1 EFFECT OF LATENCY OF RUPTURED MEMBRANES ON NEONATAL OUTCOMES
*M Zhao, SK Lee, L Kovacs, C Ojah, P Shah
Pediatrics, University of Toronto, Toronto, Ontario

BACKGROUND: It is a dilemma when a mother presents with ruptured membranes (ROM) at 24-28 weeks GA. Whether to deliver her before infection and inflammation sets in or to wait until spontaneous labor ensues poses an important challenge.

OBJECTIVES: To examine the effect of latency after preterm prolonged ROM (PPROM) at different gestational ages on neonatal outcomes and to identify the optimal time of delivery after PPROM.

DESIGN/METHODS: In a secondary analyses, the database of preterm infants <28 weeks GA at ROM admitted to Canadian Neonatal Network (CNN) participating NICUs between 2003 and 2009 was utilized. The infant and maternal characteristics and composite neonatal outcome of mortality or major morbidity (BPD, severe ROP, NEC, or severe neurological injury) were compared between different latency period groups at various GA at ROM groups.

RESULTS: Among 9402 eligible infants, 8023 (85.3%) had ROM for 1-7 days, 627 (6.7%) had ROM for 8-14 days, 314 (3.3%) had ROM for 15-21 days and 438 (4.7%) had ROM >21 days. Of these, 6769 (72%) were singleton and 1633 (19.1% of total with available data) mothers had clinical chorioamnionitis. GA, BW, antenatal steroids and maternal antibiotics use increased as duration of latency increased. However, the composite morbidity decreased significantly as duration of latency increased for each GA at ROM group.

There was no difference in the results in subgroup with or without chorioamnionitis. This apparent improvement appears to be likely due to the increase in GA at birth as duration of latency increased.

CONCLUSIONS: There was a steady improvement in the composite neonatal outcome as the duration of latency of ROM increased. This was most likely due to increased GA at birth. There is no indication for early birth in preterm infants who had PPROM unless complicated by other issues.

2 DOES THE CONCENTRATION OF OXYGEN (21%, 22-99% OR 100%) USED AT THE INITIATION OF RESUSCITATION HAVE AN IMPACT ON THE SURVIVAL WITHOUT MAJOR NEONATAL MORBIDITY AMONG PRETERM INFANTS (<33 WEEKS)?
*AS Soraiahm, N Singhal, A Lodha, Y Rabi, K Aziz, SK Lee, P Shah
Pediatrics, University of Calgary, Calgary, Alberta

BACKGROUND: In 2006, Canadian Neonatal Resuscitation Program guidelines recommended that newborn resuscitation should begin with room air for infants of all gestational ages. Recent resuscitation studies in preterm infants were not powered to show an effect of initiating resuscitation with low oxygen on early neonatal outcomes except bronchopulmonary dysplasia (BPD).

OBJECTIVES: To compare the neonatal outcomes of preterm infants who received room air, 22-99% oxygen and 100% oxygen at the time of initiation of resuscitation in the delivery room.

DESIGN/METHODS: This is a retrospective cohort study. We conducted secondary analyses using the Canadian Neonatal Network database of very preterm infants born <33 weeks GA admitted to participating NICUs during the year 2010. We compared the survival without major neonatal morbidity (defined as IVH grade ≥3, PVL, BPD, NEC stage ≥2 orROP stage ≥3) among three groups.

RESULTS: Of the 2664 eligible infants, 718 (27%) received room air, 1084 (41%) received 22-99% oxygen and 860 (32%) received 100% oxygen at initiation of resuscitation. Infants who received 100% oxygen were of lower GA, lower BW and had low 1 minute Apgar score compared to other groups (p<0.05). Table 1 shows univariate comparisons of outcomes. Multivariable logistic regression analysis showed the odds of surviving without major morbidity were higher in 22-99% oxygen group as compared with room air group (OR 1.38, 95% CI 1.03-1.83), but there was no difference when 100% oxygen group was compared with room air group (OR 0.79, 95% CI 0.60-1.04).

CONCLUSIONS: Resuscitation with oxygen concentration between 22% and 99% oxygen is associated with increased survival without major neonatal morbidity as compared with room air in preterm infants. Further studies are needed to identify ideal initial oxygen concentration to be used for neonatal resuscitation.

3 DOES BRONCHOPULMONARY DYSPLASIA RELATE TO REDOX STATUS IN INFANTS LESS THAN 29 WEEKS OF GESTATIONAL AGE?
*I. Mohamed, T. Rouleau, W. Elremaly, J. Lavoie
Pediatrics – Neonatology, University of Montreal, Sainte-Justine Hospital, Montreal, Quebec

BACKGROUND: The two major sources of oxidants in premature infants are inspired oxygen that will favor in vivo generation of peroxides, and parenteral nutrition that is contaminated with peroxides. Glutathione is the key molecules in detoxification of peroxides leading to an oxidized glutathione redox status (GRS). We hypothesizes that GRS plays an important role in the etiology of several complications of prematurity including bronchopulmonary dysplasia (BPD).

OBJECTIVES: To test the relation between GRS at 6-7 days of life as well as at 36 weeks of corrected age and BPD. To identify perinatal factors affecting GRS.

DESIGN/METHODS: Whole blood GRS was measured at 6-7 days of life and at 36 weeks of corrected age (CA) in 51 infants less than 29 weeks of gestational age (GA).

Perinatal clinical data that may affect the GRS were collected. The GRS was calculated using concentration of GSH and GSSG according to the Nernt equation (Schauer & Buettner, 2001). Severity of BPD was classified according to NICHD classification (Job & Bancalari, 2001).

RESULTS: Infants in our cohort had gestational age of 26±1 weeks with birth weight of 847±166 gm. Significant relation between GRS and BPD was confirmed with less risk of BPD in infants with most reduced GRS (jor 6-7) and higher risk of BPD for infants with most oxidized GRS at 36 weeks CA [figure1]

Different perinatal factors effect on GRS was evaluated (mean ± SEM, n=5-21 per group) [Table1]

CONCLUSIONS: There is a significant relation between GRS 6-7 days of life as well as at 36 weeks CA and BPD outcome in infants less than 29 weeks of GA. The significant impact of both gestational age and birth weight on GRS at 6-7 days of life can be explained by the glutathione level that is also reported to be correlated with gestational age.

Paediatr Child Health Vol 17 Suppl A June/July 2012 7A
4 HYPOTENSION AND WHITE MATTER INJURY (WMI) IN PRETERM NEONATES
*K Mohammad, K Poskitt, V Chau, A Synnes, R Grunau, J Rigney, S Miller
University of British Columbia, Vancouver, British Columbia
BACKGROUND: WMI is identified on MRI in >1/4 of preterm neonates. While WMI risk is not adequately predicted by gestational age (GA), preliminary data suggests that hypotension may increase the risk of WMI.
OBJECTIVES: To determine 1) the association of symptomatic hypotension with WMI in the very low gestational age (VLGA) newborn, and 2) the timing and context of hypotension modifies this relationship.
DESIGN/METHODS: 118 preterm neonates (24-32 weeks GA) underwent MRI at a median of 32 weeks (IQ range: 30.3-33.6). The severity of WMI was scored using a validated system by a neuroradiologist blinded to clinical history. The severities of intraventricular hemorrhage (IVH) and cerebellar hemorrhage (CH) were also documented. Clinical information extracted from detailed chart review included: symptomatic hypotension defined as blood pressure <GA (by cuff, umbilical or peripheral arterial line) treated with fluid bolus or pressors, context of hypotension (occurring either (a) during sedation or (b) without sedation), timing of hypotension (either (a) early (72 hours of age) or (b) late (>72 hours). We used logistic regression analyses to determine the association of hypotension with the risk of WMI, IVH, & CH, adjusting for GA, age at MRI, SNAP score, days of ventilation, and infection.
RESULTS: WMI was seen in 34 (29%) neonates, IVH in 56 (48%) and CH in 15 (13%). Symptomatic hypotension (1 episodes n=45 [38%]) was associated with a significantly increased risk of WMI (OR 4.7; CI 1.4-16, P=0.013) in the multivariable model. Hypotension episodes during sedation occurred in 56% (25/45). The risk of WMI was greater in the context of hypotension without sedation (OR 5.2; 95% CI 1.4-19.4, P=0.014) compared to with sedation (OR 4; 95% CI 0.9-18.1). Days and doses of sedation did not differ significantly in neonates with or without hypotension, or by WMI status. WMI risk was greater with late (OR 5.9; 95% CI 1.4-24.2, P=0.014) than early hypotension (OR 3.9; 95% CI 0.9-15.7). Hypotension was not an independent predictor of IVH (OR 1; CI 0.4-2.9), or CH (OR 1.5; CI 0.3-7.7).
CONCLUSIONS: Hypotension, even when treated, is an important risk factor for WMI in premature newborns. This risk is modulated by the timing and context of hypotensive episodes. Further study on the effect of management of hypotension on WMI is needed.

5 HOW EFFECTIVE IS NASAL HIGH FREQUENCY OSCILLATION AS COMPARED TO NASAL CONVENTIONAL VENTILATION FOR LUNG CO2 CLEARANCE IN THE NEWBORN?
*A Mukerji, M Finelli, J Belik
Department of Pediatrics, Mount Sinai Hospital, Toronto, Ontario
BACKGROUND: To minimize ventilation-induced lung injury (VILI) there is a clinical interest in noninvasive nasal ventilation (NINV) for neonates with respiratory disease. Whether nasal ventilation is effective at promoting CO2 removal from the lungs is unclear. The two modalities of NINV currently in use lack data supporting CO2 clearance. These include nasal high frequency oscillation (nHFO) and nasal conventional ventilation (nCV).
OBJECTIVES: To compare lung CO2 clearance efficacy of nHFO and nCV in neonates.
DESIGN/METHODS: A newborn mannequin was attached to an artificial lung containing a fixed amount of CO2. A small gas leak at the oral level was allowed to simulate the clinical scenario. A commercially available neonatal mechanical ventilator (Drager VN 500) was used for all studies. A manufacturer-provided nasal adaptor was attached to the mannequin. The evaluated settings for the two modes were: nHFO (Amplitude 30, MAP 10, Frequencies 12, 10 and 8 Hz) and nCV (PIP 25, PEEP 10, Rate 20). These were compared with nasal CPAP of 10. All pressures were measured at the ventilator in cmH2O. CO2 levels were measured at the larynx with a continuous CO2 analyzer. Pressures near the nasal adaptor and the larynx were simultaneously measured with on-line transducers.
RESULTS: During nHFO the MAP decreased from a ventilator-set value of 10 to 7.5 at the nasal adaptor and 3.5 at the larynx. As shown in Figure 1, CPAP alone did not lead to any CO2 clearance. When compared to nCV, nHFO showed a significantly higher CO2 clearance (P<0.01) that was frequency-dependent and lowest at 8 Hz (P<0.01).
CONCLUSIONS: A significant pressure loss between the mechanical ventilator, nasal adaptor and larynx is observed when using NINV. Despite much lower pressures at the larynx than conventionally used in intubated infants, ventilation with nHFO allows for much greater elimination of CO2 when compared with nCV. These data suggest that nasal HFO can effectively ventilate the newborn at low tracheal pressures that likely minimize VILI.

6 NASAL INTERMITTENT POSITIVE PRESSURE VENTILATION (NIPPV) DOES NOT CONFERENCE BENEFIT OVER NASAL CPAP (nCPAP) IN EXTREMELY LOW BIRTH WEIGHT (ELBW) INFANTS - THE NIPPV INTERNATIONAL RANDOMIZED CONTROLLED TRIAL (RCT)
*B Lemyre, H Kirpalani, D Millar, B Yoder, A Chiu, RR Roberts Pediatrics, Children’s Hospital of Eastern Ontario, Ottawa, Ontario
BACKGROUND: Respiratory care practice in ELBW to avoid intubation or upon extubation includes nCPAP or NIPPV. Whether NIPPV reduces bronchopulmonary dysplasia (BPD) by 36 weeks post-menstrual age (PMA) has not previously been studied in an adequately powered RCT. OBJECTIVES: To compare rates of BPD or death, in ELBW infants randomized to NIPPV or nCPAP.
DESIGN/METHODS: Eligibility criteria: Gestational age <30 weeks and birthweight (BW) <1000 g; requiring non-invasive respiratory support in first 7 days of life, or post-extubation within first 28 days of life. MANOEUVRE: ELBW infants were randomized (stratified by center, BW, and prior intubation) to either NIPPV (synchronized or not with a variety of devices) or nCPAP. Guidelines for extubation and re-intubation were provided.
PRIMARY OUTCOME: Composite of death by 36 weeks PMA, or BPD defined as receiving ventilation or on > or = 30% O2 at 36 weeks, or a positive Oxygen Reduction Test (ORT-BPD) if in 22%-29% O2. Sample Size and Analysis: 500 patients per group giving 80% power for a 20% relative risk reduction in the primary outcome (0.05, 2 tailed).

Paediatr Child Health Vol 17 Suppl A June/July 2012
RESULTS: Preliminary results: 36 sites randomized 1009 infants. Primary outcome is unknown for 25 [2 parents withdrew consent, 21 did not receive an ORT (due to early transfer) and 2 are currently incomplete]. Data for n=984 (487 NIPPV, 497 nCPAP) babies are presented; as well as supporting analysis for n=1005. Key baseline characteristics were equally balanced between treatment groups [mean (SD) BW 801 g (131) vs 805 g (126); 92% vs 91% received antenatal corticosteroids]. Observed rates of BPD or death were similar within the two treatments. To assess BPD outcome for 21 infants missing ORTs, the old definition (any supplemental O2 at 36 weeks) was used; this did not alter treatment differences. No differences were seen comparing early or later use of NIPPV. There were no differences in outcomes whether NIPPV was synchronized or not. Rates of necrotizing enterocolitis and nasal excitation were similar.

CONCLUSIONS: For ELBW infants who require non-invasive respiratory support, current devices providing NIPPV do not confer additional benefit or risk, when compared to nCPAP, for survival to 36 weeks corrected age without BPD.

7 THERMOGRAPHIC ABDOMINAL IMAGING AND DECISION TREE ANALYSIS TO DIFFERENTIATE PRETERM NEONATES WITH NECROTIZING ENTEROCOLITIS

*E Barciak, M Frize, R Nur, C Henry
Pediatrics, University of Ottawa, Ottawa, Ontario

BACKGROUND: Necrotizing Enterocolitis (NEC) is a devastating intestinal disease, primarily affecting preterm neonates. Feeding intolerance in healthy preterm infants can mimic signs of early NEC, but there is no reliable imaging technique to differentiate this. Thermographic imaging utilizing non-ionizing infrared technology can non-invasively detect tissue inflammation, and may be useful in differentiating normal preterm infants from those with NEC.

OBJECTIVES: This was a pilot study to determine if thermographic abdominal profiles of preterm neonates, analyzed using decision tree (DT) artificial intelligence modeling, can be used to differentiate between normal infants and those diagnosed with NEC.

DESIGN/METHODS: We enrolled infants who were between 23+0 and 32+6 weeks gestation and included a normal group consisting of infants with no clinical or radiographic signs of NEC, and a NEC group consisting of infants with at least Bell's Stage 2 NEC. Bedside thermographic imaging was obtained over a 60 second period. From the images, we isolated the upper-to-lower (UL) region temperatures differed significantly of the DT classifier was highest when using all four features (medians of UL and LR regions) with a mean specificity of 90% (± 12%) and sensitivity of 86% (± 13%) in the NEC cohort. Bivariate analysis revealed both the normal and the NEC groups of infants, however the performance of the DT classifier was highest when using all four features (medians of UL and LR regions) with a mean specificity of 90% (± 12%) and sensitivity of 86% (± 13%) in the NEC cohort. Bivariate analysis revealed.

CONCLUSIONS: For ELBW infants that require non-invasive respiratory support current devices providing NIPPV do not confer additional benefit or risk, when compared to nCPAP, for survival to 36 weeks corrected age without BPD.

8 RISKS FOR AND OUTCOMES OF TRANSFUSION ASSOCIATED NECROTIZING ENTEROCOLITIS

*N Rashid, J Afifi, MM Seshia, J Baier
Pediatrics, University of Manitoba, Winnipeg, Manitoba

BACKGROUND: Transfusion associated necrotizing enterocolitis (TANEC) is a new pathogenic entity. Little is known whether these infants differ in risk factors for development of NEC from others that develop NEC not associated with transfusion.

OBJECTIVES: To identify risk factors for the development and outcome of TANEC compared to NEC not associated with transfusion.

DESIGN/METHODS: Retrospective comparison of infants ≤34 weeks of gestation who developed NEC within 48 hours of packed red blood cells (PRBC) transfusion with others who developed NEC unrelated to PRBC transfusion.

RESULTS: A total of 46 cases of NEC ≥stage 2a were identified over a 5-year period. Nine infants (19.5%) developed NEC within 48 hours of transfusion. TANEC was diagnosed 23±5.1 hours after transfusion. Infants with TANEC were smaller, less mature and more often growth retarded than other NEC infants (863±71 vs 1489±83 grams, 26.7±30.1 weeks, 44 vs 11% SGA; p<0.02 for all). TANEC was diagnosed later in life (23±4 vs 162±2 days; p<0.001). TANEC was more often surgical (5/9 vs 7/37; p=0.025) and associated with higher mortality (4/9 vs 6/37; p=0.066). There were no differences between TANEC and NEC with respect to maternal conditions (PPROM, chorioamnionitis, abnormal fetal blood flow patterns, indomethacin, tocolysis, antenatal steroid receipt) and need for respiratory support at birth (7/9 vs 27/37; p=0.768), surfactant replacement (7/9 vs 23/37; p=0.378), PDA (3/9 vs 9/37; p=0.581), medical (2/9 vs 5/37; p=0.597) or surgical treatment of PDA (1/9 vs 1/37; p=0.267). Infants with TANEC were more likely to be receiving respiratory support at the time of developing NEC (8/9 vs 22/37; p=0.006) TANEC was associated with a greater number of PRBC transfusions prior to the development of NEC (3 IQ Range 2.5 vs 0.5 IQ Range 0-4; p<0.001, higher total volume of PRBC (69±11 vs. 22±11ml/kg; p=0.010). The incidence of BPD (2/9 vs 9/37; p=0.895) and ROP (3/9 vs 5/37; p=0.159) was similar between groups. LOS was longer in surviving TANEC infants (121±31 vs 75±9 days; p=0.047).

CONCLUSIONS: Infants who developed TANEC were disproportionally smaller and less mature than other infants who developed NEC. In addition the number and volume of preceding PRBC transfusions were associated with TANEC. TANEC was more often surgical and was associated with increased mortality and LOS. Prospective studies are needed to clarify these associations but meanwhile caution may be exercised in transfusing these infants.

Abstract presentation A (Platform) / Présentation d’affiches A (plateforme)

9 MENTAL ILLNESS IN THE CLASSROOM: AN ADVOCACY PROJECT

*S Talarico, C Gray
General Pediatrics, Children’s Hospital of Eastern Ontario, Ottawa, Ontario

BACKGROUND: One in five Canadian children and youth have an emotional, mental, or behavioural disorder. Of these only one in six seek and get help and they may wait over a year to see a psychiatrist. Teachers are the frontline workers with children and youth with mental illness. However, Intermediate/Senior teachers in Ontario are not required to have any education or training in mental illness.

OBJECTIVES: This paper describes a resident advocacy project that evaluates the impact of a case-based workshop on teachers’ understanding of mental illness, and on their teaching practice with regards to identifying students with mental illness and facilitating their learning.

DESIGN/METHODS: Over 100 teachers, guidance counselors, and principals of three secondary schools in the Ottawa District School Board
participated in the workshops. Within the first two months of the semester, the participants attended two case-based workshops on common psychiatric disorders affecting adolescents, manifestations of mental illness in the classroom, the impact of mental illness on learning, and accommodations that can be made to facilitate the learning of students with mental illness. Prior to attending the workshops, the participants received a survey in order to identify the proportion of teachers who have received prior education or training in mental health and in what form; teachers’ experiences with students with mental illness; which mental health topics teachers would like to learn more about; and barriers to professional development in this area. Eighty-seven teachers completed this first survey. At the end of the semester the participants received a second survey in order to evaluate the impact of the workshop on their understanding of mental illness and on their teaching practice in terms of attempting to identify students with mental illness and facilitating student learning. Fifty-five teachers completed this second survey.

RESULTS: Only 40% of teachers reported that they had received any education or training on mental illness, while 43% had played a role in identifying students with mental illness, and 82% had made accommodations for them. Of the teachers who completed a post workshop survey, 78% identified that they became more aware of the manifestations of mental illness in adolescents and 64% began wondering if certain students were suffering from mental illness. Forty-two percent of teachers indicated that they had learned of accommodations that could be made, while 32% became more comfortable implementing them.

CONCLUSIONS: Workshops given at teachers’ schools are effective in increasing their awareness of manifestations of mental illness in the classroom and accommodations which can be made to facilitate the learning of students with mental illness. There is definitely a need and an interest for more professional development in this area.

10 ENERGY DRINKS IN CHILDREN AND TEENAGERS: A CPSP SURVEY

* D Teddeo, A Boutin, J Harvey, J Frappier
Division of Adolescent Medicine, Department of Paediatrics, Centre hospitalier Ste-Justine-Sainte-Justine, Montreal, Quebec

BACKGROUND: Sales and use of energy drinks are rapidly increasing. These drinks are marketed and consumed to improve energy, concentration and performance. They can contain high levels of caffeine, having potential serious adverse health effects, especially in children/adolescents. These effects are underdocumented and often not recognized, particularly by the industry. Studies suggest that combining alcohol and caffeine may increase the rate of alcohol-related injuries.

OBJECTIVES: The objectives of the survey were to evaluate if paediatricians are screening for use of energy drinks and if they have seen related complications in their practice.

DESIGN/METHODS: Initiated by the Canadian Paediatric Surveillance Program, a questionnaire was sent to Canadian Paediatricians in March 2011. It covered items: paediatrician’s qualification (general or subspecialist), screening for use of energy drinks, complications seen during the last 12 months associated with their use, number of children/youth presenting with problems and the quantity ingested, combining use with alcohol or other substances and reasons for consuming these products.

RESULTS: Altogether 741 surveys were returned. Of these, 476 (64%) were from General Paediatricians, 256 (35%) from Paediatric Subspecialists (12 specialties) and 9 unidentified. Among them, 341 (46%) do not screen for energy drinks (56% Subspecialists vs 41% General Paediatricians). However, 388 (52%) of the respondents screen, mostly occasionally (42% Specialists vs 58% General Paediatricians). Among those who screen, 15% have seen children/adolescents with complications vs 1.8% among those who do not screen. Of these 67 Paediatricians who report seeing patients with complications, 88% are among those who screen for energy drinks, and 50 report having seen 5 or less children/adolescents with complications in the last 12 months. Complications most often reported are: nervousness (52%), agitation (51%), tachycardia (49%), palpitations (43%), insomnia (42%), headaches (30%), nausea (24%), atrynthia (16%), hypertension (15%). Respondents reported that alcohol (28%) and other substances (26%) were used in combination, the most popular being ADHD stimulants (30%), cannabis (20%) and amphetamines (10%). Reasons for consuming energy drinks are: increasing alertness (41%), peer pressure (39%), enhancing physical endurance (25%), increasing attention (11%), increasing exam performance (9%), decreasing alcohol effects (8%) and weight loss (5%).

CONCLUSIONS: There is a need to better inform healthcare professionals of the risks and effects of consuming energy drinks. Screening for energy drinks as well as assessment of possible complications are important when children and adolescents are consulting.

11 ‘JUST WEED?’ – TARGETING ADOLESCENTS’ PERCEPTION OF RISK OF CANNABIS

*M Burke, M Kilvert, K Leslie
Faculty of Medicine, University of Toronto, Toronto, Ontario

BACKGROUND: Cannabis use is prevalent in Canadian adolescents. Studies in this age group have linked the perception of risk of cannabis to the prevalence of cannabis use, and have also demonstrated that heavy users of cannabis report significantly lower perception of risk compared to occasional or non-users.

OBJECTIVES: The goal of this project was to develop and evaluate a peer-informed educational resource aimed at increasing the risk perception of cannabis among adolescent cannabis users.

DESIGN/METHODS: This project consisted of four stages. The first stage involved a series of discussion/feedback sessions with a group of five adolescents attending a Substance Abuse Day Treatment Program. These sessions focused on gathering input regarding the content and modality of the resource. The second stage integrated evidence-based information with the compiled insights from the small group sessions. This resulted in the development of an interactive, animated, multimedia presentation. The content focused on the effects on brain and behaviour, including the link between cannabis use and schizophrenia. The third stage was the delivery of the resource to groups of adolescents attending several substance abuse treatment programs. The fourth stage assessed the impact of the resource through the administration of pre- and post-risk perception surveys. The risk perception surveys were modified from an existing tool used to measure perception of risk. Participants also completed the Drug Use Inventory (DUI), to characterize their alcohol and other substance use in the past 6 months prior to being exposed to the educational resource. Data analysis was completed by comparing pre-post scores of risk perception using a paired student T-test. Institutional ethics approval was obtained prior to the start of the project.

RESULTS: Twenty-one young people aged 14-21 (mean age = 16), 65% male, participated in the initial evaluation stage of this project. The DUI indicated that 88.9% of the cohort reported using cannabis on 20 or more occasions in the past 6 months. Questionnaire risk perception scores were significantly higher post presentation (p<0.05). The greatest shifts in risk perception were in the areas in which the resource was focused.

CONCLUSIONS: A peer-informed, educational resource, based on preliminary results, increases the perception of risk of cannabis among adolescent cannabis users. Future evaluation of the resource will include longer term follow-up to assess whether this increased perception of risk is sustained over time and if there are associated drug-use behavior changes.

12 TORONTO STREET INVOLVED YOUTH AND BARRIERS TO ACCESS OF HEALTH SERVICES

*L Shamrakov, S Klar, L Fang, R Nisenbaum, M Weekes, T Barozzino
Department of Pediatrics, The Hospital for Sick Children, Toronto, Ontario

BACKGROUND: Street-involved youth (SY) are a physically and emotionally vulnerable group. Living conditions and background circumstances may lead SY to engage in high risk behaviors. Previous studies have shown that SY’s access to basic healthcare services is inequitable compared...
LONGITUDINAL COMMUNITY STUDY

better aid youth in accessing healthcare are needed. Great challenges to access healthcare; solutions to address these barriers to physical health and higher level of healthcare access barriers. SY are facing CONCLUSIONS:

as fair or poor (24.1%) reported significantly more barriers than those self-reported physical and mental health. SY who reported physical health tion or history of abuse. Reported barriers to healthcare access differed by SY experiencing at least one type of abuses (73.9%). More females than males reported being abused (82.9% vs. 68.6%, p=0.03). SY who reported poor or fair mental health (30.3%) reported significantly more barriers (64.4% vs. 47.1%, p=0.03).

CONCLUSIONS: In Toronto, a high proportion of SY faced barriers accessing healthcare irrespective of gender, ethnicity, education, and history of abuse. There is an association between lower level of mental and physical health and higher level of healthcare access barriers. SY are facing great challenges to access healthcare; solutions to address these barriers to better aid youth in accessing healthcare are needed.

13 CHILDHOOD ONSET DEPRESSION IS ASSOCIATED WITH ADULT OVERWEIGHT: RESULTS FROM A PROSPECTIVE LONGITUDINAL COMMUNITY STUDY

* D Korczak, P Szatmari, E Duku, K Morrison, K Georgiadis, E Lipman

Psychiatry, University of Toronto, Toronto, Ontario

BACKGROUND: Current public health initiatives recognize that obesity, a leading cause of morbidity and mortality, is increasing to epidemic proportions in developed countries. In keeping with the view of obesity as a developmental, progressive condition, targeting childhood factors that predict increases in body mass index (BMI), may result in the development of more effective prevention interventions. To date, prospective studies of childhood-onset psychopathology and adult obesity in representative community samples are lacking.

