

2008 Telethon Competition Projects Awarded

Nine projects were awarded funding from the 2008 Telethon Competition amounting to almost \$248,000.00 from the BC Children's Hospital Foundation. These projects were selected from 30 initial applicants who submitted letters of intent in back in January. The Telethon Review Committee, under the chairmanship of Dr. Stuart Turvey, worked very hard to select projects that were innovative, well designed and led to outcomes that would lead to improved practice or further research.

1. Abrahams, Ronald Fir Square Project: An Evaluation of Rooming-In in Substance-Exposed Newborns

The use of illicit substances such as heroin and cocaine during pregnancy is a major pediatric problem affecting approximately 3-11% of all newborns, and up to 44% of newborns within impoverished populations. Substance-exposed newborns are at risk for serious consequences including symptoms of drug withdrawal, delays in social, cognitive and physical development, and even death. The standard practice is to immediately separate substance-exposed newborns from their mothers, transfer them to a special care nursery to monitor for signs of withdrawal, and treat with morphine if necessary. However, these infants often suffer social, behavioral and developmental deficits as a result of such separation. The Fir Square Combined Care Unit (Fir Square) aims to improve outcomes of substance-exposed newborns by caring for the mother and her newborn together in the same room (i.e., "rooming-in"). Given that rooming-in is an accepted practice in the general population with well known benefits (e.g. increased breast-feeding rates and improved mother-infant bonding), it seems logical to apply a similar strategy in caring for substance-exposed populations.

Preliminary results suggest the rooming-in model is both beneficial and safe and may be the preferred mode of care for substance-exposed newborns. This investigation will expand upon our original study to compare outcomes of substance-exposed newborns who roomed-in at Fir Square versus those who received standard care in B.C. This is the most comprehensive evaluation of rooming-in among substance-exposed newborns. Findings will generate critical information for the care of this vulnerable population and will ultimately lead to improved outcomes for substance-exposed newborns.

Co-Applicants: Janssen, P. Harris, S. Hodgson, Z

Amount Awarded: \$29,964.00

2. Cabral, David Evaluation of the Rheumatology Research Report - a clinical research knowledge translation strategy to enhance patient participation in research

Rheumatic diseases are infrequent in childhood so that a children's hospital will follow a very low number of children with these disorders. Effective research into these conditions requires collaboration of many hospitals and maximal participation of patients and their families. Patients and parents are more likely to participate in research projects if they perceive research as integral to clinical care and recognize that research is the best route to improving health outcomes for their child and all children with similar diseases. To promote this clinical care-research "culture", four years ago the Division of Rheumatology at BCCH began a three-times-yearly distribution of a newsletter [the Rheumatology Research Report (RRR)] to patients and families to disseminate information about research. In the past two years, the number of chronic patients followed in our clinics who are involved in national and international research studies has increased from 5% to 30%. As yet, the role of the RRR in promoting this success has not been evaluated.

This project aims to develop a questionnaire to determine if the RRR has been an effective tool for knowledge translation (KT), and if it has increased the likelihood of patient and parent participation in research. Questionnaire development will follow a detailed design process and final administration. KT is now an essential component of all funded research programs, and although KT evaluation is fundamental, it

is rarely undertaken. This project will move our Division in the direction of initiating KT research and effective KT in children's health.

Co-Applicants: Ulrbe, A; Hong, Q, Espinosa, V; Tucker, L; Masse, L

Amount Awarded: \$24,481.00

3. Castillo, Eliana Detection of congenital CMV infection in children at risk of developing late onset hearing loss.

Cytomegalovirus (CMV) is the most common infection acquired by infants prior to birth (congenital infection), and is thought to be the second most common cause of hearing loss in childhood. In BC, it is estimated that each year 400 babies are born with CMV infection and although the majority will be healthy at birth, 60 of them will develop some sort of permanent damage from the infection, most commonly hearing loss. CMV-related hearing loss is progressive and at least 50% of affected children will not experience hearing loss until they are 3-4 years old (late-onset hearing loss). CMV infection can be detected reliably soon after birth on 'dried blood spots' that are already collected to test for other diseases.

