to describe the results of sleep studies in the NICU and relate the findings to the clinical course.

METHODS:
A retrospective approach was used to collect data from 4 sources. The sleep study report gave summary data and initial interpretation; birth and NICU records provided demographics and information on clinical course; digital data was retrieved for additional analyses.

RESULTS:
1277 cardio-respiratory sleep studies from 815 children were reviewed. Mean chronological age at the time of the study was 7.8±5.7 weeks with an average gestational age of 32.2±4.9 weeks. Most of the studies were requested for diagnostic purposes (57%) versus evaluation of treatment (43%); most were conducted as inpatient overnight studies (65%). 10% of studies were infants with bronchopulmonary dysplasia (BPD). Infants treated with caffeine made up 44% of the sample. Infants with and without BPD showed no difference with respect to longest apnea (BPD 11.3±5.2s vs No BPD 11.3±4.5s, p=ns); however, a higher amount of periodic breathing was seen in infants without BPD vs those with BPD (3.8±5.6% vs 7.3±10.6%, p=0.00). Infants on caffeine vs not on caffeine had no difference in longest apnea (Caff 11.1±5.1s vs no Caff 11.4±4.2s, p=ns) nor in period breathing (6.5±9.9% vs 7.4±10.5%, p=ns). Overall, study results were abnormal in 55% of infants.

CONCLUSIONS
Most sleep studies conducted in the NICU are for diagnostic reasons. A small percentage of the infants studied show classic preterm complications including BPD and apnoea of prematurity. Over half of the studies were diagnosed as abnormal but further work is needed to pinpoint determinants and implications of abnormal results.
INTRODUCTION:
Myocardial ischemia is a leading cause of mortality worldwide. Despite considerable research interest in the potential of stem cell (SC) therapy, many clinical trials have failed to show effective cardiac regeneration with SC therapy. Because energy metabolism in SC is primarily glycolytic, while the heart has a very high energy demand, SC differentiation into cardiomyocytes requires the maturation of mitochondrial oxidative metabolism. Therefore, a better understanding of energy metabolism during stem cell-to-cardiomyocyte differentiation is necessary to optimize SC therapy.

METHODS:
Rat bone marrow mesenchymal SC were used in these experiments. In fatty acid (FA) supplemented media, FA was bound to 4% albumin. The MTT assay was used to assess viability.

RESULTS:
We report here the first direct metabolic rate profile of BMSC. BMSC rates of glycolysis were high (3091±440 nmol/mg protein/hr, n=3), while rates of glucose oxidation (GO) and FA oxidation (FAO) were very low (3.5±0.33 and 0.21±0.04 nmol/mg protein/hr, respectively, n=3). As a result, 98.1% of ATP was produced from glycolysis and only 1.9% from oxidative metabolism. This differs dramatically from the adult heart, which derives 5% of ATP from glycolysis and 95% from oxidative metabolism. The inability of BMSC to oxidize FA may be responsible for an observed decrease in survival of BMSC exposed to physiologically relevant levels of palmitate (0.2 mM). Low rates of FAO may increase FA being used for production of ceramides, which have been implicated in promoting apoptosis. Interestingly, oleate, a FA not used in ceramide synthesis, partially protected against palmitate-induced BMSC death. However, inhibiting ceramide production with myriocin, a SPT1 inhibitor, did not prevent palmitate-induced BMSC death. Palmitate and oleate did have distinct effects on BMSC metabolism, with only palmitate reducing GO and neither affecting glycolysis.

CONCLUSIONS
In conclusion, a low capacity for mitochondrial oxidative metabolism in SC may increase their susceptibility to death in the presence of physiologically relevant levels of palmitate.
INTRODUCTION:
In newborn mammals the ventilatory response to hypoxia comprises an initial increase followed by a secondary depression, which can be life-threatening in premature infants. During hypoxia, ATP is released in the brainstem, including the preBötzinger Complex (preBötC, critical site of rhythm generation), where its excitatory actions at P2Y1 receptors (R) attenuate the secondary depression. In addition, ATP is degraded to adenosine which inhibits breathing and is implicated in apnea of prematurity. Thus, there is clinical interest in understanding the mechanisms underlying the actions of ATP and adenosine on preBötC networks. The goal of this study is to define the pathways through which ATP acts on astrocytes and neurons in the preBötC to increase ventilation.

METHODS:
We used primary cultures of preBötC astrocytes from neonatal rats loaded with the calcium indicator Fluo-4 and compared responses to ATP before and after application of carbenoxolone (gap junction blocker), U73122 (phospholipase C [PLC] antagonist), and thapsigargin (depletes calcium stores). We then explored the role of these pathways in mediating the effects of ATP on inspiratory rhythm using a brainstem slice preparation that generates inspiratory rhythm. We compared the P2Y1R frequency increase before and during application of EGTA-AM (calcium chelator), 2-APB (IP3R blocker), and chelerythrine chloride (PKC inhibitor).

RESULTS:
In glial cultures, thapsigargin and U73122 blocked ATP-evoked calcium increases. In rhythmic slices, EGTA-AM reduced the P2Y1R-evoked frequency increase by 64±7%. 2-APB and chelerythrine attenuated the MRS2365-evoked frequency increase by 85±29% and 74±11% respectively.

CONCLUSIONS:
The frequency increase evoked by P2Y1Rs in the preBötC involves the IP3-PKC pathway and is dependent on the release of intracellular calcium. Delineating the signaling cascades underlying the actions of ATP on inspiratory rhythm and the interaction between ATP and adenosine are necessary. Such mechanistic insight is important for the development of therapies for disorders of breathing that involve the brain.
Abstract #: 87  
Submitter: Laura Reyes  
Title: Exercise as a therapeutic approach for Fetal-programmed Cardiovascular Dysfunction  
Authors: Laura Reyes, Jude Morton, Raven Kirschenman, Sandra Davidge  
Presenter: Laura Reyes  
Affiliations: University of Alberta  
Category: Child Youth Development  
Investigation Type: Quantitative Research

INTRODUCTION:  
Prenatal hypoxic insult causing intrauterine growth restriction (IUGR) has been shown to increase long-term susceptibility to myocardial ischemia/reperfusion injury. Exercise is a practical and effective preventive treatment for cardiovascular diseases. Whether exercise can be an effective intervention for hypoxia-induced cardiovascular complications is unknown. We hypothesized that the myocardial susceptibility to ischemia insult in offspring born from a hypoxic in utero environment will be ameliorated following exercise training.

METHODS:  
Female Sprague Dawley rats at 3 months of age were mated and exposed to control (room air) or maternal hypoxia (11% oxygen) conditions from gestational day (GD) 15 to 21. At GD 22, litters were randomly reduced (4 males, 4 females). At 10 weeks of age, male and female rats from hypoxic and normoxic pregnancies were randomized to either an exercise-training or sedentary group. Rats were habituated to treadmill running then exercised for 6 weeks; 5 days/week, 30 min/day at 20 m/min. After 24 hours of recovery, animals were euthanized and their hearts perfused for 10 min in retrograde Langendorff mode. Hearts were then switched to working heart mode and global, normothermic flow ischemia was induced for 10 min. Following ischemia, hearts were reperfused for 40 min.

RESULTS:  
Our preliminary data show that, compared to controls, offspring born from hypoxic pregnancies exhibited a decrease in recovery of cardiac performance during the reperfusion period (36.3% controls vs. 19.6% IUGR). Exercise improved the recovery of cardiac performance in both groups (58.2% controls, 36.0% IUGR). These data suggest that while exercise is beneficial, it does not appear to improve the specific complications associated with IUGR.

CONCLUSIONS:  
Our data suggest that exercise improves cardiac performance after ischemia. Additional studies will continue to determine the mechanisms involved in the improved function with exercise in order to develop therapeutic approaches to cardiac complications that may be more severe in offspring born growth restricted.
A systematic review of instruments for scoring physiological and behavioural cues of pain, non-pain related distress, and adequacy of analgesia and sedation in pediatric mechanically ventilated patients

OBJECTIVE: pain and sedation assessment scales to standardize measures of distress in mechanically ventilated, nonverbal pediatric patients are increasingly available but few have been identified and evaluated for efficacy of use in the PICU population.

Purpose: A systematic review was conducted to: 1) identify available instruments appropriate for measuring physiological and behavioural cues of pain, non-pain related distress, and adequacy of analgesia and sedation in mechanically ventilated PICU and NICU patients; 2) describe instrument development, 3) describe the physiological and behavioral variables assessed, and, 4) evaluate the instruments in terms of their psychometric properties.

METHODS: Relevant studies for review were selected from an electronic search of library databases. Studies were included in the review if they met the pre-established eligibility criteria. The systematic review was completed by two reviewers who independently reviewed all articles for inclusion, assessed the quality of the articles, and extracted the data from the included studies.

RESULTS: Twenty-eight articles were included in this systematic review, identifying 17 instruments. Of these instruments, three were determined to assess pain, non-pain related distress, sedation, five were identified to assess pain only, seven scales assess sedation only, one scale assesses sedation in mechanically ventilated muscle relaxed patients, and one was determined to assess delirium in mechanically ventilated patients.

CONCLUSION: The Comfort Scale has the greatest clinical utility in the assessment of pain, non-pain related distress, and sedation in mechanically ventilated pediatric patients. Modified FLACC and the MAPS are more appropriate for the assessment of procedural pain and other brief painful events, and N-PASS is the most appropriate tool for the assessment of neonates.
Sphingosine 1-phosphate (S1P)-induced endothelial permeability causes leakage of circulating constrictors generating increased vascular tone

BACKGROUND:
Preeclampsia with and without IUGR is associated with increased endothelial permeability and vascular tone. However, a direct relationship between increased endothelial permeability and generation of vascular tone remain uninvestigated. Low levels of S1P, a bioactive lipid, enhance endothelial barrier via S1P1 receptors, but disrupts the barrier at high levels via S1P3 receptors. How S1P contributes to preeclampsia or IUGR is unknown. HYPOTHESIS: High S1P levels will increase endothelial permeability allowing circulating constrictors access to smooth muscle cells leading to increased vascular tone.

METHODS:
A novel functional assay (% constriction) using pressure myography assessed leakage of infused constrictors through the endothelium. 0.01 or 1μM S1P or 0.2U thrombin were infused inside arteries with or without constrictors 5nM U46619 or 1μM PE. Some arteries were co-infused with S1P1/3 antagonist 1μM VPC23019 or S1P1 agonist 0.1μM SEW2871. Arteries from S1P3 KO mice and littermate controls were also used. Constriction was compared to that obtained by adding these agents directly to the smooth muscle in the vessel bath.

RESULTS:
Infusion of S1P, thrombin or U46619 had no effect. Both PE and U46619 induced constriction when added to the vessel bath (29.49±9.50; 56.9±6.75%). Infusion of PE also induced constriction (18.31±2.61%) when infused suggesting that in ex-vivo arteries the endothelial barrier is not fully intact. Indeed, co-infusion of SEW2871, which decreases permeability, blocked constriction induced by infused PE. Constriction by co-infused 1μM S1P and U46619 (33.24±8.58%) was attenuated by VPC23019 (12.42±3.91%) or using arteries from S1P3 KO mice (8.25±8.38%), suggesting S1P-induced permeability is S1P3-mediated. Thrombin and U46619 co-infusion also induced constriction (37.48±8.74%).

