

POWER OF PREVENTION IN THE EARLY YEARS

Dr. Kristi Adamo's research program takes direct aim at the problem of obesity by focusing on intervening in the early years. Her program includes patient-oriented clinical research, applied physiology, and bench-science related to lifestyle determinants of child obesity and its progression. The 'early years' continuum is an opportune time for encouraging and promoting the adoption of healthy behaviour patterns and appropriate knowledge translation to care providers, educators, parents and policy makers related to this period. Her team's ongoing projects include:



- i) **the Maternal Obesity Management (MOM) Trial:** The multi-disciplinary MOM trial team has been performing this two-arm, parallel group, randomized controlled trial (RCT) (*ISRCTN75323409*) targeting pregnant women to test the efficacy of a structured physical activity (PA) and nutrition program to prevent excessive gestational weight gain (GWG) and reduce downstream child obesity (PMID: 23459089). **Progress:** Data collection will be complete (i.e., 24 month child outcome) by July 2015. This pilot trial is a stepping stone towards the larger, multi-centered, pan-Canadian, RCT to thoroughly test our hypotheses.
- ii) **SmartMoms-Canada: Evaluation of a mobile Health (mHealth) pregnancy intervention:** Today's tech savvy pregnant moms expect the latest information easily and quickly and thus a new approach to prenatal health care delivery is urgently needed. We believe that intervention via mobile technology is the answer to better outcomes for mom and baby. We are working towards launching a personalized, cost-effective, real-time mobile technology application to provide pregnancy-specific health information. **Specific aim:** to determine the efficacy of a pregnancy-specific mHealth program (*SmartMoms-Canada*), designed to improve weight outcomes in the moms, thereby reducing obesity in the infants. **Progress:** We have 9 committed sites across Canada. Our ultimate goal, with the assistance of our established Research Network, is to put *SmartMoms-Canada* in the hands of every pregnant woman as part of their standard prenatal care. We are collaborating with colleagues at the Pennington Biomedical Research Center in Baton Rouge to customize their US-based SmartMoms app for Canada.
- iii) **Activity Begins in Childhood (ABC) Trial:** The goal of the ABC trial (*ISRCTN94022291*), in collaboration with colleagues from the University of Victoria, is to identify whether we can positively influence PA patterns in preschoolers through a daycare provider-directed intervention with or without a parental component. Targeting the preschool years is relevant as this is a critical phase in the development of motor skills, PA, eating and sleeping patterns. (PMID:25073797) Outcomes include time spent in moderate-to-vigorous PA, sedentary time, fundamental and gross motor skills, anthropometrics, and daycare providers' attitudes, control beliefs and perceived competency toward incorporating PA into the daycare curriculum.
- iv) **Do built environment neighborhood characteristics predict gestational weight gain?** In collaboration with colleagues from the Dept. of Geography, Dept. of Psychology, and the Institute of Population Health at the University of Ottawa as well as the Better Outcomes Registry Network (BORN) Ontario, we aim to determine if there is an independent relationship between characteristics of the built environment and gestational weight gain (GWG). Specifically, are neighborhood characteristics such as the food environment and the physical activity environment associated with GWG, independent of individual-level factors?
- v) **Women's Perceptions of the Current Weight Gain in Pregnancy Guidelines** We have developed a web-based questionnaire, grounded in the Social Cognitive Theory, to examine women's perceptions, attitudes and behaviours surrounding the Institute of Medicine (IOM) GWG guidelines, pregnancy dietary recommendations, PA practices as well as other lifestyle habits. Information gathered through this process will serve multiple purposes including: to gather useful data on relationships between various social determinants of health and GWG as well as associated health behaviours and validate the related questionnaire, in addition to assisting health care providers by providing them with useful information supporting appropriate weight gain in pregnancy.
- vi) **Does maternal physical activity affect placenta biology?** The aim of this work being done in collaboration with a multi-disciplinary team of physiologists, and molecular biologists and metabolomics experts is to determine if regular PA during pregnancy is associated with differences in placenta biology (e.g. gene expression of placental nutrient transport, signaling and sensing pathways, uptake and transmission of macronutrients). It is hypothesized that these signals will be manifested in the metabolome and alter fetal growth and adiposity. In order to identify the key differences between the placenta biology of active and inactive women, we are using a multi-tiered approach that includes global gene expression, placenta perfusion kinetics and systemic metabolome characterization.