CONDUIT

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"Our grandfathers had to be active to survive."

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Spring/Summer 2007 · Volume 1 · Number 1

The official publication of
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EXECUTIVE EDITOR
Dr. Arya M. Sharma,
CON Scientific Director

EDITOR
Owen Roberts

ASSOCIATE EDITORS
Kim Waalderbos
Brad Hussey

PROJECT CO-ORDINATOR
Arthur Churchyard

PROJECT MANAGEMENT
Lilian Schaer

COPY EDITOR
Barbara Chance

DESIGN
LINDdesign

Printed at Ampersand Printing

Address correspondence to:
Canadian Obesity Network
McMaster University,
Hamilton General Hospital
237 Barton St. E., Hamilton, ON L8L 2X2, Canada
Phone: 905-522-4518
E-mail: conduit@obesitynetwork.ca

For address changes, contact:
Alice Bradbury, Manager
Canadian Obesity Network
McMaster University
Hamilton General Hospital
237 Barton St. E., Hamilton, ON L8L 2X2, Canada
Phone: 905-522-4518
E-mail: bradbury@obesitynetwork.ca

CONDUIT is a publication designed to promote dialogue and understanding about obesity research and networking activities across Canada. The opinions expressed in the articles do not necessarily reflect those of CON, its members, its partners or its supporters. CON does not endorse any products, services, methods or research results contained herein.

CONDUIT is written and co-ordinated by students in the Students Promoting Awareness of Research Knowledge (SPARK) program at the University of Guelph in Ontario, Canada. Read more about SPARK at www.sparkguelph.ca.

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Canadian Obesity Network,
McMaster University, Hamilton General Hospital
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COVER PHOTO BY IAN DIAMOND

MAKING WAVES WITH OBESITY RESEARCH

As a multidisciplinary agent of change, the Canadian Obesity Network (CON) has a mandate to link researchers with the private sector, practitioners and policy-makers to foster innovations and investments toward cost-effective solutions to prevent, control and treat obesity.

The epidemic of overweight and obesity continues to plague Canada. More than 5.5 million adults are obese, as are 500,000 children. In total, that's six million people who are at increased risk for early disability and death, decreased quality of life and a diminished capacity to contribute to our economy. These factors translate into more than $1.8 billion in direct health costs to the Canadian health-care system.

Staying active in the North. See page 10.

There is no simple solution to the problem. Significant improvements in the understanding, prevention and treatment of obesity that result in tangible humanistic and economic benefits for Canadians can be made only through a collaborative effort across many sectors and disciplines.

In keeping with the network's commitment to foster open communication across sectors and disciplines, we are pleased to present the inaugural issue of *CONDUIT*. To be published three times a year, *CONDUIT* will profile the latest Canadian obesity research news, highlighting the invaluable partnerships among academia, industry and government that will lead the way to a healthier future for all Canadians.

CON is pleased to produce *CONDUIT* with the award-winning Students Promoting Awareness of Research Knowledge (SPARK) program at the University of Guelph. SPARK teaches students how to communicate research news and create publications that promote the understanding of science. SPARK has won numerous national and international awards for its stories and publications.

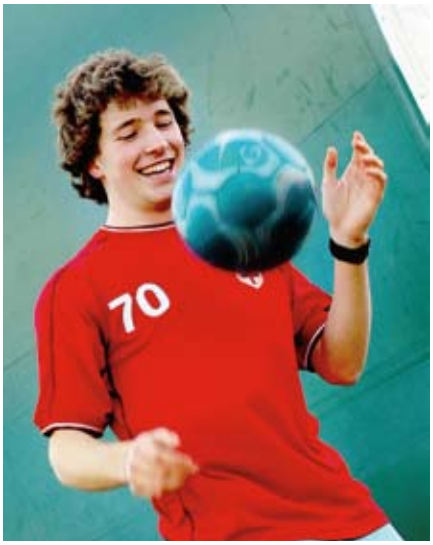
We hope you find *CONDUIT* an informative, inspiring publication, and we look forward to your feedback.

Irving Gold
Chair, Canadian Obesity Network
Board of Directors

Dr. Arya M. Sharma
Scientific Director
Canadian Obesity Network

PHOTO: YOUTH HEALING SERVICES,
CREE NATION DEVELOPMENTAL CAMPS

CONTRIBUTORS



After two years in Guelph's arts and sciences program, **ARTHUR CHURCHYARD** knows the importance of balance – not only between academic disciplines but also between work and play. A soccer player since he was knee-high, Arthur makes time for exercise while juggling writing, music and community volunteering interests.

MARIA DOMBROWSKY is a second-year student majoring in animal biology. Writing commitments and school keep her busy, but she makes an effort to find time each day to go to the gym for a workout. She takes exercise and daily activity seriously as an important aspect of maintaining a healthy lifestyle.

KAYLA DUFFIELD, a fourth-year agricultural science student, enjoys country walks around her parents' farm in Fordwich, Ont. Walking not only helps clear her mind of everyday stresses, but it also keeps her fit. As a SPARK writer, Kayla finds being active also helps generate new ideas – the ideal solution for writer's block.

KATIE SAVAGE, a fourth-year agricultural science student, loves the outdoors in the summer. One of her passions is playing ultimate Frisbee with friends. But whether she's thinking over a story, playing Frisbee or kicking around a soccer ball, Katie simply aims to get outside and soak up the sun.

All contributors to *CONDUIT* are part of the University of Guelph research writing program called Students Promoting Awareness of Research Knowledge (SPARK). www.sparkguelph.ca

Photos by Olivia Brown

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Fourth-year marketing major **KATE ROBERTS** is a true sports fan. She likes taking time off from writing to play basketball, soccer, squash and badminton, but her all-time favourite activity is volleyball. Kate enjoys playing indoor volleyball in the winter, but the sand and the sun of the beach courts are the ultimate setting for her.

Have a story idea for *CONDUIT*? Want to give us your suggestions? Contact us at conduit@obesitynetwork.ca. Check out CON online at www.obesitynetwork.ca for network news, events and networking opportunities.


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PHOTO: CANADIAN PARAPLEGIC ASSOCIATION ONTARIO

FITNESS FIRST FOR QUEBEC KIDS

Improved physical health has overall benefits

BY KATIE SAVAGE

A SCHOOL FITNESS PROGRAM implemented in Quebec is helping children shape up physically, sleep well and perform better in school, says a Université Laval researcher.

Dr. Angelo Tremblay of Laval's Faculty of Medicine, who is head of the Canadian Obesity Network's exercise and recreation section, says Québec en Forme, a children's fitness program, has demonstrated significant benefits to participants.

"Québec en Forme is improving the fitness, physical activity and health-related variables of children," he says.