CONCLUSION: We have for the first time, identified a unique mechanism whereby increased endothelial permeability can lead to generation of vascular tone through increased leakage of constrictors. This mechanism is not unique to S1P, as shown by thrombin-induced responses. Endothelial permeability may be reduced by activating S1P1 or blocking S1P3. These results will be invaluable in finding therapeutic solutions not only against vascular-related complications in general, but more importantly, pregnancy-related complications such preeclampsia and IUGR.

Supported by CIHR, NSERC and WCHRI
INTRODUCTION:
To study the possible synergetic effect of low intensity pulsed ultrasound and the local injection of plasmid loaded bFGF into the posterior attachment of mandible condyle on mandibular growth.

METHODS:
6 Sprague Dawley rats were divided into 3 groups namely; control, plasmid loaded bFGF and plasmid loaded bFGF+ LIPUS. The control group received 25µg of gWiz, bFGF group received 25 µg of plasmid loaded bFGF on the first day of the experiment. The third group received 25 µg of plasmid loaded bFGF on the first day and was treated with 20 min daily application of LIPUS for next 28 days. The left mandible was used as the experimental side. After 28 days, all the rats were euthanized and mandibles were harvested for histomorphometric analysis. 6 slides were taken from each sample, so total 12 slides were analyzed for the proliferative cells, hypertrophic cells, thickness and the area in the anterior, middle and posterior segments in each slide. The data was processed with SPSS for Window release 19.0.0 using One-Way ANOVA and Bonferroni Post-doc test at p=0.05

RESULTS:
Both plasmid loaded bFGF and plasmid loaded bFGF+ LIPUS has statistical significant (p value is < 0.05) increase in the mandibular growth when compared to the control group. There was a significant increase in the number of proliferative and hypertrophic cells, thickness and area in the groups treated with bFGF plasmid which is followed by the ultrasound treated bFGF plasmid group when compared to the control group.

CONCLUSION: Both the treatments plasmid loaded bFGF and LIPUS have positive effect on the mandibular condylar growth as compared to control. Further research needs to be conducted to evaluate long term and potential systemic effects of either or combined treatments.
INTRODUCTION:
Parents of children with complex health issues report significant difficulties in navigating the health care system. A patient navigator (PN) is a person who guides patients and families through the health care system to ensure they gain access to the people and programs required for the achievement of optimal health. Despite increased interest in the PN role, most of the literature pertains to adult health. The purpose of this knowledge synthesis project was to identify and synthesize evidence regarding the effectiveness of the PN in pediatric settings in Canada.

METHODS:
A scoping review was conducted. Relevant studies were identified through searches in online databases, using the search terms patient navigator, nurse navigator, case manager, and care coordinator. Two reviewers independently screened the articles in three phases as per established inclusion criteria. The results were then summarized in a data extraction table.

RESULTS:
Five articles passed through the screening process. None of the articles used the term “patient navigator.” The terms “care coordinator” and “service coordinator” were used and associated with these roles was evidence of coordinated and comprehensive care, greater parental involvement in decision making and care, and earlier discharge. However, parents still reported a need for greater information. Discrepancies were noted between studies on parental satisfaction with supportive and respectful care, and access to care.

CONCLUSIONS
There are gaps in the Canadian literature on the effectiveness of the PN in pediatric settings with specific populations and implementation across Canada. This highlights the need for Canadian-based evidence on the PN role with this population. Care coordination research does demonstrate effectiveness regarding timeliness of care that is a focus of the PN role. The review results will contribute to potential advancement of the PN role in child health settings in Canada.
INTRODUCTION:
Many pediatric trials are published each year in high impact journals, but criticism has been raised regarding the validity of the outcome measures used and the adequacy of reporting their psychometric properties. Reporting standards set out by the Consolidated Standards of Reporting Trials (CONSORT) group require accurately defined primary outcomes and use of valid measures to improve the meaningfulness of assessments. The objective was to conduct a systematic review to identify gaps in outcome reporting in pediatric diabetes randomized controlled trials (RCTs).

METHODS:
Journals were searched for pediatric RCTs related to diabetes (2000-2010). Two independent reviewers screened the references. Variables extracted included: journal, participant age range, sample size, condition under study, intervention, control, details of the primary outcome and measurement tool.

RESULTS:
Searches identified 8350 unique references. Screening of titles and abstracts resulted in a total of 717 potentially included references. From this, 421 and 222 were potentially included for Type 1 and Type 2 diabetes, respectively. Of the 421 type 1 RCTs, 42 have been included with 110 excluded and 268 pending assessment. Of the 42 included RCTs, data extraction has been carried out on 21. Mean sample size was 74.6 (SD 76.9). Interventions consisted of drugs (24%), diet (38%), or other (38%). Controls included placebo (23%) or another active intervention (55%). With respect to primary outcome reporting, 12(57%) trials did not identify a primary outcome, while 9(43%) reported at least one primary outcome. Of these 9, 6(67%) reported one specific primary outcome and 3 identified more than one outcome as primary. Of the 6 trials with one primary outcome, 1 used a scale or questionnaire type tool.

CONCLUSIONS:
We identified heterogeneity amongst diabetes researchers in outcome measurement selection and an opportunity for the diabetes research community to come together to identify a core outcome set of interest to researchers, clinicians, patients, policy-makers, and players, as recommended by COMET.
INTRODUCTION:
Obesity is a major health problem in our population, with the incidence rapidly rising in Canada and worldwide. Obese individuals are predisposed to heart disease that may, in part, be due to obesity-induced alterations in cardiac energy metabolism. One such alteration is a greater reliance of the heart on fatty acid oxidation, at the expense of carbohydrate oxidation, as a source of energy. Lysine acetylation has recently been shown to be an important pathway involved in the control of energy metabolism. Reversible acetylation of the enzymes involved in insulin signaling and glycolysis affect their activities. However the precise effect of this post-translational modification on the control of energy metabolism in the obese heart is poorly understood. The aim of this study was to investigate the effect of lysine acetylation on insulin signaling and glycolysis in a diet induced obesity mouse model.

METHODS:
8-week old C57BL/6 mice were placed on either a high fat diet (HFD) (60% kcal from fat) or a standard chow/low fat diet (LFD) (4% kcal from fat) for 16 weeks. Hearts were excised, immediately frozen in liquid N2 and processed for acetylation status.

RESULTS:
Overall myocardial acetylation levels increased in obese HFD mice. Expression of the mitochondrial deacetylasen sirtuin (SIRT) 3 was significantly lower in HFD mice, while expression of SIRT1 and the mitochondrial acetyltransferase GCN5L1 did not change. A significant increase in the acetylation level of the insulin signaling enzyme Akt was seen in HFD, which was accompanied by a decreased phosphorylation status of Akt. Acetylation of the glycolytic enzyme hexokinase 1 (HK1) was also increased; scenarios consistent with the decrease in insulin signaling and glycolysis seen in Type II diabetics.

CONCLUSIONS:
Acetylation of Akt and HK1 can inhibit insulin signaling and glycolysis, contributing to the overall insulin resistance in obese mice. Targeting lysine acetylation of insulin signaling components is a potential approach for the treatment of insulin resistance in obesity.
INTRODUCTION:
Milrinone is widely used in critically ill children despite limited data on safety and effectiveness. The objectives of the study were: To determine if clinically important variability in milrinone blood levels (MBL) occurs during intravenous administration to critically ill children and to determine if this variability can be predicted with current pharmacologic knowledge.

METHODS:
A prospective cohort study evaluated children. 78 (36%, 95%CI: 29%-42%) were sub-therapeutic; 36 (16%, 95%CI: 11-21%) supra-therapeutic. Supra-therapeutic MBL were associated with increased mixed venous-arterial oxygen saturation difference on the second day of milrinone infusion (p=0.007). There was a significant association between age, type of cardiac repair, creatinine clearance, and MBL. The correlation between measured and predicted MBL was weak (rho=0.2 to 0.5).

CONCLUSIONS:
Non-therapeutic milrinone levels are clinically important and common. The pharmacologic prediction of MBL is not accurate for individual pediatric patients. The clinical impact of MBL outside the therapeutic range and a better pharmacologic model for prediction of these levels require further evaluation.
INTRODUCTION:
In order for an invading bacterium to survive in a host environment, it must be capable of obtaining sufficient nutrients for growth. One limiting nutrient in mammalian systems is iron, which is unavailable in a free form as host proteins segregate it. On mucosal surfaces, host iron is sequestered by the glycoprotein, lactoferrin (Lf). During the infection and colonization of the host, the pathogenic bacteria Neisseria meningitides makes use of lactoferrin binding proteins (Lbp) that bind and appropriate the host’s iron by binding lactoferrin. The lactoferrin binding system is composed of two proteins, an integral beta-barrel transporter protein (LbpA) and an associate lipoprotein (LbpB).

RESULTS:
We have dissected the binding of lactoferrin to one component of this iron acquisition system LbpB, using surface plasmon resonance. We have also determined a high-resolution crystal structure of the N-terminal domain of LbpB in order to understand the molecular basis of lactoferrin recognition. The structure reveals two elements, a beta-barrel and a handle domain both of which provide a large interface for interaction with lactoferrin. Computational docking experiments between the LbpB N-lobe and lactoferrin suggest that the interaction with the protein is mediated by a combination of ionic interactions and the burial of hydrophobic amino acids. We have mutated the predicted amino acids and are performing ITC (Isothermal Titration Calorimetry) binding experiments to validate the docking model.

CONCLUSIONS:
The crystallography and binding studies should provide molecular details of the Lf binding determinants on Lbp which is essential for understanding of iron sequestering mechanism of this pathogenic bacteria and possible vaccine design.
Non-invasive assessment of right heart and pulmonary vascular coupling in children with Pulmonary Hypertensive Vascular Disease: A simultaneous Echocardiographic and Catheterization study

INTRODUCTION:
Cardiac catheterization is the gold standard for assessment of hemodynamics in children with pulmonary hypertensive vascular disease (PHVD). There is a need for accurate, non-invasive correlates of these hemodynamics. We aimed to identify correlations between echocardiographic and catheter parameters in children undergoing cardiac catheterization to investigate PHVD.

METHODS:
Echocardiograms were performed on patients with PHVD undergoing cardiac catheterization, after induction of anesthesia. Echocardiographic parameters assessed included tricuspid valve (TV) annular tissue Doppler velocities (TDI), TV inflow Doppler, right atrial (RA) and right ventricular (RV) dimensions and function. Cardiac catheterization data included RA and RV pressures, pulmonary arterial pressure (PAP), pulmonary blood flow, pulmonary vascular resistance index (PVRI), pulmonary capacitance index (PCI) and cardiac index (CI).

RESULTS:
We studied 14 consecutive patients (8 male; median age 6 years, range 1 - 15) with mean PAP 42±22 mmHg and PVRI 13 ± 6 WUm2. TV peak regurgitant velocity correlated with systolic PAP (r=0.79, p=0.01) suggesting patients were studied under the same hemodynamic conditions. RA mean pressure correlated with TV E/e prime ratio (r=0.67, p=0.02). There was no correlation between echocardiographic parameters of RV function (TAPSE, MPI, TV S prime) and catheter parameters. PVRI correlated with TV TDI a prime (r=0.56, p=0.03). CI correlated with TV inflow E velocity time integral (VTI) (r=0.82, p=0.01). PCI correlated negatively with RA fractional area change (FAC) (r=-0.62, p=0.03) and TV inflow E (r=-0.72, p=0.01).

