



SHOW ME THE EVIDENCE

CIHR-SUPPORTED RESEARCH WORKING TO REDUCE HEALTH DISPARITIES



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WELCOME TO THE FOURTH ISSUE OF **SHOW ME THE EVIDENCE**

Not all Canadians face the same health risks. Economic and social factors can interact to increase a population's vulnerability to disease. How can we give everyone the same chance at a healthy future? How do we help those already weakened by disease get back on their feet? Researchers are collaborating with communities across the country to develop interventions that will help ensure everyone achieves true health equality.

The Canadian Institutes of Health Research (CIHR) is the Government of Canada's health research investment agency. CIHR provides support for investigator-driven health research, but also sets strategic investment priorities to respond to key health and health system challenges. CIHR has established five research priorities for the organization and health research across the country:

- Enhance patient-oriented care and improve clinical results through scientific and technological innovations.
- Support a high-quality, accessible and sustainable health care system.
- Reduce health inequities.
- Prepare for and respond to existing and emerging global threats to health.
- Promote health and reduce the burden of chronic disease and mental illness.

Show me the Evidence showcases some of the evidence being produced by Canadian health researchers in response to the challenges listed above. In this issue, we report the progress of several researchers and community partners who are helping identify and combat health disparities. Their research is helping Canadians and people around the world reduce their risk of disability and disease. These stories highlight:

- a province-wide program to increase physical activity among BC primary school students;
- a community-led project to address rising rates of type 2 diabetes and obesity in the Kahnawake Mohawk Territory; and
- a patient-oriented exercise program focused on stroke survivors to improve mobility and prevent muscle weakness.

These CIHR-funded research projects have delivered:

- **A 20% IMPROVEMENT IN CARDIOVASCULAR FITNESS AMONG BC PRIMARY SCHOOL STUDENTS;**
- **A NEW APPROACH TO PHYSICAL ACTIVITY IN SCHOOLS;**
- **A MODEL FOR PARTICIPATORY RESEARCH; AND**
- **AFFORDABLE, CONVENIENT STROKE REHABILITATION.**

ACTION SCHOOLS! BC: A 'WHOLE SCHOOL' APPROACH TO GETTING KIDS ACTIVE

Originally a 10-school CIHR pilot project, it now operates in every BC school district

AT A GLANCE

WHO: DR. HEATHER MCKAY, UNIVERSITY OF BRITISH COLUMBIA

ISSUE: IN BRITISH COLUMBIA, 30% OF CHILDREN ARE OVERWEIGHT OR OBESE AND 50% ARE NOT PHYSICALLY ACTIVE ENOUGH TO REAP HEALTH REWARDS. THE PROBLEM IS NATIONWIDE: ACCORDING TO STATISTICS CANADA, FEWER THAN 7% OF CANADIAN CHILDREN AND YOUTH GET THE RECOMMENDED 60 MINUTES OF MODERATE TO VIGOROUS PHYSICAL ACTIVITY SIX DAYS A WEEK.

PROJECTS: DR. MCKAY LAUNCHED A PILOT ACTION SCHOOLS! BC (AS!BC) PROJECT AT 10 PRIMARY SCHOOLS TO ASSESS THE IMPACT OF INSTRUCTING TEACHERS ON HOW TO INCORPORATE PHYSICAL ACTIVITY INTO THEIR LESSON PLANS. DR. MCKAY AND HER TEAM THEN LAUNCHED A CIHR-FUNDED STUDY IN 25 SCHOOLS ACROSS BC TO EVALUATE WHETHER THE MODEL COULD BE EFFECTIVE WHEN SCALED UP.

RESEARCH EVIDENCE: DR. MCKAY AND COLLEAGUES SHOWED THAT IN THE PILOT, ON AVERAGE, CHILDREN'S CARDIOVASCULAR HEALTH HAD IMPROVED BY MORE THAN 20% ONE YEAR AFTER THE PROJECT'S LAUNCH. IN THE SCALED-UP STUDY, THE MAGNITUDE OF THE CHANGE IN FITNESS WAS EVEN HIGHER AFTER ONE YEAR.

