ALBERTA CENTRE FOR
CHILD, FAMILY
& COMMUNITY
RESEARCH

Inventory of Alberta-based FASD Research and Evaluation Activities

Updated March 2016

Project: Update the Inventory of Alberta-based FASD research and evaluation covering all four pillars: basic, clinical, population, and health services.

Introduction

The Alberta Centre for Child, Family & Community Research (ACCFCR) facilitated the development of this report, which was prepared on behalf of the Cross Ministry Committee (CMC) as part of an initiative to develop an Alberta-Based FASD research and evaluation inventory. The initial inventory was created as part of the Year 5 and 7 evaluations of the Government of Alberta' FASD Strategic Plan, led by ACCFCR. This report serves as an updated summary of research and evaluation conducted within the province of Alberta, Canada between mid-year 2014 and April 2016. The updated inventory includes evaluation and research completed and on-going in the province of Alberta since 2012 to present covering the four pillars of research: a) basic, b) clinical, c) population, and d) health, identified by the Alberta FASD Cross-Ministry Committee (FASD-CMC) in the Year 5 and 7 Evaluation. The overall goal of this report is to provide a summary and make comparisons to the baseline data provided in the Year 5 and 7 Evaluation. This report also highlights existing gaps in Alberta-based research. The definitions used to guide our work within the four pillars follow those provided in the Year 5 and 7 Evaluation.

Procedure

A systematic literature review was replicated to identify research and evaluation conducted between mid-year 2014 and mid-year 2016. We provide a summary of recent peer-reviewed literature and published scholarly articles, active projects, and conference presentations by Alberta-based researchers/practitioners. We employed the same search terms and search engines used in the Year 5 and 7 Evaluation. The following section presents these key findings organized by pillar guided by the same definitions identified in the Year 5 evaluation:

- *Basic* pillar focused on animal or neuroscience research in relation to the effects of prenatal alcohol exposure (PAE) on brain and function, as well as psychotropic treatment.
- C*linical* pillar focused on human research studies that examine diagnosis and assessment, intervention and supports, and program evaluation.
- *Population* pillar focused on research that concerns the epidemiology and prevalence for incidence of FASD within the province, as well as prevention, and program evaluation.
- *Health* pillar focused on research involving health related services and health factors relating to the mother or child affected by FASD.

Key Findings on Research and Evaluation Completed in the Province of Alberta

Overall, consistent with previous years, majority of findings have been published within the clinical pillar but with a paucity of projects focused within the population, health, and basic research pillars. Trends within the four research pillars are presented below.

A. **Basic**

Summary of Basic Research

Between 2001-2012, we identified a breadth of research within Alberta related to the basic pillar covered human imaging, animal studies (those involving rodents), and pharmacological (e.g. effectiveness of psychotropic treatments in FASD). However, our search completed between 2012 and 2014 identified a greater emphasis on human imaging research within the province primarily lead by researchers at the University of Alberta and in collaboration with other FASD researchers nationally and internationally. The following section summarizes research conducted within the basic research pillar between mid-year 2014 and mid-year 2016.

Human brain imaging studies: Research in this area continues to be lead by Dr. Christian Beaulieu at the University of Alberta in collaboration with Drs. Carmen Rasmussen and Jacqueline Pei. The teams research program remains focused on detecting differences in longitudinal brain development using Diffusion Tensor Imaging (DTI) by comparing children with FASD to non-alcohol exposed children into young adulthood. Recent findings from the lab continue to report on correlates between brain differences and cognitive abilities (Treit et al., 2016) and between oculomotor deficits and brain structures (Paolozza et al., 2014c). We anticipate an increase in brain imaging research findings using data from the multisite FASD Demonstration Project funded by NeuroDevNet and conducted in collaboration with FASD researchers at the University of Alberta (see Reynolds et al., 2011). Furthermore, there are also proposed plans to focus human imaging studies toward adults with FASD (pending funding). For example, Dr. Ada Leung and Dr. Sharon Brintnell (March, 2015; April, 2016) have proposed to examine the functional abilities of adults with FASD in relation to brain imaging.

