CHANGE Health Community Centre

A Centre of Excellence in Health

CHANGE Alberta Team

- Doug Klein, Family Physician, CHANGE Alberta Principal Investigator, University of Alberta
- Serena Humphries, CHANGE Alberta Research Manager, University of Alberta
- Mathew Kallio, CHANGE Alberta Exercise Specialist, University of Alberta
- Khursheed Jeejeebhoy, Gastroenterologist, University of Toronto
- Rupinder Dhaliwal, Director of Operations, CHANGE Program
- Lee Green, Family Physician, University of Alberta
- Leah Gramlich, Medical Lead for Nutrition Services, Alberta Health Services
- Jennifer Klein, Qualitative Researcher, University of Alberta
- Chris McCabe, Health Economist, University of Alberta
- Caroline Rheaume, Family Physician, Laval University
- Paula Brauer, Nutrition, University of Guelph
- Angelo Tremblay, Kinesiologist, Laval University
- David Mutch, Nutrigenomics, University of Guelph
- Sonja Reichert , Family Physician, University of Western Ontario
- Jeff Vallance, Physical Activity and Cancer, Athabasca University
- Felicia Ochs, Wellness Coordinator, Parkland School Division
- Carolyn Jensen, Principal, Memorial Composite High School
- Dianne McConnell, Associate Superintendent, Parkland School Division
- Allan Bailey, Family Physician, Westview Primary Care Network

Table of Contents

It is the vision of CHANGE Health to be widely-recognized as Canada's leading health protection and improvement program for both adults, children and families. Partnering with government, health care, businesses and community leaders, CHANGE Health will support Alberta Families to learn, or for most of us, Re-Learn Healthy Living through lifelong healthy nutrition, active lifestyles, and positive social connections. Our ambition is to develop CHANGE Health as a turn-key solution to some of society's most pressing problems, that can be scaled across Canada and exported around the world to help address the global physical and mental health crisis.

Executive Summary

Countless studies show that growing numbers of Canadians lead increasingly unhealthy lives. Whether this is because our busy lifestyles require more time sitting in cars and in front of screens, or a lack of knowledge about how to purchase and prepare healthy foods, the situation is dire. In the past, children and adults would spend several hours each week outdoors. This is no longer the case. As Richard Louv says, we have a '"nature-deficit disorder". For today's generation, nature is found on Youtube or Wikipedia, rather than through actual experience. This disconnection with nature may be contributing to increasing rates of mental health problems, chronic disease and the obesity crisis that Canada currently faces.

In Canada, like every other developed economy, we are responding to this crisis by **spending increasing amounts of money on health care; although what we are really buying is disease care**. Something has to change. CHANGE Health is working to create a new model of health service delivery that supports preventive personalized and community-relevant care to Albertans.

CHANGE Health connects community members with programs that build life skills to support lifelong healthy nutrition, active lifestyles, and positive social connections that move us from disease care to true health care. Having developed and evaluated different components of CHANGE Health, it is time to scale the programing up to meet the needs of families in Alberta.

We propose the creation of the CHANGE Health Community Centre, a provincial innovation hub located in Parkland County, training and support centre focusing on excellence in health and education delivery, training and evaluation.

Specifically, this proposal will see CHANGE Health support Parkland County families to build life skills in four core areas through the CHANGE Health Community Centre.

a) Nutrition and meal preparation,
b) Physical activity and lifelong fitness,
c) Mental health and wellbeing, and
d) Strong partner and family relationships and community connections.

The CHANGE Health Community Centre will be a partnership between the health and education sectors. The University of Alberta is already working with the Westview PCN and Parkland School division to deliver innovative programing.

CHANGE Health is a customized approach to health supported by an inter-professional team focusing on families' specific needs. The principles are: 1) customized nutrition and graded exercise intervention (tailored to family preferences and abilities); 2) supervision and implementation of the program in a collaborative fashion between the family and the CHANGE Health Team (family doctor, dietitian, kinesiologist, social worker and psychologist); 3) focus on mental health, family attachment, and social connection. The program links with community resources including schools, community centres, local family programs, libraries, and local business such as grocery stores and recreation facilities. There is also an embedded evaluation component to capture the CHANGE Health Community Program's real world impact and to inform future developments to optimize the program's value to families, communities and the Alberta health eco-system.

Background

"Re-Learning Healthy Living" is a critical public health issue that is urgently needed to reverse the trend of obesity, cardiovascular disease and cancer in Canada, as well as improve mental health and reduce the social isolation that our population is currently experiencing.

Diet, physical inactivity, alcohol and smoking are the main modifiable risk factors for chronic diseases.(1) While many guidelines and resources, like Canada's Food Guide and Canada's Physical Activity Guidelines for Adults, have been produced, there has been very limited evidence of any impact at the population level.(2) Suboptimal diet and physical inactivity are common among the Canadian population.(1,3) Current physical activity guidelines for adults aged 18-64 recommend at least 150 minutes of moderate to vigorous aerobic exercise weekly, completed in intervals of at least 10 minutes, along with at least 2 days per week of resistance training.(4) However, 85% of Canadians fall short of these physical activity recommendations.(5) In relation to healthy eating, 60% of Canadians report eating fewer than 5 daily servings of fruits and vegetables.(6) In contrast, on any given day, 25% of Canadians will eat from a fast food outlet.(7) These behaviours contribute to the fact that 66% of adults are overweight or obese, and rates of hypertension, diabetes, and dyslipidemia are on the rise.(8)

Among Canadian children aged 5 to 17 years, approximately one-third are either overweight or obese.(9) The high prevalence of childhood obesity is cause for concern, since cardiometabolic and psychosocial health risks are common, (10,11) and because children with obesity are at increased risk of becoming adults with obesity.(12) Given these issues, there is substantial value in offering health programs focusing on preventing and managing pediatric obesity.