CONCLUSION:
We have demonstrated a correlation between invasive hemodynamic data and echocardiographic parameters in children with PHVD. TV inflow Doppler and annular TDI velocities correlate to PVRI, PCI, CI and RA pressure. These measures may be useful non-invasive markers of PHVD progression or treatment response.

This data also suggests increased reliance on atrial function for RV filling in patients with PVHD. This requires further investigation in our patient population.
INTRODUCTION:
In children post-liver transplant (LTX) there is little data about their dietary vitamin D/K, calcium and corresponding bone health. This study’s objectives were to compare vitamin D/K and calcium intakes in children post-LTX and age-matched healthy children with bone mineral density (BMD)/bone mineral content (BMC).

METHODS:
Dietary intake was assessed by validated food frequency questionnaires (vitamin D/calcium) and two multi-pass 24-hour recall (weekday/weekend). The intake recalls were compared to Recommended Daily Allowances (RDA)/Adequate Intakes (AI). BMD/BMC was measured using Dual X-ray Absorptiometry in children post-LTX only.

RESULTS:
Healthy children (n=19; 8±3yrs) and children who have undergone LTX within the past 13 years (n=20; 8.5 ± 3yrs) were studied. Intakes in healthy vs post-LTX children for vitamin K (26 ± 55 versus 26 ± 30 μg/d), calcium (905 ± 389 versus 741 ± 276 mg/d) and vitamin D (171 ± 88 versus 141 ± 70 IU/d) were not different (p more than 0.05). Three children (n=1 LTX; n=2 healthy) met the AI for vitamin K (± vitamin supplementation). While some post-LTX children were prescribed vitamin D supplements (400-1000 IU in either single or multivitamin preparations q daily), only 45% (n=9) and 50% of children (n=10) met the RDA for vitamin D/calcium by diet and supplementation. In multivariate models, absolute spinal BMC (g) (r²=0.891; p=0.001) was positively related to vitamin K intake (p=0.016) and bone age (p=0.001), but not to calcium/vitamin D.

CONCLUSIONS:
Routine supplementation of vitamin D/K and calcium is important in both healthy and post-LTX children to ensure that requirements are met.
INTRODUCTION:
Engaging in activities is essential to development. Children with Autism Spectrum Disorder (ASD) often have reduced motivation to participate in purposeful activities. Other deficits are in sensory modulation or filtering of irrelevant stimuli and maintaining an optimal level of arousal (Lane, 2002). Hippotherapy modulates arousal levels through vestibular and proprioceptive stimulation. It is provided by rehabilitation therapists who utilize the horse’s movement and environment to promote development. Stimulation of the vestibular system also promotes communication (Ray et al., 1988). Campbell and Brown’s critical literature review (2012) indicated that hippotherapy is a promising intervention. Research on its benefits for children with ASD is just emerging. This study builds on prior evidence of the effects of hippotherapy on motivation (Taylor et al., 2009). The hypotheses were that hippotherapy would increase the motivation and communication of children with ASD in comparison to baseline measurements.

METHODS:
A multiple baseline research design (Kazdin, 2011) across 8 participants ages 4.5 to 7 years (M = 5) was used. One hour standardized baseline play sessions (n=8) and hippotherapy sessions (n=8) were videotaped and coded by reliable raters blind to the study hypotheses. Visual analysis compared baseline and hippotherapy sessions on key variables. Statistical analysis is underway. Mothers completed the Pediatric Volitional Questionnaire (Kielhofner et al., 2008) pre and post intervention.

RESULTS:
Graphic representation of the results for each child is presented. To date there are clear changes in levels of motivation from baseline to intervention. Trend lines and percent non-overlapping data are reported. Analysis for the communication variables is ongoing.

CONCLUSION:
This study provides preliminary evidence for the use of hippotherapy with young children with ASD. In single case designs, only three replications of effects are needed to demonstrate a linkage of the intervention and the outcome (Kazdin,2011). The results are promising and require replication with larger sample.
INTRODUCTION:
Inflammatory Bowel Diseases (IBD) are chronic digestive disorders, commonly affecting children, which lead to intestinal damage. Defects in structure and function of epithelial cell tight junctions are implicated in IBD and are a common target for bacterial virulence, including adherent invasive Escherichia coli, strain LF82. We hypothesized that 5-ASA, a drug used to treat IBD, may partially achieve its therapeutic effect by antagonizing intestinal bacteria and that exposure of LF82 to 5-ASA will reduce the ability of LF82 to disrupt the barrier in an in vitro cell model.

METHODS:
Electric cell-substrate impedance sensing (ECIS) system was used to measure transepithelial electrical resistance of uninfected and infected epithelial cell monolayers in the absence or presence of 5-ASA treatment (10mM and 50mM 5-ASA). Since 5-ASA is dissolved in NaOH, to determine if strain LF82 was affected by the change in pH or 5-ASA itself, bacterial survival was assessed by colony counting.

RESULTS:
Uninfected cells maintained normal physiological resistance. Previous findings in the lab suggested that treatment of LF82 bacteria with 50mM 5-ASA (pH uncorrected) inhibit bacteria-induced permeability, compared to treatment with 10mM 5-ASA and no treatment. However, no difference in permeability was observed between untreated cells and cells treated with 10mM or pH-corrected 50mM 5-ASA (pH=7), during LF82 infection. Further, bacterial survival decreased with increasing concentration of 5-ASA, but was reversed by correcting the pH.

CONCLUSIONS:
Thus, the previously noted effect may be due to the high pH of the uncorrected 50mM 5-ASA (pH=8), rather than 5-ASA itself. The alkali environment may have impaired viability of strain LF82, resulting in reduced bacterial invasiveness, and therefore, reduced ability to compromise tight junctions of the epithelial cell monolayer. These findings suggest that 5-ASA treatment does not inhibit the increased cell permeability observed following infection with LF82, suggesting that 5-ASA may not affect the ability of LF82 bacteria to disrupt the barrier.
INTRODUCTION:
Resveratrol, a polyphenol found in grapes and nuts, can extend lifespan and improve cardiovascular
health. Although 5 weeks of resveratrol supplementation reduced blood pressure and improved cardiac
performance in spontaneously hypertensive rats (SHRs), their blood pressure rose soon after cessation
of resveratrol treatment. Here, we hypothesized that resveratrol treatment during and immediately
after pregnancy would prevent the onset of hypertension in the offspring of SHRs.

METHODS:
Female SHRs were fed a resveratrol-supplemented diet (4g/kg diet) from the start of gestation to 21
days after birth. Blood pressure (BP) was measured weekly by tail-cuff plethysmography. Vascular
function was assessed by wire myography.

RESULTS:
Despite no differences at birth, resveratrol treatment significantly reduced body weight (-29.3%, P <
0.001) at weaning, though resveratrol-treated offspring body weights caught up by 5 weeks of age.
Adult BP was not different between control and resveratrol-treated offspring. There were no differences
between groups in vascular responses to the alpha agonist phenylephrine, the endothelium-dependent
vasodilator methacholine or the endothelium-independent vasodilator sodium nitroprusside. However,
big endothelin (ET)-1-mediated constriction was reduced in resveratrol-treated offspring (28% reduction
in the area under the curve of the bET-1 cumulative concentration curve; P < 0.05). L-NAME, a potent
nitric oxide synthase inhibitor, potentiated the big ET-1 constriction in both groups (P < 0.001), and
normalized the differences between control and resveratrol-treated offspring. Prenatal resveratrol
treatment also lowered fasting glucose levels (-9%; P < 0.05), as well as fat mass (-13%; P < 0.05) which
responded with an increase in lean body mass (+1.7%; P < 0.05).

CONCLUSIONS:
Prenatal resveratrol treatment improved vascular and metabolic outcomes in the SHR, despite no
changes in BP. While these effects may be subtle here, therapeutic benefits may become apparent in
conditions such as obesity and advanced age.
INTRODUCTION:
Respiratory depression is one of the unwanted side effects of opioids as analgesics, which can be life-threatening. This is particularly problematic in pain control for premature infants with immature respiratory networks and unstable breathing. There is an incomplete understanding of the mechanisms by which opioids depress breathing. Respiratory depression is primarily dependent on activation of µ-opioid receptors, but the location, cell type and cellular mechanism(s) are incompletely defined. A leading hypothesis is that respiratory depression is mediated by the direct actions of opioids on µ-opioid receptors expressed by neurons in a brainstem region critical for generating inspiratory rhythm, the preBötzinger complex (preBötC). Recent data, however, indicate that in addition to their stereoselective action on classical opioid receptors, opioids also act by binding nonstereoselectively to toll-like-receptor 4 (TLR4)5, which are expressed almost exclusively on glia (microglia and astrocytes). And analysis of breathing pattern responses of rats in vivo to systemic application of opioids and TLR4-selective agents has implicated glial activation and TLR4 signaling in the opioid-induced depression of breathing.

METHODS:
Brainstem slice preparations from rat generate inspiratory-related activity that is recorded from the XII nerves and the slice surface as raw and integrated activity. Drugs are microinjected into the preBötC with 3-barrel pipettes and effects on rhythm measured.

RESULTS:
1. Local application of the TLR4 agonist LPS has no effect on respiratory frequency.
2. Preapplication of TLR4 antagonist LPS-RS has no effect on the DAMGO-mediated inhibition of frequency.
3. Bath application of the TLR4-selective antagonist, (+) naloxone, has no effect on the opioid-evoked depression of frequency.
4. Microglia do not contribute to the opioid-induced frequency depression.

CONCLUSIONS:
1. Activation of TLR4 has no effect on the respiratory frequency in vitro.
2. Neither the TLR4 signaling cascade, nor the activation of microglia contribute to the opioid-induced respiratory depression.
INTRODUCTION:
Neonatal Hyperbilirubinemia (NH) is a common condition in newborns. The management of NH requires repeated blood sampling to measure Total serum bilirubin (TSB). Transcutaneous Bilirubin (TcB) which estimates bilirubin in skin is being used to manage NH in term and near-term infants. However the role of TcB in preterm infant remains unclear.

METHODS:
We executed a sensitive search strategy of MEDLINE, EMBASE, Cochrane library, CINAHL, Scopus databases (all from the date of inception to October 2011). Additional citations were identified from the bibliography of selected articles and from abstracts of the conference proceedings. The studies were selected for inclusion if they compared TcB results with TSB estimation in preterm population in neonatal period. Two reviewers independently assessed studies for inclusion and discrepancies were resolved with consensus. Data were extracted on a specifically designed data extraction form by one reviewer and checked for accuracy by the second reviewer. We extracted data for population characteristics, methods of estimation of TcB and TSB, and statistical method of comparison. Quality assessment of included studies was performed using QUADAS-2 tool.