Biomarkers: Our search previously identified a new area of research examining cortisol levels in children and adolescents with FASD or PAE as a potential biomarker. Cortisol is a stress hormone produced by the hypothalamic-pituitary-adrenocortical (HPA) axis and is involved in regulating our response to stress. Abnormal patterns of cortisol indicate that the HPA axis is unable to adapt or recover from stress, as evident seen in individuals with mental health issues or difficulties with self-regulation. Recent findings from McLachlan et al (2016) have shown an association between early life adversity and a dysregulated pattern of cortisol, whereas protective factors were associated with a more typical pattern. Future work lead by Drs. Carmen Rasmussen and Jacqueline Pei, in collaboration with NeuroDevNet FASD investigators, proposes to examine changes in cortisol regulation in response to targeted therapeutic intervention.

Furthermore, deficits in oculomotor (eye movement) control have been proposed as a potential biomarker for identifying and diagnosing children with PAE. Recent findings have reported on correspondence between oculomotor control and cognitive abilities such as working memory and inhibition based on data from the multisite FASD Demonstration Project funded by NeuroDevNet (Paolozza et al., 2014a; 2014b). Future work will continue to examine oculomotor control in individuals with FASD or PAE.

New Areas of Research within Clinical Pillar between 2014-2016: Our search identified two new areas of research in addition to continued research projects identified in the Year 7 evaluation. The first study will be conducted as part of phase II for the multisite FASD demonstration project funded by NeuroDevNet, which proposes to examine links between secondary interventions and biological changes in a larger recruited sample of children and adolescents with FASD or PAE. The project will be lead by Dr. Carmen Rasmussen and Dr. Jacqueline Pei at the University of Alberta in collaboration with the Glenrose Hospital and NeuroDevNet FASD investigators across Canada. The outcomes of this study may have potential to address current gaps in evidence-based interventions and improved understanding about changes responsive to intervention. Second are identified in our search will be focus on detection of differences in brain development in adults with FASD or confirmed PAE. Prior work in Alberta has tracked longitudinal changes in children with FASD into young adulthood (i.e. Beaulieu et al.). Future work that has been proposed intends to examine and understand differences in brain development among adults with FASD in relation to functional outcomes.

Research gaps: However, as noted previously, no new published findings have emerged within the province in animal studies or pharmacological studies, which is imperative to learning about appropriate treatments for children with FASD. Therefore, these lines of research remain areas for development.

B. **Clinical**

Summary of Clinical Research

Between 2001 and mid-year 2014, FASD research in Alberta related to the clinical pillar covered four key areas that reflected diagnosis and assessment, informing clinical practice, access to services and supports, and development of interventions and services. However, current and future work has primarily focused on diagnostic assessment and identifying changes in individual needs of children with FASD, evaluation of existing supports and services, and the development of intervention for children with FASD and PAE. In the Year 5 and 7 evaluations the report highlighted continued partnerships between researchers and FASD Clinics and this remains a critical component to research within the clinical pillar. The following section summarizes key findings from current and ongoing research conducted within the clinical pillar.

Diagnostic assessment and identifying changes in individual needs: Our previous search identified an increase in research focused on tracking the long-term outcomes and needs of children and adolescents with FASD. For example, researchers at the University of Alberta and the Glenrose Rehabilitation hospital and support from the Alberta FASD-CMC are currently conducting a longitudinal follow-up of children and adolescents previously, which has potential to help identify changes in needs over time and ultimately improve clinical care and provision of an integrated service delivery that continues to meet the needs of individuals with FASD. Furthermore, recently completed study by researchers at the University of Alberta and funded by ACCFCR identified the rates of mental health and adverse environmental risk factors in a large sample of children with FASD or PAE (Tamana et al. 2016). Findings revealed that approximately 57% of children with FASD or PAE aged 3 to 17 years and seen by the Glenrose

FASD diagnostic clinic were diagnosed with a co-morbid mental health. Furthermore, children with FASD and a mental health disorder reportedly experienced much higher rates of adversity those children with FASD but not co-morbid mental health diagnosis. Adverse life experiences reported among children with FASD will remain a priority area for future research in the clinical pillar. Moving beyond clinically referred individuals with FASD, more recent findings have described the functional needs of youth with FASD involved with the youth justice system relative to high risk youth without FASD (Wyper et al., 2015). Findings have revealed increased neuropsychological and functional impairment among high-risk youth with FASD compared to high-risk youth without an FASD or PAE.