Studies show that Albertan children and youth are leading increasingly unhealthy lives. In a study examining the average number of steps per day, 86% of children in Alberta were not achieving the 16,500 steps per day recommended by Canada's Physical Activity Guidelines (14) and 76% were exceeding the recommended maximum limit of two hours of screen time per day. (15) Screen time and sedentary time also affects sleep and 31% of school age children and 26% of adolescents in Canada are not getting enough sleep (16) which has implications for diet and weight gain. (17) The lure of increased screen time combined with longer work hours for parents and busier family schedules have created a problem coined by

Richard Louv as the "nature-deficit disorder". Children are more active when they are outside. (18-20) For example, children who play outdoors get 2100 more steps a day and are 3 times more likely to achieve activity recommendations. (15)

The food choices many Canadian families are making also promote disease rather than health. For example, fruit and vegetable consumption in the Canadian population has been decreasing since 2009, with only 33% of children aged 4-13 eating 5 servings of fruit and vegetables daily, a trend that further decreases as children age. (21,22) Sugar sweetened beverages have become dominant in the diets of children over the age of 19. (23) Children are growing up without the skills to grow food or cook at home as busy families eat pre-packaged processed and restaurant meals more often. (24,25) In addition, a lack of cooking skills contribute to decreased balanced food choices and increased processed food consumption. Increased screen time and time indoors also influences food intake. Children make food choices based on taste rather than healthiness, and research has demonstrated that children exposed to unhealthy food marketing messages exhibit altered psychological and neurobiologic mechanisms impacting food decisions. (26)

Many children and their families are disconnected from each other as well as the outdoors, have low physical activity levels and increased screen time, may not be sleeping enough and are eating more processed and less healthy food. (27-29) This is contributing to the increased rates of chronic disease, obesity and accompanying mental health problems that Alberta currently faces.

In addition, a Canadian study exploring cancer incidence due to obesity and physical inactivity concluded that interventions to reduce these risk factors could prevent thousands of cancers annually.(13) These findings are consistent with an international study which estimated that 3.6% of all new cancer cases in adults were attributable to obesity worldwide.(30) Modifiable lifestyle risk factors including maintaining a healthy weight, eating a healthy diet and being more physically active could significantly reduce the incidence of cancer in Alberta.(31)

Unhealthy habits are linked to a multitude of physical illnesses among Canadians; however, mental health problems, and their ties to sedentary lifestyles and the overconsumption of processed foods, alcohol and tobacco products within our population are not to be overlooked. In fact, it is estimated that 20% of Canadians will experience a mental illness during their lifetime, and the number of Canadians living with mental illness is only expected

to increase.(32) A habitually poor diet, comprised of processed foods high in saturated fat and refined carbohydrates and low in fiber is associated with a greater risk of depression and anxiety in children, adolescents, and adults.(33, 34) The prevalence of mental illness in Canada is further compounded by the fact that chronic conditions, many of which are at least partly attributable to unhealthy diet and lifestyle choices, often co-occur at high rates with mental health problems, including mood and anxiety disorders.(32) This is true in the case of cardiovascular disease,(35) type 2 diabetes,(36) and obesity. (37) In addition, people with one mental illness are at increased risk of developing other mental disorders. (38)

A sedentary lifestyle, which can be characterized by increased screen time, is also linked to depressive symptomatology, low self-esteem, and loneliness in adolescents. (39) Obesity and impaired social competence often occur together in children, with negative impacts on the wellbeing of these youth. (40) The diagnosis of a chronic condition can also be a source of social isolation; in fact, a diagnosis of type 2 diabetes can reduce the social contacts held by an individual, negatively impacting their quality of life. (41) In older adults, a positive relationship has been shown between increased physical activity leisure time and a stronger social support system. (42) However, statistics show that total sedentary time increases with age, and older adults attain, on average, only 14 minutes of moderate to vigorous physical activity per day, (43) and 50 % of Canadians over 80 report that they feel lonely. (44) This data is staggering when considering that the influence of social relationships on the risk of death is comparable to that of other more well-established risk factors for mortality, such as smoking and alcohol consumption. (45)

As we look for solutions to these staggering trends in the health of children and families, it is important to recognize that Family Doctors' offices are the setting for most prevention and screening services in the health care system. Family Doctors are typically the first and continuing point of contact for access to health services, support and care. Eighty-five percent of Canadians have a Family Doctor and most people consider their physician to be their major source of health advice.(46) Despite the evidence showing that lifestyle interventions could substantially reduce costs and complications of diabetes and cardiovascular disease,(31-50) the implementation of programs into primary care settings has been low.(51) Recent articles in CMAJ(52) and Globe and Mail (53) highlight the significant role of Family Doctors in implementing lifestyle interventions, managing chronic disease, and reversing obesity in Canada. New Canadian guidelines strongly recommend the Family Doctor offer or refer overweight and obese patients at high risk of diabetes to structured behavioural interventions

(including diet and exercise interventions) aimed at achieving and maintaining a healthy weight.(52) Unfortunately, in a recent national survey in primary care, less than half of Family Doctors reported discussing obesity and physical activity with their patients during their periodic health examinations.(51) Reasons for the poor implementation of lifestyle interventions in primary care include lack of time, resources, and training.(54-57)

From an economic perspective, costs of medications are growing exponentially.(58) Cardiovascular disease is the most expensive clinical condition, accounting for 11.6% of the total costs of illnesses and 13.9% of all drug prescriptions.(59) Estimates for the cost of lifetime treatment for dyslipidemia and hypertension to prevent cardiovascular disease through the use of cholesterol lowering medication and blood pressure medication is $36 billion in Canada.(59) In addition, due to the use of medical resources and productivity losses, the economic cost of mental illness in Canada is estimated at $51 billion per year, with this figure only expected to increase in the future. (60) A novel approach to the care for these patients is required and the solution to these complex issues must be broad.

In response to these complex issues, Metabolic Syndrome Canada (a not-for profit organization dedicated to developing innovative, evidence based programs that reverses metabolic syndrome and prevent progression to serious conditions such as diabetes, hypertension, and cardiovascular disease) brought together internationally recognized researchers and clinicians from across Canada and developed the evidence-based CHANGE Program. The CHANGE Program (Canadian Health Advanced by Nutrition and Graded Exercise) is a one-year program that is personalized, graded and linked to the patient's own health care team in existing primary care settings. By embedding Dietitians and Kinesiologists into primary care settings to work alongside Family Doctors, the CHANGE Program overcomes some of the barriers to lifestyle interventions, increasing the uptake of diet and physical activity best practices to improve health outcomes of patients. With support from Metabolic Syndrome Canada, the CHANGE Program is being implemented in over forty sites across Canada. In addition, Dr. Klein has received $1.6 million dollars in research dollars to evaluate and expand the CHANGE Program across Alberta.