OBJECTIVES: The aim of this study is to investigate the association of depression in childhood and adolescence with adult body mass index in a prospective longitudinal study of 3,294 community participants in the Ontario Child Health Survey (OCHS).

DESIGN/METHODS: This study included 1,992 children aged four to 11 years and 1,302 adolescents aged 12-16 years at study entry in 1983. The provincially funded OCHS is a prospective cohort study of the psychiatric and general child health of a representative sample of Canadian community children undertaken in 1983 with follow-up assessments in 1987 and 2000. Data are collected from multiple informants including youth, parents and teachers. Psychiatric disorders are determined by a combination of parental, youth and teacher self-report and face-to-face, interviewer-administered measures. BMI is a derived variable determined from self-reported height and weight in 2000.

RESULTS: Adults with a history of childhood-onset depression had a BMI of 27.2 kg/m² (SD=6.4) as compared with a BMI of 25 kg/m² (SD=4.8) for adults who were non-depressed as children, regardless of lifetime depression status (p=0.02). After accounting for demographic and family-related variables, investigation of the relationship between depression in childhood and adult BMI by gender revealed an association for boys only (p<0.05). Among adolescents, a significant interaction between gender and depression exists (p=0.01). Depressed adolescent girls are at increased risk for adult overweight when compared with their non-depressed peers, after controlling for effects of demographic, parental mental illness and substance-related variables.

CONCLUSIONS: This epidemiologic study confirms clinical findings of an association between early-onset depression and adult overweight. Research examining the mechanism of the association of childhood-onset depression with future adult overweight is needed.

14 PREVALENCE OF HYPOTHALAMIC-PITUITARY-ADRENAL AXIS SUPPRESSION IN CHILDREN TREATED FOR ASTHMA WITH INHALED CORTICOSTEROID

* RW Smith, K Downey, M Gordon, A Hudak, R Meeder, S Barker, G Smith

Pediatrics, Orillia Soldiers’ Memorial Hospital, Orillia, Ontario

BACKGROUND: Current clinical practice guidelines and consensus statements recommend daily Inhaled Corticosteroids (ICS) for treatment of non-intermittent asthma in children. ICS use is considered safe, however high-dose use in children is met with some caution. No study to date has evaluated the prevalence of hypothalamic-pituitary-adrenal (HPA) axis suppression in children over a range of Inhaled Corticosteroids (ICS) used for asthma.

OBJECTIVE: To determine the prevalence of HPA-axis suppression and to determine what factors predict suppression at time of diagnosis.

PATIENTS AND METHODS: Children (aged eight months to 18 years) were recruited over a nine-month period in a regional pediatric centre in Ontario, Canada. Clinical and demographic variables were recorded on pre-constructed, standardized forms. HPA-axis suppression was measured by morning serum cortisol and confirmed by low-dose ACTH stimulation testing.

RESULTS: Two hundred and fourteen children participated and n=43 had ACTH stimulation testing. A total of 20 children (9.3%, 95% CI: 5.3 to 13.4%) had confirmed HPA-axis suppression. All children were on a medium dose for age or lower of ICS (range: 200 to 500 µg/day fluticasone or equivalent). HPA-axis suppression was not predicted by drug type, dose duration, concomitant use of long-acting β-agonist or nasal steroid, or clinical suspicion of HPA-axis suppression. Weight-adjusted daily ICS dose was predictive of HPA-axis suppression (Ornavigation ratio 1.005, 95% CI: 1.003 to 1.029, p<0.001).

CONCLUSION: A clinically important prevalence of HPA-axis suppression exists in children taking ICS for asthma. This places them at significant risk of adrenal crisis at times of physiological stress. Children should be regularly screened for the presence of HPA-axis suppression when treated with high dose ICS (>500 µg/day fluticasone or dose equivalent). Additional consideration should be given to screening children on medium dose ICS. Future research should focus on designing larger studies to further delineate the degree of suppression with multiple doses and types of ICS.

15 PREVALENCE OF CELIAC DISEASE IN PATIENTS WITH CYSTIC FIBROSIS

* A Martinez, G Davidson, C Barker

Pediatrics, McMaster University, Hamilton, Ontario

BACKGROUND: Celiac disease (CD) is an immune-mediated enteropathy caused by a sensitivity to gluten. It is associated with HLA alleles DQA1*0501/DQB1*0201 genes encoding DQ2,DQ8. The gold standard for definitive diagnosis is the histological findings of intestinal damage graded according to the modified Marsh criteria. The first case report of an infant with both cystic fibrosis (CF) and CD was described in 1969 by Hide and Burman. In 1989 Valletta and Mastella reported a prevalence of CD with CF of 1:220.
OBJECTIVES: Identify prevalence of the coexistence of CD in patients with CF through screening tests and intestinal biopsies positive when warranted. 

DESIGN/METHODS: Prospectively screen CF population with TTG and IgA for point prevalence of CD. Proceed with HLA typing DQ2/DQ8 of any CF patient with (+) TTG or IgA insufficient and normal or inconclusive histological findings.

RESULTS: Of the 114 patients tested, 7 had elevated TTG and 3 patients were IgA deficient. All 3 IgA deficient patients were HLA DQ2/DQ8(-) and were not biopsied; 4/7 high TTG patients were HLA DQ2(+); and 1/7 were HLA DQ8(+). Small bowel biopsies were performed on 6/7 TTG positive patients and biopsies graded according to the modified Marsh criteria. Two biopsies were graded as negative for CD, and four positive for CD (Figure 1). Initiation of GFD led to significant growth and weight gain in all patients when reviewed 1 year post diet initiation.

CONCLUSIONS: This is the first report of the prevalence of CD in a pediatric patients with CF in the era of modern screening for CD. Given the similarity of symptoms between the two entities, it is important to do proper screening to identify a possible association. A serological prevalence of 7% and histologic prevalence of 3% is higher than the general population. The CF population may warrant routine screening in order to do a prompt diagnosis of CD and start treatment. Further studies will be required to confirm this hypothesis.

17 GIRLS VS BOYS: EPIDEMIOLOGY OF HOCKEY INJURIES IN CANADIAN YOUTH

*K Forward, T Lynch, R Lim, G Sangha
Pediatics, Centre hospitalier Ste-Justine, Montreal, Quebec

BACKGROUND: Hockey is a sport enjoyed by youth across Canada. Among females, hockey participation has grown exponentially since the early 1990s. Despite the increasing popularity of this sport, there has been little epidemiologic data describing the injury patterns seen in young female hockey players.

OBJECTIVES: 1) To describe the epidemiology of injuries sustained by female hockey players (age 7-17.5 years) using the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) database over a 15-year period (January 1, 1995 to December 31, 2009). 2) To compare the injuries reported in female players to those reported in males.

DESIGN/METHODS: A retrospective review of the CHIRPP database was conducted to identify all hockey-related injuries sustained by female and male children age 7 years (Novice) to 17.5 years (Midset) over a 15-year period. Exclusion criteria included children with injuries sustained while playing road hockey (ie, involving cars, injured on the road, in home or yard, no coaches involved) and professional players who receive a salary.

RESULTS: Inclusion criteria were met by 36,357 children: 2,981 (8.2%) females and 33,406 (91.8%) males. The majority of injuries occurred in the 13-14 age group for both females and males (34.4% and 35.5%, respectively). Injuries during the regular season (October to late April) were more common in females (87% vs. 84.6%; p<0.001). The most common injuries reported in female players included: soft tissue injury (25.3%), sprains/strains (21.1%), fractures (18.2%), superficial injuries (15.3%) and minor head injuries (9.5%). Females sustained more soft tissue injuries (25.3% vs. 16.8%; p<0.0001) and fewer fractures (18.2% vs. 26.9%; p<0.0001). More concussions were reported in females age 13-14 than same-aged males (11.2% vs. 6.2%, p<0.001). Females age 15-17 years were also more likely to sustain a sprain or strain injury compared to same-age males (24.8% vs. 17.9%, p<0.0001).

CONCLUSIONS: In general, female hockey players exhibit significantly more soft tissue injuries and fewer fractures than male players. Further analysis of the injury patterns seen in females may highlight areas for improvement in protective equipment and injury prevention.
18
PARENTS MORE OFTEN CITED AS USEFUL SOURCES OF SEXUAL HEALTH INFORMATION BY GAY, LESBIAN, BISEXUAL, TRANSGENDERED, QUEER AND QUESTIONING YOUTH (GLBTQQ) THAN BY THEIR HETEROSEXUAL PEERS
*DJ Martens, G Di Meglio, J Frappier, P McDuff
Adolescent Medicine, McGill University, Montreal, Quebec

BACKGROUND: Few studies have addressed how GLBTQQ youth get information on sexual health and sexuality.

OBJECTIVES: The purpose of this analysis was to compare the responses of GLBTQQ youth and heterosexual youth to questions about adolescent sex and sexuality.

DESIGN/METHODS: In 2005, an online survey of 1171 Canadian teens, aged 14-17, was conducted. The survey included questions on sources of sexual health information; relationship/communication (general and sex-related) with parents; family functioning; and sexuality role model. Sexual orientation was presumed from responses to a question on who the teens found sexually attractive. Statistics: Chi square analysis, t-test and ANOVA.

RESULTS: Of the 1170 participants who answered the question regarding sexual attraction, 1014 reported exclusive heterosexual attraction, and 156 reported some same sex attraction (GLBTQQ group). There were no sex or age differences between the groups. Regarding sources of sexual health information, GLBTQQ boys (50%) and girls (51.2%) equally cite their parents as one of the most useful sources of sexual health information, which is more frequent than their heterosexual peers (boys, 38.6%; girls, 45.2%). GLBTQQ males are the least likely to indicate friends (19.2%) as their most valuable sources of sexual health information as compared to GLBTQQ girls (40.2%) and heterosexual boys (27.5%) and girls (30.2%). More GLBTQQ youth find it difficult to access health care professionals compared to their heterosexual peers (14.1% versus 8.3%, p=0.019), with confidentiality as an additional barrier to accessing sexual health information (GLBTQQ 27.7%; heterosexual 19.3%, p<0.015). Parents are an important sexuality role model for GLBTQQ boys (45.3%) and heterosexual boys (42.7%) and girls (51.6%), but less so for GLBTQQ girls (23.2%). More GLBTQQ girls (42.7%) have ever been sexually active compared to GLBTQQ boys (28%) and heterosexual girls (26.5%) and boys (25.2%). Fewer GLBTQQ girls (13%) and boys (22.9%) report being important sexuality role model for GLBTQQ boys (45.3%) and heterosexual boys (31.1%) and girls (30.2%).

CONCLUSIONS: GLBTQQ youth, more so than heterosexual youth, frequently cite their parents as useful sources of sexual health information. Therefore families should be encouraged to discuss sex with their teenagers. Concern about confidentiality and access to doctors are still barriers for GLBTQQ youth. Emerging sexual orientation is a diagnostic consideration.

19
APPENDIX NOT SEEN – THE PREDICTIVE VALUE OF SECONDARY INFLAMMATORY SONOGRAPHIC SIGNS
*A Estey, R Lim
Paediatrics, University of Western Ontario, London, Ontario

BACKGROUND: Acute appendicitis is the most prevalent emergency surgical diagnosis in children. While traditionally a clinical diagnosis, the diagnosis of acute appendicitis is uncertain in approximately 30% of pediatric patients. In attempts to avoid a misdiagnosis and facilitate earlier definitive care, imaging modalities such as ultrasonography have become important tools. In many pediatric studies, the absence of a visualized appendix with no secondary sonographic features has been reported as a negative study, and a study in which the appendix is not seen, but demonstrates secondary features is often deemed equivocal. With ultrasound appendical detection rates reported at 60-89%, the dilemma of the non-visualized appendix or equivocal study is frequently faced by clinicians.

OBJECTIVES: To assess the value of the non-visualized appendix on ultrasound and the association of secondary sonographic findings in patients with acute right lower quadrant pain in whom acute appendicitis was a diagnostic consideration.

DESIGN/METHODS: Retrospective case review of 662 consecutive children (age less than 18 years) presenting to a pediatric emergency department with clinically suspected appendicitis who had graded compression sonographic studies during the 24 month study period.

RESULTS: The appendix could not be visualized in 241 (36.4%) studies. An alternate diagnosis was identified via sonography in 47 patients (19.5%). Twenty-five patients (12.9%) were taken to the OR where 17 (9%) had acute appendicitis confirmed via pathology. Negative predictive values of the presence of secondary signs of inflammation (free fluid, prominent lymph nodes, pericecal inflammatory fat changes, phlegmon) are 92%. The specificity of moderate to large amounts of free fluid is 98%, phlegmon 100%, pericecal inflammatory fat changes 98%, and any free fluids with prominent lymph nodes 81%.

CONCLUSIONS: Although uncommonly seen, large amounts of free fluid, phlegmon and pericecal inflammatory fat changes were very specific signs of acute appendicitis. The absence of a distinctly visualized appendix and secondary inflammatory changes provides strong indicators against a diagnosis of acute appendicitis.

Abstract presentation C (Platform) / Présentation d’affiches C (plateforme)

20
SUPPLEMENTATION WITH ORAL VITAMIN D3 (400 IU/DAY) SUPPORTS PLASMA LEVELS OF 25-HYDROXYVITAMIN D OF 50 NMOL/L BUT HIGHER INTAKES ARE REQUIRED TO REACH 75 NMOL/L IN BREASTFED INFANTS
*S Gallo, K Comeau, C Vanstone, S Agellon, G Jones, M L’Abbé, A Khameesan, A Sharma, °C Rodd, †H Weiler. °Senior author
Dietetics and Human Nutrition, McGill University, Ste-Anne-de-Bellevue, Quebec.

BACKGROUND: In the 2011 update of the Dietary Reference Intakes, the Institute of Medicine (IOM) established an Adequate Intake of 400 IU for infants to support plasma 25-hydroxyvitamin D (25(OH)D) concentrations >50 nmol/L. The Canadian Paediatric Society suggests an optimal target range of 75-150 nmol/L. Both groups advocate that dose response studies are clearly needed to assess the biochemical and functional outcomes associated with vitamin D status.

OBJECTIVES: We aimed to identify a dosage of vitamin D which would support plasma 25(OH)D ≥75 nmol/L in 97.5% of infants across infancy.

DESIGN/METHODS: Healthy, term born, breast fed infants (n=132) were randomized to oral supplements of 400, 800, 1200 or 1600 IU of vitamin D3 daily from ~1 month of age and plasma 25(OH)D3 was measured by liquid chromatography tandem mass spectrometry at one, two, three, six, nine and 12 months of age (NCT00381914).

RESULTS: The 1600 IU/d group was discontinued due to some 25(OH)D concentrations >225 nmol/L. Logistic regression at each time point accounting for gender, season, weight, mother’s race, education and parity were tested for the effects of treatment on meeting the cut-offs, by intent-to-treat analysis. Compared to the 400 IU/d group, dose significantly predicted (see Table) achieving ≥75 nmol/L, with odds ratios (CI) of 15 (3-73) at 2 mo, 13 (2-76) at 3 mo, 5 (1-17) at 12 mo for 1200 IU/d and 16 (2-128) for 1600 IU/d. All dosages established concentrations ≥50 nmol/L by 3 months of age, confirming the IOM’s statements, while higher dosages were necessary to reach the 75 nmol/L.

CONCLUSIONS: The best cut-off remains to be demonstrated. However, if 75 nmol/L is the goal, then these results suggest dosages >400 IU/d may be necessary. It remains to be established whether functional outcomes may be improved with concentrations ≥75 nmol/L.

Percent of infants ≥ 50 or 75 nmol/L of plasma 25(OH)D by age and group compared to 400 IU/d (*p<0.05 at same age).
21

PRESClOOL CHILDREN FROM NON-WESTERN IMMIGRANT FAMILIES HAVE LOWER VITAMIN D LEVELS THAN CHILDREN FROM WESTERN FAMILIES: A TARGET KIDS! STUDY

*J Omand, PB Darling, PC Parkin, CS Birken, JL Maguire
Department of Pediatrics, Li Ka Shing Knowledge Institute of St Michael’s Hospital, Toronto, Ontario

BACKGROUND: Toronto’s multiculturalism plays an important role in shaping its population. National data suggests that infants of immigrant families are at increased risk of vitamin D deficiency rickets. Preschool children from immigrant families may also be at risk of low 25-hydroxyvitamin D levels. There is emerging data connecting low vitamin D levels and poor health outcomes, suggesting the importance of identifying subgroups at risk and targeting interventions.

OBJECTIVES: To determine if preschool children from non-western immigrant families have lower serum 25-hydroxyvitamin D levels than children from western born families. Secondary objective was to examine which biological, ethnic, demographic and environmental factors influence this relationship.

DESIGN/METHODS: Cross-sectional study using data from the TARGet Kids! cohort of healthy children ages one to five years recruited during routine primary care. For the primary analysis, 25-hydroxyvitamin D levels of children from non-western immigrant families (defined as children born outside of Europe, North America, Australia or New Zealand or had a parent who immigrated from a non-western country) was compared to children from western families. Linear regression was used to identify biological, ethnic, demographic and environmental factors which might influence this relationship.

RESULTS: 1235 children enrolled in TARGet Kids! between July 2007 and August 2011 had measured 25-hydroxyvitamin D and were included in the analysis. Children from non-western immigrant families made up 29% of the population. The mean age was 35 months (SD 18), 51% were male, 83% had ‘light’ skin pigmentation (Fitzpatrick scale I, II or III), 57% took vitamin D supplements and average milk intake was 436 ml/day (SD 304). Mean 25-hydroxyvitamin D level was 88.5 nmol/L (SD 32). Univariable analysis revealed that children from non-western immigrant families had 5nmol/L lower 25-hydroxyvitamin D than children from western families (p=0.0046). Linear regression modeling revealed that this association is primarily influenced by cow’s milk intake (p=0.0001), vitamin D supplementation (p=0.0001) and season (p=0.0008). After adjusting for these variables the residual 25-hydroxyvitamin D difference was no longer significant. Subgroup analysis of children <16 months revealed that those with East Asian ethnicity appear to be at highest risk of low 25-hydroxyvitamin D.

CONCLUSIONS: Preschool children from non-western immigrant families have lower 25-hydroxyvitamin D than children from western families. This finding may be explained by lower cow’s milk intake and less frequent vitamin D supplementation, which represent two modifiable targets for future intervention studies to increase 25-hydroxyvitamin D in this vulnerable population.

22

FEEDING BEHAVIOURS PREDICT NON-HDL LEVELS DURING EARLY CHILDHOOD: A TARGET KIDS! STUDY

*NPersaud, JL Maguire, GL Lebovic, BM McCrindle, PC Parkin, CS Birken
Keenan Research Centre in the Li Ka Shing Knowledge Institute, St Michael’s Hospital, Toronto, Ontario

BACKGROUND: It is unclear if health related behaviours in early childhood such as dietary intake, eating behaviours, physical activity or sedentary behaviours predict later cardiovascular risk. The NutriSTEP® is a reliable parent-completed measure of these health-related behaviours in young children, and has been validated with a dietitian’s assessment. One emerging surrogate marker for later cardiovascular risk is the serum non-HDL level (or total cholesterol minus HDL). Objectives: To determine if the score on NutriSTEP®, a validated nutritional risk tool, is associated with serum non-HDL levels, a surrogate marker of cardiovascular risk.

DESIGN/METHODS: 1090 children aged one to five with complete survey data, BMI measurements and lipid levels were recruited from TARGet Kids! practice sites between 2008 and 2011. TARGet Kids! is a primary care research network for children. A parent of each participant completed the NutriSTEP®, a 17-item tool (total score range 0–68) that includes five domains: food intake, food-related behaviours (such as watching television while eating), parental concerns about food and activity, screen time duration, and the use of supplements. Linear regression models controlling for age, gender, ethnicity, WHO BMI Z scores, parental BMI, and history of gestational diabetes were used to assess the relationship between NutriSTEP® score, and serum non-HDL.

RESULTS: The mean (SD) age of participants was 3.0±0.7 and 51% were male. The mean (SD) total score on NutriSTEP® was 13·5±6 and the mean (SD) non-HDL was 2·8±0·7. Total NutriSTEP® score was associated with the non-HDL level (p=0.007); for each unit increase in total NutriSTEP® score there was a 0.01 mmol/L (95% CI: 0.004, 0.02) increase in serum non-HDL. A separate model showed that food-related behaviours was the only domain of the NutriSTEP® tool that significantly predicted serum non-HDL (p=0.006); for each unit increase in the feeding behaviour sub-score there was 0.03 mmol/L (95% CI: 0.01, 0.05) increase in serum non-HDL.

CONCLUSIONS: In young children, feeding behaviours reported on the NutriSTEP® are associated with non-HDL serum lipid values. Feeding behaviours in young children are important potentially modifiable determinants of cardiovascular risk, and may be a focus for screening and interventions.

23

IRON STATUS IN LOW BIRTH WEIGHT PRETERM AND NEAR-TERM INFANTS

*E Estrabillo, M Perwez, K McFadyen, L Bartholomew, D Campbell
Pediatrics, St Michael’s Hospital, Toronto, Ontario

BACKGROUND: Iron deficiency (ID) in infancy is common and has been linked to poor school performance and abnormal behaviour. Risk factors for ID include prematurity or low birth weight (<2500 g). Despite this, larger preterm and near-term infants (1500-2500 g) have been infrequently studied. Current recommendations for iron supplementation by the American Academy of Pediatrics (AAP) and Canadian Pediatric Society (CPS) for these newborns are not clearly defined for weight and gestation. The AAP recommends that all preterm babies should receive iron supplementation until 12 months, while the CPS has no specific guidelines for those >1500 g.

OBJECTIVES: To determine the iron status in the first 18 months of life of LBW infants born at our institution in order to provide relevant and specific recommendations regarding iron supplementation at discharge.

DESIGN/METHODS: This study used a prospective design to monitor the iron status and growth of infants with BWT 1500-2500 g. As per guidelines from the CPS and AAP, infants <2000 g at birth were prescribed 7.5 mg of elemental iron daily for 12 months. Growth, dietary records and iron indices were tracked at discharge, six, 12 and 18 months. ID was defined as serum ferritin <12 µg/L. Iron deficiency anemia (IDA) included those with Hb <10 g/L.

RESULTS: Of the 186 infants currently enrolled, 96 infants were prescribed iron at discharge (GA 33±1.7 wks, BWT 1.75±0.16 kg), and 90 infants did not receive iron (GA 34±1.3 wks, BWT 2.20±0.14 kg). Six-month, 12-month, and 18-month data were available for 124, 83, and 42 infants respectively. Eighteen of 54 non-iron infants developed ID, while 9 had IDA. All but one of these ID infants were breastfed exclusively at 6 months. At 6 months, the iron group had significantly higher ferritin levels (61.4±39 µg/L vs. 24.8±19 µg/L, p<0.001), and none had ID or IDA. At 12 months, 0 of 48 infants in the iron group, and 2 of 34 infants in the non-iron group were ID. At 18 months, three of 22 infants in iron group, and one of 16 in the non-iron group were ID. There were no significant differences in overall ferritin levels between the groups at these ages. IDA was not seen in either group at 12- and 18-months. No differences were noted with respect to growth parameters.

CONCLUSIONS: Supplementation of LBW preterm and near-term infants (<2500 g) improves iron indices at six months. Specific iron supplementation guidelines for these infants may need revision, especially in breast-fed LBW infants.
24 CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS IN NEONATAL INTENSIVE CARE UNITS
*AC Blanchard, E Fortin, I Rocher, D Moore, C Frenette, C Tremblay, C Quach
Pediatrics – Infectious Diseases, McGill University Health Centre, Montreal Children’s Hospital, Montreal, Quebec

BACKGROUND: Central Line-Associated Bloodstream Infections (CLABSI) represent an important cause of morbidity and mortality in neonatal intensive care units (NICU).

OBJECTIVES: 1) Describe the epidemiology of nosocomial CLABSI in NICUs participating in a standardized mandatory CLABSI Surveillance Program. 2) Evaluate the prevalence of gastrointestinal pathologies and use of peripherally inserted central venous catheters (PICC)

DESIGN/METHODS: Hospitals with ≥ four-week periods/year. We included all patients admitted to seven level II/III NICU in Quebec (April 2007 to March 2011) with a central line in place and an established nosocomial BSI, following the definition of the Centers for Disease Control. CLABSI/1000 catheter-days and device utilization ratio (DUR) were calculated. The Chi-square test was used to compare proportions.

RESULTS: Overall, 197 patients had 202 CLABSI episodes. There were 248,267 patient-days and 50,269 catheters-days with a pooled mean rate of 4.0 CLABSI episodes/1,000 catheter-days and a pooled mean DUR of 0.20 catheter-day/patient-day. Annual pooled mean CLABSI rates increased over the study period, from 3.6 CLABSI/1,000 catheter-days in 2007-2008 to 5.1 CLABSI episodes/1,000 catheter-days in 2010-2011. While participating NICUs were the same throughout the study period, 57% of CLABSI were declared during the last year of study, which represented 29% of overall catheter-days. CLABSI presented at a median of 24 days of age, 20 days after admission to the NICU. The 30-day mortality was 8% (n=17) and occurred a median of 8 days after CLABSI was diagnosed. Birth weight was ≤1,000 g in 65% of patients for whom the data was available and 87% received parenteral nutrition. Gram-positive organisms were responsible for 74% of CLABSI, predominantly coagulase-negative Staphylococcus. S. aureus was identified in 22 cases: 3 of which (14%) were resistant to methicillin. An underlying gastrointestinal pathology was found in 20% (40/202) of CLABSI cases, 50% of which (20/40) were reported in the last year of study. The majority of these 40 cases had a PICC: 31/40, 78% (p=0.021).

CONCLUSIONS: Our study shows an increased incidence of CLABSI in NICU and an increased prevalence of underlying gastrointestinal pathologies. Targeted interventions, including process surveillance, will be put in place in the province of Quebec aiming to decrease to its minimum the proportion of preventable CLABSI in NICUs.

25 NEEDLE FEARS AND IMMUNIZATION COMPLIANCE
Paediatrics, The Hospital for Sick Children, Toronto, Ontario

BACKGROUND: Needle fears are a documented barrier to immunization in children and adults. There are limited data however regarding the prevalence of needle fears and their impact on immunization compliance.

OBJECTIVES: To evaluate the prevalence of needle fears among children and parents and its association with immunization non-compliance.

DESIGN/METHODS: Cross-sectional interviewer-administered survey. Eligibility was based on a convenience sample of parents between July 6, and August 30, 2011. Parents were asked about needle fears in their children and themselves and their experience with immunization compliance.

RESULTS: 949 adults participated. Responses from only one survey per family (n=883) were included. Those excluded were 66 surveys completed by both mothers and fathers. The median number of children was two (range, one to seven). 62% of parents reported needle fear in at least one child and 5% reported having avoided or delayed immunization as a result of the fear. Needle fear was predictive of non-compliance (RR=5.3; p<0.001). Regarding influenza immunization specifically, 71% of parents chose not to routinely immunize their children. Of these, 17% would definitely agree to immunization if it was given in a non-painful way. While 45% of parents reported being very confident in knowing how to make immunizations less painful and frightening for their children, 70% had never received any formal information on how to do so and 79% would like more information. 24% of parents reported needle fear in themselves; 7% reported avoiding or delaying immunization as a result of needle fear.

CONCLUSIONS: Needle fears were commonly reported by parents in this survey and were predictive of immunization non-compliance in both themselves and their children. The impact of providing education on how to make immunizations less painful warrants further investigation.