RESULTS:
27 studies met the inclusion criteria. Studies varied in terms of gestational age of participants (between 24-36 weeks); site of TcB estimation [forehead (21), sternum (13) and abdomen (3)]; TcB devices used [Bilicheck (10), JM103 (7), Minolta air shields (7), JM 102(5) and Bilimed (1)]; method of estimation of TSB [Direct Spectrophotometry (14), Diazo method(10), Vitrous BuBc(1), Enzymatic method(1), and HPLC(1)]; and statistical methods used for comparison of TcB with TSB [co-relation coefficients (25 studies) and Bland-Altman plots(12 studies)]. The correlation coefficients varied from 0.37 to 0.94. In the analysis by Bland Altman plots TcB values varied from the TSB value in the range of + 55.6 to -22.4 micromol/L.

CONCLUSIONS:
We identified a large number of studies measuring diagnostic accuracy of TcB devices in preterm infants. A formal meta-analysis of data is planned.
INTRODUCTION:
Various measurement instruments exist in clinical settings to assist physicians with the diagnosis, prognosis, long-term follow up of a disease, or even to assess quality of life. However, a measurement instrument must be both valid and reliable before application. An invalid questionnaire can lead to outcome misinterpretations. Despite the abundance of questionnaires used in clinical settings, very few have had a formal validation. Also, a lack of training in environmental health prevents physicians from exploring environmental risk factors apart from routine ones such as tobacco smoke. The Pediatric Environmental Health History (PEHH) questionnaire used by Pediatricians in Edmonton AB, is no exception and requires validation.

METHODS:
For Phase I, content validation; experts were identified throughout the worldwide PEHSU-linked network (Pediatric Environmental Health Specialty Units, as defined by the Environmental Protection Agency –EPA-). Their opinion on item relevancy and comprehensiveness was obtained for the 200 items that compose the PEHH questionnaire, via an online survey created through the REDCap (Research Electronic Data Capture) program. Inter-rater agreement based on the kappa statistic was calculated for two variables: 1) item agreement for nine constructs (dichotomous) 2) four supplemental questions per construct (based on a Likert scale).

RESULTS:
Among 10 reviewers, the kappa value for item agreement ranged from 0.71 to 0.91. For the supplemental questions, the kappa value ranged from 0.34 to 0.55. An overall kappa value of 0.84 reveals almost perfect agreement for the items in total. Of the 10 reviewers, three were inconsistent, but only one was statistically significant. After removal of the significantly inconsistent reviewer, a Kendall’s Tau-b test revealed a significant positive association between the two variables (R=0.756, p=0.034).

CONCLUSIONS:
After completing Phase I of the validation process, we have a modified questionnaire based on expert suggestions. This version will be utilized in Phase II for construct validation.
INTRODUCTION:
Balance between inhibition and excitation in the forebrain is critical for proper neural function. An increase in the ratio of excitation to inhibition has been proposed to be a cause of some neurodevelopmental disorders such as autism. Proper differentiation of inhibitory interneurons from neural precursor cells and their migration to the appropriate regions of the forebrain contributes to maintaining this balance. The DLX homeobox genes, transcription factors that bind to TAAT/ATTA tetranucleotide motifs of target genes, are required for differentiation and migration of inhibitory interneurons during forebrain development. Two genes expressed in the developing forebrain with homeodomain binding motifs in their promoters are CXCR4, a chemokine receptor involved in interneuron migration, and NKX2.2, a gene expressed in oligodendrocyte precursors. DLX2 is predicted to regulate these genes to ensure proper interneuron differentiation and migration.

METHODS:
The objective of this project was to determine whether DLX2 regulates CXCR4 and NKX2.2 by cloning the mouse Nkx2.2 and Cxcr4 gene promoters and by performing chromatin immunoprecipitation (ChIP)-based PCR to identify candidate DLX2 binding sites.

RESULTS:
Several clones containing the upstream promoter regions of Nkx2.2 and Cxcr4 were isolated and sequenced; experiments are ongoing to identify the most suitable clones for functional analysis in vitro. ChIP PCR of embryonic mouse forebrain identified three regions upstream of the transcriptional start site of Cxcr4 and two regions upstream of the transcriptional start site of Nkx2.2 containing putative DLX2 binding sites. These isolated promoter regions will be subcloned and sequenced.

CONCLUSIONS:
These results suggest that DLX2 binds to the Nkx2.2 and Cxcr4 gene promoters in vivo. Further experiments will assess specificity of binding to these regions and assessment of Nkx2.2 and Cxcr4 expression in the Dlx1/Dlx2 double knockout mouse forebrain.
Evaluation and quantification of morphological differences in the esophageal mucosa of Eosinophilc Esophagits, Reflux Esophagitis, and control patients using a transmission electron microscope

INTRODUCTION:
Eosinophilic Esophagitis (EoE) is a clinical pathological diagnosis characterized by inflammation of the esophagus. EoE patients present with symptoms of dysphagia, episodes of food impaction, and abnormal eating habits. The hallmark feature of EoE is the presence of more than 15 eosinophils/HPF in esophageal biopsies. Previous studies used TEM to show dilated intercellular space (IS) in Reflux Esophagitis (RE) compared to normal; however, TEM findings in EoE patients are unknown. Our aim is to use a TEM to identify and report any morphological differences between esophageal biopsies from EoE, RE, and Normal patients.

METHODS:
This study is approved by HREB. Patients with upper GI symptoms who have consented for endoscopy were recruited from the pediatric GI clinics. Biopsies for this study were collected from the most inflamed area of the esophagus or from the lower esophagus if the esophagus looked normal. The AGA guidelines were used to diagnose EoE (more than 15 eosinophils/HPF in esophageal biopsies, non-responsive to PPI treatment, normal 24h pH monitoring). Biopsies were viewed under TEM (15K X) and assessed for IS and number of desmosomes. Clinical data from patient charts were entered to an online database, REDCap.

RESULTS:
55 patients (32 EoE, 9 RE and 14 Normal) were recruited. EoE patients were mostly males (78%). Incidences of food impaction were highest in EoE (53%) and acid brash was highest in RE (22%). EoE patients had significantly higher incidences of esophageal abnormalities compared to RE and Normal patients. Initial TEM RESULTS:
(5 EoE, 5 RE, and 3 Normal) show that mean IS was wider in EoE (0.88µm) and RE (0.92µm) than in Normal (0.76µm), but the difference were not statically significant.

CONCLUSIONS:
Presenting Symptoms are similar in EoE and RE patients, except for food impaction which is more in EoE and acid brash which is more in RE. There was no difference in the intercellular space of the three patient groups.
Abstract #: 106
Submitter: Aldrich Leung
Title: Intestinal permeability in children with Eosinophilic Esophagitis and Gastroesophageal Reflux Disease
Authors: Aldrich Leung, Jon Meddings, Rabin Persad, Sujata Persad, Hien Huynh
Presenter: Aldrich Leung
Affiliations: UA
Category: Child Youth Development
Investigation Type: Quantitative Research

INTRODUCTION:
Eosinophilic Esophagitis (EoE) is a disorder characterized by esophageal inflammation due to eosinophilic infiltration into the mucosa. Patients may present with upper GI symptoms, such as dysphagia and vomiting. The pathogenesis of EoE is not well understood, and intestinal barrier function in EoE has not been studied.

METHODS:
This study was approved by HREB. Patients were recruited from pediatric GI clinics. They were consented to an EGD as recommended by their treating physicians. Patients were asked to provide biopsies for routine histopathology. They also provided separate overnight urines after drinking a solution containing sucrose, lactulose, and mannitol. Overnight urines were used to assess gastric (sucrose concentration) and intestinal permeability (lactulose/mannitol ratio). Patients were classified as either EoE or RE/normal endoscopy and histology. They were diagnosed with EoE if they were endoscopically and histologically non-responsive to PPI treatment; their esophageal biopsies exhibited an eosinophil count greater than 15; and their elevated eosinophil counts were limited to the esophagus.

RESULTS:
23 patients participated in the permeability study: 12 were in the EoE group with mean age of 11.8 yrs, and 11 were in the RE/normal endoscopy and histology group with mean age of 11.3 yrs. Within our RE group, we had 6 patients who had high eosinophil counts prior to PPI treatment. It is possible that they could be PPI-responsive EoE patients, but for our pilot data, we categorized them as RE. The mean peak eosinophil counts following a PPI trial for EoE and RE/normal were 39 and 2, respectively. The median l/m ratio for EoE and RE/normal were 0.0271 and 0.0221, respectively (p-value=0.334). The median total sucrose excreted was 68.2600mg for EoE and 39.6225mg for RE/normal (p-value=0.7979).

CONCLUSION:
There was no difference in the l/m ratio between EoE patients and RE/normal patients. The result does not rule out the possibility that there is a change in intestinal permeability in either condition. A healthy control group with no symptoms is needed for comparison.
INTRODUCTION:
Breast cancer is a major health problem for women but its treatment is commonly compromised by the development of resistance to chemotherapy. Our work focuses on how the novel lipid growth factors, lysophosphatidate (LPA) and sphingosine 1-phosphate (S1P) cause chemoresistance. LPA is produced by the secreted enzyme, autotaxin, from the abundant lysophosphatidylcholine in circulation. LPA and S1P signal through different G-protein coupled receptors, which increase tumor progression, aggressiveness, metastasis, angiogenesis and chemoresistance. S1P is produced by sphingosine kinase inside the cells and can be secreted to stimulate new blood vessel formation and survival of breast cancer cells. This secretion is mediated by the multi-drug resistant transporters, ABCC1 and ABCG2, which are expressed abundantly in the drug-resistant breast cancer cells. At present, there is no cancer treatment that blocks the actions of LPA and S1P. We hypothesized that blocking the signaling actions of LPA and S1P will decrease tumor progression and improve the efficacy of chemotherapy in breast cancer.

METHODS:
Cultured wild-type and chemo-resistant breast cancer cell lines were used in this study.

RESULTS:
LPA and S1P cause resistance to doxorubicin-induced killing of breast cancer cells. LPA does this by increasing phospholipase D2 (PLD2) activity, which produces the bioactive lipid, phosphatidate. Phosphatidate then binds to mTOR and sphingosine kinase, which cause their activations. This increases S1P production and secretion, which promotes the survival of breast cancer cells and stimulates the formation of new blood vessels for the growing tumor. In addition, the LPA increased the expression of ABCC1 and ABCG2 which also increases the export of chemotherapeutic drugs, such as doxorubicin, from cancer cell and thus promotes chemoresistance.

CONCLUSION:
This work identifies PLD2 as an important component of signaling by LPA and S1P. We will now test if blocking PLD2 activity will decrease tumor progression and improve the efficacy of chemotherapy in a mouse model of breast cancer.
INTRODUCTION:
Infants born extremely premature (under 28 weeks GA) are at high risk of health related complications. Bronchopulmonary dysplasia (BPD), caused by premature lungs exposed to use of breathing machines and oxygen treatments, is associated with long term respiratory limitations. However, most studies include small numbers of subjects and focus on limited respiratory outcomes. The aim of this study is to measure a broad range of respiratory function in pre-teens who were born under 28 weeks GA and compared outcomes measures between those with and without BPD as well as to term born (greater than 36 weeks GA) healthy control children.