The CHANGE Program was the catalyst for CHANGE Health, an Alberta-based not-for-profit organization working to create a new model of health service delivery that supports

preventive personalized and community-relevant care to Albertans. The CHANGE Adventure Camp was the first initiative developed by CHANGE Health.

The CHANGE Adventure Camp builds on the work done by Metabolic Syndrome Canada and the development of the CHANGE Program. The two main strategies used by the camp include school field trips and traditional summer camp style activities. These two strategies are well known to schools and families and can be adapted for our goals around partnership, education and action. Building on the emerging evidence on the health benefits of nature, the CHANGE Adventure Camp appeals to children and parents alike by combining adventure with teaching environmental principles, healthy eating behaviours and lifelong physical activity. Targeting both children and the family enhances the uptake of new knowledge into everyday living among the participants.

CHANGE Health Proposal

This proposal builds on the success of the CHANGE Program and the CHANGE Adventure Camp and proposes to make CHANGE Health Canada's leading health protection and improvement innovator. The long-term vision of CHANGE Health is to establish CHANGE Health as a Centre of Excellence, creating an innovation hub of health service delivery, training, and research in Alberta. CHANGE Health is also proposing the expansion of its current evidence-based programs to establish the CHANGE Community Program. In the next five years, the CHANGE Health Community Program will see 1000 Alberta families build life skills that support healthy eating, active lifestyles, and positive social connections, truly moving us from disease care to true health care. See Figure 1 for a Diagram of the CHANGE Health Centre of Excellence.

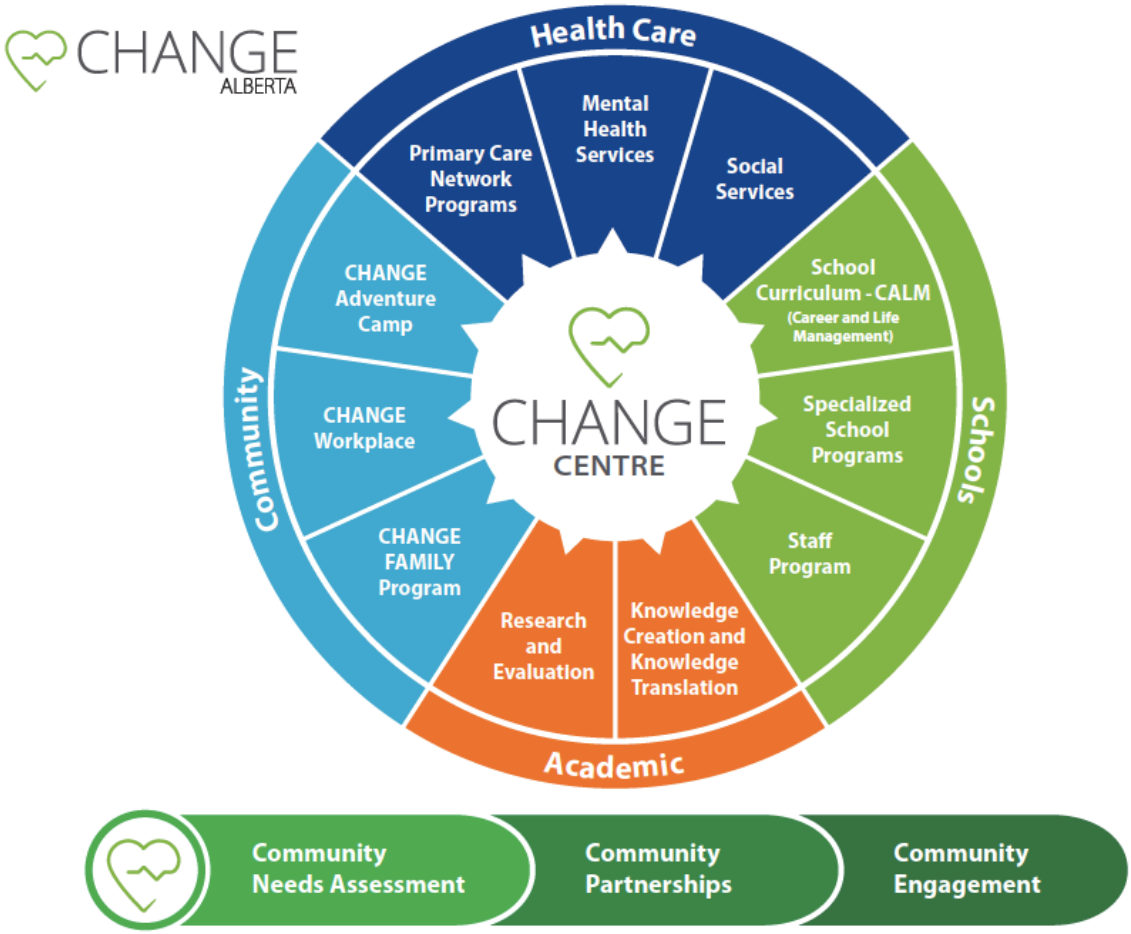
The vision of CHANGE Health includes:

1. Building a CHANGE Health Centre of Excellence
    1.1. Excellence in Health Delivery & Innovation
    1.2. Excellence in Training
    1.3. Excellence in Research and Evaluation
2. Implementing the CHANGE Community Program - Supporting 1000 Families to Achieve Health

This proposal is specifically for the CHANGE Health Community Centre and the infrastructure to support that.

(The Development of Accredited CHANGE Health Training and Research Programs to be funded subsequently)

Figure 1: CHANGE Health Community Centre



1. Building a CHANGE Health Community Centre

The CHANGE Health Community Centre will establish Alberta as a leader in health protection and improvement. The goals of the CHANGE Health Community Centre include demonstrating Excellence in Health Delivery & Innovation, Excellence in Training and Excellence in Evaluation.