26 VARICELLA VACCINE SAFETY PROFILE BASED ON REPORTING TO THE CANADIAN ADVERSE EVENT FOLLOWING IMMUNIZATION SURVEILLANCE SYSTEM (CAEFISS): 1999-2010
*HA Anotty, J Lafleche, R Lewis, B Law
Public Health Agency of Canada, Ottawa, Ontario

BACKGROUND: The first varicella vaccine was licensed in Canada in December 1998. In 1999, the National Advisory Committee on Immunization recommended immunization of healthy susceptible individuals after one year of age. In 2000, Prince Edward Island became the first province in Canada to integrate varicella into their universal childhood immunization program. By 2007 all other provinces and territories had implemented universal programs for children 12 to 15 months of age. Many included catch-up campaigns. MMRV vaccine was approved for marketing in 2007.

OBJECTIVES: The purpose of this study is to profile Adverse Events Following Immunization (AEFI) with single antigen varicella vaccine (excluding MMRV) reported to the Public Health Agency of Canada through CAEFISS, and to provide a baseline prior to the adoption of two dose schedules, and/or MMRV.

DESIGN/METHODS: AEFI reports received up to November 23rd, 2011 where the vaccine was administered between December 02, 1999 and December 31, 2010 were included. Demographic characteristics of patients along with annual AEFI and serious adverse events (SAE) reporting rates per 100,000 doses distributed were determined using SAS® EG 4.0.

RESULTS: A total of 5,811 varicella vaccine AEFI reports were extracted from CAEFISS. The mean number of AEFI reports per year of vaccine administration was 400 with the highest seen in 2005 at 929. Varicella was given alone in 1,604 (28%) reports, and with 3 other vaccines (MMR, pneumococcal and meningococcal conjugate) in 1,690 (29%). The male to female ratio was near 1:1. Approximately 95% of the reported AEs were non-serious with the most commonly reported events being rash and fever for those aged <7 years, and vaccination site reactions and fever for >7 years. The proportion of SAE was 5% overall with febrile convulsion being the most frequently reported event. The annual AEFI reporting rate per 100,000 doses distributed ranged from 77 in 1999 to 200 in 2008, declining to 184 in 2009 and 141 in 2010.

CONCLUSIONS: Most of the reported adverse events following the single antigen varicella vaccine were mild, expected, and non-serious. Canada’s reporting rates of AEFI post varicella are higher than those previously reported for the US (52.2) or Australia (8-11.5). This finding is not specific to varicella and reflects the high general rate of AEFI reporting achieved by public health in Canada.
27 TRAVEL-RELATED ILLNESSES IN PAEDIATRIC TRAVELLERS WHO VISIT FRIENDS AND RELATIVES ABROAD (TRIP-VFR)
*M Crockett, C Hui, S Kuhn, L Ford-Jones, D Grondin, J Keystone

PEDIATRICS and Child Health, Medical Microbiology, University of Manitoba, Winnipeg, Manitoba

BACKGROUND: Travellers who visit friends and relatives (VFRs) are at increased risk of travel-related illnesses (TRIs); however, there are few data regarding travel-related illnesses among paediatric VFRs.

OBJECTIVES: To determine the number, epidemiology, clinical manifestations and severity at presentation of and prevalence of risk factors for significant TRIs among paediatric VFR travellers living in Canada.

DESIGN/METHODS: The Canadian Paediatric Surveillance Program (CPSP) is a national active surveillance program that collects data from approximately 2,500 paediatricians and paediatric sub-specialists in Canada. We undertook a two year surveillance project through the CPSP of all reported cases of significant travel-related illness among paediatric VFRs in Canada from March 2009 to February 2011. Mild respiratory and gastrointestinal illnesses were excluded.

RESULTS: There were 91 confirmed cases of significant travel-related illnesses among paediatric VFRs in Canada. Among the paediatric TRIs, 61% were acquired in Asia, 22% in Africa, 11% in Central/South America and the Caribbean, 5% in the Middle East and 1% in Europe. The average duration of travel was 7½ weeks. Enteric fever (33 confirmed and three presumed cases) was the most common TRI. Malaria (17 cases) and hepatitis A (11 cases) were the next most common TRIs. Fever was the most common presenting symptom, reported in 81% of children with TRIs. Three patients presented with hypotension (malaria) or septic shock (Salmonella bacteremia). There was one death and four children had significant sequelae following their TRIs. More than 70% of cases (n=65) required hospitalization with an average length of stay of 11.5 days (median six days). Only a quarter of paediatric VFR travelers sought pre-travel advice and only 1/3 of those sought advice from a travel health clinic.

CONCLUSIONS: Our data indicate that TRIs cause significant morbidity and some mortality among paediatric VFRs in Canada. Furthermore, the majority of the TRIs were potentially preventable if appropriate pre-travel advice had been obtained and followed. This study highlights the need for increased education of families and health care providers regarding the importance of pre-travel advice to minimize the risk of acquiring travel-related illnesses among paediatric VFRs.

28 FACTORS INFLUENCING BODY MASS INDEX AMONG IMMIGRANT AND NON-IMMIGRANT CANADIAN YOUTH: EVIDENCE FROM THE CANADIAN COMMUNITY HEALTH SURVEY
*G Wahl, M Boyle, K Morrison, K Georgiades

Department of Pediatrics, McMaster University, Hamilton, Ontario

BACKGROUND: Over the past two decades the prevalence of childhood obesity has reached epidemic proportions. In Canada recent population growth has relied heavily on immigration. Immigrant versus non-immigrant youth appear to exhibit better health overall and maybe at less risk for obesity. Unfortunately, there is a paucity of literature on the physical health of immigrant youth in Canada.

OBJECTIVES: The objectives of this study are 1) to examine differences in the prevalence of overweight and obesity among children and youth, aged 12-19 years, who were born outside of Canada as compared to Canadian born youth, and 2) to identify the extent to which physical activity, diet, and sedentary behaviour may account for between-group differences.

DESIGN/METHODS: Data for this study was collected by Statistics Canada through the Canadian Community Health Survey (CCHS) from 2001 to 2007. Weight, height, fruit and vegetable consumption, sedentary behaviours, and activity were self-reported by participants. Proportion of normal weight, overweight/obese, and zBMI were calculated. Multiple imputation was used to assign values to missed responses. Participants’ body composition characteristics, diet and activity and socio-demographic characteristics were reported with descriptive statistics. The associations between standardized BMI scores, immigrant status and socio-demographic covariates were analyzed using multilevel linear regression.

RESULTS: The CCHS sample included 67406 participants, aged 12 to 19 years. The mean (SD) age of respondents was 15.5 (2.1) years and 10.6% respondents identified themselves as being born outside of Canada. Among immigrant youth the mean (SD) time from immigration was 7.7 years (4.4). 21.8% of non-immigrant youth were overweight/obese compared to 18.8% of immigrant youth (p<0.001). Canadian immigrant children and youth had a zBMI lower by 0.34 compared to Canadian-born children and youth (p<0.001). Furthermore, zBMI increased by 0.02 for every year an immigrant-respondent resided in Canada (p<0.001). Measures of diet, activity level and sedentary behaviour did not account for the differences in body composition between immigrant and Canadian born children.

CONCLUSIONS: In this secondary data analysis of the Canadian Community Health Survey immigrant Canadian youth had a lower rate of overweight/obese and lower zBMI scores as compared to Canadian-born youth. When examining determinants of obesity, consumption of fruits and vegetables, sedentary behaviour and energy expenditure were not statistically significant predictors of overweight/obese among this sample of Canadian youth.

29 REMOVAL OF CODEINE IN PEDIATRIC ONCOLOGY: A QUALITATIVE EVALUATION OF SUCCESS AND ATTITUDES
*M Belletrutti, K Black, S Perry, J Shepherd, M Venner, M Romanick
Northern Alberta Children’s Cancer Program, Stollery Children’s Hospital, Edmonton, Alberta

BACKGROUND: Codeine is an opioid analgesic that requires hepatic conversion to morphine via CYP2D6 to provide analgesic effect. CYP2D6 population polymorphisms cause unpredictable conversion to morphine. This phenomenon, and multiple reports of death or adverse events in children receiving codeine, has led to increased calls for discontinuation of codeine use in children. Several methods have been attempted to avert harm, including genetic testing panels for children likely to receive codeine as well as the removal of codeine from the formulary of one Canadian pediatric hospital. When we were looking for ideal implementation strategies, neither successful implementation of these changes, nor barriers to the changes had been reported. Our Pediatric Oncology Program volunteered to pilot codeine removal.

OBJECTIVES: To evaluate whether prescription of codeine was reduced, to assess the attitudes of health professionals at different points during practice change, and to determine if our educational tools were successful in aiding this practice change.

DESIGN/METHODS: An electronic survey was created and distributed to all Pediatric Oncology Team members prior to implementation, and three and six months after. In our hospital, all opioids are dispensed from automated cabinets and reports assessing the number of codeine doses dispensed two months prior to, and two months following implementation were obtained from the Pharmacy Department.

RESULTS: Survey response rate was 55% (100% of prescribing physicians). In the assessment points prior and subsequent to implementation, 249 doses were administered to 35 patients, and seven doses were administered to three patients respectively. Initial concerns about provincial tripplicate prescription program barriers and needing to use other opioids were minimal (22% rated as major concern for both), but still decreased 6 months after implementation (8% rated as major). Barriers to successful implementation initially rated significant were: attitudes of other health professionals (42%, 80% of physicians) and perceptions of parents/families (60%). Both of these showed marked improvement six months after implementation (other health professionals’ attitudes: 25% (0% of physicians), parents/families: 25%). Education strategies for implementation were well-utilized and rated by participants as beneficial. Eighty-two percent of respondents rated the practice change as easy.

CONCLUSIONS: Removal of codeine was successful using a diverse,
planned education program. Initially identified barriers did not hinder implementation. Our intent is to use these results to implement a similar practice change within the entire children’s hospital.

30 PAEDIATRIC NEUROLOGICAL DISEASES: WHAT DOES ACTIVE CANADIAN SURVEILLANCE TELL US?  
*D Grenier, A Ugnat, M Davis, M Laffin Thibodeau  
Paediatrics, Childrens Hospital of Eastern Ontario, Ottawa, Ontario  

BACKGROUND: Paediatric neurological diseases individually are rare; however, collectively affect thousands of children and typically have life-long impacts. The actual incidence of many of these disorders is not readily available information and yet is essential for improved clinical care, advocacy and health service planning.  

OBJECTIVES: To obtain and examine, in a timely manner, national population based data on acute flaccid paralysis (AFP), progressive intellectual and neurological deterioration (PINID), acquired demyelinating syndromes of the central nervous system (ADS), congenital myotonic dystrophy (CMD) and paediatric myasthenia (PM).  

DESIGN/METHODS: Studies were conducted through the Canadian Paediatric Surveillance Program, a network of ≥2,500 paediatricians and paediatric sub-specialists, reporting cases monthly according to preset protocols. Confidentiality is mandatory; studies receive ethical approval.  

RESULTS: The AFP study, with 657 cases in 15 years, affirms that Canada is free of wild-type poliovirus. The PINID study demonstrated several genetically defined neurodegenerative disorders, and only one case of iatrogenic Creutzfeldt-Jakob disease. A yearly incidence of 0.9 per 100,000 Canadian children was estimated from the ADS study, with optic neuritis being the most common presentation. Awareness of multiple sclerosis as a possible outcome of ADS increased markedly over the course of the study. Of the 38 confirmed CMD cases in six years, 61% were the index cases for the families. In the first year of surveillance, 33 cases of PM were confirmed; almost half did not have elevated titers of acetylcholine receptor antibodies, and 21% had other co-existing or familial immune disorders.  

CONCLUSIONS: Active surveillance at the national level has more reliably characterized several rare neurological disorders and their associated burden in Canadian children, supporting and informing the development of medical and public health interventions.

31 PROCEDURAL SKILLS IN PEDIATRIC RESIDENCY: RE-EVALUATING THE COMPETENCIES  
*R Levy, A Dubrowski, H Amin, Z Bismilla  
University of Toronto, Toronto, Ontario  

BACKGROUND: The Royal College of Physicians and Surgeons of Canada (RCPSC) sets forth objectives for residency training. The list of procedural objectives required of graduating pediatric residents is lengthy and includes several skills that may not be commonly performed in practice.  

OBJECTIVES: We sought to describe the attitudes of senior residents enrolled in Canadian pediatric residency programs towards procedural skills training, including residents’ perceived importance of the RCPSC required procedures, and their perceived proficiency in these skills.  

DESIGN/METHODS: An anonymous survey was distributed to all senior residents enrolled in Canadian pediatric training programs via Surveymonkey, an online survey distribution tool. The survey utilized a five-point Likert scale to address resident attitudes towards procedural importance and corresponding proficiency. Data were analyzed using descriptive statistics, with Pearson correlation coefficients used to describe relationships between variables.  

RESULTS: Sixty-eight residents responded. 15 skills had a mean importance ≥4 (very or extremely important) and five skills had a mean importance <3 (somewhat to not important). Residents felt they were extremely or very proficient (mean rating ≥4) for 3 skills, which included bag-mask ventilation, lumbar puncture and chest x-ray interpretation. They reported 23 procedures in which they felt somewhat to not proficient (mean <3). The correlation between importance and proficiency was high (Pearson’s 0.87). However, proficiency was significantly lower than importance (p<0.05) for the majority of procedures (88%). The largest gaps between importance and proficiency were found for chest tube insertion, gathering specimens for evidence of child maltreatment, defibrillation and intra-osseous insertion (all p<0.001).  

CONCLUSIONS: Many but not all RCPSC-required procedures are felt to be important. Residents do not feel adequately proficient in many of these procedures. Skills with the greatest gap between importance and proficiency should be targeted for curricular interventions.

32 SEXUAL HEALTH OF ADOLESCENTS IN QUEBEC YOUTH PROTECTION CENTERS  
*N Haley, G Lambert, S Jean, C Tremblay, J Frappier, J Otis, E Roy  
Centre hospitalier Sainte Justine, Montreal, Quebec  

BACKGROUND: Adolescents in youth protection centres (YPC) are a vulnerable population with difficult life trajectories and numerous social and health challenges. Many of them engage in health compromising behaviours, notably related to sexual health.  

OBJECTIVES: To document risk behaviours and sexual health consequences among adolescents aged 14-17 years old entering residential care in YPC in Quebec, and to measure prevalence rates of Chlamydia trachomatis and Neisseria gonorrhoeae genital infections among sexually active youth.  

DESIGN/METHODS: From July 2008 to May 2009, adolescents residing in six YPC completed questionnaires during face-to-face interviews. Questions covered sexual and substance-use behaviours during the year prior to admission, as well other health behaviours related to their mental and physical health. Urine samples were tested by PCR for Chlamydia trachomatis and Neisseria gonorrhoeae genital infections.  

RESULTS: Among 578 participants aged 14-17 years old, 89% were sexually active. Sexual risk behaviours included early sexual initiation (66% before age 14); multiple partners (median: girls 5; boys 8); half or more of sexual relations under the influence of drugs or alcohol (girls 43%, boys 48%); group sex at least once (girls 38%, boys 43%); and sex in exchange for money or other goods (girls 27%, boys 8%). Use of protection during last vaginal relation was low: only a quarter of boys and girls used dual protection (condom and contraceptive method); 28% of girls and 21% of boys did not use a condom or any type of contraceptive. Of those using a condom at last relation, twenty percent reported having had difficulties using the condom that resulted in inadequate protection. A history of pregnancy (lifetime) was reported by 28% of girls (median age at first pregnancy: 14 years). Prevalence of Chlamydia trachomatis was 9.3 (CI: 5.5-14.5) among girls and 1.9 (CI: 0.6-4.4) among boys. Prevalence of Neisseria gonorrhoeae was 1.7 (CI: 0.3-4.8) among girls and 0.0 (CI: 0.0-1.4) among boys.  

CONCLUSIONS: Adolescents in care have risky sexual behaviours often associated with drug and alcohol use. Their use of double protection is minimal, and improper condom use is frequent, resulting in high rates of sexually transmitted diseases and unplanned pregnancies. Their passage through youth protection facilities is an opportune moment to screen adolescents for sexual health risks and provide them with individualized risk reduction education and skill building to improve their sexual health.

33 AN INNOVATIVE CHILD MALTREATMENT CURRICULUM FOR PEDIATRIC TRAINEES  
*SB Schwartz, E Cory, M Mian, I Capra, M Shoullice  
Medicine, University of Toronto, Toronto, Ontario  

BACKGROUND: Child maltreatment is a mandatory component of pediatric residency training. Learning in this area often occurs through opportunistic exposure and studies show that both trainees and practicing pediatricians have inadequate comfort and knowledge in this area. Few published studies have evaluated curricula in child maltreatment. An innovative, evidence-based curriculum was developed to address these concerns.  

OBJECTIVES: To design, implement, and evaluate an evidence based child maltreatment curriculum for pediatric trainees that will improve...
learning in this area.

**DESIGN/METHODS:** A 4-week child maltreatment curriculum for post-graduate pediatric trainees was designed utilizing the Royal College of Physicians and Surgeons of Canada Objectives of Training in Pediatrics. The curriculum consists of seminars, guided practice, and case-based, small group application exercises. The curriculum is based on principles from the medical education literature, including integration of basic knowledge with clinical application, use of case examples to promote pattern recognition, guided incremental exposure to pattern variation, explicit instruction to use diagnostic strategies to minimize error, deliberate practice with feedback, and formative use of tests. Evaluation of the curriculum was designed as a prospective cohort study, comparing post-test results of six trainees completing a typical rotation in Child Maltreatment to six trainees completing the new curriculum. The post-test was developed and piloted on individuals with no experience in child maltreatment, trainees following a typical rotation, and experts to ensure construct validity and reliability. All tests were scored by two experts. Tests of means (t-tests) and medians (non-parametric Kruskal-Wallis test) were used to determine if there was a difference between the two groups. Research Ethics Board approval was obtained.

**RESULTS:** Tests of means and medians (t-test and nonparametric Kruskal-Wallis test) respectively showed improvements in the total test scores, sexual abuse subset scores, and physical abuse subset scores of trainees who had been exposed to our curriculum (Table 1). Statistical significance was not reached, likely due to the small sample size.

**CONCLUSIONS:** Opportunistic learning is insufficient to master skills in a novel topic area. This curriculum, based on best practices from the medical education literature, provides a more effective model for teaching and learning in Child Maltreatment.

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### 35 ATTITUDES AND OPINIONS OF PEDIATRIC PHYSICIANS REGARDING DECISIONS TO WITHDRAW OR WITHHOLD MEDICALLY-PROVIDED HYDRATION OR NUTRITION

*M Belletrutti, D Spady, E Tsai, D Davies
Paediatrics, University of Alberta, Edmonton, Alberta

**BACKGROUND:** The American Academy of Pediatrics and the Canadian Paediatric Society (CPS) have both recently published guidelines for clinicians contemplating the withholding or withdrawing of medically-provided hydration and nutrition (MPN) from their patients. Despite this and other guidance, these decisions remain controversial. Minimal published research exists that explores the attitudes and approaches of clinicians in everyday practice who are to make these decisions.

**OBJECTIVES:** The primary objective of this study was to explore attitudes and opinions of paediatric physicians and residents that influence decisions to withdraw or withhold tube-feeding, parental nutrition or intravenous hydration. A secondary objective was to identify clinical and practitioner factors that influence these decisions.

**DESIGN/METHODS:** A web-based survey was designed based on key issues identified through literature review and discussion with experienced practitioners involved in the care of children with serious or terminal medical conditions. Face and content validity was assessed through multiple pilot surveys and in-depth input from the CPS Bioethics Committee. The final survey was distributed electronically to CPS physician members, Paediatric Critical Care Physicians (PCCM), and Paediatric Hematology/Oncology/Palliative Care Physicians (H/O/P).

**RESULTS:** Sixty surveys were completed with the majority from H/O/P (25, response rate: 24%) and PCCM (15, response rate: 18%). Forty-nine respondents (88%) had previous experience with withdrawing or withholding MPN across a variety of conditions. Respondents felt that both medically-provided hydration and nutrition were medical treatments (86% and 89%), that withdrawal of either was ethically permissible (92% and 93%) and that they should be separately addressed during discussions about withdrawal of life-sustaining therapies (78%). However, fewer respondents felt MPN was ethically equivalent to other life-sustaining therapies (56%) and most respondents felt greater discomfort with withdrawal of MPN (63%). Factors that contributed to greater discomfort included: the influence of personal beliefs, previous clinical experiences and own emotional comfort. A minority of respondents knew of existing guidelines on the withdrawal of MPN (23%).

**CONCLUSIONS:** Most respondents were paediatric subspecialists who are most likely to encounter withdrawal of MPN on a regular basis. Response rate was too low to draw valid conclusions for other paediatric disciplines. Several personal and clinical factors were identified which make decisions around withdrawal of MPN more difficult compared to other life-sustaining therapies. These factors should be considered when designing guidelines and education strategies to aid practitioners in addressing this issue.

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**Abstracts**

**34 EFFECTS OF EARLY NUTRITION IN THE PREVENTION OF ALLERGIC DISEASE: PRACTICES OF GENERAL PEDIATRICIANS AND DIETITIANS IN ATLANTIC CANADA**

*A Haynes, S Leo, E Chan, L Newhook
Department of Pediatrics, Memorial University of Newfoundland, St John's, Newfoundland

**BACKGROUND:** Recent studies suggest maternal elimination diets and delayed introduction of commonly allergenic foods (e.g., cow's milk, egg, peanut protein) beyond four to six months of age do not reduce the risk of allergic disease in children. There are no recent Canadian guidelines on allergy prevention and early nutrition. Understanding the current practices of healthcare providers related to early nutrition in the prevention of allergic disease is important to develop best practice guidelines.

**OBJECTIVES:** To determine how general pediatricians and dietitians in Atlantic Canada counsel families regarding early nutrition as a means of preventing allergic disease.

**DESIGN/METHODS:** In 2010 a 14-question survey was mailed to 107 general pediatricians and emailed to 1029 dietitians in Atlantic Canada. Respondents were asked a series of questions regarding their recommendations to families about early nutrition as a way to prevent allergic disease. Responses were analyzed together and selected responses were compared to a similar study recently completed in British Columbia.

**RESULTS:** Survey responses were received from 57 (53%) general pediatricians and 44 (4%) dietitians. During pregnancy, most respondents never advise mothers to abstain from consuming peanut products (68%), with the remainder advising peanut elimination diets. Most (60%) do not counsel mothers to avoid allergenic foods during breastfeeding. 50% make this recommendation for infants at risk of allergic disease and 2% to all mothers. Specifically, 60% never recommend mothers abstain from consuming peanut during breastfeeding. Only one third advise breastfeeding as a way to prevent the development of atopic dermatitis. Survey respondents recommend delayed introduction of cow's milk (44%), egg (56%) and peanut protein (78%) after one year of age for infants not at risk of allergic disease.

More respondents recommend delayed introduction of cow's milk (62%), egg (80%) and peanut protein (90%) beyond one year of age for infants at risk of allergic disease. A higher portion of practitioners in British Columbia never advise abstaining from peanut during pregnancy (95%) and more advise breastfeeding to prevent atopic dermatitis (75%).

**CONCLUSIONS:** This study outlines the variations in practices of general pediatricians and dietitians with respect to early childhood nutrition in the prevention of allergic disease. Some survey respondents continue to recommend maternal elimination diets and delayed introduction of commonly allergenic foods despite a recent growing body of evidence suggesting against these recommendations. Variations in practice highlight the need for Canadian evidence based guidelines and subsequent education on allergy prevention.

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**18A Paediatr Child Health Vol 17 Suppl A June/July 2012**

### 18A Paediatr Child Health Vol 17 Suppl A June/July 2012
36
THE STATUS OF PRIMARY CARE IN CANADA AFTER REFORMS: LACKING IN PERFORMANCE INCENTIVES FOR CHILDREN

*P Li, S Glazer, JF Reissman, A Guttmann
Division of General Pediatrics, Montreal Children’s Hospital, McGill University Health Centre, Montreal, Quebec

BACKGROUND: Primary care is the foundation of all health systems. Children who have access to primary care services experience better overall health outcomes and less inappropriate acute health services use. Over the past decade, primary care in Canada has undergone major reforms to improve accessibility, continuity, coordination, and comprehensiveness of services. Performance incentives intended to encourage physicians to provide better quality of care, such as financial compensation and public reporting, are a key component of reform initiatives. However, it is not known the extent to which these incentives apply to children and their quality of care.

OBJECTIVES: For all provinces and territories in Canada, characterize the performance incentives for primary care of children.

DESIGN/METHODS: We conducted a policy analysis of primary care structures and physician payments drawing from documents published on websites of governments, government agencies, and professional associations as well as semi-structured interviews with key informants from each jurisdiction (including pediatricians, family physicians).

RESULTS: Primary care reforms have introduced inter-professional teams of care, more widely adopted in some provinces (e.g., Quebec, Ontario) than others (e.g., Manitoba, Newfoundland). No reform initiatives currently offer incentives to ensure that all children have access to primary care physician services. Some provinces target access to care for vulnerable children. For example, additional payments are available for visits of children 0-5 years old in Quebec and Saskatchewan. Most provinces (except Newfoundland and PEI) offer additional remuneration for the care of children with pre-specified chronic diseases. However, the flat fees do not account for the varying complexity of children in the latter group. In provinces with pay for performance to incentivize aspects of primary care, very few are aimed at children. Only one performance indicator (immunization rates) relates to children in Ontario, whereas in Manitoba, three out of 40 quality indicators apply to children >12 years old (obesity screening, physical activity, smoking cessation). While most provinces have published health quality indicator reports within the past ten years, only a few have mechanisms to produce regularly updated statistics (Manitoba, Saskatchewan, Alberta) and few measures relate to kids.

CONCLUSIONS: Although some performance incentives exist for the primary care of children, it is unclear whether they are appropriately incentivizing physicians caring for Canadian children, especially those beyond the early years and with multi-system complex chronic conditions. Current performance incentives largely focusing on adult care may inadvertently compromise care of children – future research will examine incentives as they relate to child outcomes.

37
FEASIBILITY STUDY ON THE MODEL SCHOOLS PEDIATRIC HEALTH INITIATIVE PILOT PROGRAM

*S Freeman, M Sgro, K Thorpe, A Vandermorph, M Mamdani
Pediatrics, St Michael’s Hospital, Toronto, Ontario

BACKGROUND: Canadian inner city children face barriers to accessing health care including transportation, cultural and linguistic barriers. The school system represents an innovative access point for these children to receive health care.

OBJECTIVES: This retrospective chart review assesses the feasibility of a school-based health centre (SBHC) established at a Canadian inner-city elementary school. The primary aim was to determine usage of the SBHC, and to establish why families chose to utilize the SBHC. Secondary aims were to assess new diagnoses and treatment plans established at the SBHC. Interim results are shown for the first five months of the program.

DESIGN/METHODS: Inclusion criteria: All students at the inner-city elementary school (Jk-grade 6) and their siblings (ages zero to 12 years) who are enrolled at the SBHC. Additionally, all infants and preschool aged children attending the on-site Parenting and Family Literacy Centre who enrolled at the SBHC.

RESULTS: 270 children enrolled at the clinic and 83 children attended the clinic. 87% of clinic visits were for students, 11% of visits were for siblings and 4% were for children from the literacy centre. 87% of clinic users were South Asian and 96% did not speak English as their primary language. 80% of clinic users had a total family annual income of <$30,000. Previously, 78% of clinic users used a family doctor, 14% used a walk in clinic and 4% did not have primary health care. 57% of parents chose to use the SBHC because they felt more comfortable seeing a doctor at school, 33% chose the clinic because it was convenient and 10% chose the clinic because they did not have a family physician. The most common presenting complaints were acute medical problems (77%). 15% of children presented with school problems. The most common diagnoses were upper respiratory infection (24%) and gastroenteritis (10%). A developmental or behavioural diagnosis was made in 9% of children. The most common intervention was health counselling (38%) and reassurance (29%). A prescription was given to 28% of children. 22% of children were referred to a pediatric sub specialist.

CONCLUSIONS: Interim results indicate that the SBHC is feasible. By being at the school, paediatricians can perform medical and developmental assessments on site therefore eliminating many of the barriers to accessing health care. Further, being in the school allows paediatricians to work and communicate directly with teachers and school support teams so that each can gain a better understanding of the child.