Clinical data from FASD diagnostic clinics within the province have provided information critical to improving diagnostic practice. For example, recent findings from CanFASD pilot *data form* highlighted common outcomes such as frequency and pattern of functional deficits as well as intervention recommendations from clinics across Canada (Clarren et al., 2015). Their findings are helpful for ensuring consistency across clinics and further helpful for identifying service needs of individuals with FASD such as health, mental health, social services, and education. Similarly, one provincial study conducted by researchers at the University of Alberta and supported by the support from the Alberta FASD-CMC is continually examining reasons for a deferred diagnosis, which again will have important implications for improving diagnostic practice and for identifying unique needs of children with PAE being referred to an FASD diagnostic clinic. There has also be recently completed work conducted by the University of Alberta in collaboration with the Alberta FASD-CMC that has examined caregiver stress and needs in caring for children and adults with FASD (Bobbitt et al. 2016). Clearly, identifying the needs of individuals with FASD has become an important focus for current FASD research within the province.

Development of targeted intervention for children with FASD and PAE: Moreover, as highlighted in the Year 5 evaluation, the development of targeted interventions for individuals with FASD is considered a priority area. Dr. Jacqueline Pei and Dr. Carmen Rasmussen have extensively expanded their current work examining and adapting evidence-based intervention programs for improving outcomes for children and adolescents with FASD. Current and ongoing projects are focused on supporting teachers and teaching assistants to implement a school-based math intervention program for young children with FASD (Kulley-Martens et al., 2015), implementation of working memory home intervention program for children and adolescents with FASD (Leung et al., 2015), fostering social skills, and improving self-regulation skills for adolescents with FASD. Evidently, this work appears to continue building on emerging research themes in the Year 5 and 7 Evaluation. Furthermore, researchers evaluating the impact and promise of new and existing programs and services remain important to continued service and delivery to individuals and families living with FASD. Current work lead by Dr. Jacqueline Pei is currently evaluating the McDaniel Youth program (funded by ACCFCR).

Research gaps: Future research should explore whether health, mental health, social services, and education are accessible and meeting needs of individuals and families affected by FASD. There also remains a lack of follow-up research conducted in adults with FASD or PAE that requires further attention.

C. **Population**

Summary of Population Research

Economic and personal costs: In the Year 7 evaluation, research in Alberta related to the population pillar focused on the prevalence of FASD and the economic cost of FASD, specifically the cost-effectiveness of services and supports for the prevention of FASD. Most research in the population pillar has be lead by the Institute of Health Economics reporting on the incidence and costs associated with FASD within the province but with no plans for further developments in this area.

Prevention: We also found an increase in research and evaluation to support primary level prevention activities to increase knowledge about risks associated with alcohol use during pregnancy. The Alberta Treatment Improvement Protocol (TIP) for FASD was designed to help service providers to screen for women at risk of giving birth to a child with FASD and individuals who may have FASD themselves, and aims to help facilitate access and referral to services and supports. The TIP was piloted at four agencies in Alberta who work directly with adolescents and adults accessing mental health or substance abuse services (Kully-Martens et al., 2015; Cook et al., 2014). Another area that has been developed within the province over recent years is the 'Prevention Conversation' (an initiative to raise awareness of the effects of alcohol during pregnancy (Pei et al., 2015). There has also been work completed with Albertan youth's to explore their current perceptions of alcohol, drugs, and sex that has important implications for supporting awareness and programming targeting youth (Heudes, 2014). Similarly, evaluation of outcomes for the Parent-Child Assistance (P-CAP) program (El Hassar, 2014) and Lakeland addiction treatment centre for high-risk women (McFarlane, 2014) programs have been conducted.

Research gaps: Continued evaluation of programs serving women at-risk for giving birth to a child with FASD and child or adult service users. Future collaborations across province to examine prospectively the costs and incidence of FASD across Canada are needed.

D. **Health**

Summary of Health Research

In comparison to previous years our search revealed a paucity of research conducted within the health pillar. Research and evaluation identified included housing projects conducted in Calgary (Badry et al., 2014) and Edmonton (Offrey et al., 2014), and supporting individuals with FASD in the justice system (Leung et al., 2016; McNab et al., 2014). There has also been some evaluation research focused on supporting caregivers of children with FASD (Badry & Goodman, 2014).

Research gaps: However, we continue to lack research to examine the needs of individuals with FASD involved with the foster care system. There is also a lack of research exploring service access and pathways for older children with FASD transitioning out of the pediatric healthcare system. One possible development is the change in the diagnostic billing code for FASD that would be helpful for tracking heath care and mental health service utilization but outcomes from this work is yet to be established.