1.1. Excellence in Health Delivery & Innovation- Moving from Disease Care to Health Care

The CHANGE Health Centre of Excellence will be a provincial innovation hub for the promotion and protection of health.

The CHANGE Health Centre of Excellence will reconnect individuals and families with nature, their community and each other to achieve healthy, active lifestyles through a series of health and educational programming.

The CHANGE Health Centre of Excellence will bring together a multi-disciplinary team of clinicians, health service administrators, health services and policy researchers, health economists, basic science researchers and experts in nutrition, exercise, mental health, gerontology and community engagement and facilitation to work with communities, individuals and families to develop, deliver and evaluate innovative health protection and improvement programs that can be scaled-up to the provincial and national level. See Appendix A for current community partners.

1.2. Excellence in Training – CHANGE Health Certification

The CHANGE Health Centre of Excellence will provide support to sites across Alberta that implement the CHANGE Programming by establishing Clinical Networks for The CHANGE Health Centre of Excellence will develop and deliver provider certifications in accredited programs. Training and Certifications will be developed for clinicians, educators, administrators and community facilitators. Certificate programs will include targeted training on the CHANGE Program, and the CHANGE Community Program. Content and delivery will include a range of options. The Certificate Program content will be tailored to meet the needs of a variety of participants. Certificate Program delivery modes will include: train the trainer, online courses, weekend retreat programs, workshops, practicums, and facilitation of new

site set-ups. The intention of the CHANGE Health Centre of Excellence is to pursue innovation in training and be a leader in health protection and improvement education. The CHANGE Centre of Excellence will also develop and maintain support networks of CHANGE providers to establish communities of practice that will provide continuing support and professional development related to CHANGE Health programming.

1.3. Excellence in Research and Evaluation – A "Learning Health System"

The CHANGE Health Centre of Excellence will be a dynamic innovation hub that will evolve to meet the changing needs of patients, families, communities and the health system. The CHANGE Health Centre of Excellence will develop a Learning Health System where the foundation of programming is evidence and innovations will be developed, delivered and evaluated in a robust research environment. The CHANGE Health Centre of Excellence will have a Health Evaluation Team led by researchers at the University of Alberta, the University of Calgary, Athabasca University and the Institute of Health Economics. All CHANGE Health programming will include a robust embedded evaluation process. Evaluation will be integrated into all programs and will include the evaluation of short, medium and long-term health outcomes (See Appendix B). The embedded evaluation component is designed capture CHANGE Health's real world impact and to inform future developments to optimize the value of CHANGE Health Programs to families, communities and the Alberta health eco-system.

2. CHANGE Community Program

The CHANGE Health Centre of Excellence provides the foundation for the CHANGE Community Program. The CHANGE Community Program will be an expansion of CHANGE Health's current evidence-based programs specifically designed to meet the needs of Alberta families. The CHANGE Community Program will engage communities, develop partnerships and assesses community need in order to support 1000 Alberta families to protect and improve their health. The CHANGE Community Program will build life skills in four core areas: Nutrition and meal preparation; Physical activity and lifelong fitness; Mental health and wellbeing; and Strong partner and family relationships and community connections. See Appendix C for a detailed description of the principles of the CHANGE Community Program.

The CHANGE Community Program Components include Family Retreats, Family Needs Assessments, the CHANGE Alberta Family Program and the CHANGE Alberta Alumni Program.

2.1. CHANGE Family Retreat

Families will be enrolled to participate in a weekend-long CHANGE Family Retreat, which will kick off their experience with the CHANGE Health Community Program. This retreat will focus on family building, network creation between families, and skill development in nutrition literacy, physical activity literacy, and nature awareness. Participants will also have the opportunity to set some health and wellness goals that they would like to work on as a family. These goals can be related to diet, exercise mental health and/or social connection. Please see Appendix D for an outline of sample programming for the weekend retreat.

2.2. CHANGE Health Family Needs Assessment

As part of the CHANGE Community Program, families will have the opportunity to complete a Family Needs Assessment with the CHANGE Health Team that will be used to customize their CHANGE Alberta Family Program experience. The Family Needs Assessment will include individual and family assessments. Family and individual dietary and exercise knowledge, skills and behaviours will be assessed. The Family Needs Assessment will also include mental health assessments, and evaluate the social supports that are currently in place for the family. Families will also identify goals and prioritize their needs with the CHANGE Health Team.

2.3. CHANGE Alberta Family Program

The CHANGE Alberta Family Program is a one-year program customized to meet the identified family needs and priorities. For the first 12 weeks of the program, families will meet with the CHANGE Health Team to participate in a structured CHANGE Health activity every week. Each week will have a different theme, based on the pillars of nutrition, physical literacy, nature awareness, mental health and communication. By coordinating these activities so that families will complete them together, it is expected that the families will also develop significant social connections. Activities will occur on weekends or evenings to work

with families' schedules. Each activity will take approximately 1 to 3 hours, depending on the scheduled programming. For the following 3 months, families will meet with the CHANGE Health Team to engage in CHANGE Health activities every 2 weeks, continuing to alternate between the themes of nutrition, physical literacy, nature awareness, and mental health, exploring a different family goal through the customized CHANGE Health activities. For the final 6 months of the CHANGE Alberta Family Program, families will meet with the CHANGE Health Team every month to engage in an activity targeting skill development in food preparation, physical literacy, awareness of nature, or mental health based on the needs, preferences and priorities of the family. Throughout the program the families will be encouraged to develop their own community based activities that will support their health goals. It is expected that by the end of the CHANGE Alberta Family Program that families will have established their own community activities and groups to support their ongoing health and wellness. In addition, the CHANGE Health program will be holding regular drop-in activities where alumni families can continue to stay connected. Please see Appendix E for a sample layout of the CHANGE Alberta Family Program.

2.4. CHANGE Alberta Alumni Program

After the family completes the year long CHANGE Alberta Family Program, they will continue to have access to the CHANGE Health Team and CHANGE Community Program activities through a number of CHANGE Alberta Alumni Programming. An Individual/Family Intensive Program will be available to individuals or families that require the support of the clinically intensive CHANGE Program. The CHANGE Adventure Camp will be available to families through weekend Family Retreats and Summer Day Camps for children. The CHANGE Alberta Alumni Program will also provide customized post program supports for families at risk. See Appendix F for example programming available through the Alumni Program.