38
HEALTH RELATED QUALITY OF LIFE FOR TEENS WITH ASD: APPLICATION OF A MODIFIED ICF MODEL OF FUNCTIONING AND DISABILITY

*BG Clark, C Koning, JM Magill-Evans
Pediatrics, University of Alberta, Edmonton, Alberta

BACKGROUND: Research in Autism Spectrum Disorder (ASD) has not examined parent’s perceptions of their teen’s Health Related Quality of Life (HRQoL) within the framework of a modified version of the International Classification of Functioning, Health and Disability (ICF) (McDougall et al., 2010). This framework offers a unique perspective to guide consideration of HRQoL.

OBJECTIVES: 1. Examine mother-reported HRQoL. 2. Use the modified ICF to examine factors affecting HRQoL

DESIGN/METHODS: Twenty mothers of teens with ASD (Mean age=15 years) gave consent to participate in the ethics approved study. The parent proxy Kidscreen-52 measure (Ravens-Sieberer et al., 2006) was used to examine perceptions of teen HRQoL. A 30-60 minute semi-structured telephone interview addressed services and supports received and factors that had the biggest impact on the teen’s quality of life. Interviews were transcribed verbatim, coded for content analysis and entered into a data management program (NVivo9).

RESULTS: Mean HRQoL scores reported by mothers were within one standard deviation of the normative mean for all subscales except for Moods/Emotions, Social Support/Peers, and Social Acceptance. The family was an essential part of the environment. Parents’ ability to advocate for and identify supports linked to functional impairments provided access to government programs that funded community and school supports. Most teens received support during their education. Several mothers felt this had a great impact on HRQoL, although some teens wanted minimal support so they could be normal. Support for participation in community outings or staying with respite families played a positive role in both teens’ and families’ HRQoL. Mothers mentioned the importance of other parents or community members that helped with decision making, finding information, and getting support. Living in a supportive community that was accepting of their child was important. Developmental issues as teens transition to adulthood were evident in mothers’ concerns about their teen’s future. Some teens had work or life style goals that mothers identified as unrealistic while others had goals that would require significant support to reach.

CONCLUSIONS: These results differ from research with parents of younger children with ASD which indicated a significantly lower HRQoL.
39 DEFINING THE NEURODEVELOPMENTAL PROFILE OF CHILDREN WITH PRENATAL SOLVENT EXPOSURE
*C Bulman, A Hanlon-Deaum, T Benoit
Faculty of Medicine, University of Manitoba, Winnipeg, Manitoba
BACKGROUND: Organic solvents are inexpensive and commonly available substances of abuse that are found in accessible items such as spray paint, lacquer and glues, and which are often abused by young people in poverty. More than 50% of solvent abusers are women in their childbearing years and up to 12,000 pregnant women each year abuse inhalants. Solvents are highly lipophilic and can cross the placenta resulting in fetal exposure. Case reports have suggested that children exposed in utero to solvents have developmenal and/or physical features similar to those seen in children with a diagnosis of Fetal Alcohol Spectrum Disorder. There are few community based therapies and supports specifically targeting children with prenatal solvent exposure.

OBJECTIVES: The objective of this study was to review a large clinical cohort of solvent exposed children with regards to dysmorphology, medical comorbidity and neurodevelopmental characteristics in order to consoli-date their clinical profile and diagnostic characteristics.

DESIGN/METHODS: This is a retrospective quantitative and qualitative chart review based on an 11-year clinical dataset kept at the Manitoba FASD Centre. In total 169 charts were reviewed where solvent exposure was confirmed. Quantitative data recorded include type of exposure, complications, dysmorphic features, growth parameters, and associated diagnoses. Qualitative clinical descriptions were recorded under each of the 9 brain domains as defined by the Canadian Guidelines for FASD Diagnosis and clinically used at the Manitoba FASD Centre.

RESULTS: Sixty-seven percent of solvent exposed children had cognitive delays, and over 60% had an expressive and receptive language delay. Dysmorphology, medical comorbidity, and metabolic abnormalities in this group are described. This study details the neurodevelopmental profile including the significant behavioural comorbidity, sensory processing deficits, executive functioning deficits, and adaptive delays resulting from prenatal solvent exposure.

CONCLUSIONS: This study describes in detail the developmental and behavioural profile of children with prenatal solvent exposure. This study is the largest clinical cohort of solvent exposed children described to date. The results of this study support the use of the diagnostic term Fetal Solvent Syndrome (FSS) and recommend it be used by clinicians in advocating for this severely affected and vulnerable group of children.

40 CONCUSSION IN CHILDREN AND YOUTH: TRACKING THE TRENDS IN A PEDIATRIC ABI PROGRAM
*J Gray, S Somers, P Frid
PABICOP, Thames Valley Children’s Centre, London, Ontario
BACKGROUND: Concussion referrals to the Pediatric Acquired Brain Injury Community Outreach Program (PABICOP) have increased substantially over the past several years. The PABICOP program follows children and youth with acquired brain injury and implements a needs-based multidisciplinary approach to support the physical, educational, and psychosocial needs of the child and family. As part of an ongoing research project, concussion referrals have been tracked with regard to demographic and recovery process, revealing interesting age and gender trends in both rates of concussion and complexity of the recovery process.

OBJECTIVES: This poster will present current data from our research and will highlight the unique aspects of concussion for children and adolescents and their families, including the impact on school performance and psychosocial wellbeing. We will also outline factors that may be related to more complex and protracted concussion recovery, and describe the multi-disciplinary management principles employed by PABICOP to support clients and their families.

DESIGN/METHODS: An ongoing retrospective chart review of all concussion referrals received by the program since September 1, 2007 to the present has been conducted to obtain demographic data, as well as information regarding number and duration of symptoms reported, and the amount and nature of client contact with our program.

RESULTS: Chart review to date has identified that the proportion of concussion referrals to PABICOP has increased to 48% of all referrals. Findings have been in line with previous research in that a higher number of males than females sustain concussions. In addition, the incidence of complex recovery from concussion is higher in adolescents, particularly for female teens, based on number and duration of reported symptoms. More specifically, the 13-18 year old age group of both genders sustained concussions more frequently and had a more complicated course of recovery. Females in this age group had the highest percentage of complex and long-term concussion sequelae, requiring ongoing and multidisciplinary intervention.

CONCLUSIONS: Sustaining a concussion during adolescence can have a multi-faceted impact on the youth and family. Review of the data from clients of the PABICOP program indicates that despite more males than females sustaining concussions in all age groups, ongoing and complex sequelae are more prominent among the 13-18 year old age group overall and especially for females within this age group. Understanding trends in the data allows program staff members to provide a more informed and proactive multidisciplinary approach to supporting these families. This investigation also adds to information regarding the unique aspects of concussion for children and adolescents, and the complexities often involved in supporting this client group.

41 EXTERNAL VALIDATION OF SCORING INSTRUMENTS TO EVALUATE PEDIATRIC RESUSCITATIONS
*A Levy, A Donoghue, B Bailey, N Thompson, O Jamouille, J Gravel
Division of Emergency Medicine, Department of Pediatrics, Centre hospitalier Sainte-Justine, Montreal, Quebec
BACKGROUND: Many scoring instruments have been described to capture clinical performance during resuscitation; however, the validity of these tools has yet to be proven in pediatric resuscitation.

OBJECTIVES: To determine the external validity of published scoring instruments (Donoghue et al, 2010) to evaluate clinical performance during simulated pediatric resuscitations using PALS (Pediatric Advanced Life Support) algorithms and to determine if inter-rater reliability could be assessed.

DESIGN/METHODS: This was a prospective quasi-experimental design performed in a simulation lab of a pediatric tertiary care facility. Participants were residents from a single pediatric program distinct from where the instrument was originally developed. A total of 13 PGY1’s and 11 PGY3’s were videotaped during five pediatric resuscitation simulated scenarios. Pediatric emergency physicians rated resident performances before and after a PALS course using standardized scoring. Each video recording was viewed and scored two raters blinded to one another. A priori, it was determined that for the scoring instrument to be valid, participants should improve their score after participating in the PALS course. Differences in means between pre-PALS and post-PALS and PGY1 and PGY3 were compared using an ANOVA test. To investigate differences in the scores of the two groups over the five scenarios, a two factor ANOVA was used. Reliability was assessed by calculating an interclass correlation coefficient for each scenario.

RESULTS: Following the PALS course, scores improved by 8.6% (3.8%-13.3%), 15.7% (8.6%-22.7%), 6.3% (-1.8%-14.3%), 18.2% (9.3%-27%), 4.1% (-3.0%-11.2%) for the pulseless non-shockable arrest, pulseless shockable arrest, dysrhythmia, respiratory, and shock scenarios, respectively. There were no differences in scores between PGY1’s and PGY3’s before and after the PALS course. The ICCs demonstrated excellent reliabilities for the pulseless non-shockable arrest 0.95 (0.74-0.92), pulseless shockable arrest 0.98 (0.96-0.99), dysrhythmia 0.92 (0.87-0.96), respiratory 0.97 (0.95-0.98), and shock 0.94 (0.90-0.97) scenarios, respectively.
CONCLUSIONS: The scoring instrument was able to demonstrate significant improvements in scores following a PALS course for PGY1 and PGY3 pediatric residents for the pulseless non-shockable arrest, pulseless shockable and respiratory arrest scenarios only. However, it was unable to discriminate between PGY1’s and PGY3’s both before and after the PALS course for any scenarios. The scoring instrument showed excellent inter-reliability for all scenarios.

42 DELAYS AND ERRORS AMONG PEDIATRIC RESIDENTS DURING SIMULATED RESUSCITATION SCENARIOS USING PALS ALGORITHMS

*A Levy, M Labrosse, A Donoghue, J Gravel
Division of Emergency Medicine, Department of Pediatrics, Centre hospitalier Sainte-Justine, Montreal, Quebec

BACKGROUND: Recent data suggest alarming delays and deviations in major components of pediatric resuscitation during simulated scenarios by pediatric housestaff.

OBJECTIVES: To identify the most common errors of pediatric residents during multiple simulated pediatric resuscitation scenarios.

DESIGN/METHODS: A retrospective observational study was conducted in an academic tertiary care hospital. Participants were all pediatric residents (PGY1 and PGY3) from the same center. They were videotaped performing a series of five pediatric resuscitation scenarios using a high-fidelity simulator (Simbaby, Laerdal): pulseless non-shockable arrest, pulseless shockable arrest, dysrhythmia, respiratory arrest and shock. The primary outcome was the presence of significant errors prospectively defined using a validated scoring instrument designed to assess sequence, timing and quality of specific actions during resuscitations based on the 2005 AHA PALS guidelines. Residents’ clinical performances were measured by a single video reviewer. The primary analysis was the proportion of errors for each critical task for each scenario. It was estimated that the evaluation of each resident would provide a confidence interval smaller than 0.20 for the proportion of errors.

RESULTS: Twenty-four of 25 residents completed the study. Across all scenarios, pulse check was delayed by more than 30 seconds in 56% (95% CI: 46-66%). For non-shockable arrest, CPR was started more than 30 seconds after recognizing arrest in 21% (95% CI 7-42%) and inappropriate defibrillation was performed in 29% (95% CI: 13-51%). For shockable arrest, participants failed to identify the rhythm in 58% (95% CI 37-78%), CPR was not performed in 25% (95% CI: 10-47%) while defibrillation was delayed by more than 90 seconds in 33% (95% CI 16-51%) and not performed in one case. For shock, participants never asked for a rapid dextrose check in 71% (95% CI 51-86%), and it was delayed by more than 60 seconds for all others.

CONCLUSIONS: The most common error across all scenarios was a delay in pulse check. Delays in starting CPR and inappropriate defibrillation were common errors in non-shockable arrests, while failure to identify the rhythm, CPR omission and delaying defibrillation were noted for shockable arrests. For shock, omission of rapid dextrose check was the most common error, while delaying the test when ordered was also significant. Future training in pediatric resuscitation should target these errors.

43 VALIDITY OF THE CANADIAN TRIAGE AND ACUITY SCALE FOR CHILDREN: A MULTI-CENTRE, DATABASE STUDY

Centre hospitalier Sainte-Justine, Université de Montréal, Montréal, Quebec

BACKGROUND: The Canadian Triage and Acuity Scale (CTAS) is a five-level triage tool constructed from a consensus of experts.

OBJECTIVES: To evaluate the validity of the Canadian Triage and Acuity Scale (CTAS) for children visiting multiple paediatric Emergency Departments (ED) in Canada.

DESIGN/METHODS: This was a retrospective study evaluating all children presenting to eight paediatric, university-affiliated EDs during one year in 2010-2011. In each setting, information regarding triage and disposition were prospectively registered by clerks in the ED database. Anonymized data were retrieved from the ED computerized database of each participating centre. In the absence of a gold standard for triage, hospitalisation, admission to intensive care unit (ICU), length of stay in the ED and proportion of patients who left without being seen by a physician (LWBS) were used as surrogate markers of severity. The primary outcome measure was the association between triage level (from one to five) and hospitalisation. The association between triage level and dichotomous outcomes was evaluated by a Chi-square test while a Student’s t test was used to evaluate the association between triage level and length of stay. It was estimated that the evaluation of all children visiting these EDs for a one year period would provide a minimum of 1,000 patients in each triage level and at least 10 events for outcomes having a proportion of 1% or more.

RESULTS: A total of 404,841 children visited the eight EDs during the study period. Pooled data demonstrated hospitalisation proportions of 59%, 30%, 10%, 2% and 0.5% for patients triaged at level 1, 2, 3, 4 and 5, respectively (p<0.001). There was also a strong association between triage levels and admission to ICU (p<0.001), the proportion of children who LWBS (p<0.001) and length of stay (p<0.001).

CONCLUSIONS: The CTAS is a valid triage tool as demonstrated by its good correlation with markers of severity.

44 DOES PELVIC ULTRASOUND LEAD TO A SIGNIFICANT DELAY IN MANAGEMENT OF ACUTE PEDIATRIC APPENDICITIS?

*J Gregory, R Lim, S Van Osch, T Andrusiak, S Mekhael, G Joubert, N Poonai
Schulich School of Medicine & Dentistry, University of Western Ontario, London, Ontario

BACKGROUND: Appendicitis is the most common condition requiring urgent abdominal surgery. Early appendectomy is instrumental in avoiding complications, as the risk of perforation is proportional to the delay in diagnosis. Younger children often pose a diagnostic dilemma due to non-specific symptoms, which often results in delayed diagnosis. The liberal use of ultrasound for the workup of suspected appendicitis in children is now the standard of care. Currently there are no large studies quantifying the delay in definitive management caused by ultrasound.

OBJECTIVES: The objective was to investigate whether or not a diagnostic ultrasound is associated with a clinically significant delay in time to appendectomy.

DESIGN/METHODS: This study involved a retrospective case-controlled chart review to compare time to appendectomy in children aged 0-17 years who did or did not receive an ultrasound. The study included all children who presented to the pediatric emergency department (ED) from 2000-2010 with a discharge diagnosis of appendicitis. The primary outcome variable was the time interval from initial assessment by an emergency physician until appendectomy. Secondary outcome variables included the frequency of appendicitis-related complications (sepsis, abscess, or perforation). Statistical analysis was performed using SPSS version 19. Univariate statistics were used to describe demographic variables. The Student’s t test was used to compare the primary outcome variable means between the two groups of patients, a Chi Square analysis was used to compare categorical dependent and independent variables, and a significance level of 5% was chosen.

RESULTS: A total of 332 patients (66% male) were included in this interim analysis. Patients ranged in age from 20 months to 17 years. All patients presented with abdominal pain and 37% presented with a fever. Two hundred nine patients (63%) received an US. The proportion of children with US performed was significantly greater in females (77%) compared to males (57%), (X²=12.9, p<0.001). The frequencies of perforation, abscess, and shock were 54/332 (16%), 13/332 (4%), and 1/332 (0.3%), respectively. There were no significant associations between the frequency of complications and whether or not the child received an ultrasound. The time to appendectomy from initial assessment by an ED physician was significantly greater in patients who received an US (11.6 hours) compared to those who did not (7.2±5.5 hours), t=5.8, p<0.001, unequal variances assumed (CI: 2.5,5.1).
CONCLUSIONS: In conclusion, this study has shown that in children with a discharge diagnosis of appendicitis from the ED, an US is associated with a significantly increased time to appendectomy but does not seem to be associated with an increase in appendicitis-related complications.

45 EVALUATION OF A CLINICAL DEHYDRATION SCALE IN CHILDREN REQUIRING INTRAVENOUS REHYDRATION
*S Kinlin, S Freedman
Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia

BACKGROUND: Gastroenteritis treatment guidelines employ goal directed therapy, with recommendations based on dehydration severity. Although clinical dehydration scales (CDS) are available, attempts employing formal methodology have been limited.

OBJECTIVES: Our primary objective was to prospectively evaluate inter-observer reliability of a CDS in a cohort of children with dehydration secondary to gastroenteritis using independent, simultaneous, blinded assessments.

DESIGN/METHODS: Participants were 226 children 23 months of age who presented to an emergency department and required intravenous rehydration. Reliability was assessed at treatment initiation by comparing the scores assigned by a trained research nurse and a physician. Criterion validity was assessed using percent weight gain as a proxy for percent dehydration. Construct validity was evaluated using parameters reflective of dehydration severity: (1) number of episodes of vomiting and diarrhea prior to presentation, (2) respiratory rate, (3) capillary refill, (4) bicarbonate, (5) pH, (6) physician dischargeability Likert score, and (7) length of stay. Discriminative validity was explored for the outcome of hospitalization.

RESULTS: Forty-one per cent of subjects had moderate to severe dehydration (CDS score ≥5). Inter-observer reliability was moderate (weighted kappa=0.52; 95% CI 0.41, 0.63) for the total score. Reliability was similar for children <36 and ≥36 months (kappa=0.51, 95% CI 0.40, 0.65 and 0.53, 95% CI 0.27, 0.68, respectively). Kappa coefficients for individual elements of the CDS were lower: eyes=0.32 (95% CI 0.21, 0.43), mucous membrane=0.38 (95% CI 0.26, 0.50), tears=0.40 (95% CI 0.27, 0.51), and general appearance=0.49 (95% CI 0.35, 0.62). There was no correlation between score and percent weight gain, (Spearman correlation coefficient=−0.04; 95% CI −0.19, 0.10). The strongest correlations related to construct validity were between CDS scores and bicarbonate (Pearson correlation coefficient=−0.35; 95% CI −0.46, −0.22) and length of stay (Pearson correlation coefficient=0.24; 95% CI 0.11, 0.36). Discriminative ability for the outcome of hospitalization, had an area under the ROC curve=0.65 (95% CI 0.57, 0.73). Test characteristics were optimal using a cut-point of ≥5: sensitivity=62% (95% CI 48, 75), specificity=66% (95% CI 53, 73), positive likelihood ratio=1.8 (95% CI 1.3, 2.4), and negative likelihood ratio=0.59 (95% CI 0.41, 0.84). When evaluated using the CDS scores at 2 and 4 hours, the area under the curve was 0.70 (95% CI 0.62, 0.78) and 0.72 (95% CI 0.64, 0.80), respectively.

CONCLUSIONS: In a cohort of children requiring intravenous rehydration secondary to gastroenteritis, the CDS exhibited moderate inter-observer reliability and limited criterion, construct and discriminatory validity. It should not be used in isolation to determine the management of children with dehydration.

46 PREDICTORS OF SUCCESSFUL EMERGENCY DEPARTMENT DISCHARGE OF CHILDREN WITH GASTROENTERITIS REQUIRING INTRAVENOUS REHYDRATION
*S Freedman, J DeGroot, PC Parkin
Child Health Evaluation Sciences, The Hospital for Sick Children Research Institute, Toronto, Ontario

BACKGROUND: Although most children with gastroenteritis administered intravenous rehydration are discharged home, there is little evidence available to guide clinicians when making disposition determinations.

OBJECTIVES: Our primary objective was to identify, amongst children discharged to home, predictors of an ED revisit within seven days. Secondary objectives were to assess the association between metabolic acidosis and (a) successful oral rehydration; (b) hospitalization; and (c) successful discharge.

DESIGN/METHODS: Data were prospectively collected on 226 children, aged >3 months, treated with intravenous rehydration for dehydration secondary to gastroenteritis. On days 3 and 7, a research nurse telephoned the family and asked, using a standardized script, whether the child had returned to an ED, had received intravenous fluid treatment or had been hospitalized. Acidosis was defined by a serum bicarbonate level of ≤16 mmol/L. Successful discharge was defined as discharge at the index visit and the absence of a repeat visit requiring intravenous rehydration.

RESULTS: Seventy-seven per cent (174/226) of patients were discharged, three were lost to follow-up, and 30 (18%) had a revisit. In regression analysis, ED revisits were most strongly associated with a lack of primary care provider access (OR 14.5; 95% CI: 1.4, 152.2). Amongst discharged children, those with and without a metabolic acidosis were equally likely to have a revisit (8/46 (17%) vs. 22/125 (17%); P=0.96). Although those with a baseline acidosis were more likely to be hospitalized at the index visit (29/76 (38%) vs. 23/149 (15%); P=0.02), regression analysis identified only two independent predictors of successful discharge: volume of intravenous fluids administered (OR: 0.84/10 ml increase; 95% CI 0.76, 0.93; P<0.08), and baseline dehydration scale score (OR: 0.75; 95% CI 0.58, 0.97; P<0.01).

CONCLUSIONS: Among children with gastroenteritis requiring intravenous rehydration who were discharged home, the absence of a primary care provider was associated with unscheduled ED revisits. Metabolic acidosis was not independently associated with ED revisits or successful discharge.

47 RANDOMIZED TRIAL OF STANDARD VS LARGE VOLUME SALINE BOLUS ADMINISTRATION ON SERUM SODIUM IN PEDIATRIC GASTROENTERITIS
*S Freedman, D Geary
Paediatrics, The Hospital for Sick Children, Toronto, Ontario

BACKGROUND: In children who are volume depleted, experts recommend isotonic bolus fluid therapy, in doses ranging from 20-60 ml/kg. However, the impact of large volume bolus rehydration in children with non-osmotic ADH secretion is unknown.

OBJECTIVES: This study’s objective was to assess the risk, in children with gastroenteritis and dehydration, of developing hyponatremia when 0.9% saline large volume bolus fluid rehydration therapy is administered.

DESIGN/METHODS: Data was prospectively collected on a cohort of children randomized to receive 60 or 20 ml/kg of intravenous rehydration over 1 hour. All children subsequently received 0.9% saline at a maintenance rate for 3 hours. Serum biochemical tests were performed at baseline and repeated at 4 hours. A change in plasma sodium of ≥2 mmol/L was considered to be biochemically significant. A variable (hyponatremia predictor) was created by multiplying urine osmolality, urine sodium, and serum sodium values.

RESULTS: Sixty-two of 224 (27%) participating children were hyponatremic at baseline. At 4 hours, 28 of 217 (13%) with repeat samples were hyponatremic. Children who received 60 ml/kg experienced a larger mean increase (1.6±2.4 mmol/L vs. 0.9±2.2 mmol/L; P=0.04) and were less likely to experience a significant sodium decrease (8/112 vs. 17/105; P=0.04) than those administered 20 ml/kg. A variable combining urine sodium, osmolality and serum sodium was able to identify children who experienced a significant decrease in serum sodium with an area under the receiver operating characteristic curve of 0.72 (95% CI: 0.56, 0.87) and likelihood ratio positive of 1.8 (95% CI: 1.3, 2.6).

CONCLUSIONS: Large volume bolus rehydration therapy with 0.9% saline is safe. It does not promote the development of hyponatremia over the short term, but hastens the resolution of baseline hyponatremia.
48  
ETIOLOGY OF BACTERIAL MENINGITIS IN CHILDREN PRE AND POST INTRODUCTION OF PNEUMOCOCCAL AND MENINGOCOCCAL VACCINES

*C Corriiveau-Bourque, D Hartfield, J Robinson  
Pediatrics, University of Alberta, Edmonton, Alberta

BACKGROUND: Bacterial meningitis is an important infectious cause of morbidity and mortality worldwide. Before the routine use of conjugated pneumococcal and meningococcal vaccines in infancy, Streptococcus pneumoniae and Neisseria meningitidis were the leading causes of bacterial meningitis in Canadian children. Pneumococcal (7-valent) and meningococcal serotype C vaccines were implemented into our province’s routine infant immunization schedule in 2002. Epidemiological studies in Canada and worldwide have demonstrated a decrease in the incidence of invasive pneumococcal and meningococcal disease after vaccine implementation; however, a rise in the incidence of invasive disease due to pneumococcal non-vaccine serotypes was also observed.

OBJECTIVES: The purpose of our study was to describe the impact that routine use of these two vaccines had on the epidemiology of pediatric bacterial meningitis at our institution.

DESIGN/METHODS: Children 0-17 years of age admitted to our institution from January 1, 1998 to December 31, 2010 with a diagnosis of bacterial meningitis were identified by the medical records department after ethics board approval. Exclusion criteria included immunodeficiency, premature infants still in NICU, CNS foreign material, or meningitis within four weeks of neurosurgery or hospitalization for a head trauma. Hospital charts were retrospectively reviewed for demographics, exposure variables, diagnostic measures and outcome data. Data analysis was performed using SPSS software.

RESULTS: In total, 125 children fit the study criteria. The average number of cases annually in the pre-vaccine era was 10.2 (SD 2.17) and in the post-vaccine era was 9.25 (SD 2.38) (p=0.48.) The mean annual number of cases of S. pneumoniae in the pre-era was 5.4 (SD 1.26) and post era was 3.0 (SD 1.69) (p=0.018.). There was an increase in organisms other than S. pneumoniae in the post era as compared to the pre era (p=0.035.) There was a statistically significant decrease in the number of cases of pneumococcal vaccine serotypes in the post-era vs the pre-era (p=0.037.) N. meningitidis was a relatively infrequent cause of meningitis in our institution and all three cases were serotype B. There were no vaccine failures.

CONCLUSIONS: It appears that the pneumococcal vaccine is changing the epidemiology of bacterial meningitis with a decrease in the cases of S. pneumoniae. We are not yet seeing the significant rise in S. pneumoniae non-vaccine serotypes that has been described in the literature. However, continued surveillance is required to monitor the impact of routine immunizations on invasive bacterial infections, including bacterial meningitis.

49  
FOETAL DEATH AND SHORT-LIVED LIVE BIRTH AT THE LIMIT OF VIABILITY IN A TERTIARY CARE CENTRE; COMPARISON OF TWO DIFFERENT EPOCHS OVER THE LAST DECADE

*M Landry, PG Davis  
Neonatology, Dalhousie University, Halifax, Nova Scotia

BACKGROUND: Foetal death rates may be under-reported and the causes of foetal and early neonatal deaths may be misclassified. Accepted borders of viability go down to 22 weeks of gestation in some countries around the world.

OBJECTIVES: To clarify the circumstances of foetal death and short-lived live birth in a tertiary care centre by describing and comparing end-of-life practice over time using uniform definitions of interventions.

DESIGN/METHODS: We studied all foetal deaths and deaths of babies in labour delivered between or after 22 weeks of gestation or with a weight of at least 400 g between 1st of January 2000 and December 31st 2002 (epoch 1) and between July 1st 2007 and June 30th 2010 (epoch 2). We classified foetal or neonatal deaths into eight distinct categories: congenital anomalies terminated during pregnancy with KCl or terminated via induction of labour; termination of pregnancy for obstetric reasons with KCI or via induction of labour; stillbirth diagnosed on mother’s arrival at hospital or that occurred after maternal admission; and born alive and comfort care at birth or born alive but failed resuscitation.