The program, which began in 2002 as a pilot in Trois-Rivières, Que., is designed for children in economically underdeveloped areas. It uses physical activity as a way to improve participants' physical development. The program is implemented in elementary schools with the idea that the children will share their new fitness and healthy eating habits with family members. That way, entire communities feel the impact, says Tremblay.

This unique approach could help make a lasting impression, says Dr. Jean-Pierre Chanoine, head of the Endocrinology and Diabetes Unit at the University of British Columbia and head of the Canadian Obesity Network's childhood and adolescence section.

"There are so many good ideas in children's health programs, but the real difficulty is getting these ideas to last in children's lifestyles," he says. "Using the approach that children carry the information home to incorporate into

Fitness programs in Quebec are helping children lead active lifestyles inside the home and out.

their families helps ensure such programs are effective in the long term."

Chanoine says Tremblay's study has the potential to have an impact on families from the inside out. Perceptions of family health often differ between children and their parents, but Québec en Forme opens communication about health within the family as children bring home the enthusiasm and knowledge needed to maintain a healthy body weight, he says.

In this study, Tremblay, who holds the Canada Research Chair in Physical Activity, Nutrition and Energy Balance at Laval, is collecting information such as body weight, height and waist circumference from more than 400 children aged five to 10 who are enrolled in Québec en Forme. He is also distributing a questionnaire to parents asking about the activity and exhaustion levels of their children.

In preliminary study results, he's finding that children in the program are more physically active, sleep better and have a lower risk of developing childhood obesity. He says active children eat healthier foods and perform better in school because they are less tired and better able to concentrate.

Final results of the study are expected later this year. These may support expansion of the program into other cities so that more children can be involved, says Tremblay.

Also involved in this project is Laval researcher Jean-Philippe Chaput. This work is sponsored by the Lucie and André Chagnon Foundation and the Obesity Prevention Research Centre.

PHOTO: VINCE FILBY

BOUND TOGETHER BY CORN FIBRE

Canadian nutraceutical, U.S. researchers take aim at obesity rates

BY ARTHUR CHURCHYARD

It was an eye-opening moment for clinical biochemist Joseph Artiss, an associate professor at Wayne State University in Michigan. He had studied the binding capabilities of the fibre α-cyclodextrin for many years without thinking about how his work could be applied to obesity research. Then, at a diabetes conference in 2001, as a speaker digressed to a discussion of fatty acids and their role in obesity, Artiss saw a link to his own research in the way α-cyclodextrin derived from corn could bind to fatty acids. He began considering how fibre could help fight obesity.

When he returned to Wayne State, he sought out nutrition and food science professor Catherine Jen, who has spent her entire career studying obesity. Together they examined the possibility of using this particular corn fibre to bind fatty acids in the gut.

The two researchers have developed a soluble fat-binding fibre material and dubbed it "FBCx" (pronounced "F-Bex"). It's been shown to bind nine times its own weight in dietary fat and has caused a stir in the world of obesity treatments as a unique nutraceutical that could help people maintain or lose weight without changing their diet.

"FBCx cannot be used as a licence for overeating, but we also realize that this could help take a great weight off our economy and health-care system," says Artiss. Indeed, natural products such as this fibre may provide an alternative to some patients for whom prescription obesity medications are less suited.

Artiss and Jen studied the effects of their product on laboratory animals and saw significant weight gain prevention within two weeks. In addition, the animals' blood fat levels were reduced by 30 per cent. FBCx increased sensitivity to signals in the body that help prevent overeating. As a final indicator, the researchers measured fecal fat excretion and observed higher fat content in the feces of animals treated with FBCx.

To support and market the product, Artiss and Jen have formed ArtJen Complexus Holdings Corp., which is headquartered in Windsor, Ont. They continue to add to their understanding of the FBCx mechanism in the gut.

It's already well-known that fat is broken down by an enzyme called lipase, forming fatty acids that can be absorbed by the small intestine. Artiss and Jen say they were surprised to find that when FBCx is consumed with a meal, it binds triglyceride to form a stable complex that can't be absorbed by the small intestine. The complex is then passed in the feces.

Dr. George Grunberger, chair of the Grunberger Diabetes Institute in Bloomfield Hills, Mich., and a clinical professor in the Department of Internal Medicine and in the Center for Molecular Medicine and Genetics at Wayne State, was intrigued by FBCx and carried out a three-month study with obese diabetic patients.

He noticed that FBCx led to increased insulin sensitivity, which he says could mean less need for insulin treatment in people with type 2 diabetes. He also confirmed that FBCx was able to bind nine times its own weight in dietary fat

"We're a Canadian company, so we'd really like to see obesity research continuing here in Canada."

when consumed with meals. There were no reported side effects, apart from gas if a patient didn't eat enough fat to bind with the fibre.

"FBCx is a safe treatment that has not interfered with any other medication my patients were taking," says Grunberger. "It addresses one of the major concerns my obese patients often have, which is that no matter what they do, they can't seem to lose weight."

Although FBCx has performed well in trials and succeeded in markets as far away as Taiwan, it is caught in a bureaucratic traffic jam at home. Canada's Natural Health Products Directorate is wading through a backlog of product applications, leaving ArtJen unable to market FBCx using health claims that could be made based on previous research.

Artiss says there is potential for FBCx research to be carried out in this country.

"We're a Canadian company, so we'd really like to see obesity research continuing here in Canada."

ArtJen is one of many industry partners in the Canadian Obesity Network that are connected to hundreds of researchers and practitioners in every province. For Artiss, the network is the next open door in a series of unexpected but fortunate opportunities.

"Canada must do its part in dealing with the worldwide spread of obesity," says Artiss. "The work we've done with FBCx is not the final answer, but it could go a long way in preventing further health problems for our generation and the next."

ILLUSTRATION: BRANDON DENARD

Eating traditional foods and being more active would help kids' health, but it's just the tip of the iceberg

SETTING THE STAGE FOR BIGGER HEALTH PROBLEMS IN THE NORTH

BY MARIA DOMBROWSKY

Obesity rates in Cree children are four times higher than the Canadian average for all children and may result in obesity-related health problems such as diabetes, a University of Alberta researcher has found. Prof. Noreen Willows of the Department of Agricultural, Food and Nutritional Science says encouraging children to lead more active lifestyles and eat healthier foods, including more traditional Cree foods, which are low in fat and high in protein, can help.

Willows, who is also a member of the Canadian Obesity Network (CON), has partnered with the Cree Board of Health and Social Services and Cree communities to study obesity in children from the Eeyou Istchee Cree communities in James Bay, Que.

In the study, dubbed by community members as the "Emiyuu Ayayaachiit Awaash Project (Active Kids Project)," she and her collaborators assessed 205 children in grades 4 to 6, representing 89 per cent of those in the age range. They measured levels of obesity, physical activity, fitness and adiposity (fat tissue) in the participants.