METHODS:
Subjects were recruited from a cohort of extreme premature infants born between 1997 and 2002 and cared for in the Northern Alberta Neonatal Intensive Care Program. Children were included if they were able to ride a bike and control children had no significant respiratory illnesses except asthma. A physical examination, echocardiography, lung function, and cardio-pulmonary exercise testing (CPET) were performed for all subjects. This abstract reports on lung function and CPET results expressed as % of predicted normative values.

RESULTS:
To date 56 children have completed testing: 25 control children, 16 born premature without BPD, and 15 born premature with BPD. Compared to control children, children with a history of BPD had smaller FEV1/FVC ratio (86.2 vs. 98.3, p 0.05), lower forced expiratory flow 25-75% (67.6 vs. 91.4, p 0.05), and lower peak expiratory flow (%predicted, 79.8 vs. 103.7, p 0.05). There were no significant differences in the lung function of children born premature without BPD and children born at term control. Children born premature without BPD had a lower VE/VCO2 slope than children born premature with BPD (27.5 vs. 29.5, p 0.05) suggesting blunted CO2 response to exercise in those with a history of BPD.

CONCLUSIONS:
Our preliminary data supports lower lung function and exercise performance in children with a history of BPD. Children born preterm without a history of BPD appear to be protected from long term respiratory impairment.
INTRODUCTION:
Alterations to tumor suppressor genes may inhibit apoptosis and result in uncontrolled tumor growth. Acute lymphoblastic leukemia (ALL) along with acute myeloid leukemia (AML) received much attention from researchers within the past fifty years; however, challenges are still encountered when it comes to avoiding a relapse of the disease.

We speculate that MOAP-1 is a tumor suppressor in leukemia. Samples of leukemia patients have in some cases demonstrated a reduced expression of MOAP-1, while others display post-translational modifications of MOAP-1. Both of these events will result in the loss of or altered MOAP-1 function and may provide clues when predicting the likelihood of leukemia relapse.

METHODS:
To explore this hypothesis, leukemia cells that have been identified to have low and high expression of MOAP-1 were studied to investigate the ubiquitination of MOAP-1, and the cellular distribution of MOAP-1 using sucrose density centrifugation. Such techniques as immunoblotting and tissue fractionation of mouse samples were also used.

CONCLUSIONS and RESULTS:
The detection of MOAP-1 in mouse tissues revealed possible unique roles for MOAP-1 in heart, liver and colon. Cell death activation can re-localize MOAP-1 and experiments in various cell lines revealed differential ubiquitination of MOAP-1. Our experiments revealed the complexity to MOAP-1 expression and possible function related to tumour suppression.
INTRODUCTION:
Lymphoma is a common cancer in children, and although the rate of survival is increasing, every 2 out of 3 survivors will have at least one late occurring effect, 1 of 3 being major, serious or life threatening according to Canadian Cancer Statistics (2011). siRNA can achieve sequence specific silencing of cancer causing genes in lymphoma, inducing apoptosis but requires a carrier [1]. Polyethyleneimine (PEI) is capable of delivering siRNA and aiding endosomal escape [2]; however, high MW (25kDa) PEI is toxic, and low MW (2kDa) PEI is non-toxic but inefficient. Substitution of 2kDa PEI with hydrophobic lipids has the potential to increase its efficiency, while keeping its toxicity low [3,4]. In this study, we aim to develop a polymeric carrier system that will deliver siRNA molecules into cancer cells and achieve apoptosis.

METHODS:
Several lipid substituted 2kDa PEIs were synthesized and screened to silence GFP -due to easy detection- in Hut78 (T-cell lymphoma) cells using anti-GFP siRNA, and the decrease in GFP fluorescence was quantified using flow cytometer. The carriers were tested against several commercial reagents, and other gene targets were screened for their ability to decrease viability.

RESULTS:
Caprylic and linoleic acid substituted polymers showed a significantly lower toxicity and higher efficiency than the 25 kDa PEI, and their efficiency was equivalent or superior to the commercial reagents, while their toxicity was lower. Several gene targets for cell death were identified, and their validation to decrease viability is ongoing.

CONCLUSIONS:
Potent targets whose down-regulation would cause apoptosis are to be identified and inspected. With further investigation and achieving such efficiency in animal models, the method has the potential to be used in successful and safe treatment of lymphoma.

REFERENCES
**INTRODUCTION:**
Adolescent Idiopathic Scoliosis (AIS) affects 2-3% of adolescents, with 70% of cases being girls. Bracing is the most common non-surgical treatment for AIS, but the best therapeutic pressure and wear-time dosages have not yet been identified. To research ideal dosages, we must measure wear-time and control pressure. This study validated a system that can accomplish both tasks.

**METHODS:**
An electro-mechanical system was designed to control brace pressure, measure wear-time, and log data throughout treatment. The system was designed to be embedded in a Scoliosis brace, and regulates the pressure at the three key pressure points. Two healthy volunteers wore a brace with the system enabled for 2 hours and disabled for 2 hours; the system’s effect on the brace pressure distribution was observed.

**RESULTS:**
The system raised the percentage of time spent in a desired pressure range from 31% to 71%. Average pressure in the brace was 46±14 mmHg without the system enabled, and 56±10 mmHg with the system – thus the system increased average pressure and reduced pressure variance. The system regulates brace pressure effectively, and is ready for use in dosage research.

This system can be used during brace fitting, to vary the amount of pressure applied to the patient’s body. By observing the corrective effect of each pressure configuration, we can discover the ideal pressure. The system can also be embedded in a brace and used throughout treatment: the pressure regulation should positively affect treatment outcome. Data logged during treatment can be analysed to derive a model for the ideal treatment dosages. This model can then be used to improve treatment protocols.

**CONCLUSIONS:**
An electromechanical system for measuring brace wear-time and controlling brace pressure has been developed. The system’s regulation of brace pressure is effective. It will enable research into the ideal brace treatment dosages, which will have a direct effect on the quality of life and treatment outcome for children with AIS.
INTRODUCTION:
Although receiving services for developmental disabilities is a strong protective factor against negative outcomes in fetal alcohol spectrum disorder (FASD), there is little research on service utilization patterns among individuals with FASD. The goal of the current study was to examine rates of service utilization among children with FASD and those with confirmed prenatal alcohol exposure (PAE) without an FASD diagnosis. Service utilization patterns were compared across diagnostic group, diagnostic assessment before age six vs. after age six, and residential location (urban vs. rural).

METHODS:
Caregivers of 46 children with FASD and 26 with PAE were interviewed using the Services for Children and Adolescents Parent Interview (SCAPI). The SCAPI collects information about child medication, individual child therapy, parent/family therapy, education services, parenting classes/groups, and parent medication. Questions about respite and early intervention were added.

RESULTS:
The most frequently used services among both diagnostic groups were education services, child medication, child therapy, and parenting classes. The groups differed in access to educational support (accessed more by FASD) and parenting classes/groups (accessed more by PAE). Children assessed before age 6 had better service access than those diagnosed later in areas of early intervention, parent/family therapy, and parent medication whereas a greater proportion of those diagnosed after age 6 accessed respite. Service access did not differ between urban and rural participants.

CONCLUSIONS:
An FASD diagnosis instead of just confirmed PAE does not generally seem to increase overall rates of service utilization. Furthermore, geographic location has little effect on service utilization. However, being diagnosed before age six appears to be associated with better service access.
INTRODUCTION:
Fatigue is one of the many consequences of shift work in the nursing profession. Natural health products (NHPs) for fatigue are becoming an increasingly popular topic of clinical study; one such NHP is Rhodiola rosea. A well-designed, rigorously conducted randomized controlled trial (RCT) is required before therapeutic claims for this product can be made.

METHODS:
A parallel-group randomized, double-blinded, placebo-controlled trial of 18-55 year old nursing students from the University of Alberta, participating in clinical rotations between January and September 2011. Participants were randomized to take either 364 mg (2 capsules) of R. rosea or identical placebo at the start of their wakeful period and up to one additional capsule within the following four hours daily for 42 days. The primary outcome was reduction in fatigue measured using the vitality subscale of the RAND-36 cross-validated by the visual analogue scale for fatigue (VAS-F).

RESULTS:
A total of 48 participants were randomized to R. rosea (n=24) or placebo (n=24). The mean difference between groups on the vitality subscale score at day 42 was -19.6 (95% CI -33.5 to-5.7] favoring placebo. The mean difference between groups on the VAS-F score at day 42 was 2.5 (95% CI 0.9 to 4.1) favoring placebo.

CONCLUSIONS:
Among nurses on shift work, R. Rosea compared with placebo worsened fatigue, and therefore should not be recommended at this dose and duration. There were no significant differences in adverse events between treatment groups.
INTRODUCTION:
Sleep studies are a routine investigation for breathing concerns during sleep in all age groups. There are, however, no accepted criteria to define an abnormal result in infancy. The aim of this study is to describe the indications and results of sleep study for children under 2 years of age and evaluate their relationship with physician’s recommendations. The results will define parameters on sleep study that relate to clinical decision making for infant sleep studies.

METHODS:
Retrospective sleep study data from children under 2 years were retrieved from 3 year period (2008-2010). Sleep study data and clinical notes were reviewed to collect study indication, sleep study results, and physician’s recommendations.

RESULTS:
A total of 435 sleep study records from 325 children were retrieved. Of the 250 studies that have been reviewed to date, the average age was 9 months 4 days ± 14 days, with 42% of the children < 6 months at the time of study. Compared to children greater than or equal to 6 months, children < 6 months had higher arousal index (54.5 events/h vs 11.5 events/h, p 0.001), higher apnoea hypopnea index (AHI; 31.9 vs 12.9, p 0.001), and higher desaturation index (34.0 events/h vs 15.2 events/h, p 0.001) but similar minimum oxygen saturation (83% vs 79%, p=ns). Applying the current paediatric criteria for abnormal sleep study (AHI greater than 1.0 events/h), 243 (97%) of the children studied had an abnormal result and 61% of these children had an AHI greater than 10 events/h. Only 33% of children were similarly classified by AHI and physicians with AHI always classifying as more severe than physician classification.

CONCLUSIONS:
The current paediatric criteria defining abnormal sleep study leads to over estimation of the severity of sleep study abnormalities. Separate criteria should be investigated for children < 6 months and 6-24 months of age. Linking sleep study data to clinical recommendations and treatment will support development and testing of new criteria to identify abnormal sleep study results in children under 2 years of age.
INTRODUCTION:
Kidney dysfunction is a common problem in children with liver or heart transplant. If this is allowed to progress, irreversible damage can develop. Thus, it is important to recognize, monitor frequently, and institute appropriate measures early to reverse, prevent or arrest progression. Tests that are available to do this have several problems; serum creatinine level depends on muscle mass and since most children with transplants have poor muscle mass, overestimates renal function; nuclear medicine glomerular filtration rate (NM-GFR) measurement is the gold standard but requires radioisotope (Tc-99-DTPA) exposure to radiation, very expensive, and only used annually. Serum cystatin C has been shown to be a better test than creatinine in other conditions. Measurement of this is not routinely available in Northern Alberta. This study aimed to determine if serum cystatin C could predict renal function as well as NM GFR in these children.