Conclusion

Our findings indicate that research capacity in Alberta remains similar to that in the Year 5 and 7 Evaluation. Although researchers identified within the province focused on FASD appear to have narrowed over the years, the reasons for the change in researcher capacity within the province remain unclear. Based on our findings in the current evaluation, we conclude that the areas of focus in Alberta within 2014-2016 are similar to the Year 5 and 7 evaluations respectfully. However, FASD research, within the province, has increased within the clinical pillar and builds on the previous years' recommendations, but the emphasis on the health, population pillar, and basic pillars has attenuated. Although our findings are logical given the research and evaluation needs highlighted in the prior report. Therefore, we conclude that research and evaluation in Alberta largely represent the clinical pillar with a key focus on identifying and improving services and cater interventions towards the functional needs of individuals with FASD and their families throughout the lifespan. As a result, there is a breadth of research involving partnerships between institutions and FASD Clinics or community-based programs and therefore an increase in research and evaluation of programs, services, and clinics. However, research and evaluation within Alberta to address the four basic pillars remains critical.

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McLachlan, K., Pei, P., Kully-Martens, J., Paolloza, A., Oberlander, T. F., Loock, C., Andrew, G., Reynolds, J., & Rasmussen C. (2014b, July). Performance- and questionnaire-based tools for the evaluation of executive function in children and adolescents with Fetal Alcohol Spectrum Disorder. Presented at the Joint ISDN-NeuroDevNet Conference, Montreal, Quebec.

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McLachlan, K., Rasmussen, C., Weinberg, J., Oberlander, T., Loock, C., & Reynolds, J. Early life adversity, adverse outcomes, and cortisol regulation in FASD. Paper presented at the Fetal Alcohol Spectrum Disorders: Study Group at the Annual Research Society on Alcoholism, Florida, US.

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Pelech, W., Badry, D., & Daoust, G. (2013). It takes a team: Improving placement stability among children with Fetal Alcohol Spectrum Disorder in care in Canada. Children and Youth Services Review. 35, 120-127.

Racine, E., Bell, E., Yan, A., Andrew, G., Bell L. E., Clarke, M., et al., (2014). Ethics challenges of transition from paediatric to adult health care services for young adults with neurodevelopmental disabilities. Paediatrics & Child Health, 19(2), 65-8.

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Reynolds, J. N., Weinberg, J., Clarren, S., Beaulieu, C., Rasmussen, C., Kobor, M., Dube, M-P., & Goldowitz, D. (2011). Fetal Alcohol Spectrum Disorders: Gene-Environmental Interactions, Predictive Biomarkers, and the Relationship Between Structural Alterations in the Brain and Functional Outcomes. Seminars in Pediatric Neurology, 18(1), 49-55.

Sanders, J., et al. (under review). Access to long acting reversible contraception as a means of PAE prevention

Spaans, R. (2013 Sept & November). The Impact of a Mentoring Program for Adolescents with FASD on Adverse Life Experiences. Presented at the First International Conference on Prevention, Edmonton AB. & 2013 Alberta FASD Conference, Calgary, AB.

Tamana, S., Pei, J., & Rasmussen, C. (2013, November). Overview of Mental Health in FASD Taking a Biopsychosocial Perspective. Presented at 2013 Alberta FASD Conference, Calgary, AB

Thanh, N. X., Jonsson, E., Moffatt, J., Dennett, L., Chuck, A. W., & Birchard, S. (2014). An Economic Evaluation of the Parent-Child Assistance Program for Preventing Fetal alcohol Spectrum Disorder in Alberta, Canada. Administration and Policy in Mental Health and Mental Health Services Research. First available online January, 2014.

Thanh, N. X., Moffatt, J., Jacobs, P., Chuck, A. W., & Jonsson, E. (2013). Potential Impacts of the Alberta Fetal Alcohol Spectrum Disorder Network Services on Secondary Disabilities: A Cost-Benefit Analysis. Journal of Population, Therapeutic, and Clinical Pharmacology.

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Werk, C. (2013). Prevalence of FASD in Young Aboriginal Children Living off Reserve in Canada. Presented at the First International Conference on the Prevention of FASD, Edmonton AB.

Whitford, C., Mitchell, N., & Rasmussen, C. (2014, April). Best Practices for Supporting High-Risk Youth with FASD in a Secondary School Setting. Presented at the 6th Biennial Conference on Adolescents and Adults with Fetal Alcohol Spectrum Disorders, Vancouver, BC.

Wilson, A. (2013). Social workers understanding of FASD. First Peoples Child & Family Review: An Interdisciplinary Journal V8(1).