Body-mass categories (e.g., overweight, obese) were assigned using guidelines from the International Obesity Task Force and based on the body mass and height of each child. Adiposity was calculated from waist circumference and skinfold thickness. The fitness and physical activity of the children were determined by using sprinting exercises and counting the number of steps a child walked daily.

The study found that half of the Cree children had waist measurements that either met or exceeded those of 85 per cent of typical American children. In addition, just slightly

Cree children need more activities and traditional foods to prevent obesity, say researchers.

more than half of the children met physical activity recommendations for their age.

Willows says these findings are worrisome, given that obesity is strongly linked to type 2 diabetes and other serious illnesses.

Cree children were also found to have energy-rich but nutrient-poor diets. Only three per cent of energy in the diet was from traditional Cree foods such as moose, caribou, goose, fish and beaver, which are considered healthy eating choices. Children who ate traditional foods had better iron and zinc nutrition, says Willows.

She notes that a fast-food diet was common among participants, with three-quarters of Cree children consuming at least one meal from a restaurant or as takeout during a three-day period. This is comparable with findings from the 2004 Canadian Community Health Survey that many Canadian children eat fast-food restaurant meals daily. Willows says this shows that, despite living in remote areas, Cree children are exposed to similar risk factors for obesity as other Canadian children.

Reducing the prevalence of obesity in Eeyou Istchee is a challenge, she says. Aboriginal Peoples tend to be constrained by factors such as lower education levels, less opportunity for economic employment, fewer extracurricular opportunities, poorer diets and crowded living conditions. That's why a multi-pronged solution is needed.

"Poverty may be a direct cause of obesity in Cree communities because it limits access to healthful foods and increases exposure to unhealthy foods," she says. "To improve the health of Cree children, we must improve the economic circumstances of First Nations in Canada, including the Cree of James Bay."

Solomon Awashish, a diabetes prevention program officer for the Cree Board of Health and Social Services, says diabetes and obesity are just the tip of the iceberg when it comes to health crises in native communities. Rising obesity and diabetes rates are symptoms of the rapid change in native lifestyles over the last century, he says. Nomadic hunting traditions and traditional food have given way to fast food, sedentary living and modern conveniences.

"Our grandfathers had to be active to survive," says Awashish. "They also believed that, in life, there were no problems, only solutions. Studies like Prof. Willows' make solutions possible because of the constructive partnerships formed among native organizations, researchers and community members."

Willows says Cree children need a supportive environment that encourages them to maintain a healthy body weight, stay physically active through organized sports and activities, and have healthy eating habits that include traditional Cree foods.

Funding for this research was provided by the Canadian Institutes of Health Research. Other University of Alberta researchers involved in this study were vice-dean Dru Marshall of the Faculty of Physical Education and Recreation; Prof. Linda McCargar of the Department of Agricultural, Food and Nutritional Science and a CON member; Prof. Kim Raine, director of the Centre for Health Promotion Studies and a CON member; and graduate students Amber Arnold, Shauna Downs, Carmina Ng and Denise Ridley.

PHOTO: YOUTH HEALING SERVICES, CREE NATION DEVELOPMENTAL CAMPS

MOOD A

BY KAYLA DUFFIELD

Canadians with mood disorders have higher obesity rates

Almost everyone affected by a mood disorder also has metabolic problems leading to obesity, says University of Toronto professor and Canadian Obesity Network member Roger McIntyre. At the Mood Disorders Psychopharmacology Unit at the University Health Network in Toronto, he is exploring the links between obesity and mood disorders such as bipolar disorder and depression.

He says mood disorders and obesity are two of the most common simultaneously occurring diseases in Canada. Mood disorders affect 10 to 20 per cent of the population; overweight and obesity affect more than 50 per cent. The close connection between mood disorders and obesity means physicians must begin to consider both health problems in their diagnosis, he says.

"When dealing with one disorder, we must not ignore the other," says McIntyre. "We must think of the treatment of mood disorders as well as the patient's general health."

His in-depth study of a recent survey by Statistics Canada confirmed that Canadians with major depressive disorder have an increased obesity risk. The Canadian Community Health Survey: Mental Health and Well-Being provided national data that helped him determine that Canadians, particularly women, should be extra careful about weight management if they have mood disorders such as depression.

To reduce the risks of developing obesity and related problems such as cardiovascular disease in patients with mood disorders, health-care professionals must encourage patients to eat healthy foods and get more exercise, says McIntyre. Obesity and poor health can make people with mood disorders more unstable, leading to problems such as disturbed behaviour and chaotic eating.

He notes that medications to control mood disorders can often add pounds as a side effect. He recently conducted

ND FOOD

ILLUSTRATION: BRANDON DENARD

two extensive literature reviews to confirm that both fat metabolism and insulin sensitivity in the body are negatively affected by antidepressant drug treatments.

To counteract this problem, health-care providers must communicate to their patients that there's a link between weight and mood disorders, says McIntyre. They also need to consider treatment options that could address weight problems and improve physical health, he says.

"It's about improving quality of life and increasing lifespan at the same time. We need to encourage people to live better, eat better and get more exercise."

Dr. David Lau of the University of Calgary's Department of Medicine says many questions about obesity and depression require more study.