METHODS:
Children aged 2-17 years who are followed in the heart and liver transplant programs were enrolled in the study and their NM-GFR measurements were compared to serum cystatin C based GFR (Filler formula. Sample size of 60 patients was adequate with a power of 90% and 5% level of significance for an anticipated correlation of 0.5 or greater between cystatin C measurements, and NM-GFR. Normal GFR value is greater than 90 and < 60 indicates significant renal dysfunction.

RESULTS:
59 children (48 liver, 11 heart) with a mean age of 9.45 plus or minus 4.7 years were enrolled. Mean GFR by cystatin C and NM-GFR was 110 plus or minus 30 (95 percent CI 103 – 119), and 90 plus or minus 24 (95 percent CI 85-97), respectively. 8.47 percent were outside the limits of agreement. Agreement between these two tests was very good (Kappa 0.88) when NM-GFR was < 60 and moderate with greater than 90 (Kappa 0.58). Age, gender, type of transplant and number of transplant did not have an impact.

CONCLUSIONS:
Serum cystatin C correlates very well with NM-GFR, particularly when the GFR is < 60 (early indication of significant renal dysfunction) which is a major morbidity in these children. Discussions are underway to implement this test as standard of care for renal follow-up in these children.
INTRODUCTION:
Autism Spectrum Disorder, which can affect social, cognitive and communicative function, is a major cause of social disability in children. Many single-gene mutations are associated with autism, with two of the most prevalent being fragile X mental retardation 1 (FMR1) and phosphatase and tensin homolog (PTEN) gene mutations. Our study aimed to determine if an assay of social interaction could be developed in Drosophila to reliably detect impaired social interaction due to loss of dFMR1 and/or dPTEN gene function, and in the case of dFMR1, where in the nervous system this loss is most debilitating.

METHODS:
The Drosophila UAS-Gal4 system was utilized to produce RNA interference (RNAi) against either dFMR1 or dPTEN, to promote loss of function of the gene in question. This was done by expressing RNAi transgenes throughout the nervous system using a pan-neuronal driver. Subsequently, the UAS-Gal4 system was also used to express RNAi against dFMR1 in specific nervous system regions. To test the effect of expressing these RNAi lines, we placed two 3-day-old, virgin female flies of a given genotype in a chamber with a perforated divider separating them. Optical tracking software recorded the movements of each fly for 3.75 minutes.

RESULTS:
Flies expressing either dFMR1 or dPTEN RNAi transgenes spent significantly (p value < 0.001) less time together at the chamber divider than did controls, which we interpreted as a reduction in social interaction. Neither control nor experimental groups differed in any locomotive or exploratory aspects, implying that they were otherwise normal. This impaired social behavior was also seen when RNAi against dFMR1 was expressed in subsets of the nervous system. More specifically, pan-neuronal expression of the dFMR1 RNAi appears most debilitating, while broad-brain or mushroom body expression likely also impact social interaction to some degree.

CONCLUSION:
The results validated our assay and showed that it can be used to both identify autism-related genes in Drosophila and determine where in the nervous system loss of gene function is most debilitating.
INTRODUCTION:
Microphthalmia, anophthalmia, and coloboma (MAC) represent a spectrum of inherited eye disorders that cause pediatric visual impairment and blindness. These phenotypes encompass small (microphthalmia) or absent (anophthalmia) eyes, with the former often associated with coloboma (impaired fusion of a fissure in the developing eye). While some of the genes associated with MAC have been identified, approximately 80% remain to be defined. Characterizing the genetic basis of MAC represents an effective means for advancing our understanding of the inheritance, prognosis, and disease mechanisms and provides an opportunity to enhance treatment for a potentially blinding pediatric condition.

METHODS:
We examined a pedigree comprising 7 patients with colobomatous microphthalmia and we selected 3 affected and 1 unaffected individual for Next Generation Sequencing. This novel technique sequences an individual’s entire exome.

RESULTS:
Analysis of the list of genes mutated in affected individuals revealed one, Bone Morphogenetic Protein 3 (BMP3) that is a member of the TGF-β superfamily of proteins where several members have well established eye developmental roles. We confirmed that the BMP3 variant A470P segregates with disease and identified an additional four BMP3 variants by sequencing our MAC patient cohort. These variants are predicted to be damaging and exist at a higher prevalence compared to control populations. Finally, in situ hybridization experiments in zebrafish demonstrated that BMP3 is expressed in the eye.

CONCLUSION:
We have identified BMP3 as the cause of MAC in both a large pedigree and in a panel of isolated cases. Five BMP3 mutations were discovered and these equate to 1-2% of MAC cases.

Future Directions: Using zebrafish as a model organism, the effect of inhibiting BMP3 in vivo is currently being studied. In addition, constructs for the BMP3 variants are being created for functional assays that will further characterize the role of BMP3 in ocular disease.

Sources of Funding: Alberta Innovates-Health Solutions (AIHS), Women and Children’s Health Research Institute (WCHRI)
Introduction:
Significant fetal anemia can cause fetal compromise due to high fetal cardiac output (CO), with intrauterine transfusion (IUT) being the treatment of choice. IUT carries risks including preterm delivery and fetal demise. Peak middle cerebral artery (MCA) Doppler velocity of >1.5 multiples of the mean (MoM) is sensitive for moderate-severe fetal anemia with false positive rates of ≥12%. We sought to explore the additive value of FE and calculated fetal combined CO (CCO) in assessing fetal anemia.

Methods:
We identified pregnancies that underwent FE prior to IUT for suspected fetal anemia from June 2009-June 2012 in our program. FE was used to calculate fetal CO. Prenatal records were reviewed for peak MCA velocity at IUT, pre-transfusion hemoglobin (Hb) and hydrops. Anemia was graded as moderate if fetal Hb was less than 0.65 MoM and severe if less than 0.55 MoM.

Results:
11 pregnancies complicated by fetal anemia had 20 IUTs. Nine of the 11 pregnancies had FE within the preceding thirty days. One case was excluded due to no pre-transfusion Hb measurement. Median gestation at FE was 24wks (range 19wks-29wks). Peak MCA Doppler was greater than 1.5 MoM (range 1.5-2.5) in all. Of the nine fetuses with measured Hb, 44% had severe (n=4, 3 of whom with hydrops), 22% moderate (n=2) and 33% (n=3) mild anemia. Fetal CO was above the 90th centile in all fetuses with moderate or severe anemia. In 3 with mild anemia, two had normal CO and one had CO at the 90th centile.
INTRODUCTION:
Eosinophilic esophagitis (EoE) is a newly recognised allergic disease. The aim of our study was to determine whether there is an association between different environmental exposures, particularly cigarette smoking in children with EoE when compared to children without.

METHODS:
A cross-sectional survey study in which children with EoE and controls were screened for smoking and other environmental exposures using structured questionnaires. Children were recruited from pediatric gastrointestinal clinics. Chart review was performed to confirm their diagnosis. SPSS was used to perform univariate analysis.

RESULTS:
The questionnaire was completed by 69 parents in the EoE group and 65 controls. In addition, 74 children >9yo (45 patients and 29 controls) completed the child questionnaire in private. Mean age was 10.9 yr for EoE and 10.2 yr for controls. Among EoE 82% were male and 57% in controls (p=0.0023). Caucasian accounted for 80% of EoE group and 81% in controls. 13% of both EoE and control groups were from rural area. The diagnosis in the control patients was 32% GERD, 25% IBS, 8% feeding disorder, 35% others. Atopy and environmental allergies were more common in EoE as compared to control. No significant difference was seen in smoking exposure between EoE and control (39% vs. 45% p=0.5999).
Of other environmental factors, including birth order, breastfeeding, day care attendance, farm animals and pets’ exposure, antibiotics/acetaminophen/NSAIDs exposure and living close to air pollution emitting plants, none was associated with EoE. Only fast food consumption was associated positively with the disease, with 60% in the EoE having 1 or more fast food meals per week, vs. 37% in the control (p=0.0249).

CONCLUSION:
EoE in children is not associated with cigarette smoking exposure. Breast feeding and exposure to farm animal does no appear to be protective in having EoE. Fast food consumption appears to be more common in the EoE children when comparing to controls. Further in-depth study is needed to determine the role of fast food as a risk factor in the development of EoE.
INTRODUCTION:
Preterm infants are at increased risk of developing type 2 diabetes mellitus, cardiovascular disease, metabolic syndrome, obesity and hypertension. This pilot study will determine the feasibility of undertaking a larger study aimed at clarifying the relationship between postnatal growth, body composition and hormonal status in preterm infants with differing prenatal and postnatal growth patterns in the first six months after discharge.

METHODS:
Post-natal growth is obtained by referring to the NICU growth charts and by measuring head circumference, length and weight every 4 weeks after discharge. Body composition is measured as percent fat mass and percent fat free mass every 4 weeks after discharge using the PEA POD air displacement plethysmograph. Blood samples are collected every 3 months and analyzed for glucose, insulin, leptin, ghrelin and IGF-1.

RESULTS:
The infant currently enrolled in the study was born at 26 weeks, with a weight of 900 g (56th %ile) and is classified as appropriate for gestational age (AGA) with no growth restriction (GR-) as weight fluctuated roughly ±10 percentile units. At 39 weeks or term equivalent age (TEA) the infant weighed 3585 g and had a 25.6% fat mass and a 74.4% fat free mass. Over the first three visits, there was an increase in %FM and a decline in %FFM reaching 29.7% fat mass and 70.3% fat free mass by 7 weeks corrected gestational age. Between 7-11 weeks body composition remained essentially unchanged.

CONCLUSION:
The infant will be followed for the remainder of the study and hormonal status will be analyzed following completion.
Co-creating a memorandum of understanding (MOU) is considered a respectful and integral component of developing a community-based research partnership with an Indigenous community (e.g., Schnarch, 2004). The purpose of this presentation is to describe the process of co-creating an MOU for a school-university partnership. This MOU outlines each party’s roles and responsibilities for developing and implementing a physical activity and sport research project with Aboriginal youth as well as each party’s anticipated outcomes of the research project. “nehiyawiyisin,” as translated by an Elder in the school, means “learning the cree way of life.” The process of co-creating the MOU served as a path to nehiyawiyisin in that it facilitated co-learning between the researcher and the school. The process also fostered mutually beneficial agendas for each party based on the shared interest of enhancing Aboriginal youth sport and physical activity participation. The partnership background and MOU format will be described. The process of communicating key terms and concepts, and negotiating key components of the MOU, including relationship development, ethical considerations, and project goals and timelines, will be discussed.

Our gratitude goes to the Women and Children's Health Research Institute and Community-University Partnership for the Study of Children, Youth, and Families at the University of Alberta for sponsoring this project.
INTRODUCTION
Successful pregnancy requires several cardiovascular adaptations to supply nutrients and oxygen to the placenta and fetus. Cardiac output and blood volume increase, maternal vasculature is remodeled, and sensitivity to vasodilators increases. Exploring vasodilation mechanisms in pregnancy could lead to novel treatments of preeclampsia and intrauterine growth restriction. Estrogen increases in pregnancy and induces vasodilation although the mechanisms are not well understood. Previous studies in cancer cells have shown that Estradiol (E2) binds to GPR30 and increases production of sphingosine-1-phosphate (S1P), a bioactive signaling sphingolipid. We hypothesized that in uterine arteries from nonpregnant (NP) mice, E2 will signal through GPR30 and increase vasodilation through S1P1,3 receptors only at concentrations found in pregnancy. In late pregnant (LP) mice, increased sensitivity to E2 will be mediated by increased S1P1,3 signaling.