Creating the Environment for Training and Research

Just outside Edmonton we will transform a current retreat facility into the CHANGE Health Centre of Excellence. Families will have the opportunity to come for weekend and weeklong sessions where they will learn to cook, be active and CHANGE the way they live. The CHANGE Health Centre of Excellence will be available for businesses, community groups, schools, families and children. Throughout the summer, the CHANGE Health Centre of Excellence will host the CHANGE Adventure Camp children can come to have fun outside while learning about nature, ways to stay active and the importance of good nutrition. Land is currently for sale and has been appraised by CHANGE Health Alberta.

The investment in the CHANGE Health Centre of Excellence is fundamental. As we create a new model of health delivery we need to safeguard the environment in which CHANGE Health is operating. Security and safety for the children and families involved is paramount.

The investment in the CHANGE Health Centre of Excellence will capitalize on economies of scale. Adapting to the local context at every site and every delivery location of the CHANGE Health Programming takes time, energy and resources that are costly. We can more effectively support many more many families at a single site.

In addition, different partners who may be willing donate locations for programming each have their own agenda and regulations which limit what we can do an influence the programming. For example, at a particular site the programming may be limited by the organization's rules. With the creation of our own site, we make the rules and partners can be more flexible in our facility.

Budget

CHANGE Family Community Program and CHANGE Health Centre of Excellence
Proposed Budget

		Families Served					
		200	200	200	200	200	
Activity Category	**Activity Details**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	
CHANGE Health Community Program	Community Facilitator	$40,000	$80,000	$80,000	$80,000	$80,000	
	Kinesiologist	$60,000	$120,000	$120,000	$120,000	$120,000	
	Dietitian	$60,000	$120,000	$120,000	$120,000	$120,000	
	Social Worker	$50,000	$100,000	$100,000	$100,000	$100,000	
	Physician Leadership (5 Physicians 1 day per week each; $50,000 per year per physician)	$250,000	$250,000	$250,000	$250,000	$250,000	
	Psychologist	$90,000	$180,000	$180,000	$180,000	$180,000	
	Community Program Support	$50,000	$55,000	$60,000	$65,000	$70,000	
	Community Program Leadership	$80,000	$85,000	$90,000	$95,000	$100,000	
Implementation and Training Costs	Start-Up Costs	$10,000	$10,000	$0	$0	$0	
	Training	$6,000	$6,000	$6,000	$0	$0	
	Travel costs	$10,000	$10,000	$10,000	$10,000	$10,000	
	Site Visits	$2,000	$2,000	$2,000	$2,000	$2,000	
Property	Land purchase	$1,800,000	$0	$0	$0	$0	
	Facility Improvement	$100,000	$200,000	$100,000	$100,000	$100,000	
	Operating Costs	$100,000	$100,000	$100,000	$100,000	$100,000	
	Maintenance	$50,000	$50,000	$60,000	$60,000	$70,000	
Equipment	Clinical and Exercise Equipment Purchase and Maintenance	$40,000	$20,000	$20,000	$20,000	$20,000	
	Supplies and Materials	$10,000	$20,000	$20,000	$20,000	$20,000	
	Accelerometers	$40,000	$0	$0	$0	$0	
Evaluation and Quality Improvement	Evaluation Lead	$80,000	$80,000	$80,000	$80,000	$80,000	
	Data Analyst (from IHE)	$50,000	$25,000	$25,000	$25,000	$50,000	
	Data Analyst (EPICORE)	$25,000	$25,000	$25,000	$25,000	$25,000	
	Data Management	$50,000	$50,000	$50,000	$50,000	$50,000	
	Trainees	$40,000	$60,000	$60,000	$60,000	$60,000	
CHANGE Health Centre of Excellence	Clinical Network Support	$40,000	$40,000	$40,000	$40,000	$40,000	
	Community Engagement Facilitation	$10,000	$10,000	$10,000	$10,000	$10,000	
	Program Implementation Facilitation	$10,000	$10,000	$10,000	$10,000	$10,000	
	Resource Development	$10,000	$10,000	$10,000	$10,000	$10,000	
	Centre of Excellence Support	$50,000	$55,000	$60,000	$65,000	$70,000	
	Centre of Excellence Leadership	$80,000	$85,000	$90,000	$95,000	$100,000	
Total Budget		**$3,293,000**	**$1,858,000**	**$1,778,000**	**$1,792,000**	**$1,847,000**	**$10,568,000**

Summary

Harnessing the momentum of the CHANGE Adventure Camp developed in Edmonton by Dr. Doug Klein, innovative health delivery will be achieved through CHANGE Health. Combining physician leadership, a range of health professionals, expertise from the University of Alberta and key community stakeholders, we will demonstrate that customized, wellness focused health care (rather than the current disease care) can be provided in Alberta. CHANGE Health will support families in developing the motivation, knowledge, skills and confidence to improve their health. The CHANGE Health Programs will focus on the protection and improvement of health through evidence-based programming focused on nutrition, physical activity, nature and positive social connections.

In order to attract families and encourage participation with the educational activities, CHANGE Health will connect Primary Care Networks, schools and local business and community organizations to create a sustainable effective health and education experience. The goal is to demonstrate that incorporating healthy living behaviour into families lives can be fun and stimulating.

APPENDIX A: CHANGE Health Community Partnerships

CHANGE Health Community Partners Staff and Volunteers:

CHANGE Health Alberta has six staff members and approximately 40 volunteers and a network of community organizations.