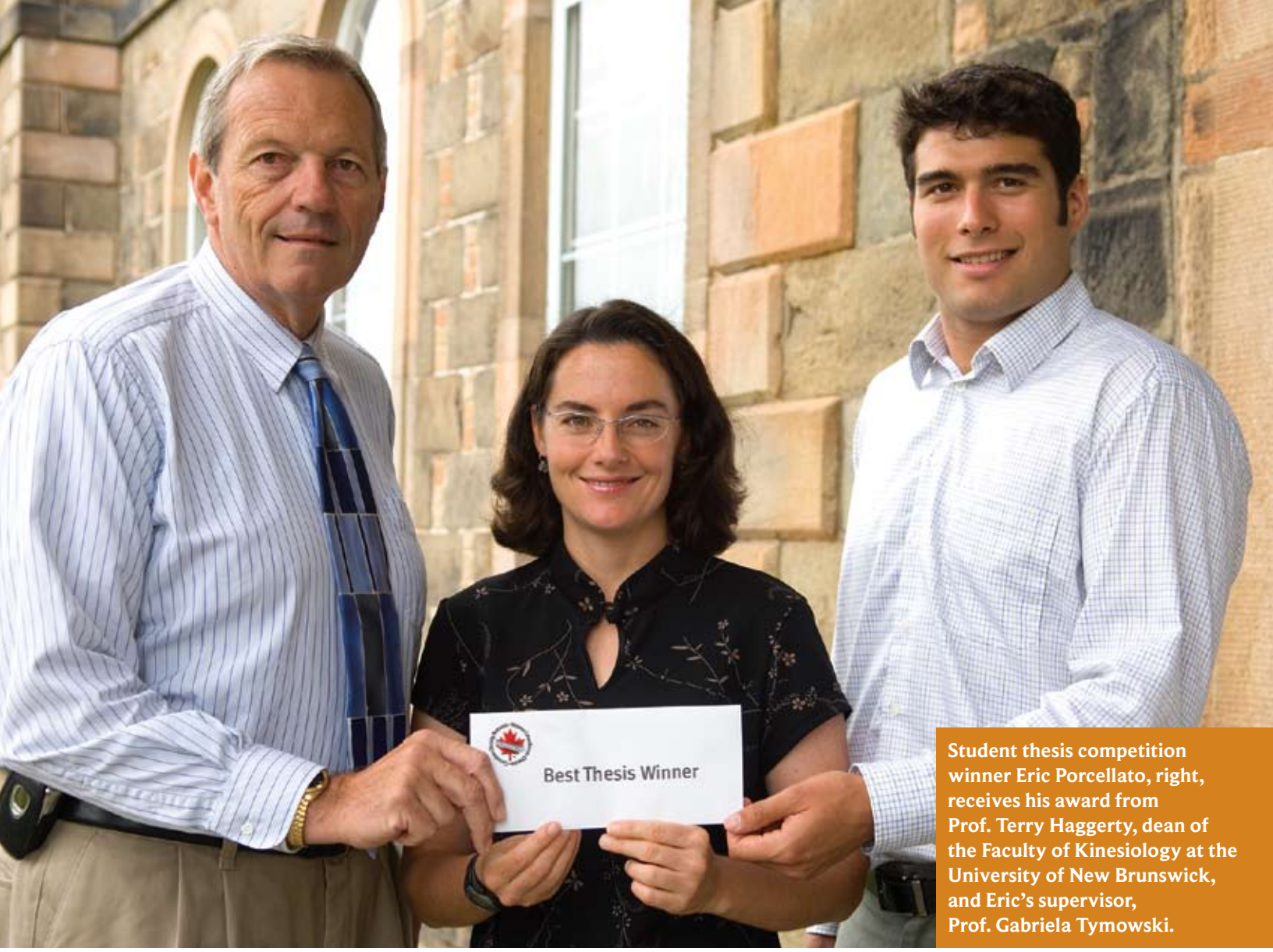
"We now need to understand the triggers and mechanisms that link mood disorders such as depression with obesity," he says. "When people are depressed, they often feel paralyzed, and practitioners need to screen for these types of disorders to determine the best way to help patients move forward to health."

Failure to counteract mood disorders and obesity could threaten the economic and productive potential of a community, says McIntyre. Treatments for these problems can be expensive, and an individual's reduced physical health can further decrease productivity. These factors have significant economic implications for Canada's public health-care system, he says.

"Society needs to look at this problem because it poses a threat to the optimal functioning of our national system."

In his first year as a member of the Canadian Obesity Network, McIntyre has focused on connections between physical health and mood disorders. He has helped develop guidelines for the Canadian Network for Mood and Anxiety Treatments to better manage depressive and bipolar disorders.

Funding for this research is supported by many organizations, including Wyeth Pharmaceuticals, Wyeth Ayerst Canada Inc., GlaxoSmithKline, Merck Frosst Canada Ltd., Servier and Statistics Canada.



Student thesis competition winner Eric Porcellato, right, receives his award from Prof. Terry Haggerty, dean of the Faculty of Kinesiology at the University of New Brunswick, and Eric's supervisor, Prof. Gabriela Tymowski.

RESEARCHERS: CHILDREN NEED PARENTS TO SET HEALTHY EXAMPLE

BY ARTHUR CHURCHYARD

Responsibility is a characteristic many parents try to instil in their children. But a University of New Brunswick graduate student says parents are failing to make responsible weight management choices for themselves and their children.

Eric Porcellato's thesis about the need for parents to set a good example, titled "The Weight of Responsibility: Childhood Obesity, Children's Rights and the

PHOTO: CANADIAN OBESITY NETWORK

Best-Interest Standard," topped entries in a student thesis competition sponsored for the first time last year by the Canadian Obesity Network (CON). The competition seeks fresh perspectives on obesity issues from students and new professional members in the network.

"Children are not yet ready to make mature and rational decisions about food and exercise, so parents must take responsibility in providing healthy eating and activity options," says Porcellato.

His thesis springs from the idea that parents are responsible for weighing the risks of decisions to serve the best interests of their children. This best-interest standard is often used as a legal and moral guide in making decisions for those who can't make competent choices themselves.

"There will be cases where parents knowingly expose their children to health risks, such as injuries from participating in sports," says Porcellato, "but parents are failing to think about the health risks of obesity that lead to unjustifiable harm."

More than 500,000 Canadian children are obese, as are 5.5 million adults. Direct health-care costs to the Canadian economy exceed $1.8 billion a year. But this isn't just an economic issue, he says. Obesity is also troubling on a moral level.

Porcellato argues that parents bear the main responsibility for preventing childhood obesity. If parents allow a sedentary lifestyle for themselves and their children, or choose a family diet with excess calories, they are denying their children the right to a healthy lifestyle. That leaves the door open for obesity-related health risks such as heart disease and diabetes.

These ideas are backed by Porcellato's academic supervisor, Prof. Gabriela Tymowski, director of the University of New Brunswick's Learning, Eating, Activity Programme (LEAP!). LEAP! is a community-based program for the treatment of pediatric obesity, combining elements of nutrition, kinesiology and counselling for overweight children.

Tymowski says LEAP! is unique because it's family-focused and located in an environment near the university that's filled with physically active people, including students, faculty, staff and seniors.

Parents must take responsibility for their children's weight management choices, say researchers.

"When clinics are based in hospitals, the problem of childhood obesity is medicalized, but LEAP! prefers to focus on community-related lifestyle choices," she says. "By exposing these children and families to healthy active-living role models, we hope to instil a new norm."

Both she and Porcellato are members of CON, which Tymowski says is a valuable networking resource for researchers and organizations in smaller provinces such as New Brunswick.

"We need to increase our clinical and research expertise, and CON allows us to do that by providing access to experts across Canada and, potentially, the opportunity for a local network to develop," she says.

CON serves as a conduit for the next generation of innovative thinkers in obesity prevention and treatment. Developing young Canadian professionals through initiatives such as the graduate thesis competition is a critical component of the network's long-term strategy.

Just months after finishing his graduate degree, Porcellato started working as a well-being officer for New Brunswick Power Nuclear, training security and emergency personnel to prepare for mandatory physical fitness tests. He also continues to advocate for health and wellness through workplace programming.

||| To view Porcellato's full thesis or to learn more about the 2007 CON national student thesis competition, check out www.obesitynetwork.ca. For more information about students and new professionals in the network, visit www.con-snp.ca.