METHODS
A pressure myograph system was used to measure E2-induced dilation in uterine arteries from NP or LP S1P3 knockout (-/-) or littermate control (+/+) mice with or without S1P1,3 inhibitor, VPC23019. Drug or control was infused inside a pressurized artery at a low rate, and measurements were taken during flow and after flow was stopped. E2-induced dose-dependent vasodilation in uterine arteries from NP mice began at pregnancy-level concentrations.

RESULTS
Sensitivity to E2 increased in arteries from LP mice with initial dilation at 1nM E2, while arteries from NP mice showed first dilation at 10nM. Arteries from NP and LP S1P3 -/- mice showed attenuated vasodilation compared with arteries from +/- mice. VPC23019 did not attenuate E2-induced dilation. However, when infused alone, VPC23019 induced dilation in arteries from +/- mice but not -/- mice.

CONCLUSION
Uterine arteries from NP mice dilated to E2 only at pregnancy levels and this was dependent in part on S1P3. LP mice are more sensitive to E2-induced dilation likely due to increased receptor expression.

Supervisor: Denise Hemmings, Department of Obstetrics and Gynecology
Summer research scholarships provided by WCHRI and NSERC
INTRODUCTION:
Choline is an essential nutrient that plays a critical role in fetal brain and neural tube development. The adequate intake (AI) value for choline for women of childbearing age is 425 mg/day. The objective of this study was to develop a choline database and use it to estimate the total amount and sources of choline in the diet of women in the Alberta Pregnancy Outcomes and Nutrition (APrON) study, in the six months prior to pregnancy.

METHODS:
APrON participants (n=453) completed food frequency questionnaires (FFQ) that asked about intake in the six months prior to pregnancy. The 2008 USDA Database for the Choline Content of Common Foods was used to estimate choline content of foods in the FFQs. For foods not in the USDA database, choline values were estimated using comparable items. Recipes were used to estimate the choline content of mixed foods. All five forms of choline in addition to total choline were included in the database. The estimated total intake of choline was compared to the recommended AI.

RESULTS:
The mean total choline intake was 428 ± 141 mg/day and only 48% of the participants met the daily AI recommendation. Phosphatidylcholine constituted the highest proportion of total choline intake (48%). Of the women who reported not consuming milk, only 33% met the AI and the average daily intake of choline was significantly lower (p<0.05) than women who consumed more than one cup of milk per day (386 ± 138 vs. 521 ± 122 mg). Only 13% of women who did not consume eggs met the AI; they had significantly lower (p<0.05) daily choline intakes than women who consumed at least one egg per day (356 ± 91 vs. 609 ± 190 mg/day).

CONCLUSIONS
The majority of APrON women were not meeting current daily recommendations for choline prior to pregnancy. Women who regularly consume milk and/or eggs have significantly higher total choline intakes than women who do not, and these women are more likely to meet the choline AI.
INTRODUCTION:
5-Aminosalicylic acid (5-ASA; mesalamine) is one of the most commonly prescribed agents for the treatment of active inflammatory bowel diseases (IBD), which include Crohn disease and ulcerative colitis. IL-1β is a potent pro-inflammatory cytokine that contributes to the sustained inflammatory responses in IBD and is found to be consistently elevated in biopsy tissues. IL-1β converting enzyme or caspase-1 was found to induce a type of epithelial cell extrusion called pyroptosis. Caspase-1 can be activated by inflammasome—a multi-molecular complex that can be induced by microbial or non-microbial stimuli. We have previously reported that pyroptosis-mediated cell extrusion can compromise the integrity of intestinal epithelium and permit entry of luminal microbes. Previous studies have shown that 5-ASA inhibited the activity of caspase-1, but the mechanism by which it reduces intestinal inflammation is unknown.

We hypothesize that 5-ASA acts, in part, by inhibiting inflammasome activation and cell extrusion in intestinal epithelial cells (IECs).

METHODS:
We propose to investigate the effect of 5-ASA on inflammasome-mediated IEC extrusion in vitro. Nigericin activates the inflammasome via NLRP3, glyburide is a selective NLRP3 inhibitor, and YVAD is a selective caspase-1 inhibitor. First, we plan to investigate whether 5-ASA prevents the increase in permeability of IECs induced by Nigericin by assessing the in vitro permeability using T84 cells plated on Transwells. Transepithelial resistance will be measured before and after treatment with Nigericin, 5-ASA, glyburide, and YVAD. Next, we will characterize the effects of 5-ASA on inflammasome-induced cell death, cytokine secretion, and cell morphology. Finally, signalling pathway analysis will provide insight into mechanisms of 5-ASA activity.

CONCLUSIONS
Understanding the role 5-ASA in inhibition of the inflammasome complex will provide in depth insights into the mechanisms of drug action, which could be used to select appropriate treatments for IBD patients.
**INTRODUCTION:**
Increased epithelial layer permeability, dysregulations of immune responses to microbes, and activation of cytokines are salient features of IBD pathogenesis. We have recently demonstrated increased gaps between epithelial cells in adult patients and that this predicts disease course.
The aim of our study is to evaluate epithelial gap density in children with IBD and to investigate the potential link between cytokine levels, epithelial barrier markers, and microbial virulence in pediatric IBD patients.

Our hypothesis is that there is increased intestinal epithelial cell extrusion in children with IBD. This study will not only evaluate epithelial gap shedding, but will also delineate relevant biological correlations and potential targets for therapy.

**METHODS:**
1. To evaluate epithelial gap density: In a prospective, blinded, cohort study, epithelial gap density in the duodenum of patients with known or suspected IBD will be evaluated using probe-based confocal laser endomicroscopy (pCLE). The control group will include patients undergoing gastroscopy for indications other than IBD.

2. To evaluate the prognostic value of epithelial gap density for clinical outcome: Association of gap density with IBD diagnosis and its correlation with disease severity will be conducted employing standardized scoring indices. Post endoscopy follow up will include disease severity, flare ups, treatments, and hospitalizations.

3. To correlate epithelial gaps with cytokine levels, barrier markers, and bacterial counts and virulence in duodenal and ileal aspirates: Cytokine levels will be measured using a cytokine array. Concentration of epithelial barrier proteins will be measured using standardized assays. Bacteria quantification will be done by cell culture and qPCR and microbes will be isolated for in vitro studies.

**CONCLUSIONS**
Delineating the role of epithelial gaps and investigating the potential connection between cytokines, microbes, and epithelial barrier disruption in pediatric IBD will provide valuable insight into the molecular basis of disease.
Abstract #: 126
Submitter: Emily Chan
Title: Development of a Canadian socioeconomic index for children
Authors: Emily Chan, Chuck Humphrey, Jesus Serrano, Alvaro Osornio-Vargas
Presenter: Emily Chan
Affiliations: University of Alberta
Category: Child Youth Development
Investigation Type: Qualitative Research

INTRODUCTION:
The need for an index that is current and indicative of the Canadian population’s socioeconomic status (SES) is highlighted in this study. We provide an example of how to develop an SES index that could be useful for work that examines children’s health outcomes and environmental pollution.

METHODS:
Socioeconomic variables (n=22, Census Canada 2006) were selected based on: 1) Cultural origins; 2) Environmental pollutants related to children’s health outcomes; 3) Canadian Environmental Justice studies; 4) Variables utilized in a previously proposed Canadian deprivation index. We investigated these data from each of Canada’s dissemination areas (DAs, n= 52974). Principal component analysis with a single varimax rotation (factor loadings ≥ |0.60|) was performed on SES variables (SAS 9.2, North Carolina, USA). The final SES index was created by averaging the factor scores per DA according to the three components retained.

RESULTS:
An overall examination of the index for Canada shows a relatively normal distribution (median= 0.11, mean = 0.0, SD= 0.58). Individual analysis of the distribution of indices within each province and territory per DA yielded different results. Alberta showed increasing numbers of DAs within higher values of SES index, which suggests that within the province, greater numbers of the population have higher SES. Newfoundland, Northwest Territories and Nunavut showed greater numbers of DAs within lower values of SES index. This suggests that there are larger numbers of people living with lower SES within these areas. A simple chi-square test examining the distribution of DAs within each quintile of SES showed that it was not homogeneous among provinces (Pearson chi-square=2637.9, p <0.001).

CONCLUSIONS:
Our SES index is unique and comprehensive of the Canadian population, and can be used for future research involving environmental pollution and children’s health outcomes at the national, provincial and municipal level.
INTRODUCTION:
Endothelial cells (ECs) form the inner lining of blood vessels and regulate homeostasis, vasomotor tone and inflammatory responses upon interactions with different physical and chemical stimuli within the circulation. Coiled-coil domain-containing protein 3 (CCDC3) is a newly identified secretory protein mainly expressed in adipocytes and ECs. The biological function of CCDC3 is unknown. A recent study reported that CCDC3 mRNA expression is down-regulated by tumor necrosis factor-α (TNF-α) in ECs. Our objective is to investigate the biological function of CCDC3 in ECs, especially its interactions with Notch and TNF-α signaling.

METHODS:
Human microvascular endothelial cells (HMECs) were stably transduced with Jagged1 (a Notch ligand) or Notch intracellular domain 1 (NICD1) to activate Notch in HMECs. CCDC3 mRNA expression was examined by real-time PCR. HMECs were also stably transduced with CCDC3-FLAG to generate HMECs/CCDC3-FLAG, and overexpression was confirmed by Western blotting. HMECs stably transduced with an empty vector (HMECs/vector) were used as a control. Paracrine effects were examined by applying conditioned medium (CM) of HMECs/CCDC3-Flag or control cells to HMECs for 24 hour. Effects of inflammatory responses were examined by applying 10 ng/ml tumor necrosis factor (TNF)–α to HMECs/CCDC3-Flag or HMECs/vector cells. Changes in protein levels were observed by Western blotting.

RESULTS:
We found that Notch activation increased CCDC3 mRNA expression by 243.6 fold in HMECs. CM from HMECs/CCDC3-FLAG increased phosphorylation of STAT3 but decreased phosphorylation of AKT in receiving HMECs compared to the control. Interestingly, CCDC3 overexpression in HMECs attenuated the TNF-α induced expression of vascular cell adhesion protein (VCAM) but did not affect the expression of the intercellular adhesion molecule (ICAM).

CONCLUSION:
Our results show that a) CCDC3 is a downstream target gene of Notch in ECs, b) overexpression CCDC3 modulates signaling pathways in adjacent cells via a paracrine mechanism, and c) CCDC3 may play a role in limiting the inflammatory response in the endothelium.
INTRODUCTION:
Families with a child with autism may need supports and services daily and across the lifespan. Alberta has adopted family-centered care (FCC) across service sectors. Study questions included: (1) Do parent perspectives of FCC differ depending on which sector is providing the service [i.e., health, education, community]? (2) Do parents’ and professionals’ perspectives of FCC differ? (3) Is there a relationship between service features, FCC scores & parent wellbeing? (4) What do parents and professionals perceive as strengths and gaps of current systems of care?