Wyper, K., Rasmussen, C., & Andrew, G. (2013a, November). Diagnosing Fetal Alcohol Spectrum Disorders (FASD): Why do some Children get Deferred? Presented at the Alberta FASD Conference, Calgary, AB

Wyper, K., Hayes, S., & Rajani, H. (2013, November). Follow-up for Children and Adolescents Diagnosed with FASD. Presented at the Alberta FASD Conference, Calgary, AB.

Wyper, K., Potts, S., Stewart, M., & Hassman, D. (2014, April). Front-line Perspectives of Professionals Working with Individuals with FASD in the Justice System. Presented at the 6th Biennial Conference on Adolescents and Adults with Fetal Alcohol Spectrum Disorders, Vancouver, BC.

Zhou, D., Rasmussen, C., Pei, J., Andrew, G., Reynolds, J., & Beaulieu, C. (2014). Thinner Cortex and Reduced Brain Volumes in Children and Adolescents with Prenatal Alcohol Exposure. Presented at the Joint NeuroDevNet-ISDN Conference, Montreal, Quebec.

Peer Reviewed

Basic Detection

Researcher Author / Year	Type of Study	Study	Institution / Clinic	Funding	Published / Journal	Purpose	Findings	Sample
Treit S, et al. (2014)	Basic	Longitudinal MRI Reveals Impaired Cortical Thinning in Children and Adolescents Prenatally Exposed to Alcohol.	University of Alberta/Glenrose	Grant	Human Brain Mapping.	Examine the developmental trajectory of cortical thinning in children and adolescents with FASD.	Children and adolescents with FASD undergo less developmental thinning than controls in many regions of the cortex.	Children and adolescents with FASD (11) and controls (21)
Treit S, et al. (2013)	Basic	Longitudinal MRI Reveals Altered Trajectory of Brain Development during Childhood and Adolescence in Fetal Alcohol Spectrum Disorders.	University of Alberta/Glenrose	Grant	The Journal of Neuroscience	Examine longitudinal changes in white matter DTI in FASD during childhood and adolescence.	Altered developmental profression in three major white matter tracts pertaining to the frontal regions. Findings revealed correlations with reading and receptive vocabularly.	Children with FASD 5-15 years (17) and healthy controls (27).
Green C, et al. (2013)	Basic	Diffusion Tensor Imaging Correlates of Saccadic Reaction Time in Children with Fetal Alcohol Spectrum Disorder.	University of Alberta/University of Queens	Grant	Alcoholism: Clinical and Experimental Research	Correlate oculomotor performance with DTI.	Correlation between prosaccade and antiscaccade reaction time and cerebellum. Findings sugest that cerrebellar dysfunction as a significant contributor to deficits in oculomotor control in FASD.	Children with FASD age 8 to 13 years (14)
Zhou Z, Lebel K, et al. (2011)	Basic	Developmental cortical thinning in fetal alcohol spectrum disorders.	University of Alberta/University of McGill.	CLLRNet (via Alberta Innovates Health Solution) and NSERC	Neuroimage. V58(1), 16-25.	Compare the variation of cortical thickness and make age-related comparisons and correlations between cortical thickness and cognitive function.	Cortical thinning with age as compared to controls. This cannot be attributed to overall smaller brain volumes. No correlation with cognitive function, but sig differences on tests reported between the two groups.	38 participants with FASD, and aged matched controls (age 6-30).
Lebel C, Rasmussen C, Wyper K, Andrew G, & Beaulieu C. (2010)	Basic	Brain micro-structure is related to math ability in children with fetal alcohol spectrum disorder.	University of Alberta.	CIHR	Alcoholism: Clinical and Experimental Research, 34, 1-10. University of Alberta.		Reductions in children and adolescents with fetal alcohol spectrum disorder	
Lebel K, et al. (2008)	Basic	Brain Diffusion Abnormalities in Children With Fetal Alcohol Spectrum Disorder	University of Alberta.		Alcoholism: Clinical and Experimental Research			

Inventory of Alberta-based FASD Research and Evaluation activities **Updated: March 2016**