EVIDENCE IN ACTION: THE AS!BC MODEL, FUNDED BY THE BRITISH COLUMBIA GOVERNMENT, NOW OPERATES IN EVERY SCHOOL DISTRICT WITH A SUPPORT TEAM COORDINATING 70 REGIONAL TRAINERS CONDUCTING 400 TO 500 WORKSHOPS ANNUALLY – MORE THAN 3,700 SO FAR – TO TEACH TEACHERS HOW TO INTEGRATE PHYSICAL ACTIVITY INTO THE SCHOOL DAY. AS!BC HAS BEEN HELD UP AS A MODEL FOR OTHER JURISDICTIONS.

SOURCES: ACTION SCHOOLS! BC: A SOCIOECOLOGICAL APPROACH TO MODIFYING CHRONIC DISEASE RISK FACTORS IN ELEMENTARY SCHOOL CHILDREN, *PREVENTING CHRONIC DISEASE: PUBLIC HEALTH RESEARCH, PRACTICE, AND POLICY* 3, 2:A60 (2006).

Ten years ago, a day in the life of an elementary school student in British Columbia meant mostly sitting in a classroom and listening to a teacher. Physical activity was limited to going outside at recess and lunch and, on average, two 40-minute physical education sessions a week, with 15 minutes of each of those sessions lost to “class management” – getting instructions and getting to and from the gym or school grounds.

TOTAL STRUCTURED PHYSICAL ACTIVITY? ABOUT 50 MINUTES A WEEK.

Today, most elementary school students live a different daily life. Math class might begin with two minutes of jumping on the spot to get the circulation going. Recess or lunch might feature skipping games – with instructions and skipping ropes supplied by the teacher. Back in class, there could be a quick discussion on healthy eating. Every day is to include one half-hour of exercise.

TOTAL STRUCTURED PHYSICAL ACTIVITY? AT LEAST 150 MINUTES PER WEEK.

What happened to turn things around so drastically in Canada's third most populated province?

In 2002, Dr. Heather McKay of the University of British Columbia was disturbed by what she saw around her: 30% of kids aged 5–17 were overweight or obese, and 50% of youths aged 12–19 were not physically active enough to reap any health rewards.¹

“I was being confronted by fairly compelling data that suggested children were a lot less physically active than they had ever been,” says Dr. McKay. “I thought this was a tremendous problem that is going to have devastating consequences if we do not take immediate action.”

Focusing on schools – because that's where kids spend 50% of their waking hours² – she began bringing together key players: parents, teachers and principals, and decision makers in the BC Ministries of Education, Health and Sport. She talked to leaders from 2010 Legacies Now, a BC organization created to support Vancouver's 2010 Winter Olympics, and JW Sporta, a physical activity and sport education consulting company with a strong record of working with BC's schools.

“We pulled them all together,” says Dr. McKay, “and said, ‘Let's not talk about whether we need to do something; let's talk about what we're going to do.’ They responded to that.”



PHYSICAL ACTIVITY DOES NOT MEAN SPORTS

BECAUSE NOT ALL KIDS ARE INTERESTED IN OR EXCEL AT SPORTS, AS!BC FOCUSES ON CREATING SIMPLE AND EFFECTIVE EXERCISES THAT CAN EASILY BE DONE IN THE CLASSROOM OR THE SCHOOLYARD. "IT ISN'T GEARED TO ANY PARTICULAR SPORTS ACTIVITY," ACCORDING TO AS!BC EXECUTIVE DIRECTOR BRYNA KOPELOW. "IT'S NOT COMPETITIVE IN ANY WAY." THERE ARE NO WINNERS OR LOSERS, SHE SAYS. "IT'S ABOUT PROVIDING TEACHERS WITH A LOT OF WAYS IN WHICH THEIR KIDS CAN BE ACTIVE," SAYS AS!BC TECHNICAL DIRECTOR JENNIFER FENTON.