PHOTO: MIROSLAV FERKUNIAK

RECOVERY ROAD MAP NEEDED FOR SPINAL CORD INJURIES AND OBESITY

University of Guelph nutrition professor Andrea Buchholz is developing guidelines for spinal cord injury patients to keep them fit on the road to recovery.

BY KATE ROBERTS

THE LONG-TERM PHYSICAL challenges facing victims of spinal cord injury (SCI) are immense and include nerve degeneration, osteoporosis and respiratory issues. Then there are the emotional challenges, which are also huge. Having to cope with all this is an uphill battle for patients and their health-care team alike, so it probably comes as no surprise that obesity is rarely on the radar screen. Given the high rates of obesity and obesity-related diseases being seen in the SCI population, however, there are growing concerns about the lack of dietary and physical activity guidelines for those with long-term SCI.

Researchers work towards guidelines for patients in rehabilitation

The lack of guidelines for both diet and exercise leapt out at University of Guelph nutrition professor and Canadian Obesity Network member Andrea Buchholz while she was working with SCI patients as a neurotrauma rehabilitation dietitian at Hamilton Health Sciences (HHS) in Hamilton, Ont. There she observed how people with SCI adapted to changes in their physical activity levels and how their diet affected them.

"These people were returning to the rehabilitation clinic overweight and with a lower physical activity level, unregulated blood fats and, quite often, poor diets," she says.

PHOTOS: ABOVE – MARTIN SCHWALBE · OPPOSITE – CANADIAN PARAPLEGIC ASSOCIATION ONTARIO

Training for road races such as the Toronto Wheelchair Relay is one way for people with spinal injuries to stay active.

Buchholz's interest in SCI led her to doctoral studies at the University of Toronto as one of the few SCI-obesity researchers in North America. Now a member of Guelph's Department of Family Relations and Applied Nutrition, she is using her research data to develop a better understanding of the link between SCI and obesity to create lifestyle guidelines to benefit this population.

Working with Dr. Joanne Bugaresti of the Spinal Cord Injury Rehabilitation Program at HHS and University of Guelph graduate student Lesley Edwards, Buchholz studied the abdominal adipose tissue (belly fat) of adults with SCI, as well as body weight and dietary intakes.

The research team also assessed the metabolic risk factors that increase the risk of heart disease for these adults. These factors include a large waist circumference and high blood pressure, blood triglycerides (fats), blood sugar and body mass index (BMI).

The study found that, regardless of waist circumference, people with SCI had 42 per cent more visceral adipose tissue (fat surrounding the internal organs) than people without SCI did. This additional tissue increases the risk of heart disease.

"This is a significant finding and shows that more needs to be done to address obesity in people with chronic SCI," says Buchholz.

She's now part of a team of 12 researchers from across Ontario working on a larger three-year study of physical activity and SCI. More than 80 participants with SCI will be measured for blood pressure, body fat, blood fat, diet and physical activity. The researchers will use this information to develop new BMI guidelines for people with SCI – guidelines that will benefit patients in the rehabilitation process. The study will also help build dietary and physical activity guidelines.

Shelly Bercovitch, senior physiotherapist at the Ottawa Hospital Rehabilitation Centre, says the guidelines could be a management tool for people with SCI who are overweight.

"Excess weight can make getting in and out of wheelchairs or using other aids much more difficult," she says. "This, in turn, makes SCI patients less likely to be independent and physically active, which results in further weight gain and increases the risk of developing associated health problems."

The Canadian Physiotherapy Association (CPA) welcomes the guidelines for patients with SCI, says CPA president Karen Hurtubise. "These guidelines could be very helpful in planning overall rehabilitation goals for people with SCI to help them remain active and mobile."

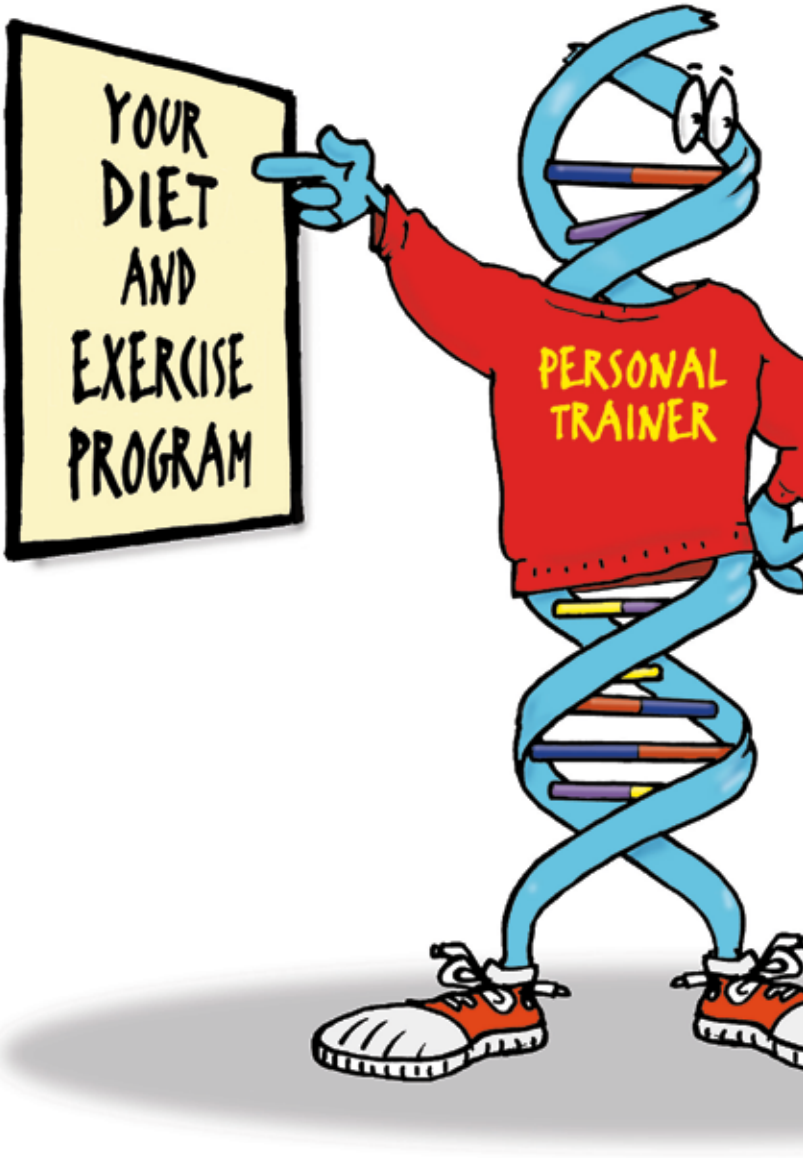
Buchholz will soon be opening a human body composition and metabolism lab at Guelph that will have the capacity to measure body fat, bone mineral density, lean body mass and caloric needs. She believes the lab, the only one of its kind in Ontario, will attract talented students and strengthen her obesity research.