Infants acquire speech and language from birth, or even earlier, and if they cannot hear well, their language and development suffers. All babies born in the province of British Columbia are being offered hearing tests at birth because early intervention has been shown to prevent language delay and improve the overall health of the child. However, this hearing test will 'miss' the CMV-infected babies who do not have hearing problems at birth but are at very high risk for developing hearing loss later.

This pilot study aims to collect preliminary data to determine if testing for CMV infection at birth helps to prevent the impact of late-onset hearing loss.

Co-Applicants: Kozak, F; Brunstein, J; Thomas, E

Amount Awarded: \$30,000.00

4. Dunham, Christopher Anencephaly: A Detailed Light Microscopic Study

Anencephaly is a fetal malformation wherein the majority of the brain and the skull "cap" (i.e., calvarium) are absent. This profound malformation often draws up monstrous analogies. Nearly 1% of all pregnancies are affected. The cause of anencephaly is unclear, but its impact on affected families is devastating.

The remnant of brain tissue in anencephaly is called the "area cerebrovasculosa" (AC). Our study's first objective is to give a detailed microscopic description of the AC in 30 autopsy anencephalics. To date, such a study has not been conducted. Second, we will look for pathognomic DNA mutations in anencephaly. Investigators have suggested that partial duplication of the DNA on the small arm of chromosome 2 is involved in the etiology of anencephaly. We will be performing fluorescent in situ hybridization (FISH) on our 30 cases to look for partial 2p duplication. FISH is a targeted genetic technique that utilizes short strands of fluorescently labeled synthetic DNA to "probe" for DNA mutations. In addition, we will be evaluating the DNA of 10 anencephalic patients using the sensitive technique of array comparative genomic hybridization (aCGH) to screen all chromosomes for mutations. By defining a characteristic mutational profile, this may lead to a diagnostic test for anencephaly and provide information as to its basic etiology. Through these investigations, we hope facilitate the journey towards a cure for this malformation.

Co-Applicants: Hendson, G; Sarnat, H; Flores-Sarnat, L

Amount Awarded: \$27,592.00

5. Du Souich, Christele The genetics of behavioural and psychiatric disease: A novel approach

Fifteen percent of BC's children and youth are affected with psychiatric disease impairing their ability to function in daily life. This pilot study takes a novel approach to understanding the genetic basis of psychiatric disease in children. Psychiatric genetics has been the subject of many studies, and though progress has been made, results are often difficult to interpret and generalize due to the variability of psychiatric disease in patients. In contrast, inherited conditions caused by a single defective gene (Mendelian malformation syndromes) have the advantages of welldefined physical and psychological characteristics (phenotype) and simpler inheritance patterns. This study focuses on a multigenerational family currently followed through the Department of Medical Genetics at BCCH. "Affected" males have severe mental retardation and distinct physical, behavioral and psychiatric features such as aggressivity and irritability; "carrier" females have psychiatric disease. Through a thorough description of the physical, behavioral and psychiatric features of the affected individuals and linkage analysis, a tool used to identify the area on a chromosome most likely to be associated with a genetic disorder, we hope to identify and characterize the gene and related biological pathway(s) involved in this family's disorder. Characterization and identification the genetic cause of this disorder will be valuable to the family for patient management and for family planning (prenatal diagnosis). Moreover, understanding the disease-causing biological pathway in this unique family may point to new therapeutic approaches that may benefit children and adults with behavioral or psychiatric disease more generally.

Co-Applicants: Boerkdel, C.F.
Amount Awarded: \$28,581.00

6. Houghton, Kristen Evaluation of dynamic postural balance using the Biodex Balance System® in children with Juvenile Idiopathic Arthritis.

Juvenile idiopathic arthritis (JIA) affects one in 700 children. While currently available medications and therapies allow children with JIA to perform basic activities, such as walking and climbing stairs, they remain less active and less fit than their peers and this may impair optimal development. Balance and activity specific rehabilitation (e.g. soccer specific movements for a child playing soccer) are not routinely assessed and current therapies may not adequately prepare children with JIA for safe activity participation.