Diagnosis

Researcher Author / Year	Type of Study	Study	Institution / Clinic	Funding	Published / Journal	Purpose	Findings	Sample
Treit S, Zhou D, Chudley AE, Andrew G, Rasmussen C, Nikkel SM, Samdup D, Hanlon-Dearman A, Loock C, Beaulieu C.	Basic	Relationships between Head Circumference, Brain Volume and Cognition in Children with Prenatal Alcohol Exposure.	University of Alberta and NeuroDevNet Investigators; FASD Demonstation Project	NeuroDevNet	PLoS One (in press, 2016)			
Paolozza A, Rasmussen C, Pei J, Hanlon-Dearman A, Nikkel SM, Andrew G, McFarlane A, Samdup D, & Reynolds JN. (2014)	Basic/Clinical	Deficits in response inhibition correlate with oculomotor control in children with fetal alcohol spectrum disorder and prenatal alcohol exposure.	University of Alberta, Queens University, Glenrose FASD Clinic, Lakeland FASD Centre	NeuroDevNet	Behavioral Brain Research, 25, 97-105.			
Paolozza A, Rasmussen C, Pei J, Hanlon-Dearman A, Nikkel SM, Andrew A, McFarlane A, Sandup D, & Reynolds JN. (2014)	Basic/Clinical	Working memory and visuospatial deficits correlate with oculomotor control in children with fetal alcohol spectrum disorder.	University of Alberta, Queens University, Glenrose FASD Clinic, Lakeland FASD Centre	NeuroDevNet	Behavioural Brain Research, 263, 70-79.			
Green CR, Rasmussen, Reynolds JN. et al. (2009)	Basic	Oculomotor control in children with Fetal Alcohol Spectrum Disorders assessed using a mobile laboratory.	Queens University/ University of Alberta		European Journal of Neuroscience, 29,1302-1309.			

Mechanisms

Researcher Author / Year	Type of Study	Study	Institution / Clinic	Funding	Published / Journal	Purpose	Findings	Sample
McLachlan K, Rasmussen C, Oberlander T, Loock C, Reynolds J, & Weinberg J.	Basic	Early life adversity, adverse outcomes, and cortisol regulation in children and adolescents with an FASD.	University of Alberta and NeuroDevNet Investigators; FASD Demonstation Project	NeuroDevNet	Alcohol (accepted 2016)			

Treatment

Researcher Author / Year	Type of Study	Study	Institution / Clinic	Funding	Published / Journal	Purpose	Findings	Sample
Doig J, McLennan JD, & Gibbard WB. (2008)	Basic	Medication effects on symptoms of ADHD in children with FASD.	University of Calgary		Journal of Child and Adolescent Psychpharmocology.2008 Aug;18(4):365-71	Assess the effectiveness of medication treatment on symptoms of ADHD.		
Savage, Bechner, de la Torre, & Sutherland. (2003)	Basic		University of Lethbridge/New Mexico		Alcohol Clin Exp Res. 2002 Nov;26(11):1752-8.		Inattention symptoms may be less responsive to ADHD medications.	24 Children with FASD referred for ADHD medication treatment (retrospective file review).

Understanding

Researcher Author / Year	Type of Study	Study	Institution / Clinic	Funding	Published / Journal	Purpose	Findings	Sample
Sylvian N, Brewster BL, & Ali, DW. (2011)	Basic	Embryonic ethanol exposure alters synaptic properties at zebrafish neuromuscular junctions	University of Alberta.	Non declared.	Neurotoxicology and Teratology	Examine the effects embryonic ethanol exposure has on muscle fibre and motor neuron morphology immediately after post fertilization.	Altered synaptic properties at the neuromuscular junction as a result of 16 hr exposure to 2.5% ethanol.	1 x control group, 3 treatment groups.
Sylvian N, Brewster BL, & Ali DW. (2010)	Basic	Zebrafish embryos exposed to alcohol undergo abnormal development of motor neurons and muscle fibers.	University of Alberta.		Alcohol, 42 (2008) 285e293	The purpose of this study was to quantify the effects of prenatal alcohol exposure on the number, size, and distribution of CCpn within the visual cortex.	Muscle fibre and motor neuron morphology is effected early on particularly underconditions of 2.5.% ethanol exposure and may be linked to problems with locomotion.	1 x control, 3 treatment groups.
Livy DJ, & Elberger AJ. (2008)	Basic	Alcohol exposure during the first two trimesters-equivalent alters the development of corpus callosum projection neurons in the rat.	University of Alberta/University of Tennesse	NIH Grant	Birth Defects Research Part B: Developmental and Reproductive Toxicology	Determine whether alcohol consumption prior to consumption has an effect on fetal development.	Differences in the development of CCpn in the visual cortex between alcohol-exposed and control animals. Higher levels of exposure increases risk for abnormal development.	1 x control, 4 x treatment (1.5-6.0g ethanol).
Livy DJ, Maier SE, & West JR. (2004).	Basic	Long-term alcohol exposure prior to conception results in lower fetal body weights.	University of Alberta/The Texas A&M University System Health Science Cente	National Institute of Alcohol Abuse and Alcoholism	Alcohol. Volume 29, Issue 3, April 2003, Pages 165–171	Compare models for studying ethanol induced injury.	Observed reduced body weight in fetus born to alcohol exposed rodents. Alcohol consumption prior to conception is a potential risk factor for low birth weight babies.	1 x femaie treatment + control, 1 x male treatment + control. Exposed to 1 dose. (treatment received prior to mating).
Livy DJ, Parnell, & West JR. (2003)	Basic	Blood ethanol concentration profiles: a comparison between rats and mice.	University of Alberta/The Texas A&M University System Health Science Cente	National Institute of Alcohol Abuse and Alcoholism	Neurotoxicol Teratol. 2003 Jul-Aug;25(4):447-58.		Observed differences in blood ethanol concentration between mice and rats. The extent of ethanal induced damage varies pending on model.	
Livy DJ, Miller EK, Maier SE, West JR. (2003).	Basic	Fetal alcohol exposure and temporal vulnerability: effects of binge-like alcohol exposure on the developing rat hippocampus.	University of Alberta/The Texas A&M University System Health Science Cente					
Sutherland S, et al. (2001-2003)	Basic	Prenatal alcohol effects on adult cortical physiology and cognition	University of Lethbridge.	AHFMR Grant (3 years)	Journal of Child Neurology.	Describe the connection between prenatal alcohol exposure, low serum vitamin A, and hydrocephalus.		
Goez, Scott, & Hasal (2010)	Basic/Health	Fetal Exposure to Alcohol, Developmental Brain Anomaly, and Vitamin A Deficiency: A Case Report	University of Alberta.	Stollery Hospital - no financial support.				