RESULTS: There were 203 and 297 deaths in epochs 1 and 2, respectively, representing 1.4% and 2.3% of the total deliveries for each epoch. There was a significant difference in the end-of-life practice over time despite having two demographically comparable populations. Overall practices, from epoch one to two, there was an increase in termination of pregnancy with KCl for congenital anomaly from 5% to 20% and a decrease in termination via induction for the same condition from 31% to 20%. However, the total rate of termination for congenital anomaly has not changed significantly (36% vs 42%). Termination for obstetric reasons remained stable at 1% with KCI and 4% via induction. Stillbirths accounted for the majority of death and did not change over time. 33-34% arrived dead while 10-13% were alive when the mother was admitted to hospital. 10-12% of babies had comfort care and passed away shortly after birth while 1-2% failed resuscitation.

CONCLUSIONS: In the last decade, the rate of foetal death and short-lived live birth increased slightly. Termination for congenital anomaly remained the second most common cause of death, but practice changed towards more KCI termination and less induction. Further studies are needed to see if this is an isolated change or a global trend and to understand the reasons for this change.

50  
THE SPATIAL MANIFESTATION OF SIDS IN ALBERTA, CANADA

*C Hansen, M Ruff, R Sauve, I Mitchell  
Paediatrics, University of Calgary, Calgary, Alberta

BACKGROUND: SIDS is still the leading cause of death in infants aged one month to one year. Identifying regions with higher than expected SIDS rates allows specific communities to be targeted, and understanding geographically based risk factors allow for more effective and focused prevention strategies.

OBJECTIVES: SIDS rates have fallen in Alberta over the past three decades. It is not known if this has occurred in all areas. The use of Geographic Information Systems (GIS) provides a visual depiction of SIDS prevalence and adds value by integrating census and health information for richer analyses. A GIS analysis of SIDS in Alberta’s two largest cities would permit the identification of spatial clusters of SIDS events, generating hypotheses about specific risk factors and vulnerable populations that predispose infants to die prematurely.

DESIGN/METHODS: We created a database after reviewing all sudden unexpected deaths in infancy identified by the Medical Examiner in Alberta from 1997-2007 inclusive. Some were classified as SIDS using a standard definition. We geo-coded this database and generated a digital GIS layer of SIDS collection points (n=1020). These events were aggregated to the census subdivision and census tract level to calculate a SIDS rate and explore spatial patterns. These data and corresponding Statistics Canada (2006) demographic variables of interest were mapped to visualize the spatial distribution pattern throughout Alberta and the two largest cities. Exploratory spatial data analysis was performed using the Moran’s I statistic and the Local Indicator of Spatial Association (LISA).

RESULTS: There was noticeable geographical variation in SIDS prevalence amongst the census tracts. Significant positive spatial autocorrelation was found, with significant clusters of high values or ‘hot spots’ of SIDS in areas with lower income.

CONCLUSIONS: The utilization of GIS techniques generates a better understanding of SIDS prevalence in cities, and reveals clusters possibly associated with specific high-risk indicators such as socioeconomic status. Parents in such clusters may benefit from targeted educational interventions.
51 TIMING OF SUDDEN INFANT DEATH SYNDROME IN TERM AND PRETERM INFANTS: 30 YEARS’ EXPERIENCE
*M Hicks, M Ruff, R Sauge, I Mitchell
Paediatrics, University of Calgary, Calgary, Alberta

BACKGROUND: Sudden infant death syndrome (SIDS) is the leading cause of post-neonatal mortality in Canada. The time to death between term and preterm infants may differ which may provide insight into the underlying pathophysiology.

OBJECTIVES: To describe patterns of SIDS in a geographic region over 30 years and determine whether there are differences between timing of SIDS in preterm and term infants.

DESIGN/METHODS: This is a population-based descriptive study of all Alberta SIDS deaths from 1977 to 2008. All sudden unexpected deaths in infancy are reported to the Medical Examiner, investigated fully and 1,841 (59.8% males) consistent with SIDS included in this analysis. Trends over three time periods were examined: 1977-1991, 1992-1999, and 2000 to 2008. Bivariate analyses were used to examine the association between GA and time of death.

RESULTS: Of the 1310 (72%) with GA available, 83 (6.3%), had GA <33 wks; 164 (12.5%), had GA 33-36 wks and 1,063 (81.2%), Had GA ≥37 wks. By 13 wks of age 57.3% of the overall group had died, 36% of <33 wks infants, 61.0% of 33 to <37 weeks infants and 58.3% in infants ≥37 wks (p<0.001). Infants <37 wks died at a chronological age (CA) and post-menstrual age (PMA) of 15.5 wks and 48.8 wks. infants at 13.7 wks and 53.3 wks (p<0.001). CA at death for term and preterm infants did not change over the time period. Differences between CA and PMA at death were consistent. At time of death preterm infants were 1379 g smaller than term infants (p<0.001). The SIDS rate per 1,000 live births was 6.3 for <33 wks infants, 61.0% of 33 to <37 weeks infants and 58.3% in infants ≥37 wks. By 13 wks of age 57.3% of the overall group had died, 36% of <33 wks infants, 61.0% of 33 to <37 weeks infants and 58.3% in infants ≥37 wks (p<0.001). Infants <37 wks died at a chronological age (CA) and post-menstrual age (PMA) of 15.5 wks and 48.8 wks. infants at 13.7 wks and 53.3 wks (p<0.001). CA at death for term and preterm infants did not change over the time period. Differences between CA and PMA at death were consistent. At time of death preterm infants were 1379 g smaller than term infants (p<0.001). The SIDS rate per 1,000 live births was 6.3 for infants <33 wks, 1.8 for infants 33 to <37 wks and 0.9 for infants ≥37 wks.

CONCLUSIONS: Age at death due to SIDS differs between term and preterm infants and preterm infants die at an older CA but younger PMA. The greater CA at death cannot be explained by time spent in the neonatal intensive care environment. The difference in time of death may provide insight into the underlying pathophysiology and further research is required to understand whether time at risk in the home environment is an important factor.

52 SERUM LEVELS OF INFLAMMATORY CYTOKINES IN PREGNANT WOMEN WHO SMOKE
*N Vair, M Kamaludddeen, J Tunnicliffe, A Akierman, K Yusuf
Division of Neonatology, Department of Pediatrics, University of Calgary, Calgary, Alberta

BACKGROUND: Cigarette smoking during pregnancy is associated with several adverse pregnancy outcomes. Paradoxically, women who smoke have a reduced risk of preeclampsia. The biological basis of this association has not been explained. Preeclampsia is associated with elevated levels of inflammatory cytokines.

OBJECTIVES: To determine serum levels of inflammatory cytokines in pregnant women who smoke.

DESIGN/METHODS: We prospectively analyzed serum levels of inflammatory cytokines in the second and third trimesters of normotensive mothers who smoked during their pregnancy and compared them to normotensive mothers who did not. Exclusion criteria include hypertension, autoimmune disorders, rupture of membranes, evidence of labour, fever and any significant medical illness. Cytokine levels were measured using Luminex xMAP technology for multiplex assay. For continuous variables, statistical analysis was performed using a two way non-paired Student t test or Mann Whitney U test as appropriate. χ² or Fisher’s exact test was used for categorical variables. Statistical significance was set at P <0.05.

RESULTS: Of the 1310 (72%) with GA available, 83 (6.3%), had GA <33 wks; 164 (12.5%), had GA 33-36 wks and 1,063 (81.2%), Had GA ≥37 wks. By 13 wks of age 57.3% of the overall group had died, 36% of <33 wks infants, 61.0% of 33 to <37 weeks infants and 58.3% in infants ≥37 wks (p<0.001). Infants <37 wks died at a chronological age (CA) and post-menstrual age (PMA) of 15.5 wks and 48.8 wks. infants at 13.7 wks and 53.3 wks (p<0.001). CA at death for term and preterm infants did not change over the time period. Differences between CA and PMA at death were consistent. At time of death preterm infants were 1379 g smaller than term infants (p<0.001). The SIDS rate per 1,000 live births was 6.3 for infants <33 wks, 1.8 for infants 33 to <37 wks and 0.9 for infants ≥37 wks.

CONCLUSIONS: Age at death due to SIDS differs between term and preterm infants and preterm infants die at an older CA but younger PMA. The greater CA at death cannot be explained by time spent in the neonatal intensive care environment. The difference in time of death may provide insight into the underlying pathophysiology and further research is required to understand whether time at risk in the home environment is an important factor.

53 FACTORS AFFECTING ADHERENCE TO A GLUTEN-FREE DIET IN CHILDREN WITH CELIAC DISEASE
*K MacCulloch, M Rashid
Dalhousie University, Halifax, Nova Scotia

BACKGROUND: The only treatment for celiac disease is strict, life-long adherence to a gluten-free (GF) diet. The GF diet is complex, costly and socially restrictive. Cross contamination can lead to complications including nutritional deficiencies such as anaemia and osteoporosis, development of other auto-immune disorders and malignancy.

OBJECTIVES: To determine serum levels of inflammatory cytokines in pregnant women who smoke. These cytokines may be involved in the reduced risk of preeclampsia seen in pregnant women who smoke.
severe. While the routine evaluations of speech and language in well-child visits during the toddler and preschool years are recommended, there is no standardized (office) approach to facilitate this. Furthermore, the long wait times for speech pathology consultation represents lost time for the child and family.

**OBJECTIVES:** To develop, with speech and language experts within the city public health department, a Preschool Speech and Language Tool for office-based use in families speaking either official languages or English as a Second Language to evaluate speech and language delays and provide practical interventions to initiate while awaiting services.

**DESIGN/METHODS:** Five common speech and language problems, articulation delays, motor speech impairment, disfluency (stuttering), voice disorders and receptive/expressive language delays were portrayed in visual format. A simple interim treatment regimen for these speech and language delays, as used by speech pathologists, was similarly constructed and depicted visually.

**RESULTS:** A simple visual tool to evaluate speech and language delays and a summary of practical “while you wait” (for services) interventions was developed in poster format and is presented for evaluation.

**CONCLUSIONS:** We believe this office tool represents an opportunity to provide guidance for practical interim treatment while waiting for speech therapy. The tool includes age specific phonology goals, word milestones, with examples, suggestions for multi-language homes, as well as types of delays and their recommended interventions. In combination with the CPS Read, Speak, Sing and Grow Literacy Initiative, pediatricians will be better positioned to enhance children’s speech and language capability.

55 **STRUCTURE OF PRIMARY CARE FOR CHILDREN: CROSS PROVINCIAL COMPARISONS**

*V Charest, *M Perreault-Samson, M Santschi
Pediatrie, Universite de Sherbrooke, Sherbrooke, Quebec

**BACKGROUND:** The bronchiolitis aigué virale (BA V) est très fréquente chez les enfants de moins de deux ans et il existe une grande variabilité dans son traitement.

**OBJECTIVES:** Nous avons décidé de décrire l'évolution de la prise en charge de la BA V dans notre institution au cours des dix dernières années ainsi que de vérifier l’adhérence aux recommandations de l’Académie Américaine de Pédiatr (AAP) publiées en 2006.

**DESIGN/METHODS:** Nous avons fait une étude de cohorte rétrospective sur le sujet des enfants de moins de deux ans avec une diagnostic clinique de BA V traités dans notre centre hospitalier entre janvier 1999 et mai 2008.

**RESULTS:** Deux mille cinq quarante-huit (2548) patients ont été évalués pour une BA V entre 1999 et 2008, totalisant 3245 visites. De ces visites, 1640 ont été traitées à l’urgence seulement et 1605 ont nécessité une hospitalisation. Les enfants hospitalisés étaient plus jeunes (5,9 vs 8,8 mois; p<0,001) et plus souvent fébriles (60 vs 37%; p<0,001), mais étaient moins porteurs de maladie chronique (25 vs 31%; p<0,05) que les enfants pris en charge à l’urgence. De plus, ils ont subi plus de radiographie pulmonaire (83% vs 76%; p<0,01) et de bilan infectieux, et ont reçu plus souvent du salbutamol (77 vs 21%; p<0,01) ou des antibiotiques (69% vs 16%; p<0,01).

Malgré la publication des recommandations par l’AAP, nous avons relevé en 2007-2008 à l’urgence, une augmentation de l’utilisation du salbutamol (27 vs 18%; p<0,001), de corticostéroïdes systématiques (4 vs 2%; p<0,05) et d’antibiotiques (14 vs 9%; p<0,001). Inversement, chez les patients hospitalisés, nous avons noté une diminution de l’utilisation de salbutamol (71 vs 78%; p<0,05) et de corticostéroïdes inhalés et systémiques (14 vs 23%; p<0,01 et 12 vs 22%; p<0,01 respectivement).

Finalement, une analyse de sous-groupe a révélé une augmentation significative de l’utilisation de salbutamol (55 vs 42%; p<0,001) et de corticostéroïdes inhalés et systémiques (29 vs 9%; p<0,01 et 22 vs 7%; p<0,01, respectivement) chez les enfants ayant eu plus d’un épisode de BA V.

**CONCLUSIONS:** En conclusion, les patients nécessitant une hospitalisation ou ayant eu plusieurs épisodes de BA V reçoivent plus de médicaments que les autres. La publication des lignes directrices de l’AAP en 2006 s’est accompagnée d’une tendance à la baisse de l’utilisation du salbutamol et des corticostéroïdes pour les patients hospitalisés, dans les deux années qui ont suivi. Cependant, l’adhérence aux recommandations est restée sous-optimale.

57 **RELATIONSHIPS BETWEEN PHYSICAL ACTIVITY AND HEALTH MEASURES IN PRESCHOOL CHILDREN**

*L Gabel, NA Proudfoot, MJ MacDonald, BW Timmons
Pediatrics, McMaster University, Hamilton, Ontario

**BACKGROUND:** Physical activity during the early years is a topic of intense research activity. However, little is known about how the amount of physical activity or the patterns of physical activity accumulation are related to health in preschoolers.

**OBJECTIVES:** To investigate the relationship between physical activity and health measures in preschoolers.

**DESIGN/METHODS:** Ninety-six preschool children (46 boys, 50 girls; 4.4 ± 0.9 years) participated in assessments of physical activity, body composition, health-related fitness, and blood pressure. Physical activity data were collected for seven consecutive days using Actigraph accelerometers. Physical activity prevalence was assessed by the amount of total and moderate-to-vigorous physical activity (MVPA) in min/day and as a % of wear time; physical activity patterns were assessed by the frequency and duration of MVPA bouts and by the duration of breaks between MVPA. Health-related fitness was assessed by a modified Bruce treadmill protocol and a modified Wingate anaerobic cycling test. Body composition was assessed by bioelectrical impedance analysis. Blood pressure was assessed using an automated oscillometric blood pressure monitor.
58 RUNNING: HOW IS IT TAUGHT AND EVALUATED IN BRITISH COLUMBIAN SCHOOLS?

*CL Protheroe, A De Souza, K Gibbs, VE Claydon, S Sanatani
Biomedical Physiology and Kinesiology, Simon Fraser University, Burnaby, British Columbia

BACKGROUND: Physical activity programs have been initiated by provincial and national organizations to reduce the burden of chronic health conditions. Although designed to heighten the importance of an active lifestyle, it remains to be proven if students are becoming healthier. Running is an inexpensive, efficient form of exercise, but requires conditioning, gradual increases in workload and persistence. Running represents a solution to the increasing number of sedentary individuals but it is unclear how it is taught and evaluated in schools.

OBJECTIVES: In order to investigate this further, we designed a survey to determine: (1) If physical education (PE) instructors teach students the skills needed to run; (2) How students are evaluated in their PE class; and (3) If there is differentiation in grading for children with chronic medical conditions (defined as those who visit a doctor once or more per year).

DESIGN/METHODS: Two surveys were designed for teachers and students in BC schools. All superintendents for BC school districts were contacted to approve participation in the study. Subsequently, schools within the district (grade 4 and up) were contacted. All participants gave informed consent. Statistical analyses were performed using Fisher’s exact test and the chi-squared test, with significance denoted when p<0.05.

RESULTS: Our preliminary results include responses from 35 teachers and 554 students, representing seven school districts and six schools. The majority of teachers have been instructing PE classes for more than five years (62.8%) in primary to senior grades. Student responses represented the mean age of 13 years. The majority of teachers reported that proper running form was taught in PE classes, different types of running were evaluated (3) If there is differentiation in grading for children with chronic medical conditions would be tailored to their physical fitness level (p<0.05). The majority of students have been instructed in less physical activity, less frequent MVPA, and longer breaks from MVPA compared to boys (p<0.001, for all). Health-related fitness was higher in preschoolers who engaged in more total physical activity, more frequent bouts of MVPA, longer bouts of MVPA, and shorter breaks between bouts of MVPA (p<0.05, for all). Blood pressure was higher in preschoolers who engaged in less physical activity (min/day) and in children taking longer breaks between bouts of MVPA (p<0.05, for both). Preschoolers who accumulated 180 min of total physical activity and 60 min of MVPA daily had better body composition and health-related fitness, respectively, compared to their peers who did not achieve these physical activity levels (p<0.05).

CONCLUSIONS: Our findings indicate that physical activity patterns are just as important as physical activity prevalence in explaining relationships between health measures in preschool children.

59 CHARACTERISTICS AND TREATMENT OF CHILDREN ADMITTED TO HOSPITAL FOR SEVERE IRON DEFICIENCY ANEMIA

*CA Slatter, M Belletrutti, D Hartfield
Pedicatrics, University of Alberta, Edmonton, Alberta

BACKGROUND: Iron deficiency (ID) is the most common nutritional deficiency worldwide. The majority of children are treated with oral iron supplementation and dietary modification. In severe IDA (SIDA) blood transfusion may be considered as part of therapy but is rarely required. The decision to transfuse should be based on clinical features – specifically the presence of congestive heart failure (CHF) – rather than on hemoglobin (Hgb) level alone. Little data is available regarding the transfusion of children with SIDA and most available data is from developing nations.

OBJECTIVES: We studied a group of inpatients with SIDA and hypothesized that transfusion rates would exceed those in published studies and that transfusion would occur in the absence of CHF.

DESIGN/METHODS: A retrospective chart review of patients with SIDA aged 6 to 60 months admitted between April 2005 and March 2010 was done. Patients with non-nutritional causes of anemia were excluded. SIDA was defined as Hgb <80 g/L, mean corpuscular volume (MCV) <70 fL and red cell distribution width (RDW) >15.6%. CHF was defined as a history of poor feeding and lethargy, tachycardia and tachypnea for age and cardiomegaly on CXR. Ethics approval was obtained and SPSS 19.0 was used for analysis.

RESULTS: Of 551 patients reviewed, 58 had SIDA. Eighteen (31%) were transfused. Of transfused patients, mean pre-transfusion Hgb was 47 g/L (range 20-72 g/L) compared with 62 g/L (range 25-79 g/L) for those not transfused (p <0.001). Only 5/18 (28%) had a documented rationale for transfusion. Ten transfused children (56%) did not have a CXR done prior to transfusion. None of the 58 children met the transfusion criteria. The mean volume transfused was 13.6 mL/kg (5-25 mL/kg) at a mean rate of 2.4 mL/kg/hour (1.2-5.0 mL/kg/hour). No adverse transfusion reactions were reported. Fifty-three patients (91%) were sent home on iron supplements. There was variability in the dose and duration of oral therapy, and in time to repeat Hgb testing.

CONCLUSIONS: Blood transfusion for SIDA was administered more frequently than in other studies and in children without CHF. The mean Hgb of children transfused was higher, suggesting that the decision to transfuse was based on Hgb level rather than clinical indication. Further, inconsistent therapy in terms of both transfusion and oral iron was apparent. Physician education and a care map would be helpful to decrease unnecessary transfusion, standardize therapy and improve the care of children admitted to hospital with SIDA.

60 RESPIRATORY SYNCTIAL VIRUS (RSV) PROPHYLAXIS IN CARDIAC DISEASE: A RETROSPECTIVE, SINGLE-CENTRE STUDY

*M Butt, A Symington, M Janes, S Steele, L Elliott, C Chant-Gambarot, B Paes, T Mondal
Neonatology, McMaster Children’s Hospital, Hamilton, Ontario

BACKGROUND: Infants aged <2 years with hemodynamically significant (HS) congenital heart disease (CHD) qualify for prophylaxis during the RSV season based on position statements issued by the Canadian Paediatric Society, American Academy of Pediatrics and international pediatric advisory committees.

OBJECTIVES: 1) Examine the characteristics of CHD patients hospitalized with RSV infection after the implementation of a RSV prophylaxis program. 2) Determine the incidence of breakthrough RSV infections post immunization and document co-morbidities during hospital stay.

DESIGN/METHODS: A retrospective, medical records review was conducted of all hospitalized paediatric patients with RSV infection and CHD from January 1, 2003 to December 31, 2009. RSV infection was identified by ICD codes and cases confirmed by RSV immunofluorescent antibody test, culture, or polymerase chain reaction (PCR). Data was collected on baseline demographics, CHD anomalies, other underlying disease, criteria for prophylaxis and breakthrough infections.
for hospitalization, type of respiratory illness and management, complications and palivizumab prophylaxis.

RESULTS: Thirty-one CHD patients with RSV were admitted over 7 years. Majority were ≤2 yr (n=25). Mean admission age was 14.6 months (SD = 18.17). Majority (90.3%; n=28) were azygotic, 38.7% (n=12) had HS disease; 41.9% had no other underlying medical illness. Almost all (87.1%) were admitted with respiratory distress; 61.7% had decreased oxygen saturation, bronchiolitis (38.1%), and a fever (58.1%). 48.4% required mechanical ventilation and the highest level of respiratory support administered in 35.5% of the infants was supplemental oxygen. 201.6% received IV antibiotics for more than 48 hours. The median number of days (range) in PICU was 3 (0-43), and the total median length of hospital stay days (range) was 10 (6-15). 5.2% of all CHD admissions with respiratory tract infections over 7 years had RSV infection. RSV-related complications included: concurrent bacterial sepsis (19.4%), electrolyte abnormalities (19.4%); and worsening pulmonary hypertension (12.9%). Of 10 infants’ ≤2 yr with HSCHD, four had received prophylaxis. One death was attributed to RSV infection.

CONCLUSIONS: Over seven years, 185 infants ≤2 yr with HSCHD received RSV prophylaxis and six qualifying infants missed immunization and were hospitalized. The incidence of breakthrough RSV infections was 2.2%, demonstrating real world experience of higher efficacy of palivizumab in this population compared to the original, multicenter, randomized trial.

61 COMPARISON OF A PROVINCIAL FIXED DATE/HOSPITAL ADMISSION VERSUS REGIONAL RESPIRATORY SYNCTIAL VIRUS (RSV) VIRUS ACTIVITY IN DETERMINING SEASONAL RSV PROPHYLAXIS

*A Latchman, B Paes, W Pigott, C Craig, N Greaves Pediatrics, McMaster Children’s Hospital, Hamilton, Ontario

BACKGROUND: In Ontario Canada the start of the RSV season is defined by a fixed date provincially. The offset is defined by RSV admission activity to the local hospital which is influenced by both populations serviced as well as individual physician admission practice patterns. Inaccurate prophylaxis period timing may result in inadequate or extra doses of a costly product. Recently, the availability of timely laboratory testing results has increased. RSV percent positivity rates can be used to better predict a regional RSV season.

OBJECTIVES: To evaluate the use of regional laboratory isolate data and current scientific guidelines to predict the RSV season such that prophylaxis can be logistically, adequately, and cost-effectively provided.

DESIGN/METHODS: A regional clinical virology database was used to obtain RSV percent positivity (2002/03-2010/11). RSV seasons were ascertained: onset-offset dates, duration, and number of prophylactic doses required. Two date-setting methods were evaluated for seasons 2007/08-2010/11: current provincial fixed date/admissions method (Ontario) and a regional annually-set fixed date method using the previous five seasons of RSV percent positivity. Of 10 infants with HSCHD, four had received prophylaxis. One death was attributed to RSV infection.

CONCLUSIONS: Over seven years, 185 infants ≤2 yr with HSCHD received RSV prophylaxis and six qualifying infants missed immunization and were hospitalized. The incidence of breakthrough RSV infections was 2.2%, demonstrating real world experience of higher efficacy of palivizumab in this population compared to the original, multicenter, randomized trial.

62 SEROGROUP C INVASIVE MENINGOCOCCAL DISEASE (IMD) IN ONTARIO, CANADA, 2000-2010: VACCINE IMPACT ASSESSMENT

*A Wormsbecker, V Dang, F Jamieson, S Wilson, P Rawte, NS Crowcroft, K Johnson, SL Deeks Surveillance and Epidemiology, Public Health Ontario, Toronto, Ontario

BACKGROUND: Meningococcal C conjugate (MCC) vaccination programs were introduced in Ontario for one year olds and for grade 7 students in 2004/5.

OBJECTIVES: We sought to assess the impact of MCC vaccine on serogroup C invasive meningococcal disease (IMD) in Ontario using provincial surveillance and laboratory data.

DESIGN/METHODS: The period under surveillance was 2000 to 2010; a provincial dataset was created through probabilistic linkage of data from the integrated Public Health Information System and Public Health Ontario Laboratories (PHOL). For most isolates, serotype and serosubtype were ascertained by indirect whole-cell enzyme-linked immunosorbent assay and electrophoretic type (ET) was determined by multilocus enzyme electrophoresis. Analysis was primarily descriptive and cohorts reflected vaccine program eligibility. Incidence rates were calculated using demographic data from Statistics Canada.

RESULTS: Of 713 cases of IMD identified over the 11-year period, 155 (22%) were serogroup C. Median age was 26 years (range 17 weeks to 95 years) and case-fatality ratio was 17%. Yearly rates varied from 0.30 to 0.02/100 000 and declined significantly over time (p<0.01). Age-specific rates were highest among 20-24, 15-19, and <1 year olds (0.23, 0.21 and 0.20/100 000, respectively). Cohort analysis showed significant reductions in IMD among both those eligible for the MCC program (born since 1992) and those ineligible (born up to 1991); however, the decrease was more marked in the eligible group (56.3% reduction versus 46.7% reduction). Of cases that occurred in program-eligible persons, 80% (n=8) occurred in children too young to have been vaccinated (age <1 or age <12) and were therefore not directly preventable by the province’s vaccination program. Serotype and serosubtype were available for 91% (n=128) of PHOL records; of these, 44% (n=56) were C:2a:P1.2. Of 114 isolates with ET, 77% (n=81) were ET-15, though its rate decreased significantly over time (p<0.01). There were four not ET-15, not ET-37 isolates since 2005 but none prior.

CONCLUSIONS: Rates of serogroup C IMD are low in the post-MCC vaccine era and clonal groups have changed. Cohort analysis suggests direct and indirect (herd) MCC program effects but those who have not reached program age remain at continuing, albeit low, risk. Future analyses with a longer time horizon and including effect of Ontario’s new quadrivalent meningococcal conjugate vaccine program will be valuable.

63 PALIVIZUMAB PROPHYLAXIS FOR 29-32 WEEK GESTATION INFANTS SELECTED BY RISK FACTORS: RESULTS FROM VICTORIA, BRITISH COLUMBIA

*RS Taylor, M Baker, A Solimano Neonatology, ViHA, Victoria, British Columbia

BACKGROUND: The American Academy of Pediatrics (AAP) and Canadian Pediatric Society (CPS) both recommend immunoprophylaxis for all infants less than 32 wk gestation at birth and under six months age at season start, based on historical average RSV+ admission risk of ~8%. British Columbia (BC) may be the only jurisdiction in North America to use risk factors to select infants 29-32 wk gestation for eligibility for palivizumab (FY2).

OBJECTIVES: Analysis of data from Victoria RSV Prophylaxis Program over the last five seasons.

DESIGN/METHODS: For RSV seasons 2006-2007 until 2010-2011 all infants 29-32 wk gestation at birth, born between May and March and admitted to Victoria General Hospital NICU as neonates, were tracked for the season of potential eligibility for RSV prophylaxis. Names were entered into a local database at discharge. Hospital RSV admissions were moni-
tored for matches. At each season end, data was transferred to a spreadsheet and identifiers removed.