This work has been funded by the Canadian Foundation for Dietetic Research and the Canadian Institutes of Health Research. Buchholz's lab is funded by the Canada Foundation for Innovation.

Success of diet, exercise program hinges on support from genetic makeup

KNOW YOUR GENES, THEN YOUR GREENS

BY ARTHUR CHURCHYARD



For most people, diets are hit-and-miss and tend to be short-term endeavours. The alternative? Weight management, a long-term lifestyle commitment. This approach, however, raises questions about which foods and exercises work best. For people who need to lose weight, it turns out the most personalized weight management advice may be found right in their genes.

A new genetic test offered by GeneOb Inc., a Quebec-based company, and its affiliate GeneObUSA, Inc. uses genetics to help those struggling with obesity and overweight. Different foods and exercises can be used as weight-loss interventions, but some studies show that the better choices may be related to each person's genetic makeup. GeneOb's genetic test, which has not yet been branded, uses cheek swab samples to identify the genes a person has that could help him or her lose weight.

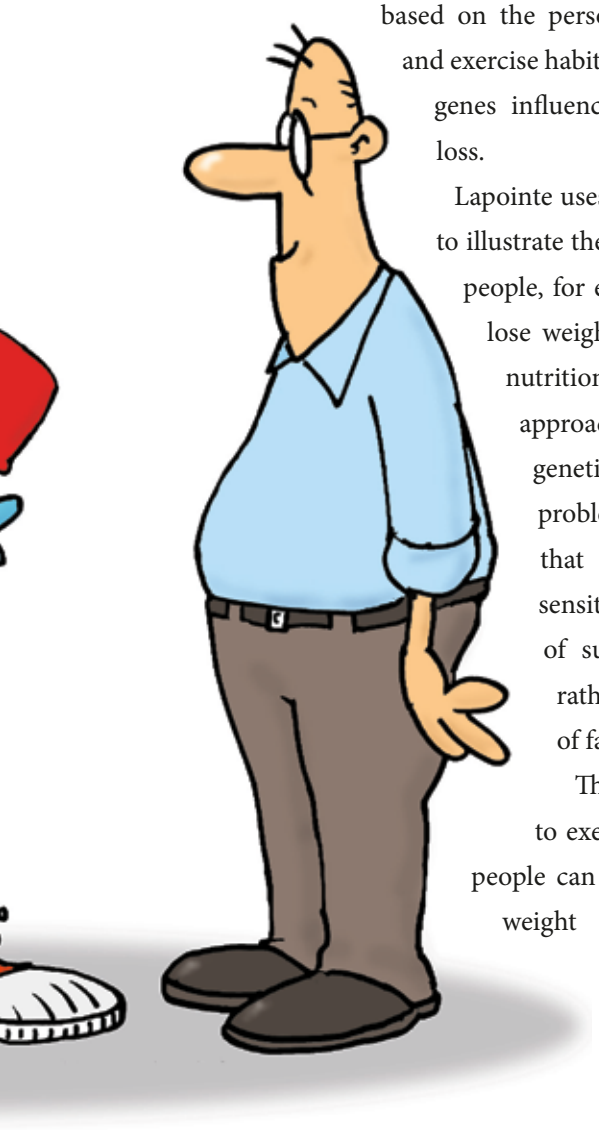
GeneOb, a partner of the Canadian Obesity Network (CON), has teamed with U.S.-based Alticor to begin distributing the genetic test in North America and Mexico, where the cost will range from $100 to $2,000.

GeneOb president Gilles Lapointe says it's one way to use genetics to meet personal weight goals.

"Rather than trying all sorts of different diets and exercise regimens, people will know exactly which kinds of food and activity work efficiently for their body," he says.

It all comes down to determining the details of a person's genetic heritage, says Lapointe. To do that, GeneOb takes a tiny DNA sample from a cheek swab and analyzes it at a U.S. or Canadian laboratory. The lab extracts the DNA and isolates the important genes that play a role in weight management.

People fit into six major categories, depending on their genetic makeup. Each category has been found to react differently to exercise regimens and food components such as carbohydrates, fats and proteins. Once a person is properly categorized, GeneOb can make personalized recommendations for improving weight management based on the person's current dietary and exercise habits and how his or her genes influence weight gain and loss.



Lapointe uses practical examples to illustrate these categories. Some people, for example, may try to lose weight by eating low-fat nutrition bars. But that approach may not suit them genetically if their weight problems are due to genes that make them more sensitive to the amount of sugar they consume rather than the amount of fat, he says.

The same idea applies to exercise choices. Some people can maintain a healthy weight with 30 minutes of walking three times a week, but others need much more exercise to manage their weight, perhaps five 45-minute sessions of brisk walking per week.

Lapointe says these different genetic categories were determined after conducting dozens of weight-loss intervention studies. Researchers have found that genes interact with each other in different ways to give each person a unique ability to process food energy and use it in physical activity.

In fact, almost 115 genes have been identified that influence weight gain and loss, including genes that determine how much fat the body stores and where. To find these genes, researchers measured how individuals with specific genes burned calories, while keeping track of the calories consumed and where they were stored in the body.

The science is complex, but Louis Pérusse, GeneOb's chief scientific officer and a CON member leading obesity studies at Université Laval, says the knowledge on which the GeneOb test is built is sound. It's based on information from an in-depth review of research that analyzed more than 100 known genetic variants that influence weight gain and loss, he says. Specific genes were carefully chosen from these studies to be the focus in the GeneOb test because of their influence in determining the body's response to diet or exercise.

"This is the only genetic test offering an individualized approach to weight management based on genes that are specifically selected for their roles in weight management," says Pérusse. "It is rewarding to see how obesity genetics research has led to a test that helps individuals lose and maintain weight."

Lapointe says GeneOb is a good example of a successful partnership between the research community and industry, a connection made even stronger by the company's involvement in CON and the network's strong focus on linking business with academia.

"Everything within the topic of obesity solutions is interrelated," he says.

Indeed, GeneOb has plans to expand its tests within the next decade to better understand how diet and exercise can benefit people with conditions such as type 2 diabetes and heart problems.