Partner Organization	**Partner Representative Name**
Diabetes, Obesity, Nutrition Strategic Clinical Network	Petra O'Connell
University Botanical Gardens	Emma Ausford
Ever Active Schools	Brian Torrence
Edmonton Public Schools	Laura Bohachyk
Parkland School Division	Felicia Ochs, Wellness Coordinator Deputy Superintendent Shauna Boyce
City of Edmonton	Councillor Scott McKeen
Edmonton Catholic Schools	Joan Carr, Superintendent
REACH Edmonton, E4C	Sacha Deelstra
Multicultural Family Resource Society	Winnie Chow-Horn

Inter-sectoral Collaborators

Collaborating Organization	**Partner Representative Name**
Edmonton Oliver Primary Care Network	Deb Anderson
Westview Primary Care Network	Dr Allan Bailey, Grace Moe
Family Physicians	Clark Svrcek
Provincial Obesity Committee	Rena LaFrance
Prairie Garden	Tam Andersen
John Janzen Nature Centre	Beckie Boutillier
Boys & Girls Clubs Big Brothers and Sisters of Edmonton & Area	Sandra Prefontaine
Community Leagues Patients and Families	Kristy Lee, Jason Shine
Family Care Psychology	Joel Pukalo
Sobey's Grocery Store	Ingrid Garcia, Angelina Small
Blitz Conditioning	Chris Tse
RCMP	Steve McQueen, Amelia Paronuzzi

APPENDIX B: CHANGE Health Centre of Excellence Evaluation

Pillar of Excellence	**Deliverables**	**Outcomes:**	**Impact:**
Health Delivery & Innovation	Innovative "health" care model – distinct from current disease care model	Improved health behaviors relating to nutrition and physical activity.	Healthier population
	Improved collaboration between health, education & community sectors	Improved mental health indicators of the participants	Decreased health care costs
	Improved sense of Community	Decreased social isolation	Stronger sense of community
Training	Job Creation and Training of Health Professionals	Increased numbers of CHANGE Health certified professionals	Health Professional focusing on health and wellness
	Train the Trainer process	Increased numbers of CHANGE Health certified professionals	Health Professional focusing on health and wellness
	Expansion of the program across Alberta & Canada	New CHANGE Health Sites	Less Disease Care and more Health

Research & Evaluation	Adaptation of the CHANGE Health Program	Dissemination of the CHANGE Health Model Results	Improved health outcomes of participating families
	Research Outputs Presentation, publication, research grants	Dissemination of the CHANGE Health Program Results	Uptake of the CHANGE Health Programs in other Jurisdictions

Evaluation Methods

Health Outcomes

Evaluation activities will include participant observation, facilitator reflection, program curriculum feedback, child and family surveys to evaluate changes in knowledge and behavior, as well as qualitative interviews with facilitators and families about their experiences. Effectiveness of the CHANGE Health will be a pre-post design and include measures of changes in knowledge and attitudes regarding nutrition, physical activity, sedentary time, sleep, and mental health in participating children and families. Outcome measurement will take place at baseline (registration), end of program and six months post-program. The psychometric properties of scales used in evaluating the effectiveness of the program will be examined (i.e., reliability and validity) and feasibility will be considered by the research team (e.g., cost of the scales, literacy level and respondent burden). Surveys will be self-administered data collection tools.

In order to have an objective method to evaluate the program, we will assess improvement in physical activity levels and eating behaviours (Healthy Eating Index) after 12 months of the intervention, as measured by 7 day accelerometer and 2-24 hr dietary recalls respectively at baseline, 12 and 24 months will be used. Additional outcomes will include self-reported physical and mental health (assessed by the SF-12 and EQ-5D-5L) completed by participants in both groups at team visits, at baseline, 12 and 24 months. Data will be analyzed using SPSS 24.0, IBM, 2015. In addition, participation numbers will be captured for the number of families referred, children and parents in attendance, program participation and waiting list registrants.

Qualitative interview questions will be semi-structured and reviewed by the research team. All interviews will be taped and transcribed and field notes will be taken by the interviewer after completion of the interview. Data will be coded and thematically analyzed. Two members of the research team will analyze the data and discuss their results until consensus is reached. To enhance the rigor of the study, a focus group will be conducted with children and families to review team findings and discuss final results and offer suggested changes to the core curriculum.

Health Care Utilization

It is expected that CHANGE Health will impact upon health care system utilization of both parents and children. To quantify the exact impact of Change Health on health care utilization we will work with Alberta Health and Alberta Health Services to capture Primary Care, Ambulatory Care, Hospital and Laboratory services utilization for all members of the household. We will seek consent for access data from three time periods: 12 months prior to enrollment; 12 months whilst on the CHANGE Health program, and the 12 months after the end of the CHANGE Health intervention. We will work with Alberta Health Secondary Use Data Access platform to create an anonymized matched cohort of households not recruited to the CHANGE Health program. Matching will be done on socio-economic and health system utilization characteristics.

We will present descriptive statistics for resource use by health service category and total health service utilization for each time period and undertake univariate tests of statistical tests. We will then construct multivariate difference in differences models to examine whether any observed changes health services utilization are attributable to differences is baseline characteristics of the households and enrollment in the CHANGE Health program.

Finally, we will use these models to predict the net health resource utilization impact of the CHANGE Health program for each health service category and total health care utilization.

References

1. Ohinmaa A, Schopflocher D, Jacobs P, Demeter S, Chuck A, Golmohammadi K, et al. A population-based analysis of health behaviours, chronic diseases and associated costs. Chronic diseases in Canada. 2006;27(1):17-24.

2. Canada H. Eating Well with Canada's Food Guide. Ottawa: Her Majesty the Queen in Right of Canada, represented by the Minister of Health Canada; 2011.

3. Klein-Geltink J, Choi BCK, Fry RN. Multiple exposures to smoking, alcohol, physical inactivity and overweight: Prevalences according to the Canadian Community Health Survey Cycle 1.1. Chronic diseases in Canada. 2006;27(1):25-33.

4. Physiology CSfE. Canadian Physical Activity Guidelines and Canadian Sedentary Behaviour Guidelines 2015 [cited 2015 April 28]. Available from: http://www.csep.ca/english/view.asp?x=949

5. Colley RC, Garriguet D, Janssen I, Craig CL, Clarke J, Tremblay MS. Physical activity of Canadian adults: Accelerometer results from the 2007 to 2009 Canadian Health Measures Survey. Health Reports. 2011;22(1):7-14.

6. Dehghan M, Akhtar-Danesh N, Merchant AT. Factors associated with fruit and vegetable consumption among adults. Journal of Human Nutrition & Dietetics. 2011;24(2):128-34.