METHODS:
155 parents (90% mothers) completed a survey including: (1) demographic info; (2) service features; (3) perceptions of receiving FCC [Measure of Processes of Care (MPOC-20)], completed separately for each utilized service sector; (4) parent well-being (Parenting Sense of Competence Scale & Perceived Stress Scale); and (5) open-ended questions about strengths and gaps of current systems of care. 159 professionals completed a survey including: (1) demographic info; (2) perceptions of providing FCC [MPOC – Service Providers], and (3) open-ended questions about strengths and gaps of current systems of care.

Descriptive statistics summarized data and described the sample. ANOVA (question 1) or t-tests (question 2) examined differences in scores. Person r correlations examined relationships between variables (question 3). Bonferroni corrections were applied. Visual analysis of MPOC domain scores and content analysis of qualitative responses determined areas of relative strength and weakness (question 4).

RESULTS:
There were no differences in perceptions of FCC based on service sector, but differences in parents’ and professionals’ perspectives of FCC were found. Both parent stress and sense of competence increased with the # of professions involved, but not frequency of services. Identified strengths and gaps, and implications of findings are discussed.

CONCLUSIONS:
This data may be used to improve systems of care to enhance family wellbeing and help make services more effective and efficient across the lifespan.
INTRODUCTION:
Effective vaccine risk communication strategies by health agencies increases compliance with immunization programs. Unfortunately, current strategies do not address the needs of recent immigrant populations in Canada, which have lower vaccination rates than non-immigrant populations. The disparity in access to health information is problematic in a Canadian context which promotes health equity as a human right. Discussions with key informants in the Edmonton area about personal and childhood vaccination information for pregnant immigrant women show an unmet need in Alberta for culturally appropriate risk communication. These observations raise important questions of how we are informing the vaccination choices of foreign-born populations and where we are failing.

METHODS:
This project will address these questions through a detailed case study facilitated by a collaboration between a research team at the University of Alberta and a local health service provision organization. We will examine how immigrant women from three distinct origin regions and social/economic/political contexts in Asia (India, China, and Bhutan) access, understand, and react to seasonal flu and childhood vaccine information. We will conduct semi-structured interviews and focus groups with community members in Edmonton and analyze the transcripts in N-Vivo software using grounded theory and the constant comparative method.

RESULTS:
Our methods paired with a community-based approach allows us to explore how women in the varying communities use different information sources to make vaccination decisions.

CONCLUSION/SIGNIFICANCE:
This type of research is important especially in the wake of the H1N1 pandemic. Understanding mothers’ personal vaccination information gathering and decision-making processes can aid public health agencies and health care workers by improving both general and emergency vaccine communication strategies to meet the specific needs of various foreign-born communities. In turn, Alberta can better deliver on, rather than pay lip service to, its commitment to health equity as a human right.
Abstract #: 130
Submitter: Marilyn Gordon
Title: Linking inflammation and cancer: A novel role for the Tumor Suppressor RASSF1A
Authors: Marilyn Gordon, Shairaz Baksh
Presenter: Marilyn Gordon
Affiliations: University of Alberta
Category: Child Youth Development
Investigation Type: Quantitative Research

INTRODUCTION:
Approximately 1/3 of all cancer cases arise from pre-existing related inflammatory diseases. The exact molecular mechanisms that connect chronic inflammation and later cancer development have not been clearly shown to date. The tumor suppressor protein Ras association domain family 1A (RASSF1A) is a multi-functional protein with roles in multiple signaling pathways, including modulating apoptosis, the cell cycle, DNA damage, and microtubule organization. The RASSF1A gene is known to be one of the most commonly epigenetically silenced genes in many cancers due to promoter specific methylation. We now demonstrate a novel role for RASSF1A in regulating intestinal inflammation and epithelial repair following inflammation-induced injury.

METHODS:
A mouse model of colitis-like inflammation induced by addition of dextran sodium sulfate in the drinking water was utilized. Colonic tissues/cells were collected for protein analysis and histology.

RESULTS:
We show that RASSF1A regulates inflammation through the nuclear factor kappa B (NFkappaB) pathway, and a novel regulation of the Hippo pathway transcription factor Yes-associated protein (YAP). Rassf1a-/- mice show decreased survival, exacerbated colitis symptoms, and increased NFkappaB activity. We have also identified a novel tyrosine phosphorylation of YAP (pY-YAP) in these animals that results in increased apoptosis in intestinal epithelial cells and inefficient epithelial repair in Rassf1a-/- mice. We have identified several candidate protein tyrosine kinases (PTK) that may cause the tyrosine phosphorylation of YAP in our model.

CONCLUSIONS:
RASSF1A is an important regulator of intestinal inflammation, and early loss of this gene may negatively impact patient prognosis. We propose possible use epigenetic loss of RASSF1A and the appearance of pY-YAP as biomarkers of colitis. Understanding how RASSF1A may modulate YAP in colitis may help explain the link between inflammation and cancer development.

FUNDING: WCHRI, CFI, Stollery Children’s Hospital Foundation/Hair Massacre Fund
INTRODUCTION:
Well-being can be understood as the fulfillment of a young person’s rights. To date, little is known about Canada’s progress toward rights realization for youth with learning difficulties (LD) or the impact of disadvantage on their subjective well-being. This study employed a rights-based framework to investigate the relative economic, social and subjective well-being of Canadian youth with LD.

METHODS:
The method is secondary analysis of the National Longitudinal Survey of Children and Youth (NLSCY) original cohort. This study focuses on a sample of these children at early adolescence (14-15 years of age). A framework based in UN human rights conventions was employed to guide selection of well-being indicators. Two hypotheses were tested. One hypothesis is that compared with their non-disabled peers, young people with LD report lower subjective well-being. The second hypothesis is that the lower subjective well-being of young people with LD can be explained by relative social and economic disadvantage.

RESULTS:
Findings demonstrate that young Canadians with LD in this nationally representative sample fared worse than their non-disabled peers on a broad range of rights based indicators. Youth with LD were less likely to participate in social activities, more likely to be living in relative poverty, and reported lower subjective well-being. The poorer subjective well-being of youth with LD could be partially explained by differential realization of rights to material and social resources. Specifically, youth with LD who felt socially included and did not experience financial hardship reported a level of life satisfaction more akin to that of their typical peers.

CONCLUSIONS:
Findings present an indication of the task ahead in improving the well-being and advancing the rights of young people with disability in Canada. Future efforts will follow a cohort of Canadian children into adolescence to identify disability-based inequities in the distribution of well-being and to further investigate mechanisms linking disability, disadvantage and subjective well-being over time.

*Research partially supported by WCHRI start-up funding.*
INTRODUCTION:
The prevalence of autism spectrum disorders (ASD) in Canada has been estimated to be 8/1,000 children (Lazoff 2010). Studies have shown that early intervention can have significant benefits for children with ASDs (Dawson 2010) and the existence of early intervention programs in many parts of Canada justifies the early identification of these children. The American Academy of Paediatrics' guidelines recommend autism screening as early as the 18 month visit while the Canadian Paediatric Society have not endorsed ASD screening. Furthermore, controversy remains as to whether there is enough evidence to support universal ASD screening (Al Qabandi 2011). It is therefore important to ascertain paediatrician practices in Canada and evaluate the factors affecting a physician's decision to assess for ASDs.

The objectives of this study are to examine general paediatricians' current ASD screening practices, identify factors that influence decisions to use ASD screening tools in clinical practice, and to design a questionnaire to be used to examine current practices in ASD screening among Canadian general paediatricians.

METHODS:
This is a mixed method study using an exploratory sequential design (Creswell 2010). The qualitative phase of the study consists of 5 focus groups with general paediatricians in Edmonton. This allows the identification of factors relating to the use of ASD screening tools in the office setting. Data analyzed from this phase will generate hypotheses to inform the design of a structured questionnaire for a pilot study of n=45 general paediatricians in Alberta. Findings from the questionnaires will be contrasted to initial qualitative data to provide corroboration and triangulation of findings in understanding the perspectives of paediatricians and to support the design of a national survey of paediatric perspectives regarding ASD screening.

RESULTS & CONCLUSIONS:
Analysis of focus groups is underway. Preliminary themes identified include the use of formal screening tools, time required for screening, age of the child at screening, and the goals of screening and diagnosis.
INTRODUCTION:
Although Hand hygiene (HH) is the most important way to reduce transmission of pathogenic microorganisms that can lead to nosocomial infections, compliance remains low. (1) HH compliance at our facility is 44.7%. (2) We believe that elucidating physicians’ attitudes and beliefs about infection control measures is necessary to improve adherence with HH.

METHODS:
A qualitative study using semi-structured interviews with 22 Pediatric Residents was conducted at the University of Alberta Stollery Children’s Hospital. Common themes were sequentially developed based on interview coding by five authors.

RESULTS:
Qualitative quotes serve as examples of each of the four main results below.

a) Importance of role models.
   i. Residents see themselves as role models and professionals.
   ii. Residents are influenced by staff physicians HH practices.
   iii. Any healthcare team member can model HH.

b) Balancing competing priorities may cause HH to be neglected.

c) Self protection is a key reason for residents to engage in HH.

d) Residents use cues to create HH habit.

CONCLUSION:
In conclusion, attending physicians were viewed as being integral to initiating group HH events, but at times, the first person in the room to start acted as a model for the rest of the group. In certain instances, non-compliance with HH was viewed as acceptable. Residents engaged in HH to protect their own health and have cues which they integrate into their own HH habit.
BACKGROUND
Pericardial effusion (PE) following cardiac surgery may result in cardiac tamponade. However, risk factors for PE are not well identified. We sought to identify the incidence and risk factors for PE within the first 6 weeks postoperatively, to evaluate our practice of echocardiographic screening for PE at day 10 (±2) postoperatively, and to describe the management and outcome of PE at our institution.

METHODS:
We searched our clinical database for patients < 18 years old who had cardiac surgery involving median sternotomy from July 2010 to January 2011. For patients with PE, medical records were reviewed to evaluate PE management and patient outcomes.

RESULTS:
Of 203 eligible patients, 46 (23%) had PE documented by echocardiography within 6 weeks of surgery, with 29 of these (63%) detected 0-7 days post-operatively. Of patients who developed post-operative PE and who had an echocardiogram at 10 (±2) days post-operatively, 10 (31%) did not have a PE at this time, while trivial, small, moderate, and large effusions were detected in 7, 10, 4, and 1 of the remaining patients, respectively. After diagnosis, most patients (32/46, 70%) had no change in management, in 8 patients either a new diuretic was added or a pre-existing diuretic dose was increased, and in 6 patients either ASA or ibuprofen was added. Of the 3 patients who developed cardiac tamponade, 2 did so while in PICU; management included open surgical drainage (1), pericardiocentesis (1), or both (1), with no complications from these procedures. One patient with PE died during the study follow-up period but did not develop tamponade.

CONCLUSION:
PE occurred in 23% of patients, with the majority detected within the first week post-operatively, including the 3 patients who developed cardiac tamponade. Of patients who developed PE and had echocardiography at 10 (±2) days post-operatively, 31% of the time the effusion had either resolved or had yet to develop, calling into question the utility of routine imaging at this interval. In most cases, the presence of a PE did not alter patient management, and no patients died from tamponade.