ILLUSTRATION: BRIAN FRAY

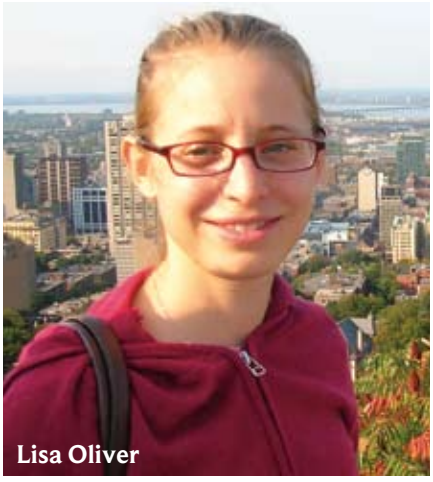
AFRAID, INACTIVE AND OBESE

Researcher connects socio-economic factors with childhood obesity

BY KAYLA DUFFIELD

Childhood obesity has more than doubled over the past 30 years, and youth living in poorer neighbourhoods are at higher risk for the disease, say researchers at Simon Fraser University. They've found that 35 per cent of youth in poorer neighbourhoods are obese, compared with 24 per cent in higher socio-economic areas.

Lisa Oliver, a doctoral candidate in SFU's Department of Geography and a student member of the Canadian Obesity Network, has been tracing the unequal distribution of youth obesity in neighbourhoods with different socio-economic profiles. The study, which gathered information from more than 11,000 participants aged five to 17, found that youth living in poorer neighbourhoods need safer play environments to help curb obesity.



Lisa Oliver

Organized sports and safer play areas are ideal ways to encourage exercise in poorer neighbourhoods stifled by fear and financial barriers.

"Parents' major reason for not allowing children out in poor neighbourhoods is safety," says Oliver.

These youth also need more organized sports and recreation programs, she says. And they should be offered at little or no cost to encourage youth participation, she adds.

"We need to decrease the barriers around organized sports to better include those living in poorer neighbourhoods."

Oliver's research is supervised by Prof. Michael Hayes, associate dean of the Faculty of Health Sciences at Simon Fraser. Hayes says the trend towards increased surveillance and reporting of neighbourhood crimes may be having an impact on obesity rates. Although weight problems are at an all-time high in most neighbourhoods, the biggest problems occur in communities that have developed a culture of fear, he says.

"We are seeing the logical consequences of a generation that is more afraid to go outside than ever before, coupled with an unprecedented array of technology that keeps us and our children sitting comfortably indoors."

Oliver says this can be solved by having safer play environments that encourage kids to get out and play, which will eventually lower the risk of weight problems. It's also important that parents in poorer neighbourhoods encourage programs in the community, lobby for safer neighbourhoods and promote physical activity in the home, she says.

Oliver notes that obese children face a long list of health problems as adults and are less likely to be able to reverse the situation as they grow older.

Oliver's research is funded by a Statistics Canada Doctoral Fellowship and the Canadian Population Health Initiative.

PHOTOS: TOP – DAVE PELESCHAK · BOTTOM – GRAHAM MCLEAN

ETHNICITY WEIGHS IN

Background influences fat distribution, risk for disease

BY MARIA DOMBROWSKY

Body-fat distribution differs greatly among various ethnic groups. And that has a big impact on the risk factors for diabetes, heart disease and high blood pressure, a Simon Fraser University researcher has found.

Prof. Scott Lear of the School of Kinesiology has completed a two-year study of more than 800 people from four ethnic groups. He's found that there's a big difference in fat deposition between ethnicities, particularly among Chinese, South Asian and European populations.

Lear's study measured both intra-abdominal and total body fat in aboriginal, South Asian, European and Chinese participants ranging in age from 30 to 65. All were free of heart disease and diabetes and were not taking medications for cholesterol or diabetes. His findings suggest that Chinese and South Asians tend to have more abdominal fat.

"These results are alarming," he says. "Abdominal fat greatly increases the risk for heart disease and diabetes."

Lear recently launched another study to determine why these differences exist among ethnic groups and if body-fat composition within each group changes over time. He will also assess at what point a person's body-fat storage is determined, whether at birth or during adolescence and adulthood.

Cultural risk factors for obesity are at the centre of McMaster University's Study of Health Assessment and Risk in Ethnic Groups (SHARE), which is led by Canadian Obesity Network member Dr. Sonia Anand. One of her group's most recent papers highlighted her finding that South Asian and aboriginal groups develop obesity-related problems at lower body-mass indexes than Europeans do.

"We know that some groups such as South Asians have a higher risk for weight-related health problems, but there is so much more to learn about the roles of genetics and environmental characteristics such as dietary intake," says Anand. "Each study takes us one step closer to identifying exactly what an individual's risks for health problems are and the best way to prevent and treat those problems."

Funding for Lear's research is provided by the Institute of Nutrition, Metabolism and Diabetes, part of the Canadian Institutes of Health Research (CIHR). Anand's research is sponsored by the Heart and Stroke Foundation of Canada and CIHR.

PHOTOS: MICHAEL BLACKBURN, JUSTIN HORROCKS, MICHAEL KEMTER, JACOM STEPHENS

PARTNERSHIPS

The full weight of the obesity problem in Canada is only now coming into focus, and the news so far is bleak. The crisis is rooted in a complex web of economic, psychosocial, behavioural, biological and other contributing factors, and its negative impact on our health, quality of life and economy is profound.

There will be no simple solution to the problem. Significant improvements in the understanding, prevention and treatment of obesity that result in tangible humanistic and economic benefits for Canadians can be made only through a collaborative effort across many sectors and disciplines.

The Canadian Obesity Network is pleased to work with the following partners:

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McMaster University
Memorial University
Queen's University
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University of Guelph
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University of Manitoba
Université de Montréal
University of New Brunswick
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University of Prince Edward Island
University of Saskatchewan
University of Toronto
University of Victoria
University of Waterloo
University of Western Ontario
York University

Universities/Institutes (International)

Karolinska Institutet, Sweden
Max-Delbrück-Centrum für Molekulare Medizin, Germany
Mayo Clinic Department of Medicine, Rochester, Minn.
Medical University of Gdansk, Poland
Pennington Biomedical Research Center, Baton Rouge, La.
Rockefeller University, New York, N.Y.
The Royal Veterinary and Agricultural University, Denmark
University of Cincinnati, Cincinnati, Ohio
University of Colorado, Denver, Colo.
University of Kansas, Lawrence, Kan.

Government

Canadian Institutes of Health Research — INMD
Communications Research Centre Canada
Health Canada, Office of Nutrition Policy and Promotion
National Research Council Canada Institute for Information Technology
Ontario Ministry of Agriculture, Food and Rural Affairs
Ontario Ministry of Education and Training
Ontario Ministry of Health Promotion
Public Health and Community Services, Hamilton, Ont.

Hospitals/Health-Care Networks

Capital Health, Primary Care Division, Edmonton, Alta.
Hamilton Health Sciences Corporation, Hamilton, Ont.
Hôpital Laval Research Centre, Sainte-Foy, Que.
Ottawa Hospital, Ottawa, Ont.
St. Boniface General, Winnipeg, Man.
St. Joseph's Healthcare, Hamilton, Ont.