7. Garriguet D. Nutrition: Findings from the Canadian Community Health Survey: Overview of Canadians' Eating Habits. Ottawa: Canada S; 2006, July. Report No. 2.

8. Vanasse A, Demers M, Hemiari A, Courteau J. Obesity in Canada: where and how many? Int J Obes Relat Metab Disord. 2006.

9. Government of Canada, Statistics Canada. Overweight and obesity in children and adolescents: Results from the 2009 to 2011 Canadian Health Measures Survey. 2015 [cited Aug 23, 2017]. Available from: http://www.statcan.gc.ca/pub/82-003-x/2012003/article/11706-eng.htm

10. Singh AS, Mulder C, Twisk JW, van Mechelen W, Chinapaw MJ. Tracking of childhood overweight into adulthood: a systematic review of the literature. Obesity Review 2008; 9(5): 474-88.

11. Reilly JJ, Methven E, McDowell ZC, Hacking, B, Alexander D, Stewart L, Kelnar CJ. Health consequences of obesity. Arch Dis in Child. 2003; 88(9): 748-52.

12. Biro FM, Wien M. Childhood obesity and adult morbidities. Am J of Clin Nutr. 2010, May;91(5):1505S.

13. Pan SY, Johnson KC, Ugnat A, Wen SW, Mao Y. Association of obesity and cancer risk in Canada. Am J Epidemiol. 2004 /02/01;159(3):259-268.

14. Canadian Fitness and Lifestyle Research Institute. Objective measures of physical activity levels of Alberta children and youth. . 2007.

15. ParticipACTION. The biggest risk is keeping kids indoors. the 2015 participaction report card on physical activity for children and youth. . 2015.

16. Chaput JP, Janssen I. Sleep duration estimates of canadian children and adolescents. *J Sleep Res*. 2016.

17. Vanderloo LM, Tucker P, Johnson AM, Holmes JD. Physical activity among preschoolers during indoor and outdoor childcare play periods. *Appl Physiol Nutr Metab*. 2013;38(11):1173-1175.

18. Smith J, Nichols D, Biggerstaff K, DiMarco N. Assessment of physical activity levels of 3rd and 4th grade children using pedometers during physical education class. *Journal of Research*. 2009;4:73-79.

19. Schaefer L, Plotnikoff RC, Majumdar SR, et al. Outdoor time is associated with physical activity, sedentary time, and cardiorespiratory fitness in youth. *J Pediatr*. 2014;165(3):516-521.

20. Statistics Canada. Fruit and vegetable consumption, 2014. . 2015.

21. Garriguet D. Canadians' eating habits. *Health Rep*. 2007;18(2):17-32.

22. Danyliw AD, Vatanparast H, Nikpartow N, Whiting SJ. Beverage patterns among Canadian children and relationship to overweight and obesity. *Appl Physiol Nutr Metab*. 2012;37(5):900-906.

23. Hartmann C, Dohle S, Siegrist M. Importance of cooking skills for balanced food choices. *Appetite*. 2013;65:125-131.

24. Engler-Stringer R. Food, cooking skills, and health: A literature review. *Can J Diet Pract Res*. 2010;71(3):141-145.

25. Bruce AS, Pruitt SW, Ha OR, et al. The influence of televised food commercials on children's food choices: Evidence from ventromedial prefrontal cortex activations. *J Pediatr*. 2016.

26. Ramsey Buchanan L, Rooks-Peck CR, Finnie RK, et al. Reducing recreational sedentary screen time: A community guide systematic review. *Am J Prev Med*. 2016;50(3):402-415.

27. Tremblay MS, Carson V, Chaput JP, et al. Canadian 24-hour movement guidelines for children and youth: An integration of physical activity, sedentary behaviour, and sleep. *Appl Physiol Nutr Metab*. 2016;41(6 Suppl 3):S311-27.

28. Gray C, Gibbons R, Larouche R, et al. What is the relationship between outdoor time and physical activity, sedentary behaviour, and physical fitness in children? A systematic review. *Int J Environ Res Public Health*. 2015;12(6):6455-6474.

29. Jull A, Chen R. Parent-only vs. parent-child (family-focused) approaches for weight loss in obese and overweight children: A systematic review and meta-analysis. *Obes Rev*. 2013;14(9):761-768.

30. Arnold M, Pandeya N, Byrnes G, Renehan AG, Stevens GA, Ezzati M, Ferlay J, Miranda JJ, Romieu I, Dikshit R, Forman D, Soerjomataram I. Global burden of cancer attributable to high body-mass index in 2012: A population-based study. Lancet Oncol. 2015, Jan 1;16(1):36-46.

31. Demark-Wahnefried W, Rock CL, Patrick K, Byers T. Lifestyle interventions to reduce cancer risk and improve outcomes. Am Fam Physician. 2008 Jun 01;77(11):1573-1578.

32. Smetanin P, Stiff D, Briante C, Adair CE, Ahmad S, Khan M. The life and economic impact of major mental illnesses in Canada: 2011 to 2041. RiskAnalytica on behalf of the Mental Health Commission of Canada. 2011.

33. O'Neil A, Quirk SE, Housden S, Brennan SL, Williams LJ, Pasco JA, et al. Relationship between diet and mental health in children and adolescents: A systematic review. Am J Public Health. 2014 Oct;104(10):e42.

34. Lai JS, Hiles S, Bisquera A, Hure AJ, McEvoy M, Attia J. A systematic review and meta-analysis of dietary patterns and depression in community-dwelling adults. The Am J Clin Nutr. 2014 Jan;99(1):181-197.

35. Celano CM, Huffman JC. Depression and cardiac disease: A review. Cardiol Rev. 2011 May-Jun;19(3):130-142.

36. McIntyre RS, Mancini DA, Pearce MM, Silverstone P, Chue P, Misener VL, Konarski JZ. Mood and psychotic disorders and type 2 diabetes: A metabolic triad. Can J Diabetes. 2005;29 (2): 122-132.

37. Faith MS, Butryn M, Wadden TA, Fabricatore A, Nguyen AM, Heymsfield SB. Evidence for prospective associations among depression and obesity in population-based studies. Obes Rev. 2011 May;12(5):438.