RESULTS: There were 181 admissions for RSV (all ages and gestations), mostly in previously healthy term and late preterm infants. Two hundred twenty-six infants, gestational age 29-32 wks and eligible for prophylaxis by both CPS and AAP guidelines were followed: 41 (18%) were eligible and received PVZ according to BC guidelines: There were six admissions in this group, but five contracted RSV prior to receiving PVZ. There were four admissions from the remaining 185 infants who did not receive PVZ.

CONCLUSIONS: Most infants admitted for RSV would not have received prophylaxis by any published guidelines. For the 29-32 wks group, our re-admission rate for BC-ineligible infants of 2.2 % [95% CI: 0.65-5.6%] was similar to Canadian Registry data [1.25%]. A risk factor approach appears to be effective in discriminating infants at this gestational age to either low or high chance for readmission with RSV. Optimal results require all eligible infants to receive prophylaxis at season start. Subgroup selection based on risk factors may be applicable to other newborn categories at higher risk for RSV admission.

64 ROBOTICS IN HEALTH CARE: REDUCING CHILD DISTRESS DURING FLU VACCINATION

*T Beran, A Ramirez-Serrano, S Kuhn, O Vanderkooi
Medical Education and Research, University of Calgary, Calgary, Alberta

BACKGROUND: Distress (combination of pain and anxiety) during vaccination is common among children, reported at a rate as high as 50% (Jacobson et al 2001). Methods of reducing distress during vaccinations are clearly desirable for children, their families, and health care professionals.

OBJECTIVES: Our goal was to determine whether children's interaction with a pre-programmed robot, compared to no robot interaction, could decrease their distress and increase coping during administration of a flu vaccination.

DESIGN/METHODS: Recruitment was conducted through physician referral and posters placed at various hospital clinics informing parents that they can obtain their child's yearly flu vaccination at the infectious diseases clinic within the hospital. Fifty-seven children (29 male, 28 female; mean age = 6.87 years, SD = 1.34) were randomly assigned to: (1) the robot condition consisted of a three-foot tall humanoid robot NAO (Aldebaran Robotics) sitting on a bed facing each child and using distractions such as playing music, talking about movies, picking up toys, and asking the child to blow during the vaccination; (2) comparison condition consisted of minimal distractions given by a nurse (eg, “I’m going to count to five.”). All children were accompanied by at least one parent and were vaccinated by a pediatric nurse. Sessions were videotaped and coded using the Behavioral Approach-Avoidance Distress Scale. It consists of two subscales with scores ranging from 1-5. Higher scores indicate more distress on one subscale and more coping behaviours on the other subscale. Intra-class correlation coefficients are 0.78 for and 0.89, respectively, indicating good inter-rater reliability from two raters of all 57 videos.

RESULTS: A multivariate analysis of variance was conducted using researcher ratings of distress and coping. Results indicate that distress was significantly lower for the robot (M = 1.71, SD = 0.96) than the comparison condition (M = 2.47, SD = 1.18), F(1, 50) = 6.42, p<0.05. Also, coping was significantly higher for the robot condition (M = 3.58, SD = 0.78) than the comparison condition (M = 3.03, SD = 1.17), F(1, 50) = 3.86, p<0.05. The effect sizes are moderate.

CONCLUSIONS: Children's interaction with a robot during a vaccination provides an effective distraction which significantly reduces distress and may be beneficial for children during other painful medical procedures.

65 ‘HELP US, HELP YOU’: A NEEDS-BASED ASSESSMENT OF PEDIATRIC RESIDENT KNOWLEDGE OF PHYSICIAN HEALTH RESOURCES AND BARRIERS TO ACCESS

*A Robinson, SE Lawrence, O Puddester
Department of Pediatrics, Children’s Hospital of Eastern Ontario, Ottawa, Ontario

BACKGROUND: Residents are uniquely affected by the demands of their current training environment. ‘A commitment to physician health and sustainable practice’ is an essential component of the CanMEDS Professional role. There is a multitude of resources at local, provincial and national levels, although it is unknown whether residents are familiar with these resources so they may seek assistance if required.

OBJECTIVES: To assess the knowledge of pediatric residents about physician health and wellbeing resources, as well as to identify barriers to access.

DESIGN/METHODS: All pediatric, medical genetics and pediatric neurology residents in a Canadian training program were invited to complete an anonymous, descriptive survey consisting of 20 questions. There were seven survey dimensions: knowledge of current physician health and well-being resources; current utilization; satisfaction; barriers to access; level of interest; program development; and demographics.

RESULTS: The survey response rate was 84% (43/51). Ninety-three percent of residents rated their current knowledge of physician health and well-being resources as none or minimal. One-third of residents have thought of contacting at least one of the available resources, while another one-third have utilized one and found it useful at that time. Almost half of the residents have known a colleague who has used a resource. Personal satisfaction with knowledge of health resources was rated as: none (34.9%), little (32.6%), or moderate (25.6%). Only 2.3% were greatly satisfied with their knowledge. The rate of dissatisfaction with the delivery of information was 81.4%. Satisfaction with the emphasis on health and well-being in the curriculum was: not at all (30.2%), to a small extent (44.2%), to a moderate extent (20.9%), and to a great extent (4.7%). The highest rated barriers to access were lack of time, unpredictable/hectic schedules, and lack of awareness. Eighty-six percent of residents were moderately or greatly interested in improving their knowledge, and 74.4% felt they would moderately or greatly benefit from having easier access to physician health and well-being resources.

CONCLUSIONS: This needs-based survey identifies both a lack of knowledge of physician health and well-being resources, as well as a self-defined need of surveyed residents to improve this knowledge. It also identifies a desire for increased emphasis on health and well-being in the curriculum. Future goals are to establish and evaluate a resident-led initiative focusing on resident health and well-being.

66 EXPLORING BEHAVIOURAL INTENTIONS OF PEDIATRIC RESIDENTS REGARDING CHILDHOOD OBESITY COUNSELLING

*E Ruano Cea, E Constantin, M Dandavino
Pediatrics, McGill University, Montreal, Quebec

BACKGROUND: Childhood obesity is increasing at an alarming rate in North America. Physicians recognize the importance of providing obesity counselling to patients and their families. Yet, there is evidence showing that current guidelines related to obesity prevention are not routinely applied in clinical practice.

In order to improve the adherence of pediatric residents to these guidelines, a Resident-led initiative for Healthy Active Living in Youth (RAILY) is being developed at our institution. The factors influencing a resident's behavioural intentions to provide obesity counselling could be explored using the Theory of Planned Behaviour.

OBJECTIVES: The objectives of our study are 1) to describe the current state of behavioural intentions among pediatric residents around counselling on childhood obesity and 2) to determine if the behavioural intentions differ in relation to the level of residency training.
DESIGN/METHODS: A previously validated questionnaire on behavioural intentions was adapted to the domain of childhood obesity counseling. The categories of questions (rated on a 7-point Likert-scale) included: baseline practice, beliefs, attitude, external referent, intention, and perceived behavioural control. All pediatric residents training in our program at the time of our study were eligible to complete this anonymous self-administered questionnaire. We calculated mean ± standard deviation scores of each category of questions for all residents and for each level of training.

RESULTS: Thirty-nine (39/42) pediatric residents participated in this study. All residents reported that in their continuity clinic they either “Often” (15%) or “Always” (85%) measured and plotted height and weight. However, only 29% reported “Often” measuring and plotting Body Mass Index (BMI) and none, reported “Always”. The overall mean score for intention was high (6.2±0.7) but for perceived behavioural control the score was just above neutral (4.7±0.8). The mean score for beliefs was 5.3±0.79; attitude, 5.72±0.97; and external referent, 5.6±0.94.

There is a trend towards increasing perceived behavioural control scores with years or residency training (year 1, 4.3±0.8; year 2, 4.6±0.7; year 3, 5.2±0.5; year 4, 5.3±0.9). Scores for the other category of questions were similar across all levels of training.

CONCLUSIONS: To our knowledge, this is the first study describing the behavioural intentions of pediatric residents regarding childhood obesity counseling. We found that BMI is not routinely measured in the clinical practice of pediatric residents. A possible barrier could be a low perceived behavioural control in providing obesity counseling. These results could help guide intervention programs aiming to improve the residents’ practice towards counselling on this major health issue.

67

PERSPECTIVES OF PEDIATRIC RESIDENTS AND FACULTY MENTORS ON A WEB-BASED REFLECTIVE PORTFOLIO IN A RESIDENCY PROGRAM

*Mc Vincent, A Levy

CHU Sainte-Justine, Montreal, Quebec

BACKGROUND: Portfolios can be used in a residency program to promote reflective learning and provide opportunities for mentorship.

OBJECTIVES: To evaluate resident usage of an on-line reflective portfolio and perspectives of participating residents and mentors.

DESIGN/METHODS: This was a prospective cohort study in a tertiary care pediatric centre. Participants were pediatric residents and faculty members from the same centre. Residents created a password-secured electronic portfolio using a standardized platform. They were paired with mentors for monthly portfolio review and were to provide their mentor with password access to specific portfolio content. Residents were required to document critical incidents for a one-year period. Surveys were used to collect demographic data, to evaluate portfolio usage quantitatively and open-ended responses were categorized, using grounded theory to elucidate themes.

RESULTS: Study Population: Fifteen residents and 12 mentors consented to participate. Seven residents (7/15, 47%) and 11/12 (92%) mentors completed the study.

QUANTITATIVE RESULTS: Portfolios were used for documenting critical incidents by 6/7 (86%) residents, all of whom wanted to continue being mentored. Only 1/7 (14%) wanted to continue maintaining the portfolio. Main reasons for not using the portfolio were lack of time (5/6 (83%) and perceived lack of relevance (4/6 (67%). Critical incidents were discussed in person by 6/11 (55%) mentors, who stated residents were able to identify learnings needs and ways to address them. Only 2/11 (18%) had electronic portfolio access. All mentors felt comfortable with supporting residents’ reflective learning and 10/11 (91%) wanted to continue being a mentor.

QUALITATIVE RESULTS: For residents, choice of mentor was the prominent theme. They disliked the imposed task of documenting critical incidents and would have preferred the option of choosing a context-specific mentor. For mentors, meeting with residents in person was perceived as more meaningful than corresponding electronically. Opportunities to promote reflective practice through mentorship were highlighted. They reported poor participation by residents in general and suggested means to increase buy-in, such as introducing portfolios and mentorship early in training.

CONCLUSIONS: Portfolio usage was hindered by poor resident buy-in. Discussion of critical incidents in-person were preferred over electronic communication. Residents and mentors were favorable to a mentorship program. Residents prefer to choose their own mentor.

68

SOCIAL PEDIATRICS EDUCATION IN PEDIATRIC RESIDENCY TRAINING

*R Levy, M Van Den Heuvel, T Martimianakis, A Atkinson, L Ford-Jones, M Shouldice

University of Toronto, Toronto, Ontario

BACKGROUND: The social determinants of health have a profound impact on children’s behavior, school achievement and overall health. Yet, there is limited literature addressing how to effectively provide social pediatrics training.

OBJECTIVES: To facilitate curriculum development, we undertook a study to describe both teacher and learner perceptions, opinions and experiences related to social pediatrics education in our school’s core pediatric training program.

DESIGN/METHODS: Survey questions were generated from both review of the literature and consultation with experts in social pediatrics and education. Online surveys were distributed to all core pediatric residents enrolled at our institution (n=75). Similar online surveys were distributed to all staff physicians (n=170) at the corresponding tertiary care pediatric hospital. Responses were collected anonymously via surveymonkey, an online survey distribution tool. Quantitative data were analyzed using descriptive statistics, and open-ended responses were categorized using two established coding approaches known as meaning condensation and meaning categorization.

RESULTS: Twenty residents (PGY 1-4) and 41 staff physicians from a range of professional backgrounds completed surveys. While residents mostly described social pediatrics occurring within the formal curriculum (core lecture series), staff reported extensive informal teaching in clinical settings. Seventy-one per cent of staff reported teaching residents to perform a complete social history, while only 47% of residents felt fully prepared to do so. While 63% of residents felt that social pediatrics was valued in the program, 53% felt that there was not enough emphasis on social pediatrics topics in the current curriculum. Fifty-six per cent of staff felt social pediatrics was valued, but the majority (56%) did not know whether social pediatrics was adequately emphasized in the curriculum. Social pediatrics was commonly perceived as an integrative field encompassing all clinical scenarios. Common themes that arose in both staff and resident surveys included the hidden curriculum as a barrier to social pediatrics education, including issues around hierarchies of learning, explicit vs. implicit teaching methods and the competition of efficiency mandates with educational roles. Other systems issues were raised as important barriers, including curriculum design, optimal settings for social pediatrics education and the presence of mandatory vs. extracurricular learning.

CONCLUSIONS: Both teachers and learners view social pediatrics as an important component of pediatric residency training. While social pediatrics is currently addressed in a variety of settings, residents do not feel fully prepared to address all social issues. There are numerous barriers that are perceived to limit the incorporation of social pediatrics issues into existing education models.

69

PRACTICE CHANGE COMMUNICATION AMONG INTERDISCIPLINARY HEALTH CARE PROVIDERS (HCPs) USING SELF-INSTRUCTIONAL VIDEO, SELF-DIRECTED FACILITY TOUR AND ELICITING FEEDBACK

*S Pegu, J Angelakis, S Shivananda

McMaster University, Hamilton, Ontario

BACKGROUND: Communicating major practice changes effectively among HCPs is a challenge due to lack of conceptualization of new
practices, dedicated in-service time and ownership among frontline HCPs. HCPs buy-in and successful implementation of practice is highly dependent on effective communication. Three new delivery rooms (DRs) and one new infant stabilization room (ISR) were added to existing L&D area in our center. Existing practice was to transfer infants after resuscitation in L&D room using transport incubators and stabilize infants in NICU. Proposed new practices were to stabilize infants in ISR and transfer infants using basinet or resuscitate.

**OBJECTIVES:** Determine NICU HCPs satisfaction on novel communication strategy for practice changes, related to neonatal resuscitation and stabilization.

**DESIGN/METHODS:** A 10 minute narrated video using mannequin, equipment and volunteer HCPs highlighting the difference between resuscitation and stabilization, and rationale for practice changes was developed. A printed sheet depicting new DRs and ISR on a floor map and a survey questionnaire on its backside was created. Video, map and survey were posted on NICU website and easily accessible at work or from home. All HCPs were requested to watch the video (conceptualise new practices easily), conduct new facility tour using map (explore new practices) and complete the satisfaction survey (create ownership) while on duty over 4 weeks.

**RESULTS:** E-mail and newsletter requests were sent to 178 interdisciplinary HCPs. Of them, 102 were requested in person. Forty-one (40%) HCPs completed the survey. More than 80% of responders agreed or strongly agreed that the video helped them in understanding the rationale for practice changes, and preferred to have this communication strategy for practice changes in future.

**CONCLUSIONS:** Self-instructional video combined with self-directed activity and feedback is an effective strategy for communicating practice changes among interdisciplinary HCPs.

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**Abstracts**

**70 NEONATAL OUTCOMES FOLLOWING EXTENSIVE DELIVERY ROOM RESUSCITATION IN PRETERM INFANTS: A MULTICENTER COHORT STUDY**

*AS Soraisham, N Singhal, K Aziz, A Lodha, SK Lee, P Shah*

**Pediatrics, University of Calgary, Calgary, Alberta**

**BACKGROUND:** Studies on the outcome of preterm infants following receipt of extensive cardiopulmonary resuscitation (ECPR; ie, chest compression with or without epinephrine administration) at birth have yielded conflicting results. Previous studies were mostly from single center and were not adequately powered.

**OBJECTIVES:** To compare the neonatal outcome among preterm infants who received chest compression with or without epinephrine administration (ECPR) at birth with a cohort of infants who did not receive chest compression or epinephrine (no ECPR).

**DESIGN/METHODS:** This is a retrospective cohort study. We performed secondary analyses of database of infants born at GA <33 weeks admitted to participating NICU in Canadian Neonatal Network between January 2010 and December 2010. Infants with major congenital anomalies were excluded from the analysis. We compared the neonatal morbidity and mortality between the two groups using univariate and multivariable analyses.

**RESULTS:** Of the 3968 eligible infants, 186 (4.6%) received ECPR. Infants who received ECPR were of significantly lower gestational age (27.2 ± 2.6 vs 29.2 ± 2.5 wks), lower birth weight (1051 ± 417 vs. 1327 ± 442 gms), more likely to be boys (61% vs 53%) and outborns (41% vs. 15%). ECPR group were less likely to received antenatal steroids (77% vs 88%) and maternal antibiotics (55% vs 65%) as compared with no ECPR group.

**CONCLUSIONS:** Chest compression with or without epinephrine administration at delivery room resuscitation is associated with increased risk of BPD, severe neurological injury, and mortality in preterm infants. Long-term neurodevelopmental follow up is warranted for this group of infants.

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**71 RISK SCORE FOR PREDICTION OF BAG AND MASK VENTILATION DURING DELIVERY ROOM RESUSCITATION AMONG TERM BABIES: A POPULATION BASED COHORT STUDY**

*AS Soraisham, N Singhal, Y Rabi, E Freiheit*

**Pediatrics, University of Calgary, Calgary, Alberta**

**BACKGROUND:** Predicting which term newborns will require bag and mask ventilation (BMV) at birth is difficult. About one in ten newborns will receive some respiratory support at birth.

**OBJECTIVES:** To develop a risk score based on antenatal risk factors for predicting need for BMV during delivery room resuscitation of term newborns.

**DESIGN/METHODS:** This was a retrospective, population based cohort study of all term live births between 2004 and 2006 in Alberta, Canada. Using the Alberta Perinatal Health database, we performed simple and multiple logistic regression analyses to identify factors associated with BMV at birth. These were used to develop a risk score.

**RESULTS:** Of 115,816 neonates, 7,823 (6.7%) received BMV at birth. The antenatal factors associated with BMV were primiparas, multiple pregnancies, pre-existing diabetes, pre-existing hypertension, PIH, GDM, APH, IUSSR, smoking, use of alcohol and street drugs during pregnancy. Multivariate logistic regression analysis showed only eight variables are significantly associated with the need for BMV. Based on odds ratio from the multivariate analysis, a risk score was created giving pre-existing diabetes a weight of 3, first pregnancy, multiple pregnancy, and pregnancy-induced hypertension each a weight of 2, and a weight of 1 each for the other four factors. The model using the risk score categories had an identical AUC to the multivariable model, (0.58, 95% CI 0.57-0.59 for both). The risk score categories were positively correlated with the odds of receiving BMV (Table 1).

**CONCLUSIONS:** Our antenatal risk score can help identify newborns at increased risk for needing BMV. The higher the risk score, more likely the infant is likely to receive BMV. The risk score should be updated further with other potential predictors and validated in other populations.

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**Estimated Odds Ratios (95% CI) for BMV Events by Risk Score**

**72 DOES DELIVERY ROOM CARDIOPULMONARY RESUSCITATION HAVE AN IMPACT ON THE NEURODEVELOPMENTAL OUTCOME AT 18-36 MONTHS OF AGE IN PRETERM INFANTS?**

*AS Soraisham, N Singhal, R Sauve*

**Pediatrics, University of Calgary, Calgary, Alberta**

**BACKGROUND:** There is limited information on the long-term neurodevelopmental outcomes of surviving infants who received delivery room cardiopulmonary resuscitation (DR-CPR).

**OBJECTIVES:** To examine the neonatal and neurodevelopmental outcomes of preterm infants (<29 weeks) who have received DR-CPR.

**DESIGN/METHODS:** Case control study. DR-CPR is defined as chest compressions with or without medications. Cases are preterm infants (<29 weeks) admitted to NICU between January 2000 and December 2006, who have received DR-CPR. Control infants are those who did not receive DR-CPR and matched by gestational age, gender and year of birth. Surviving infants were followed prospectively using standardized neurodevelopmental assessments. We compared the neonatal morbidity, mortality and neurodevelopmental outcome at 18-36 months of corrected age between two groups.
RESULTS: Of 628 eligible infants, 28 infants (4.4%) received DR-CPR. Fifty-six matched infants formed the controls. There were no differences in the baseline characteristics between the two groups except for Apgar at one and five minutes and cord pH. Infants who received DR-CPR are more likely to die as compared with no DR-CPR groups [12/28 (43%) vs 5/6 (13%), p=0.002]. No differences were found in the rates of IVH grade ≥3 (14% vs 9%), NEC stage ≥2 (7.1% vs 7.1%), BPD (86% vs 71%) and ROP stage ≥3 (27% vs. 27%) between the two groups. Table 1 shows the comparison of neurodevelopmental outcome. Of the 16 survivors in DR-CPR group, 15 were followed beyond 18 months (median: 36 months) corrected age. At last examination, 13 (81%) were both neurologically and developmentally normal. Two infants had cerebral palsy and one had visual impairment. Among the 49 survivors in control groups, 37 (76%) were normal at last examination. Nine infants had one or more major disabilities. Multivariable logistic regression analysis showed DR-CPR was significantly associated with increased risk of mortality in preterm infants. At 36 months corrected age, there were no significant differences in the neurodevelopmental outcome between survivors of infants who received DR-CPR and matched controls.

CONCLUSIONS: Delivery room cardiopulmonary resuscitation is associated with increased risk of mortality in preterm infants. At 36 months corrected age, there were no significant differences in the neurodevelopmental outcome between survivors of infants who received DR-CPR and matched controls.

### Neurodevelopmental outcomes among surviving infants. DR-CPR: Delivery Room Cardiopulmonary Resuscitation

<table>
<thead>
<tr>
<th>Variable</th>
<th>DR-CPR (%)</th>
<th>MatchedControls (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebral Palsy</td>
<td>2 (13)</td>
<td>3 (6)</td>
<td>0.15</td>
</tr>
<tr>
<td>Cerebral Palsy neonatal</td>
<td>1 (6)</td>
<td>0 (0)</td>
<td>0.27</td>
</tr>
<tr>
<td>Seizures</td>
<td>1 (6)</td>
<td>3 (6)</td>
<td>1.00</td>
</tr>
<tr>
<td>Hydrocephaly</td>
<td>1 (6)</td>
<td>2 (4)</td>
<td>0.35</td>
</tr>
<tr>
<td>Other CNS anomalies</td>
<td>1 (6)</td>
<td>2 (4)</td>
<td>0.35</td>
</tr>
<tr>
<td>Spina bifida</td>
<td>0 (0)</td>
<td>1 (2)</td>
<td>0.47</td>
</tr>
<tr>
<td>Ventriculomegaly</td>
<td>0 (0)</td>
<td>1 (2)</td>
<td>0.47</td>
</tr>
<tr>
<td>Ophthalmopathy</td>
<td>0 (0)</td>
<td>1 (2)</td>
<td>0.47</td>
</tr>
<tr>
<td>Retardation</td>
<td>0 (0)</td>
<td>1 (2)</td>
<td>0.47</td>
</tr>
<tr>
<td>Other congenital anomalies</td>
<td>0 (0)</td>
<td>1 (2)</td>
<td>0.47</td>
</tr>
</tbody>
</table>

### Resource Utilization. Data are means (SD) or percent

**74 MODULATION OF THE INFLAMMATORY RESPONSE BY EPIDERMAL GROWTH FACTOR IN THE IMMATURE HUMAN INTESTINE**

*E Ferretti, E Tremblay, C Babakissa, E Levy, EG Seidman, D Ménard, J Beaulieu*

**CHR Team on the Digestive Epithelium, Division of Neonatology, Department of Pediatrics, Children’s Hospital of Eastern Ontario, Ottawa, Ontario**

**BACKGROUND:** The inflammatory response of the preterm infant’s intestine underlines its inability to respond to hemodynamic stress, microbes and nutrients. Several lines of evidence suggest that exogenous epidermal growth factor (EGF) exerts a therapeutic influence on neonatal enteropathies. However, the molecular mechanisms underlying the beneficial effects of EGF in the developing human intestine remain to be clarified. Despite structural and some functional similarities during the first two trimesters of gestation, we identified fundamental differences between the small and large intestines, most notably a general immaturity of the colon compared to the small intestine (JPGN 52: 670-678, 2011).

**OBJECTIVES:** The purpose of the present study was to evaluate the impact of EGF on the gene expression profiles of the developing human small and large intestine at mid-gestation in serum-free organ cultures using Illumina microarray.

**DESIGN/METHODS:** The gene expression profiles of cultured human fetal ileal and colonic explants were investigated in the absence or presence of a physiological concentration of 50 ng/ml EGF for 48 h using cDNA microarrays. Data were analyzed with the Ingenuity Pathway Analysis (IPA) software and confirmed by qPCR.

**RESULTS:** We found that up to 13% of the expressed genes were differentially expressed in the two segments in response to EGF. IPA functional analysis revealed that more than 85% of the significant functional categories identified in the ileum were shared with the colon. These functions included various biological processes such as "cellular growth and proliferation", "cell cycle", "tissue development" and "cell death" as expected in response to a growth factor. More surprisingly, however, we observed that functional categories such as "gastrointestinal diseases", "immune cell trafficking", "inflammatory diseases" and "inflammatory response" were significantly modulated in both segments by EGF, and that these inflammation-related functions were regulated in a distinct manner in each intestinal segment. For instance, several intestinal-derived chemokines involved in these functional categories such as CCL2, CCL25, CXCL5, and CXCL10 and were found to be differentially regulated by EGF in the immature ileum and colon.

**CONCLUSIONS:** The findings presented here showing the anti-inflammatory influence of exogenous EGF suggest a mechanistic basis for the beneficial effects of EGF on neonatal enteropathies. Furthermore, these results reinforce growing evidence that already by mid-gestation, the human small intestine and colon rely on specific and distinct regulatory pathways. (Supported by the CIHR.)

**75 DEVELOPMENT AND USABILITY TESTING OF AN INTERACTIVE PARENT DECISION SUPPORT TOOL FOR WITHDRAWAL OF CARE IN THE NICU**

*E Bariciak, M Frize, S Weyand, S Dunn, J Gilchrist*

**Pediatrics, University of Ottawa, Ottawa, Ontario**

**BACKGROUND:** Advances in neonatology have resulted in increased survival of preterm infants without decreasing long term morbidity, and
DEATH OR DEXA: IMPACT OF CHANGE IN STEROID PRESCRIPTION HABITS ON PATTERNS OF DEATH
*Fortin-Pellerin, C Peterson, KJ Barrington, A Janvier Neonatology, Hôpital Sainte-Justine, Montréal, Quebec

Background: Administration of post-natal steroids (PNS) for prevention of BPD has been discouraged because of their side effects. It seems PNS are still widely used in preterm infants but indications may have changed.

Objectives: Compare administration patterns of PNS in two cohorts of preterm infants <28 wks, 7 yrs apart. Evaluate if there is an association between PNS use and patterns of death in the NICU.

Design/Methods: Compare administration patterns of PNS in two cohorts of preterm infants <28 wks, 7 yrs apart (2002-2003 vs 2009-2010). Evaluate if there is an association between PNS use and patterns of death in the NICU.

Results: The two cohorts were similar at birth. The number of patients who received PNS has increased in cohort 2, even more so for babies <26 wks (table1).

Among babies who died, age of death has increased significantly. There is a strong correlation between age of death (later) and total dose of steroids (HC equivalent) received in the new cohort (cohort 1 r=−0.1 p=0.6; cohort 2 r 0.91, p=0.001).

There has been a shift from dexamethasone in cohort 1 (93% of cycles) to hydrocortisone in cohort 2 (79% of cycles), p=0.001. Interestingly, the cumulative dose per cycle has not changed (in HC equivalent). Reasons for PNS administration have shifted in favor of pulmonary indications (from 36% to 58%, p=0.035)(table1).

Conclusions: In the last few years, we have had an important increase in the use of steroids for very premature infants with severe respiratory disease. This is not associated with an increase in survival but with a later age of death. The total dose of PNS received in the latest cohort was strongly correlated with time of death, which was not the case before. Are we only postponing death of our young patients with severe respiratory disease? Long term follow up will help to clarify the risk-benefit balance.