Ongoing Studies

2015 to present

Project	Type of Study	Funding Source	Researcher / Institution	Published
Imaging of Adults with FASD	Basic	Pending	University of Alberta	Two research groups are in the process but no updates available to date

2010 to 2015

Project	Type of Study	Funding Source	Researcher / Institution	Published
FASD Demonstration Project: multisite MRI study	Basic	NeuroDevNet/WCHRI	Reynolds, J. Rasmussen C. Beaulieu C./Multisite (PI Queens) inc. Glenrose.	

2009 to 2014

Project	Type of Study	Funding Source	Researcher / Institution	Published
DTI Longitudinal Study	Basic	CIHR/WCHRI	Beaulieu, C. Rasmussen, R (ongoing)/University of Alberta/Glenrose	

Non-referred Publications

2015

Researcher Author / Year	Type of Study	Study	Institution / Clinic	Published
McLachlan, K., Vavasour, I., MacKay, A., Reynolds, J., Oberlander, T. F., Loock, C., & Beaulieu, C. (Dec, 2015).	Basic	Brain myelin water imaging of children with prenatal alcohol exposure: Findings from the NeuroDevNet FASD Study	University of Alberta/NeuroDevNet Investigators: FASD Demonstration Project	Abstract published in Int J Dev Neurosci, 47(Pt A), 111. doi:10.1016/j.ijdevneu.2015.04.301
Brintnell S, Leung A. (March, 2015)	Basic	"Exploring the Neural Mechanisms of Cognitive Function in Adults with FASD"	University of Alberta	6th International Conference on Fetal Alcohol Spectrum Disorders., Vancouver, Canada

2014

Researcher Author / Year	Type of Study	Study	Institution / Clinic	Published
Zhou D, Rasmussen C, Pei J, Andrew G, Reynolds J, Beaulieu C. (2014)	Basic	Thinner Cortex and Reduced Brain Volumes in Children and Adolescents with Prenatal Alcohol Exposure.	University of Alberta/Glenrose Rehabilitation Hospital	Poster Presented at the Joint NeuroDevNet-ISDN Conference, Montreal, Quebec.
McLachlan K, Vavasour I, Mackay A, Reynolds J, Oberlandar TF, Loock C, Beaulieu C. (2014)	Basic	Brain Myelin Water Imaging of Children with Prenatal Alcohol Exposure: Findings from the NeuroDevNet Study.	Multisite/University of Alberta, University of Queens & University of British Columbia	Poster Presented at the Joint NeuroDevNet-ISDN Conference, Montreal, Quebec.
Treit S, Zhou D, Andrew G, Chudley A, Beaulieu C. (2014)	Basic	Is head circumference an accurate proxy for brain volume in individuals with fetal alcohol spectrum disorders?	University of Alberta, University of Manitoba & Glenrose Rehabilitation Hosptial	Poster Presented at the Joint NeuroDevNet-ISDN Conference, Montreal, Quebec.