Non-Government Organizations (Canada)

Active Healthy Kids Canada
Canadian Association of Bariatric Physicians and Surgeons
Canadian Association of Cardiac Rehabilitation
Canadian Association of Gastroenterology
Canadian Council for Food and Nutrition
Canadian Diabetes Association
Canadian Hypertension Society
Canadian Public Health Association
Canadian Society for Exercise Physiology
Canadian Society for Clinical Nutrition
Canadian Urological Association
Conference Board of Canada
Dietitians of Canada
Heart and Stroke Foundation of Canada
Obesity Canada
Society of Obstetricians and Gynaecologists of Canada
The Arthritis Society

Non-Government Organizations (International)

European Association for the Study of Obesity
International Association for the Study of Obesity
International Obesity Task Force

Industry

Abbott Laboratories Ltd.
Boehringer Ingelheim Ltd.
GeneOb Inc.
Global Diagnostics
Glycemic Index Laboratories Inc.
Innovus Research Inc.
Isotechnika Diagnostics
Johnson & Johnson Medical Devices Division
JSS Medical Research
Eli Lilly
Medtronics Inc.
Merck Frosst Canada Ltd.
Natural Factors
New Era Nutrition
Novartis Nutrition
Novartis Pharmaceuticals
Pfizer
Sanofi-Aventis
TM Bioscience
University Technologies International
Wyeth

Other

Acting Living Alliance
Advanced Foods and Materials Network, Guelph, Ont.
Atlantic Health Promotion Research Centre, Halifax, N.S.
Canadian Health Services Research Foundation
Centre for the Advancement of Minimally Invasive Surgery, Alta.
Connex Health
Child and Family Research Institute, Vancouver, B.C.
Dairy Farmers of Canada
De dwa da dehs nye›s Aboriginal Health Centre, Hamilton, Ont.
Drug Information and Research Centre
Food and Consumer Products of Canada
Firestone Institute for Respiratory Health, Hamilton, Ont.
Golden Horseshoe Bioscience Network, Hamilton, Ont.
Obesity Surgery
Ontario Science Centre, Toronto, Ont.
Ontario Training Centre in Health Services and Policy Research, Hamilton, Ont.
MaRS Discovery District, Toronto, Ont.
Metabolic Modulators Research Ltd., Edmonton, Alta.
PATH, McMaster University, Hamilton, Ont.
Population Health Research Institute, Hamilton, Ont.
Refreshments Canada
Society of Rural Physicians of Canada, Shawville, Que.
Technical Standards and Safety Authority, Toronto, Ont.

... and more partners are coming on board daily.

If you'd like to know more about how to partner with the Canadian Obesity Network or if you have suggestions for possible partnering opportunities, contact:

Alice Bradbury, Manager
Canadian Obesity Network
McMaster University
Hamilton General Hospital
237 Barton St. E.
Hamilton, ON L8L 2X2, Canada
Tel: 905-522-4518 · Fax: 905-528-7114
Website: www.obesitynetwork.ca

OBESITY+

The Canadian Obesity Network's Premium Obesity Literature Service

Access to the current best evidence about the causes, prevention, treatment, and health economics of obesity and its complications.

Citations are:

- pre-rated for quality by research staff
- rated for clinical relevance and interest by at least 3 members of a worldwide panel of practising health professionals with an interest in obesity

Professionals with an interest in obesity can join the Network for free and gain access to **OBESITY+**

OBESITY+ is accessible via the Canadian Obesity Network home page at

www.obesitynetwork.ca

In collaboration with McMaster PLUS

Networks of Centres of Excellence
Réseaux de centres d'excellence

Take a Bite Out of Obesity

National Obesity Preceptorship for Family Health Teams

These one-day workshops are designed to provide updates on the evaluation and treatment of obesity in adults based on the Canadian Clinical Practice Guidelines on the Management and Prevention of Obesity in Adults and Children. Offered at various venues across Canada—space is limited to 16 individuals for each workshop. Target audience: Family physicians, general practitioners and allied health care practitioners.

Go to www.con-event3.ca for information on dates and locations, and to register.

2-Hour Update: Obesity Workshops for Family Physicians and General Practitioners.

This two-hour workshop is designed for GP/FMs to optimize their management and follow-up of overweight and obese **adult** patients based on the Canadian Clinical Practice Guidelines (CPG) on the Management and Prevention of Obesity in Adults and Children. This workshop will also be held at multiple locations across Canada, and is available for rounds presentations.

Please contact obesity.network@gmail.com to make arrangements, or go to www.con-event4.ca to register.

Mobilizing Research Excellence, Creating Value

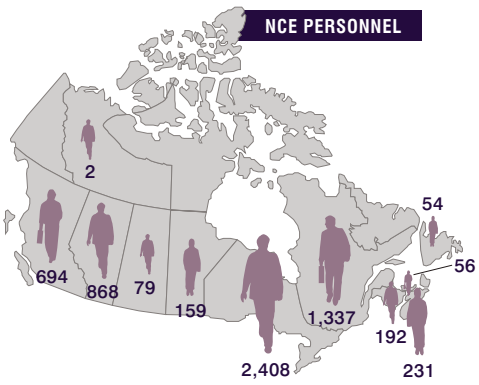
Canada has 23 Networks of Centres of Excellence (NCE). Each network builds partnerships between academia, industry and government to put new knowledge, research and technology to work to create a better Canada. Their work in the natural, social and health sciences involves everything from improving children's literacy skills, to the quality of the food we eat and the water we drink. NCE are helping to keep our forests flourishing and ease the impacts of climate change. By involving thousands of talented young Canadians in their work, they are training tomorrow's scientific leaders and ensuring Canada's continued role as a world science and technology leader.

Currently the NCE Program supports more than 6,000 researchers and highly qualified persons in 71 Canadian universities. The program partners include 756 Canadian companies, 329 provincial and federal government departments, and 525 agencies from Canada, along with 430 international partners – making it a truly national and international program.

In 2006, the networks stimulated outside cash and in-kind investments totaling almost $70 million, including more than $27 million by the participating private sector companies. With the program's own investment, the total dedicated to research, commercialization and knowledge transfer was more than $149 million.

Networks of Centres of Excellence

NCE PERSONNEL



NCE EXPENDITURES

Ontario	40.9%
Québec	23.9%
British Columbia	11.5%
Alberta	10.8%
Manitoba	5.0%
Newfoundland & Labrador	2.8%
Nova Scotia	2.4%
New Brunswick	1.2%
Saskatchewan	1.0%
Prince Edward Island	0.6%

www.nce.gc.ca

Networks of Centres of Excellence of Canada | Réseaux de centres d'excellence du Canada

Canada

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