Survival, length of stay and PNS administration by cohort

Table 1: Survival of Discordant and Concordant Twins by Gestation

Survival of Discordant and Concordant Twins by Gestation
MODIFICATION OF THE WINROP ALGORITHM TO TRY TO DECREASE THE NUMBER OF BABIES WHO NEEDED SCREENING FOR RETINOPATHY OF PREMATURITY

*F Aguinaga, JY Ting, G Jane, H Osiovich
Neonatology, Children’s & Women Health Centre of British Columbia, Vancouver, British Columbia

BACKGROUND: Retinopathy of prematurity (ROP) is a vasoproliferative disease of the retina that is associated with preterm birth. ROP screening of infants born preterm offers the promise of preventing lifelong vision loss; however, unnecessary screening should be minimized in order to minimize stress caused during screening. Current clinical practice guidelines suggest ROP screening of all premature infants born at 30+6 weeks gestational age (GA) or earlier (regardless of birth weight) and those with a birth weight (BW) of 1250 g or less.

OBJECTIVES: Our objective was to review all infants who received ROP screening under the current guidelines and use a modification to the neonatal retinopathy of prematurity WINROP algorithm to predict the infants who would develop severe retinopathy of prematurity requiring treatment.

DESIGN/METHODS: This was a retrospective analysis of all infants with GA ≤30+6 weeks and those with BW ≤1250 g, screened and/or treated for severe ROP at the Children’s & Women’s Health Centre of British Columbia (level III+ NICU) between Jan 2005 and Dec 2010. All infants were examined and followed according to the current recommendations from Canadian Pediatrics Society. ROP was classified according to the International Classification of Retinopathy of Prematurity (stage 1-5). Treatment decisions followed the criteria used in the Early Treatment for Retinopathy of Prematurity (ETROP) study.

RESULTS: In our cohort, there were a total of 794 babies screened according to the current practice guidelines, with an average BW of 958 ± 264 g and GA of 26.7 weeks ± 1.7 weeks. 8.2% developed severe ROP (65 infants were treated with laser retinal ablation), with an average BW of 706 ± 153 g (up to 1020 g) and GA of 24.9 ± 1.4 weeks (up to 28 weeks). With risk stratification according to the modified WINROP Algorithm, 52 infants (6.5% of screened subjects) belonged to the low risk group, 50 infants had no ROP and two developed Stage II ROP not requiring treatment.

CONCLUSIONS: In our cohort, using the modified neonatal retinopathy of prematurity WINROP algorithm, we were able to detect 100% of infants who developed retinopathy of prematurity requiring treatment. With this simple postnatal evaluation and stressful eye examinations could be reduced (6.5% of infants). Further research is needed to validate these new screening recommendations.

NEURODEVELOPMENTAL OUTCOMES OF 22-25 WKGA INFANTS AT ≥2 YEARS: A META-ANALYSIS

*G Moore, B Lemyre, N Barrowman, T Daboval
Obs/Gyn - Neonatal Care, The Ottawa Hospital, Ottawa, Ontario

BACKGROUND: Most clinicians refer to published data when counseling expectant parents about perinatal care decisions. Multiple cohort publications on long-term outcomes of infants exist with limitations in their sample size and outcome assessments.

OBJECTIVES: To systematically review high quality cohorts of 22-25 wk GA infants with relevant and similar definitions of neurodevelopmental impairment (NDI).

DESIGN/METHODS: We reviewed cohorts published after 2004 with: infants born ≥1995 in a developed nation; assessment for NDI at ≥2 yrs; consistent definitions for moderate-to-severe (M-S) NDI (cognitive delay, CP, blind and/or deaf) as per those used for EPICure; and results reported by GA. Two reviewers independently assessed each article. Random-effects meta-analysis, I² to assess heterogeneity, and weighted regression were used.

RESULTS: Of 1384 articles, 162 abstracts were reviewed, 68 full text articles selected and eight included with 11 potential inclusions awaiting authors’ reply. Cohorts were prospective. High heterogeneity (I² ≥76%) hampers interpretation of survival (40%, 41%, 54% and 73% for 22, 23, 24 and 25 wk GA, respectively). M-S NDI rates are shown in Figure; increasing heterogeneity was found as the GA increased, while small sample sizes for the lowest GAs resulted in large CIs around the estimates. The risk of M-S NDI is an absolute 9% lower (95% CI 5-13%) for each additional GA week (p=0.05). Severe NDI did not significantly differ – 40%, 15%, 25% and 18% for 22, 23, 24 and 25 wk GA, respectively.

CONCLUSIONS: Few recent cohorts provide high quality GA-based outcome data to assist parents and physicians in decision-making. Meta-analytical data from these studies must be interpreted with caution given the heterogeneity; results suggest a possible selection bias. However, the results provide valuable information for centers without high quality local data.
groups compared to the RA group. Respiratory outcomes are shown in Table.

CONCLUSIONS: Supplemental oxygen use was not associated with faster resolution of SP. Babies in room air did not require supplemental oxygen and did not have longer recovery times.

RESuLTS: (sem (n = 5-21 per group)) were compared by ANOVA, p<0.05.

1000 central catheter days, which was higher than that reported by other

82 INOTROPE USE AMONG EXTREMELY PRETERM INFANTS IN CANADIAN NICUs: VARIATIONS AND OUTCOMES

*J Wong, PS Shah, W Yoon, W Yee, SK Lee, K Dow

Pediatrics, Queen’s University, Kingston, Ontario

BACKGROUND: Use of inotropes is not infrequent among extremely preterm infants despite the absence of consensus guidelines on the definition and management of hypotension.

OBJECTIVES: To compare the outcomes of neonates who received inotropes with those who did not and to identify variability in inotrope use across Canadian NICUs.

DESIGN/METHODS: Data of neonates <29 weeks GA were analyzed from 27 centers in the Canadian Neonatal Network for years 2003-2010.

Characteristics and rates of mortality, ROP, IVH, BPD and NEC were compared between those who received inotropes on day 1 and 3 (both) of admission versus those who did not after controlling for confounders.

Inotrope use was also compared among participating units.

RESULTS: A total of 772 patients received inotropes on both days and 7141 did not receive inotropes on either days. Baseline comparison revealed a significantly lower GA, BW and higher SNAP II score among the inotrope group. SGA, outborn status, chorioamnionitis, surfactant use, postnatal steroid use, and need for ventilation were significantly more common in the inotrope group whereas antenatal steroid use was significantly lower. However after adjusting for these variables, differences in neonatal outcomes between the groups remained. (Table 1)

Inotrope use significantly varied between units, with adjusted odds ratios ranging from 0 (0, 0.1) to 7.7 (2.9, 21) when compared to the reference site (median rate) as shown in the figure below.

CONCLUSIONS: The risk of mortality and major morbidity increased significantly among neonates who received inotropes. Further studies are indicated to explore the wide variation in inotrope use across centres.

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Table 1. *Adjusted for GA, SGA, SNAP II, antenatal steroid use, surfactant use, ventilation requirements, chorioamnionitis, and outborn versus inborn status.

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83 IMPLEMENTATION OF DIFFERENT INTERVENTIONS TO REDUCE CENTRAL-CATHETER ASSOCIATED BLOOD STREAM INFECTION (CRBSI) RATES IN A NEONATAL INTENSIVE CARE UNIT (NICU): A 4-YEAR SURVEILLANCE

*J Ting, V Goh, H Osioovich

Pediatrics/Neonatology, University of British Columbia, Vancouver, British Columbia

BACKGROUND: The use of central venous catheters (CVCs) has permitted life-saving treatment for critically-ill neonates. However, CVCs are associated with significant infectious complications. The attributable mortality rate for these catheter-related bloodstream infections (CRBSIs) was estimated to be 4% to 20% with an attributable cost of US$3700 to $29000 per infection. In 2006/2007, our NICU had a CRBSI rate of 11.8 per 1000 central catheter days, which was higher than that reported by other Canadian NICUs.

OBJECTIVES: To implement a quality improvement collaborative named “No Bugs Project” to reduce neonatal CRBSI.

DESIGN/METHODS: This is a retrospective study using an interrupted time-series design to compare CRBSI in neonates admitted to our Level III NICU from August 2007 to March 2011. The study period was divided...
into four epochs to evaluate the secular trends. CRBSI was defined using the Canada Nosocomial Infection Surveillance Program/National Healthcare Safety Network definition prior to 2008. A comprehensive catheter-related blood stream infection prevention initiative was implemented in August 2007 which included staff education, standardization of skin preparation protocol, introduction of new antiseptic agent, implementation of central catheter insertion and maintenance checklists, reinforcement of the use of maximal sterile barrier precautions and revision of central venous line configuration and maintenance.

RESULTS: The median CRBSI was 7.9 per 1000 catheter days at the beginning of the study (Period 1: 8/2007-6/2008), gradually decreased to 3.3 per 1000 catheter days (Period 2: 7/2008-5/2009), 2.6 per 1000 catheter days (Period 3: 6/2009-4/2010) and then 2.2 per 1000 catheter days (Period 4: 5/2010-3/2011) throughout the study period (p=0.034, Kruskal-Wallis one-way ANOVA).

CONCLUSIONS: A multi-disciplinary evidence base quality improvement collaborative resulted in a significant reduction in CRBSI. Continuous measures are required to reduce catheter-related blood stream infections among extremely-low-birth-weight infants.

Characteristics of babies with CRBSI during the study period

84 RETINOPATHY OF PREMATURITY: RISK FACTORS AND VARIABILITY BETWEEN CANADIAN NICUS
*KE Thomas, P Shah, R Canning, A Harrison, SK Lee, K Dow Pediatrics, Queen’s University, Kingston, Ontario

BACKGROUND: Predictors for the development of retinopathy of prematurity (ROP) vary between reports. These factors and risk-adjusted variations in risk have not been examined in a large population-based study.

OBJECTIVES: To identify maternal and postnatal predictors of severe ROP (≥Stage 3 or need for surgery or VEGF blocker therapy) and to examine risk-adjusted variation in severe ROP among Canadian NICUs.

DESIGN/METHODS: Data of neonates with BW <1500 g who were screened for ROP were analyzed from 27 centers in the Canadian Neonatal Network (CNN) between 2003 and 2010. Characteristics of infants with and without ROP were compared. Logistic regression was used to develop a risk adjusted model for ROP. ROP rates were compared among NICUs.

RESULTS: 1163 of 9187 (12.7%) infants developed severe ROP. The incidence decreased from 17% in 2003 to 9.3% in 2010 (p<0.01). Univariate analysis revealed lower BW and GA, PDA, late onset sepsis, ≥3 blood transfusions, inotrope use, postnatal steroid use and outborn status were associated with higher risk whereas SGA, female sex and maternal hypertension were associated with a decreased risk of severe ROP. Multivariable analysis revealed lower BW and GA, PDA, late onset sepsis, blood transfusions, and inotrope use were associated with an increased risk. Marked variability exists in the risk-adjusted rates of severe ROP across CNN centers.

85 LATE PRETERM BIRTH: INDICATIONS FOR DELIVERY AND NEONATAL OUTCOMES IN A NOVA SCOTIAN POPULATION
*K Feldman, C O’Connell, C Woolcott, K Jangaard Neonatal-Perinatal Medicine, IWK Health Centre, Halifax, Nova Scotia

BACKGROUND: The preterm birth rate has increased in many developed countries in recent years. This has largely been due to an increase in the rate of late preterm (34+0-36+6 weeks) births. Although often treated as if almost term, late preterm infants manifest higher frequencies of many neonatal morbidities. Because of these concerns, delivery in the late preterm period should only occur when an accepted maternal or fetal indication exists.

OBJECTIVES: The objectives of the study were to examine the primary indications for late preterm delivery in a population of Nova Scotian residents and to compare the short-term outcomes in indicated versus spontaneous births.

DESIGN/METHODS: A population-based retrospective cohort analysis of late preterm births in Nova Scotia, Canada between 1988 and 2009 was conducted using the Nova Scotia Atlee Perinatal Database. Outcomes in indicated versus spontaneous births were compared using logistic regression and odds ratios (OR) with 95% confidence intervals (CI) were used as measures of the association.

RESULTS: During the study period, there were a total 9,889 late preterm deliveries, 39% of which were indicated. Premature rupture of membranes without chorioamnionitis (36%) and maternal hypertension (32%) were the most common stated primary indications for induction in the late preterm period. Compared with late preterm infants born spontaneously, those born by indicated delivery were more likely to experience respiratory distress syndrome (OR 1.46; 95% CI 1.22-1.76), necrotizing enterocolitis (OR 2.91; 95% CI 1.08-8.04), parenteral nutrition (OR 2.06; 95% CI 1.71-2.49), resuscitation at birth (OR 1.71; 95% CI 1.34-2.18) and hypoglycemia (OR 1.47; 95% CI 1.26-1.71). When adjusted for maternal and fetal indications for delivery, these ORs were attenuated.

CONCLUSIONS: In the late preterm period, indicated delivery is associated with neonatal outcomes, but the maternal and fetal factors that contribute to a delivery being indicated largely explain these associations.

86 INCIDENCE AND RISK FACTORS FOR CRANIAL ULTRASOUND ABNORMALITIES IN CANADIAN NICUS
*K Aziz, V Shah, A Lodha, W Andrews, K Dow, W Yoon Pediatrics, University of Alberta, Edmonton, Alberta

BACKGROUND: Papile’s classification (grades 1 to 4) used CT scan to describe brain injury in preterm infants by disease process, despite diverse etiologies such as hemorrhage, thrombosis, ischemia, and infarction. In 2010, the Canadian Neonatal Network redefined and recorded ultrasound lesions in the neonatal brain (US) by appearance of: echogenicity in the ventricles [intraventricular hemorrhage (IVH)]; echogenicity/lucency in brain parenchyma [intraparenchymal echogenicity (IPE)]; ventricular enlargement (VE); and white matter injury [cystic periventricular leucomalacia (PVL)].

OBJECTIVES: To describe the demographics and risk factors for each type of US lesion.

DESIGN/METHODS: Data from infants <33 weeks gestational age (GA) admitted from January 2010 to June 2011 to 27 participating NICUs were included. Infants with major congenital anomalies and monobini infants were excluded. Multivariate logistic regression analysis including significant antepartum, intrapartum, and immediate neonatal risk factors was performed to identify association with type of US lesion.

RESULTS: Demographic characteristics of 6,458 babies are reported by type of US lesion (Table 1). Individuals may have one or more lesions. Lower GA and higher acuity (SNAPII score) were associated with all types of lesion; born status, chorioamnionitis, Cesarean section (CS) and pneumothorax showed variable associations (Table 2). Antenatal corticosteroid (ACS) treatment was associated with significantly less IPE and less
CONCLUSIONS: All types of lesions are associated with lower GA and higher acuity. ACS may prevent white matter injury (IPE or cystic PVL).

87 PERCEPTIONS OF PARENTS AND HEALTH CARE PROVIDERS REGARDING PARENTAL PRESENCE AT NICU ROUNDS
*M Gryzb, H Coo, L Ruhling, K Dow
Pediatrics, Queen’s University, Kingston, Ontario

BACKGROUND: The views of parents and health care providers on parental presence at bedside rounds are largely unknown. The need to elicit and address concerns related to parental presence at rounds is critical to optimize this important component of family-centered care.

OBJECTIVES: To determine the proportion of parents who attend bedside rounds in the NICU, to describe their perceptions of the experience, and to compare the views of nurses, residents and senior medical students regarding parental presence at rounds.

DESIGN/METHODS: Cross-sectional survey of parents whose babies were discharged from a Canadian Level 3 NICU between October 2010 and October 2011. NICU nurses, as well as residents and senior medical students who completed at least one rotation in the unit during this period, were surveyed.

RESULTS: Surveys were completed by 80/189 (42%) of parents, 28/57 (49%) of nurses, 28/29 (97%) of residents and 36/44 (82%) of senior medical students.

The majority of parent respondents attended rounds (80%); of those, 84% felt the experience reduced their anxiety and 88% reported it increased their confidence in the health care team. Compared to parents who did not attend rounds, they were more likely to feel they had participated in medical decision making (p<0.05). The majority (67%) were not upset when uncertainty was expressed about their child’s condition or care during rounds, nor did they find the discussion confusing (83%).

Nurses were more likely than medical trainees to prefer parental presence at rounds (64% versus 39%; p=0.03) and to feel they spend less time explaining a patient’s status outside of rounds when parents attend (68% vs. 44%; p=0.03). The majority of nurses and medical trainees felt that discussion is inhibited and teaching is decreased with parents present. The benefits to parents of attending rounds, along with the learning in collaboration and communication inherent to parental presence at rounds, should be highlighted for medical trainees.

CONCLUSIONS: A high proportion of parents who attended bedside rounds in the NICU felt it was beneficial. Parents who attended rounds were more likely to feel part of the decision making process than those who did not attend. The views of health care providers were generally less positive, perhaps due to perceptions that discussion is inhibited and teaching is decreased with parents present. The benefits to parents of attending rounds, along with the learning in collaboration and communication inherent to parental presence at rounds, should be highlighted for medical trainees.

88 MECONIUM STAINED AMNIOTIC FLUID IN THE PRETERM NEONATE AS A MARKER OF ADVERSE OUTCOME – A POPULATION COHORT STUDY
*M Consul, B5 Richardson, J9 Seabrook, JH Hill, O da Silva
Division of Neonatal-Perinatal Medicine, Department of Pediatrics, Children’s Hospital, London Health Sciences Centre, Child Health Research Institute and University of Western Ontario, London, Ontario

BACKGROUND: Meconium stained amniotic fluid (MSAF) in preterm babies is an uncommon occurrence. Studies in term and post-term babies has shown poor outcome; however, the significance of MSAF in preterms is uncertain.

OBJECTIVES: To determine the rate of MSAF in premature infants, the associations of MSAF with maternal risk factors, and to assess its relationships with various perinatal/neonatal outcomes.

DESIGN/METHODS: Infants between 25 and 36 weeks gestational age (GA) born between Jan 1, 1996 and Dec 31, 2010 at London Health Sciences Centre (LHSC) were included. Exclusion criteria were major congenital anomalies. Data were extracted from the electronic Perinatal/Neonatal databases. Cohorts consisting of babies with MSAF and those with clear amniotic fluid (CAF) were compared to discharge from hospital.

RESULTS: A total of 187/4,626 infants had MSAF. There was a difference in GA between the two groups (33.0±3.8 weeks in MSAF vs 33.7±3.1 weeks CAF; p=0.03). At 25-28 weeks GA, 8.6% had MSAF, compared with 3.5% between 29-32 weeks and 3.6% between 33-36 weeks. The rate of MSAF increased with a maternal history of clinical chorioamnionitis (11.2% vs 5.8% with CAF, p=0.02), and maternal fever (4.8% vs 2.0%; p=0.18). Mothers with MSAF were more likely to have intrapartum risk factors (89.3% vs 74.8%; p<0.001), placental abruption (19.6% vs 14.3%; p=0.046) and cord complications (40.5% vs. 32.2%; p=0.02) and their neonates were more likely to require endotracheal intubation (41.1% vs 28.7%; p=0.01), cardiac compressions in the resuscitation room (8.8% vs 3.0%; p<0.01) and had lower Apgars at 1 and 5 minutes compared with babies with CAF (p<0.001). Infants with MSAF had an increased base deficit on arterial cord gas (5.8 vs 4.8; p<0.001) and a lower cord arterial pH (7.20 vs 7.25; p<0.001). On analyses of outcome data, infants with MSAF were more likely to be stillborn (7.0% vs 1.7%; p<0.001) but there was no difference in mortality after admission to NICU (2.7% vs 1.7%; p=0.31). Rate of Intracranial hemorrhage was higher (25.6% vs 13.2%, p<0.001) in those with MSAF. Regression analyses revealed meconium staining to be an independent risk factor for adverse perinatal/neonatal outcome.

CONCLUSIONS: Meconium passage in utero is associated with higher perinatal losses and a higher rate of complications in the preterm patient population.

89 OUTCOMES OF PRETERM INFANTS DIFFER BASED ON LEVEL OF CARE FOR BIRTH AND WHERE MEDICAL CARE RECEIVED
*M Ryan, X Ye, H Whyte
University of Toronto, Toronto, Ontario

BACKGROUND: Premature infants born within community rather than tertiary hospitals are more likely to die or suffer major morbidity. However, little is known about infants born and kept within community hospitals compared to those cared for within tertiary hospitals.

OBJECTIVES: Evaluate whether differences in mortality and major morbidity exist between infants <32 weeks gestation born and cared for in tertiary centers vs. born in community hospitals and transferred to tertiary centers vs. born and cared for in community hospitals.

DESIGN/METHODS: A retrospective chart review of all infants <32 weeks gestation born within a major urban center between 2003-2007 was undertaken. Infants were divided into three groups: inborn (Group 1), outborn and transferred to a tertiary NICU within two days of birth (Group 2), and outborn and either kept or transferred to a tertiary center
more than two days after birth (Group 3). The Canadian Neonatal Network provided outcomes information for all infants cared for within a tertiary NICU. Mortality/major morbidity outcomes for infants born and cared for within the community hospitals were individually collected.

RESULTS: There were 2482 infants, with 1491 infants in Group 1, 496 in Group 2, and 495 infants in Group 3. The mean birthweight was larger for infants in Group 3 (1278 gm) vs Group 1 (1169 gm) and Group 2 (1109 gm) and there was a higher percentage of 29-31 weeks gestation infants (63.0%) in Group 3 compared to Group 1 and Group 2 (53.7% and 39.5%, respectively) (p<0.001). With regards to neonatal outcomes, Group 2 had more major morbidity and mortality compared to Group 1 or Group 3 (p<0.001). Group 3 had similar rates of major morbidity and mortality at Group 1 (p=0.05). There was no difference in sepsis rates across the groups (p>0.05).

CONCLUSIONS: This is a follow-up study to the previously presented study on barriers to maternal transfer which demonstrated infants of higher gestation (29-31 weeks) were more likely to be kept and cared for within the delivering community hospital. This study is consistent with previous studies showing outcomes are better for inborn preterm infants. However, this is one of the first studies to compare neonatal outcomes of outborn and non-transferred infants. There was no demonstrable difference between outborn infants that either stayed in the community hospital or transferred to a tertiary hospital greater than two days after birth when compared to inborn infants. These findings are likely attributed to the greater birthweight and percentage of infants within 29-31 weeks gestation, making this cohort inherently more stable.

90 PROPOSED RISK SCORE TO PREDICT BRONCHOPULMONARY DYSPLASIA IN VERY LOW BIRTH WEIGHT INFANTS WITH PATENT DUCTUS ARTERIOSUS

*M Abdul Wahab, A Gallipoli, S Thomas, T Mondal, L Thabane, C Fusch
Neonatology, McMaster University, Hamilton, Ontario

BACKGROUND: Hemodynamically significant ductus arteriosus (HSDA) is associated with increased risk of developing bronchopulmonary dysplasia (BPD) in very low birth weight babies (VLBW). Medical or surgical treatment of HSDA had no effect on BPD outcome. Reason being failure to identify infants who may potentially benefit from closure of PDA. There is growing need for developing a selection strategy among HSDA for subjecting to treatment.

OBJECTIVES: To develop a risk score for predicting moderate to severe BPD outcome in VLBW babies with PDA

DESIGN/METHODS: Single centre retrospective cohort study on all VLBW babies born between October 1, 2006 and December 31, 2010 (n=744) who had PDA (n=282) as echo diagnosis. Echo parameters (trans-ductal diameter and ductal peak velocity prior to commencement of any treatment for PDA) and other confounding risk factors such as birth weight, requirement of multiple doses of surfactant and culture proven sepsis were analyzed. The parameter estimates for each predictor were obtained using multivariate logistic regression analysis. Based on beta values a new 9-point scoring system was derived. A cut-off score with optimum sensitivity and specificity was derived by receiver operating curve (ROC) to predict outcome.

RESULTS: During the study period, 282 VLBW babies who had PDA as diagnosis 28 were excluded due to unavailable Echocardiographic data. Fourteen were excluded due to associated significant congenital heart defects. Fifteen were excluded since they received indomethacin prophylaxis therapy. Male 117 (52%), female 108 (48%), mean birth weight 997 g (range 400-1490 g). Eighty-six (38%) infants had HSDA. Twenty-nine (13%) had severe RDS requiring multiple doses of surfactant. Eighty-four (37%) had culture proven sepsis. Forty-nine (22%) infants had moderate to severe BPD outcome. ROC analysis: Risk score cut-off of 5 was selected to provide optimal sensitivity and specificity. For predicting BPD, area under curve (AUC) is 0.76 (0.69-0.83, p<0.001), sensitivity 70%, specificity 70%, positive predictive value 40% and negative predictive value of 90%, OR 5.2 (95%CI 2.6 - 10.4)

CONCLUSIONS: BPD risk score >5 is associated with higher risk of developing moderate to severe BPD in VLBW infants who have HSDA and other perinatal risk factors. (p<0.001). The power of this new score needs to be validated by a prospective study.

91 FEEDING PRACTICES DO NOT ACCOUNT FOR THE DEVELOPMENT OF TRANSFUSION ASSOCIATED NECROTIZING ENTEROCOLITIS

*N Rashid, J Affi, MM Seshia, J Baier
Pediatrics, University of Manitoba, Winnipeg, Manitoba

BACKGROUND: Feeding practices may influence the development of necrotizing enterocolitis (NEC) in premature infants. Recently it has been suggested that transfusion may be a precipitating factor for NEC in some infants.

OBJECTIVES: To determine if feeding practices play a role in the development of transfusion associated NEC (TANEC).

DESIGN/METHODS: Retrospective comparison of infants ≤34 weeks of gestation who developed NEC within 48 hours of packed red blood cells (PRBC) transfusion with others who developed NEC unrelated to PRBC transfusion. A total of 46 cases of NEC ≤2age ≤1 were identified over five years (2006-2010). Cases were characterized as TANEC if the diagnosis of NEC was made within 48 hours of transfusion.

RESULTS: In nine infants (20%) NEC occurred within 48 hours of transfusion. Thirty-seven (37) NEC infants were either never transfused or transfusion occurred more than 48 hours before the diagnosis of NEC. Infants with TANEC were smaller at birth, less mature and more often growth retarded than non TANEC infants (86±7 vs 149±83 grams, 26±3±1 vs 30±1±2 weeks, 44±11% SGA; p<0.02 for all). Infants with TANEC were more likely to have been initially given minimal enteral feedings (MEF) of 10 ml/kg/d (8/9 vs. 20/37; p=0.055) and had MEF continued longer before feedings were advanced (3 IQR 1.5-1 vs 1 IQR 1.5-3 days; p=0.035). Infants with TANEC had feeds advanced later than those who developed NEC (5.5 IQR 5.75 vs. 3 IQR 1.25-3 days; p=0.002). The interval from the beginning of advancement of feeds to development of NEC was longer in TANEC (19±3 vs 13±1 days; p=0.049) as well as the interval from attaining full enteral feedings to development of NEC (13±3 vs 6±1 days; p=0.061). The volume of feedings was similar between groups (118±18 vs 120±6 ml/kg/day; p=0.986) as was the proportion of those fully enteral fed (7/9 vs 25/37; p=0.780) those receiving exclusively human breast milk (1/9 vs 9/37; p=0.389) and those receiving fortifiers (4/9 vs 13/37; p=0.604).

CONCLUSIONS: Infants who developed TANEC were disproportionally smaller and less mature than other infants who developed NEC. Feeding practices were more conservative in infants who developed NEC following transfusion. This suggests that feeding may play less a role in the development of NEC in these cases.
BACKGROUND: Ontario children's Hospital, London Health science center, London, Ontario

OBJECTIVES: To examine whether quantitative changes in CBF following medical therapy of hsPDA correlate with treatment outcomes. Design/methods: Quantitative CBF and cerebral metabolic rate of oxygen (CMRO2) were measured before and after a 3-day course of ibuprofen (IBU) or indomethacin (INDO) for closure of hsPDA in preterm neonates, using near infrared spectroscopy (NIRS) technique in conjunction with indocyanine green (ICG) tracer concentration curves (Brown et al. Pediatr Res 2002; 51:564; 2003;54:861). Treatment was deemed successful if no further intervention was necessary for the PDA.