38. Kessler RC, Chiu WT, Demler O, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the national comorbidity survey replication. Arch Gen Psychiatry. 2005 Jun 1;62(6):617-627.

39. Hoare E, Milton K, Foster C, Allender S. The associations between sedentary behaviour and mental health among adolescents: A systematic review. Int J Behav Nutr Phys Act. 2016 Dec;13(1).

40. Jackson SL, Cunningham SA. Social competence and obesity in elementary school. Am J Public Health. 2015 Jan 1;105(1):153-158.

41. Feng X, Astell-Burt T. Impact of a type 2 diabetes diagnosis on mental health, quality of life, and social contacts: A longitudinal study. BMJ Open Diabetes Res Care. 2017;5(1):e000198.

42. Smith GL, Banting L, Eime R, OSullivan G, van Uffelen JGZ. The association between social support and physical activity in older adults: A systematic review. Int J Behav Nutr Phys Act. 2017 Jan;14(1):56.

43. Government of Canada, Statistics Canada. Directly measured physical activity of adults, 2012 and 2013. 2015 [cited Jun 16,2017]. Available from: http://www.statcan.gc.ca/pub/82-625-x/2015001/article/14135-eng.htm

44. Government of Canada, Statistics Canada. Report on the Social Isolation of Seniors. 2016 [cited Jun 15,2017]. Available from: https://www.canada.ca/en/national-seniors-council/programs/publications-reports/2014/social-isolation-seniors/page05.html

45. Holt-Lunstad J, Smith TB, Layton JB. Social relationships and mortality risk: A meta-analytic review. PLoS Med. 2010 Jul;7(7):e1000316.

46. Alberta Government. PCN in Alberta. [Place Unknown] 2013. Cited august 27, 2013. Available from http://www.albertapci.ca/AboutPCNs/PCNsInAlberta/Pages/default.aspx

47. Gouveri ET, Tzavara C, Drakopanagiotakis F, Tsaoussoglou M, Marakomichelakis GE, Tountas Y, Diamantopoulos EJ. Mediterranean diet and metabolic syndrome in an urban population: the Athens Study. Nutr Clin Pract. 2011 Oct;26(5):598-606.

48. Kastorini CM, Milionis HJ, Esposito K, Giugliano D, Goudevenos JA,Panagiotakos DB. Theeffect of Mediterranean diet on metabolic syndrome and its components: a meta-analysis of 50studies and 534,906 individuals. J Am Coll Cardiol. 2011 Mar 15;57(11):1299-313.

49. Engström G, Hedblad B, Janzon L. Hypertensive men who exercise regularly have lower rate of cardiovascular mortality. J Hypertens. 1999 Jun;17(6):737-42.

50. Rubenfire M, Mollo L, Krishnan S, Finkel S, Weintraub M, Gracik T, Kohn D, Oral EA. Themetabolic fitness program: lifestyle modification for the metabolic syndrome using the resources of cardiac rehabilitation. Cardiopulm Rehabil Prev. 2011 Sep- Oct;31(5):282-9.

51. Katz A, Lambert-Lanning A, Miller A, Kaminsky B, Enns J. Delivery of preventive care: thenational Canadian Family Physician Cancer and Chronic Disease Prevention Survey. Can Fam Physician 2012;58:e62-e69.

52. Canadian Task Force on Preventive Health Care. Recommendations for prevention of weight gain and use of behavioural and pharmacologic interventions to manage overweight

and obesity in adults in primary care. CMAJ. 2015 February 17; 187(3): 184-195.

53. Weeks C. New guidelines put Family Doctors on the front line in battle against adult obesity. The Globe and Mail. 2015 Jan 26 [cited 2015 Feb 20]. Available from: http://www.theglobeandmail.com/life/health-and-fitness/health/new-guidelines-put-familydoctors-on-the-front-line-in-the-battle-against-adult-obesity/article22640516/

54. Australian Primary Care Research Institute. The Centre for Obesity Management and Prevention Research Excellence in Primary Health Care. Australia: Australian Primary Care Research Institute 2012. Available from: http://aphcri.anu.edu.au/research-program/centresresearch-excellence/centre- obesity-management-and-prevention-research-excellence-primaryhealth

55. Lau DC, Douketis JD, Morrison KM, Hramiak IM, Sharma AM, Ur E. 2006 Canadian clinical practice guidelines on the management and prevention of obesity in adults and children [summary]. CMAJ 2007;176:S1-13.

56. Petrella RJ, Lattanzio CN, Overend TJ. Physical activity counseling and prescription among Canadian primary care physicians. Arch Intern Med. 2007;167(16):1774-81.

57. Petrella RJ, Koval JJ, Cunningham DA, Paterson DH. Can primary care doctors prescribe exercise to improve fitness? The Step Test Exercise Prescription (STEP) project. Am J Prev Med. 2003;24(4):316-22.

58. Canadian Institute for Health Information. Drug Expenditure in Canada,1985 to 2012. Ottawa, ON: CIHI; 2013.

59. Grover S, Coupal L, Lowensteyn I. Preventing cardiovascular disease among Canadians: Is the treatment of hypertension or dyslipidemia cost-effective? Can J Cardiol 2008;

24(12):891-898.

60. Lim K, Jacobs P, Ohinmaa A, Schopflocher D, Dewa CS. A new population-based measure of the economic burden of mental illness in Canada. Chronic Dis Can. 2008;28(3):92.

61. Jeejeebhoy K, Dhaliwal R, Heyland DK, Leung R, Day AG, Brauer P, Royall D, Tremblay A, Mutch D, Pliamm L, Rhéaume C, Klein D. Family physician-led, team-based, lifestyle intervention in patients with metabolic syndrome: results of a multicentre feasibility project. CMAJ Open. 2017 May;5(1).

62. Government of Canada, Statistics Canada. The Daily — Age and sex, and type of dwelling data: Key results from the 2016 Census. 2017 [cited Jun 16,2017]. Available from: http://www.statcan.gc.ca/daily-quotidien/170503/dq170503a-eng.htm?HPA=1