2013				
Researcher Author / Year	**Type of Study**	**Study**	**Institution / Clinic**	**Published**
McLachlan K, Rasmussen C, Oberlander T, Loock C, Pei J, Andrew G, Reynolds J, & Weinberg J. (2013)	Basic	Diurnal cortisol patterns in children with FASD.	University of Alberta, University of British Columbia, Queens University.	Presented at Research Society on Alcoholism, Florida, US.
McLachlan K, Rasmussen C, Weinberg J, Oberlander T, Loock C, & Reynolds J. (2013)	Basic	Early life adversity, adverse outcomes, and cortisol regulation in FASD.	University of Alberta, University of British Columbia, Queens University.	Paper presented at the Fetal Alcohol Spectrum Disorders: Study Group at the Annual Research Society on Alcoholism, Florida, US.
Paolozza A. (2013, September)	Basic	Working Memory and Visuospatial Deficits Correlate with Oculomotor Control in Children with Fetal Alcohol Spectrum Disorder.	Queens University and University of Alberta.	Presented at the NeuroDevNet 2013 Brain Development Conference.
Treit S. et al (2013, September)	Basic	Within-Subject Reliability of MRI Parameters Across Scanners in the NeuroDevNet FASD Project.	University of Alberta	Presented at the NeuroDevNet 2013 Brain Development Conference.
Zhou D. et al. (2013, September)	Basic	Preserved Cortical Asymmetry Despite Thinner Cortex in Fetal Alcohol Spectrum Disorders.	University of Alberta	Presented at the NeuroDevNet 2013 Brain Development Conference.
Reynolds JN, Beaulieu C, Weinberg J, & Goldowitz D. (2013, March)	Basic	FASD: Gene-Environment Interactions and the Relationship between Structural Alterations in the Brain and Functional Outcomes.	University of Alberta, University of Queens, University of British Columbia.	Presented at the 5th International Conference on Fetal Alcohol Spectrum Disorders, Vancouver, BC.
2012				
Researcher Author / Year	**Type of Study**	**Study**	**Institution / Clinic**	**Published**
Treit S, Lebel C, Baugh, L, Andrew G, Beaulieu C, & Rasmussen C. (2012, July & 2014, Feb)	Basic	Longitudinal White Matter Development in Fetal Alcohol Spectrum Disorder.	University of Alberta/Glenrose Rehabilitation Hospital	Poster Presented at 22nd Biennial Meeting International Society for the Study of Behavioural Development, Edmonton, AB & Oral presented at the Canadian Perinatal Conference.
2011				
Researcher Author / Year	**Type of Study**	**Study**	**Institution / Clinic**	**Published**
Denys KA, Kerns KA, Pei J, Macsween J, & Rasmussen C. (2011, March)	Basic	Executive Functioning Training in Children with FASD	University of Alberta/Glenrose Rehabilitation Hospital	Presented at Fourth International Conference on Fetal Alcohol Spectrum Disorder, Vancouver, BC.
Treit S. Rasmussen S, & Beaulieu C. (2011, March)	Basic	Diffusion Tensor Imaging of Children, Adolescents, and Adults with FASD.	University of Alberta/Glenrose Rehabilitation Hospital	Presented at Fourth International Conference on Fetal Alcohol Spectrum Disorder, Vancouver, BC.

2010				
Researcher Author / Year	**Type of Study**	**Study**	**Institution / Clinic**	**Published**
Matejko A, Lebel C, Rasmussen C, & Beaulieu C. (2010, February)	Basic	Brain Imaging and Neurocognitive Function in Children and Twins with FASD.	University of Alberta/Glenrose Rehabilitation Hospital	Presented at 2010 Alberta FASD Conference, Calgary, AB.
2008				
Researcher Author / Year	**Type of Study**	**Study**	**Institution / Clinic**	**Published**
Rasmussen C, Lestideau O, & Mrazik M. (2008, May)	Basic	Brain Imaging and Executive Functioning in Children with Fetal Alcohol Spectrum Disorder.	University of Alberta/Glenrose Rehabilitation Hospital	Presented at 2008 International Conference on FASD (CanFASD Northwest Partnership), Banff, AB.

****To contribute new articles / studies to this inventory, please contact JTremblay@policywise.com**