RESULTS: Sixteen preterm neonates (GA 27.1±6 wks; BW 1072±206 g; 10M:6F) with echo-confirmed hsPDA were treated at a median age of 4 days (11 with IBU and 5 with INDO). Treatment was successful in nine (group A, seven IBU, two INDO); the remaining seven (group B) required further therapy and four needed surgical ligation. In group A, the diastolic and mean BP increased after echo-confirmed ductal closure (Table, p<0.05). The changes in diastolic BP correlated with changes in CBF (CBF) in group A only (correlation coefficient =0.45). In this preliminary sample, eight of nine infants in group A had an increase in CBF; whereas only two of seven in group B showed an increase in CBF, giving a positive predictive value (PPV) of 80% for successful PDA closure. The corresponding PPV for BP to predict outcome is 62%. CMRO2 values showed no change, suggesting that cerebral metabolism did not change with PDA closure.

CONCLUSIONS: CBF may be used as a predictor of PDA outcomes post treatment, independent of blood pressure and echo findings. The NIRS technique combined with ICG bolus-tracking is a rapid and simple bedside procedure that can provide valuable quantitative information on cerebral hemodynamics.

94

DOES THE TIME OF BIRTH IMPACT ON NEONATAL OUTCOMES IN INFANTS <33 WEEKS GA?

*V Shah, C Parikh, W Yoon, R Alvaro, M Dunn, SK Lee
Paediatrics, Mount Sinai Hospital, Toronto, Ontario

BACKGROUND: Conflicting evidence exists regarding the time of birth and neonatal outcomes. Risk-adjusted early neonatal mortality was higher in infants <32 wks GA admitted at night to 17 NICUs in the Canadian Neonatal NetworkTM (CNN) in 2003. By contrast, in 2010 the National Institute of Child Health and Human Development Neonatal Research Network reported that time of birth did not impact neonatal outcomes in infants between 501-1250 g.

OBJECTIVES: To assess the impact of time of birth on early neonatal mortality and short-term morbidities in infants <33 wks GA born in CNN sites.

DESIGN/METHODS: Data on infants <33 wks GA admitted from January 2008 to December 2009 to 26 NICUs were used. Moribund infants at the time of birth were excluded. Information on early neonatal mortality and short-term morbidities were compared based on the time of birth [day (8 am to 5 pm) vs night (5 pm to 8 am)], and [weekdays (8 am Monday to 5 pm Friday) vs weekend (5 pm Friday to 8 am Monday)].

RESULTS: 8,209 infants <33 wks GA were eligible. One hundred eighty were excluded as the time of birth was not available. Baseline data are shown in Table 1. Mortality and short-term morbidities did not differ based on the time of birth (p>0.05).

CONCLUSIONS: The time of birth did not impact mortality and morbidity for infants <33 GA in participating NICUs of the CNN.
CONCLUSIONS: We report reference ranges for euthyroid VLBW infants at three to five weeks of life. In our sample, TSH and FT4 values differed according to gender, GA and BW. We note an overlap of TSH values between hypothyroid infants with a delayed TSH surge and euthyroid infants at three to five weeks of age.

96 EFFECTS OF HIGH-DOSE VITAMIN D (35,000 IU/WEEK) DURING THE THIRD TRIMESTER OF PREGNANCY ON NEONATAL VITAMIN D STATUS AND BIRTH OUTCOMES IN A RANDOMIZED PLACEBO-CONTROLLED TRIAL IN BANGLADESH

*De Roth, AA Mahmud, R Raqib, AH Baqui
Department of Pediatrics, Hospital for Sick Children and University of Toronto, Toronto, Ontario

BACKGROUND: Vitamin D deficiency is common among pregnant women and newborns in South Asia. High-dose prenatal vitamin D supplementation readily modifies maternal-neonatal vitamin D status (indicated by serum 25-hydroxyvitamin D concentration [25(OH)D]), but the clinical benefits and risks remain unknown.

OBJECTIVES: The aim of this analysis was to describe effects of high-dose prenatal vitamin D on cord 25(OH)D and birth outcomes.

DESIGN/METHODS: In a double-blinded randomized trial, 162 pregnant women were randomly allocated to vitamin D3 35,000 IU/week (VD) or placebo (PL) from 26-29 weeks gestation until delivery.

RESULTS: There were 147 pregnancies followed-up to delivery, and 132 cord blood specimens were collected. Mean cord 25(OH)D was significantly higher with VD vs PL (103 vs 39 nmol/L; P<0.001), and significantly more newborns were vitamin D sufficient (cord 25(OH)D ≥ 50 nmol/L) with VD vs PL (95% vs 19%; P<0.001). Mean cord calcium concentration ([Ca]) was slightly higher in VD vs PL (2.66 vs 2.61 mmol/L; P=0.039); there was one newborn with cord [Ca] ≥ 3.0 mmol/L in each group (VD: 3.00 mmol/L, PL: 3.05 mmol/L). There was one stillbirth in each group, and four neonatal deaths (VD: 1, PL: 3). There was no significant between-group difference in the proportion of preterm deliveries (VD: 15% vs PL: 22%; P=0.31), yet post-term delivery tended to be less common in VD vs PL (11% vs 3%; P=0.05). VD and PL had similar mean birth weights (2800 vs 2790 g; P=0.86), lengths (48 vs 48 cm; P=0.34), and head circumferences (33 vs 33 cm; P=0.63). The overall risk of small-for-gestational age (SGA) was similar in the two groups (VD: 40%, PL: 46%; P=0.50). However, a U-shaped relationship between SGA and cord 25(OH)D was observed: as 25(OH)D rose to 70 nmol/L, the risk of SGA progressively declined, but with further increases in 25(OH)D above ~70 nmol/L, the risk of SGA increased.

CONCLUSIONS: Potent effects of 35,000 IU/wk vitamin D during the third trimester on cord 25(OH)D concentrations did not yield overall benefits with respect to birth outcomes in Dhaka, where there is a high prevalence of adverse perinatal conditions (eg, SGA, preterm birth). However, given a possible non-linear association between vitamin D status and SGA, further studies are required to evaluate whether fetal growth can be optimized by a lower prenatal vitamin D supplementation dose than used in the present study.

97 RSV HOSPITALIZATION IN DOWN SYNDROME IN THE CANADIAN REGISTRY OF SYNAGIS (CARESS) FOLLOWING PROPHYLAXIS (2006-2011)

*Mitchell, K Lanctot, A Li, B Paes
Paediatrics, University of Calgary, Calgary, Alberta

BACKGROUND: The Canadian Registry of Synagis (CARESS) tracks use of palivizumab and RSV hospitalizations in high-risk infants and has data on 299 Down syndrome (DS) infants. Information on RSV prevention in DS infants will be useful to clinicians who prescribe palivizumab.

OBJECTIVES: To determine respiratory illness (RIH) and RSV hospitalization (RSVH) rates in healthy DS infants who received palivizumab compared to: 1) infants with underlying medical disorders (MD) and 2) infants who meet standard indications for RSV prophylaxis (SD) in the CARESS database.

DESIGN/METHODS: A prospective, observational, registry of infants across 30 sites who received ≥1 dose of palivizumab during the 2006-2011 RSV seasons. Utilization and RI outcomes were collected monthly over the full course of palivizumab.

RESULTS: 10,061 infants were enrolled (DS: 299, 3.0%; infants with MD: 1247, 12.4%; and SD: 8515, 84.6%). Participants were significantly different (p<0.005) in most demographic variables and risk factors such as siblings, smoke exposure, ≥5 household members and daycare attendance. Compliance rates relative inter-dose intervals (p=0.323) across the groups was similar, though the DS group received a significantly higher proportion of their expected injections (p=0.018). A significantly greater proportion of SD had RIHs compared to MD (p<0.025), but not SD infants. DS infants did not have a significantly different RSVH rate (1.18%) from either MD (2.55%; p=0.627) or SD (1.52%; p=0.547). Neither group, compliance (by either definition) nor the interaction between the two had an effect on time to RSVH.

CONCLUSIONS: Rates of hospitalization for respiratory illnesses and RSV-related hospitalization did not differ among the groups following prophylaxis. Palivizumab may be efficacious in reducing RSVH in DS compared to reported historical untreated controls in a similar Danish cohort of DS patients (untreated; 7.6%; versus treated; 1.6%-77% reduction).

98 A NEW PEDIATRIC DIAPHRAGMATIC PACING PROGRAM: RESULTS AND OBSERVATIONS

*RJ Adderley, S Butterworth
Department of Pediatrics, University of British Columbia, Vancouver, British Columbia

BACKGROUND: Electronic pacing of the diaphragm for patients with spinal cord injury (SCI) by stimulation of the phrenic nerves was introduced in 1982 and rapidly became an accepted treatment modality. The initial technology, referred to as phrenic nerve pacing, required accessing the phrenic nerves by thoracotomy which in itself conferred significant morbidity, including a small but significant incidence of phrenic nerve injury. Other complications included electrode wire fractures, and inadvertent disconnection.

A significant consideration was cost and the necessity of patient transfer to an institution adept in the technology, most often in the United States. In 1995 a novel technology was introduced where using laparoscopic, the phrenic nerves were mapped on the undersurface of the diaphragm and pacing electrodes placed in the diaphragmatic muscle at the points of optimal response. This system is referred to as a diaphragmatic pacing system (DPS).

OBJECTIVES: To report the results of a new Pediatric Diaphragmatic Pacing Program, with observations, some unique to Pediatrics.

DESIGN/METHODS: Permission was obtained from the institution to establish a Diaphragmatic Pacing Program under the supervision of an oversight committee. Each patient had phrenic nerve function evaluated in the electrophysiology laboratory of the adjoining adult rehabilitation hospital.

Individual permission was obtained from Health Canada to implant DPS technology.

RESULTS: Three patients aged six to 15 years underwent uneventful laparoscopic diaphragmatic mapping and electrode implantation. Patient #1, at age six years was the youngest patient worldwide to receive DPS technology. Although pacing was technically very successful, she proved to be psychologically dependent on mechanical ventilation which initially limited her time pacing. In addition she had multiple wire fractures which are suspected to be due to the (adult) location in the right upper quadrant of the abdomen of the electrode/pacing cable interface, which overlapped hand placement for her therapeutic assisted cough maneuvers.
IMMUNISATION STATUS OF MEDICALLY UNINSURED CHILDREN IN A CANADIAN METROPOLITAN CITY
*LT van Waes, Z Nugent, EL Ford-Jones, P Caulford
University of Toronto, Toronto, Ontario

BACKGROUND: In Canada, children without medical insurance includes returning Canadians and landed immigrants in the 90-day waiting period, Canadians who have failed to renew their provincial health card, refugees, visitors and undocumented individuals. On entry to Canada, immunizations may be recorded during a medical examination; however, there is no requirement of adherence to the recommended schedule.

OBJECTIVES: To document the demographics, health and immigration status, and health insurance coverage of children attending a volunteer family medicine clinic in an urban setting, specifically seeking immunizations. To document the immunizations received by these children.

DESIGN/METHODS: Retrospective chart review from January 2005 to January 2011, of patients 0-18 years of age, attending clinic.

RESULTS: There were 256 visits from 186 children who received immunizations, categorized in five groups: Canadians, landed immigrants, refugees, temporary residents, unknown OHIP status and undocumented individuals. See table.

CONCLUSIONS: There are many children in this urban area who are eligible for free health care. Many of these children seek healthcare at a community health care centre or similar setting, primarily to receive vaccinations, and other crucial aspects of their care may be opportunistic. Many children receive vaccinations later than the recommended age. Complete immunization records were not available for many children. Future policy changes to ensure more complete coverage of this population could include provision of immunizations at school or at entry to Canada.

THE EFFECT OF FAMILY MEALS ON ADOLESCENT PSYCHOSOCIAL OUTCOMES: A SYSTEMATIC REVIEW
*M Harrison, M Norris, H Weinstangel, C Field, M Sampson
CHEO Research Institute, Ottawa, Ontario

BACKGROUND: Research has shown that eating together as a family can have a positive effect on the health and well-being of children. Unfortunately, there is evidence to suggest that the frequency of family meals may be decreasing. This study reviews the link between family meal time and adolescent physical and psychological health outcomes.

OBJECTIVES: To systematically review the evidence relating to family meals and psychosocial outcomes in adolescents.

DESIGN/METHODS: A comprehensive literature review was completed using articles identified from PsychINFO (1806-2009) and MEDLINE (1950-2009). A total of nine Medical Subject Headings (MeSH) terms relating to family meals and outcomes were searched alone and in combination. Bibliographies of papers deemed relevant were also reviewed. In total, 1424 studies were identified and assessed by two reviewers for relevance. Thirty-four papers were reviewed in detail.

RESULTS: In terms of eating habits, youth who ate with their family regularly were more likely to eat nutrient-rich foods, to eat breakfast, and to take multivitamins. They were less likely to eat nutrient-poor foods and to skip meals. In addition, youth who ate more meals with their family were more physically active and spent less time in front of a television or computer screen. Together, healthy eating habits and more physical activity translated to a lower average body mass index (BMI) for youth. In terms of psychological outcome, families who ate together were found to have greater cohesion and stability. Also, children who regularly shared meals with their family had improved psychological outcomes in adolescence, were less likely to abuse drugs and alcohol and to display disordered eating behavior. They had higher self-esteem, were more socially well adjusted, and performed better at school.

CONCLUSIONS: Overall, the effect of family meals on adolescent outcomes was found to be uniformly positive. Specific benefits included those related to variety and consistency of nutritional intake, an opportunity for increased interactions and education among family members, improved psychological outcomes in adolescents, and positive modeling behavior.
between parent and child. Although still limited in scope and number, studies suggest that family meals are important and should be encouraged whenever possible.

102
TEXT-MESSAGING TO REDUCE MISSED APPOINTMENTS IN AN ACADEMIC YOUTH CLINIC: A RANDOMIZED CONTROLLED TRIAL

*FNarring, NJunodPerron, NCamparini-Righini, JPHumair, MDominicéDao, BBroers, JMGaspz, DMHaller

*UnitéSantéJeunes, Départementdel’enfantetdel’adolescentet DépartementdemédecinecommunautaireHôpital universitaires de Genèveet Université de Genève, Suisse.

BACKGROUND: Non-attendance at outpatient clinics is an important obstacle to providing effective and efficient health care. Adolescents are widely reported as “poor attenders”. Telephone or text-message reminders have been shown to significantly reduce the rate of missed appointments in different medical settings.

OBJECTIVE: To evaluate the effect of appointment reminders sent as text-messages to patients’ mobile phones on the rate of attendance at outpatient clinics.

METHODS: This randomised trial was conducted at the youth clinic of a University Hospital between November 2010 and April 2011. Patients registered for an appointment at the clinic, and who gave a mobile phone number, were randomly selected to receive a reminder or not before the planned appointment. Patients were eligible each time they had an appointment. The outcome of interest was the rate of unexplained missed appointments. Appointments that were cancelled or re-scheduled before the planned appointments were not considered as missed. We considered a 10% improvement in the rate of missed appointment as a clinical relevant aim and powered the study accordingly.

RESULTS: 991 patients were included (462 in the text-message group and 529 in the control group). The rate of missed appointments was 17.7% (95%CI: 13.1-19.8%) in the text-message group and 20.0% (95%CI: 16.6-23.4%) in the control group, showing no significant effect of the intervention (p=0.346). The rate of missed appointments differed slightly between the different types of consultations inside the clinic: 17.0% with text-message vs 19.0% in the control group (p=0.614) in the general consultation and 13.9% with text-message vs 20.9% (p=0.266) in the control group in the gynecologic consultation.

CONCLUSION: In our primary care youth clinic, where most of the young patients are referred by school, social services, paediatricians or family doctors, text-message reminders are not effective in reducing significantly the proportion of missed appointments. Text-messaging may be effective in reducing missed appointments in our adolescent gynaecology clinic but further research is needed to confirm this.

103
CHANGING PATTERNS AND PREDICTABILITY OF RISK-FACTORS ASSOCIATED WITH BPD AND ADVERSE NEURODEVELOPMENTAL OUTCOME

*SUHasan, RSauve, DCreighton, STang, AKLodha

Department of Pediatrics, University of Calgary, Calgary, Alberta

BACKGROUND: Bronchopulmonary Dysplasia (BPD) defined as supplemental O2 requirement at 36 weeks postmenstrual age (PMA) or according to the NIH Consensus Definition has been used as a surrogate for abnormal neurodevelopment outcome in preterm infants. Recent data suggests that BPD without mechanical ventilation is not associated with cerebral palsy (Van Marter et al, 2011). In the absence of availability of effective Fo2 data, it remains unclear if mild or moderate BPD were associated with adverse neurodevelopmental outcome (Ehrenkrantz et al, 2005).

OBJECTIVE: To investigate the predictive value of risk factors associated with BPD for prediction of long-term neurodevelopmental outcome at 21 months of age.

DESIGN / METHODS: In our regional perinatal follow-up program, preterm infants born ≤28 weeks gestation were prospectively assessed in a multidisciplinary setting using standardized tests. The primary outcome was neurodevelopmental delay at 21 months. Major disability was defined as 1) moderate-severe cerebral palsy; 2) cognitive score >2SD below the mean; 3) bilateral neurosensory hearing loss; and 4) corrected visual acuity <20/200. Logistic regression analysis was performed for the predictive value of days on supplemental oxygen, gestational age, birth weight, mode of delivery, cranial ultrasound scan (CUS) abnormalities, length of hospitalization, retinopathy of prematurity (ROP), necrotizing enterocolitis (NEC) and red blood cells transfusions.

RESULTS: Of 1,029 live-born infants, 892 survived until hospital discharge. Follow-up data was available for 603 infants. Our data suggests that the number of weeks on supplemental oxygen (p=0.47) was not a good predictor of neurodevelopmental outcome (ROC; AUC=0.6). Similarly, gestational age (p=0.15), the length of hospitalization (p=0.30), ROP stage >3 (p=0.49) and NEC (p=0.35) did not predict the risk of minor or major disabilities. However, birth weight (p=0.02), mode of delivery (p=0.02), abnormal CUS (p=0.001) and the number of red blood cells transfusions (p=0.007) were good predictors for any neurodevelopmental disability.

CONCLUSIONS: BPD defined as the need for supplemental oxygen at 36 weeks continues to be used as a surrogate for adverse neurodevelopmental outcome. However, our data does not suggest that the number of weeks on supplemental oxygen to define BPD predict minor or major neurodevelopmental disabilities.
Laffin Tibudeau, M .......................... 30
Lafleche, J ............................. 26
Lambert, G ........................................ 32
Lambert, M................................. 16
Lancot, K................................. 97
Landry, M ....................................... 49
Latchman, A .............................. 41
Lavoie, J ........................................ 3, 81
Law, B ............................................. 26
Lawrence, SE .................................... 65, 95
Lebovic, G ...................................... 22
Lee, DS ......................................... 93
Lee, SK . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1, 2, 70, 73, 82, 94, 96
Lemire, B ....................................... 6, 79, 95
Leo, S .......................................... 34
Lefstein, K ..................................... 11
Levin, L ........................................... 54
Levy, A ............................................. 41, 42, 67
Levy, E ............................................. 74
Levy, R ............................................. 31, 68
Levits, R .......................................... 97
Li, A .................................................. 97
Li, P ................................................. 36, 55
Lipman, E ........................................ 13
Lodha, A ....................................... 2, 70, 80, 86, 103
Lynch, T ......................................... 17

M
MacLachlan, K ............................. 53
MacDonald, MJ .................................. 57
Magill-Evans, J ............................ 38
Maguire, J ................................. 21, 22
Mahmud, AA ..................................... 96
Mandani, M ...................................... 37
Martens, DJ .................................... 18
Martimianakis, T............................ 68
Martin, A ....................................... 15
Mccarren, BW ............................... 25
McDuff, P ....................................... 25
McFadyen, K ................................... 18
Meeher, A ....................................... 14
Mekhail, S ....................................... 44
Ménard, D ....................................... 74
Merlafe, S ....................................... 80
Mian, M .......................................... 33
Millar, D .......................................... 6
Millar, K ......................................... 43
Miller, S ......................................... 4
Mitchell, I ...................................... 50, 51, 97
Mohamed, I .................................... 81
Mohammad, K .................................. 4
Moharir, M ...................................... 54
Mondal, T ...................................... 60, 90
Moore, D ................................. 24, 25
Moore, G ....................................... 79
Moreau, K ...................................... 102
Morison, A .................................. 12, 28
Mukerji, A ...................................... 5

N
Nair, V .......................................... 52
Nan, X ............................................ 95
Narring, F ..................................... 102
Newhook, L .................................... 34
Nguyen, U .................................... 16
Nisenbaum, R ............................... 12
Norris, M ..................................... 101
Negent, Z ....................................... 99
Nur, R ............................................. 3
O’connell, C .................................... 85, 92
Ojeh, C .......................................... 1

O
Omand, J ....................................... 21
Osovich, H ..................................... 78, 83
Osmond, MH ................................... 43
Otis, J ....................................... 32, 61, 67
P
Paes, B ........................................... 60, 61, 97
Pageout, A .................................... 76
Farikh, C ........................................ 25, 94
Farkin, PC ................................. 21, 22, 46
Pepus, S ....................................... 69
Pelea, E ........................................... 76
Pererault-Samson, M .................... 56
Perry, S .......................................... 29
Peters, N ........................................... 22
Pereira, M ...................................... 23
Peterman, C .................................. 74
Pigott, W ........................................... 61
Poon, N .......................................... 44
Porter, R ......................................... 43
Pogues, K ..................................... 46
Protheroe, CL .................................. 58
Proudfoot, NA ................................... 57
Puddister, D ................................... 65
Quach, C ........................................... 24
R
Rabi, Y ........................................... 2, 71, 80
Ramirez-Serrano, A .................... 64
Rapu, B .......................................... 96
Rashid, M ....................................... 51
Rashid, N ....................................... 8, 91
Rawle, P ......................................... 62
Reisman, JJ .................................... 55, 36
Richardson, BS ............................ 88
Ridha, M .......................................... 93
Rigney, J .......................................... 4
Roberts, RR ................................... 6
Robinson, A ................................... 65
Robinson, J .................................... 48
Rocher, I ........................................... 24
Rodd, C .......................................... 20
Romanick, M ................................... 29
Rosenberg, RW ............................ 93
Roth, DE ............................................ 96
Rouleau, T ..................................... 3, 81
Roy, E ................................................. 32
Ruano Cea, E .................................. 66
Ruff, M ........................................... 50, 51
Ruhling, L ....................................... 87
Ryan, M .......................................... 89
S
Sampson, M .................................. 101
Sanatan, S ..................................... 58
Sangh, G .......................................... 17
Santschi, M ..................................... 56
Sauve, R .......................................... 50, 51, 72, 103
Schwartz, SB ................................... 33
Seabrook, JA .................................... 88
Seidman, EG .................................... 74
Seshia, MM ..................................... 8, 91
Sgro, M ........................................... 37
Shah, P ........................................... 1, 2, 70, 84
Shah, PS ........................................... 73, 82
Shah, V ........................................... 73, 86, 94
Shainin, H ...................................... 80
Shamir, L .......................................... 12
Sharma, A ....................................... 20
Shepherd, J ..................................... 29
Sherry, PL ...................................... 95
Shivam, S ....................................... 69
Shoulde, M ..................................... 33, 68
Singhal, N ....................................... 2, 70, 71, 72
Slatter, CA ....................................... 59
Smart, S .......................................... 25
Smith, G .......................................... 14
Smith, RW ................................. 14, 25
Soliman, A ..................................... 63
Somers, S ....................................... 40
Soraiachus, AS ............................. 2, 70, 71, 72
Sovran, J .......................................... 25
Spady, D .......................................... 35
St. Lawrence, K ............................. 93
Steinle, S .......................................... 60
Stephens, D .................................... 25
Sun, X ................................................. 65
Symington, A ................................... 60
Synnes, A ....................................... 4
Sztamari, P ..................................... 13
T
Taddeo, D ...................................... 10
Taddio, A ...................................... 25
Talarico, S ....................................... 9
Tan, S ............................................ 103
Taras, J ........................................... 54
Taylor, BS ....................................... 63
Tshabelele, L ................................. 90
Thivakaran, S ................................... 25
Thomas, KE ..................................... 84
Thomas, S ....................................... 90
Thompson, N .................................. 41
Thorpe, K ....................................... 37
Timmons, BW .................................. 57
Ting, J ............................................ 83
Ting, JY .......................................... 78
Tremblay, C ................................... 24, 32
Tremblay, E .................................... 74
Tsai, E ............................................. 35
Tunnicliffe, J ................................... 52
U
Ugner, A ......................................... 30
Van Den Heuvel, M ........................ 68
Van Osch, S .................................... 44
van Waes, LT .................................. 99
Vanderkooi, O ............................... 64
Vandermerwe, A ............................ 37
Vanstone, C ................................... 20
Venner, M ....................................... 29
Vincent, M ..................................... 67
W
Wahl, G .......................................... 28
Weekes, M ..................................... 12
Weiler, H ........................................... 20
Weinstangel, H .............................. 100, 101
Weysam, S ..................................... 75
Whyte, H ........................................... 89
Wilson, S ........................................... 62
Wong, J ........................................... 82
Woolcott, C .................................... 85
Wormsbecker, A ........................... 62
Y
Ye, X ............................................. 73, 89
Yee, W ........................................... 82
Yoder, B .......................................... 6
Yoon, W ........................................... 82, 86, 94
Yusuf, K .......................................... 52
Z
Zhao, M .......................................... 1
INDEX TO ABSTRACTS / INDEX DES RÉSUMÉS

Subspecialty Categories / Catégories de surspécialité     Abstract Numbers / Numéro de résumés

ABU – Child Abuse and Neglect / Maltraitance et négligence d’enfants .......... 33
ADO – Adolescent Medicine / Médecine de l’adolescent ................................ 10-12, 18, 32, 102
ADV – Advocacy / Défense d’intérêts ......................................................... 9
ALL – Allergy and Immunology / Allergie et immunologies ............................ 34
BIO – Bioethics / Bioéthique ........................................................................ 35
COM – Community Paediatrics / Pédiatrie générale ........................................... 23, 36, 37
DEV – Developmental Paediatrics / Pédiatrie du développement ................. 38-40
EME – Emergency Medicine / Médecine d’urgence ........................................ 41-47
EPI – Epidemiology / Épidémiologie ............................................................. 26, 30, 48, 49, 50, 51
FET – Fetal and Maternal Issues / Médecine foetomaternelle ............................. 52
GAS – Gastroenterology / Gastroentérologie ................................................. 15, 53
GPS – General Paediatrics / Pédiatrie générale .............................................. 25, 54-56
HEA – Healthy Active Living / Vie active saine ............................................... 28, 57, 58
HOS – Hospital Paediatrics / Pédiatrie hospitalière ......................................... 16, 59
INF – Infectious Diseases / Infectiologie ......................................................... 24, 27, 60-64
INJ – Injury Prevention / Prévention des blessures ......................................... 17
MED – Medical Education / Formation médicale ........................................... 31, 65-69
MEH – Mental Health / Santé mentale ............................................................ 13
NEO – Neonatology and Perinatology / Néonatologie et périnotologie ........... 1-8, 70-95, 103
NUT – Nutrition ............................................................................................... 20-22, 96
PAT – Patient Safety / Sécurité des patients .................................................. 29
RAD – Radiology / Radiologie ......................................................................... 19
RES – Respirology / Pneumologie ................................................................. 14, 97, 98
SOC – Social Paediatrics / Pédiatrie sociale ................................................... 99, 100, 101