It seems reasonable, although no data exists, that children with arthritis affecting their legs may lose balance. Children with lower limb injuries are known to lose their balance and adults with arthritis are also known to lose balance. In this proposal, we aim to determine whether children with leg arthritis have worse balance than children without leg disease or injury. We recently acquired state of the art equipment for balance assessment and training (Biodex Balance System®). Telethon funding will enable us to bring together physicians, therapists and health care researchers to perform a pilot study of balance in children with arthritis.

In this pilot study, if "loss of balance" is determined to be a component of physical disability in children with JIA, we propose to develop and test in a larger study the effectiveness of balance training. We believe balance training of children with JIA will allow counseling for increased and safe participation in physical activity, decrease risks of injury and disability, and ultimately improve quality of life

Co-Applicants: Hong, Q; Davidson, C; Potts, J
Amount Awarded: \$20,496.00

7. Keller, Bernd Mass Spectrometric Metabolic Profiling of Cordblood from Premature Neonates

Babies born prior to 29 weeks gestation have an increased risk of long-term deficits in cognitive and motor skill development. Although major advances in medical care now sustain life, much remains unknown

regarding the nutrients needed to support the developing brain ex utero. From 24 to 40 weeks gestation, the brain grows from 110 to 350 grams, with remarkable development. Our research addresses why some infants succumb to poor clinical outcomes while other seemingly similar infants do not. Our goal is to identify, characterize, and interpret the metabolic reasons that place some infants at risk for poor outcome, and by so doing open the door for interventions to avoid lifelong deficits in neurological function. We will do so by bringing to clinical research, powerful new technologies in mass spectrometry. In small blood samples, we will scan about 2000 molecules which are then mapped using sophisticated software. With comparison to term infants, we will identify immaturity in particular systems and their implications for developing organs and nutrient support. A particular strength is the ability to link early metabolic profiles to later outcome in an ongoing MRI study of brain development. In sum, this project will for the first time identify early biomarkers that predict infants at risk for poor outcome, with the potential for major breakthroughs in understanding immaturity of metabolic pathways. Our goal is to bring to clinical research advanced biomedical technologies from which an unprecedented wealth of data will open the door to improve outcome of high risk infants.

Co-Applicants: Lavoie, P; Innis, S; Miller, S
Amount Awarded: \$29,500.00

8. Olsen, Lise Exploring the Injury Prevention Perceptions and Strategies of Parents of Young Children with Chronic or Disabling Health Conditions.

The purpose of this project is to gain understanding of parents' perspectives about the safety and injury prevention issues they face as they care for a young child who has a disability or a chronic health condition associated with disability. The study methods will include in-person interviews with a primary caregiver (either mother or father) of young children (1-5 years). Open-ended interview questions will address safety related concerns they have for their child, preventive measures they use, and challenges they experience. This is the first research study on this issue and addresses an important gap in understanding for practitioners and policy makers, providing essential information to inform child safety issues in this population. The results will also provide the groundwork for a larger survey to assess the safety issues experienced by families.

Co-Applicants: Brussoni, M; Joshi, P; Miller, A
Amount Awarded: \$26,676.00

9. Panagiotopoulos, Constadina Determinants of weight gain and diabetes risk in youth with mental illness treated with second generation antipsychotic medications.

Fifteen percent of BC's youth suffer from mental illness. Many of these individuals will be treated with medications called second generation antipsychotics (SGAs). Over the past few years, prescription of SGAs to youth has increased substantially, but there has been little evaluation of the potential side effects on individuals who are still growing and developing. In adults, SGAs increase the incidence of obesity and diabetes; however, it is not yet clear if treatment of youth also elevates risk of weight gain, changes in metabolism (elevated cholesterol, blood pressure) and diabetes. Therefore, we propose to determine whether youth with mental illness treated with SGAs have an increased risk of obesity, abnormal cholesterol levels, elevated blood pressure and abnormal blood sugar levels compared to children with mental illness who are not treated with SGAs. In addition, we will examine the differences in the levels of hormones controlling appetite between these two groups as a possible cause for the weight gain, because this has been previously observed in adults treated with SGAs. This information may assist health care professionals to develop standardized approaches for prevention, education, and screening that will identify and reduce the potential body weight-related complications that youth with mental illness may experience when treated with these medications.

Co-Applicants: Davidson, JL; Chanoine, JP; Haim, A
Amount Awarded: \$29,985.00