EVIDENCE IN ACTION: A NEW APPROACH TO PHYSICAL ACTIVITY IN SCHOOLS

A U.S. REVIEW OF PHYSICAL ACTIVITY PROGRAMS FOR CHILDREN CITED AS!BC AS AN EXEMPLARY MODEL FOR OTHER JURISDICTIONS BECAUSE IT INCLUDED GOVERNMENT LEADERSHIP, ADEQUATE TRAINING OF EDUCATION PROFESSIONALS, RESOURCES FOR SCHOOLS, AND A CLEAR SET OF EXPECTATIONS (NATIONAL PLAN FOR PHYSICAL ACTIVITY: EDUCATION SECTOR, 2009).

Together, they began a bold experiment called Action Schools! BC (AS!BC) to get kids moving. Instead of just focusing on increased physical education classes or extra-curricular activities, AS!BC takes a “whole school” approach of integrating physical activity into every aspect of the school life, with the teacher as the pivotal person to make it happen.

As a first step, Dr. McKay led a two-year, 10-school pilot project to study the impacts of AS!BC. “To have credibility you have to have the evidence,” says Dr. McKay. “We did baseline and follow-up studies with the children and showed a substantial increase in fitness. A huge win was in cardiovascular health.”

Using a standardized test – repeating a 20-metre run at a steadily increasing pace – AS!BC students showed a 20% greater improvement in cardiovascular fitness than kids who weren’t in the program. They experienced a significant reduction in systolic blood pressure and were less at risk for cardiovascular disease.³ The positive results were even greater when the AS!BC model was ‘scaled up’ and delivered to 1,300 children in 25 schools across BC.

The BC Government, which had declared it wanted the province to be the healthiest jurisdiction ever to host the Olympic Games, was impressed by the outcomes.

“The results were strong,” says Meghan Day, Director of BC’s Healthy Schools, Healthy Workplaces, Healthy Weights. “They did a comprehensive evaluation and have continued to do them throughout the years. Looking at various health and behavioural outcomes, they continue to have very positive, strong results, which, of course, helps with continued and sustained investment in the program.”

Now up and running in all of BC’s school districts, the AS!BC support team operates with 70 regional trainers – mostly current or former teachers – who conduct 400 to 500 workshops annually at which educators learn how to integrate physical activity into the whole school day. In these group sessions, the teachers learn how to add aerobics to an arithmetic lesson or include stretching exercises in science.

Along with what AS!BC Executive Director Bryna Kopelow calls a “renewed appreciation for the joy of physical activity,” they come away with a bin stocked with hand grippers, stretchy bands, skipping ropes, resource materials and DVDs illustrating two-minute activities their students can do.

The BC government, which provides \$1.7 million in funding for AS!BC, increased its physical education goals in 2008, requiring that all students from kindergarten to Grade 12 get 30 minutes of daily physical activity. Many teachers have come to rely on their AS!BC training and resources to meet the quota. If they need more help, they can enroll in refresher workshops or have a trainer come to their classroom to help reorganize it for increased physical activity.

“We don’t have physical education specialists in our schools any longer,” says Ms. Day, “so increasingly, our generalist teachers were having to teach physical education and weren’t feeling equipped to do that. AS!BC really provided a way to work towards a solution to increase opportunities for physical activity in the school setting.”

Support for the program, strong from the outset, intensified when AS!BC researchers were able to show that the extra time devoted to physical activity did not detract from academic performance.⁴ While the program hasn’t yet been proven to enhance learning, AS!BC co-investigator Dr. Patti-Jean Naylor of the University of Victoria says the “compression of efficiency” – combining gyrations with geography or muscle movement with math – pays other dividends.

“Teachers have told us that when they do these types of activities they feel their relationship with the kids is strengthened,” says Dr. Naylor, who co-authored a paper that showed AS!BC sparked “positive changes in the children and school climate” and improved communication. “So we know there are social benefits as well.”⁵

A U.S. review, examining various physical activity programs for children, cited AS!BC as an exemplary model for other jurisdictions because it “brings together government policy and leadership, adequate training of education professionals, adequate provision of resources for schools, and a clear set of expectations for physical activity.”⁶

In 2006, McKay and Naylor launched the Healthy Eating pilot project to encourage students to cut back on junk food and increase their intake of fruits and vegetables. As with the physical activity program, teachers got training on healthy eating activities they could try in their classrooms as well as an “action pack” with placemats and utensils such as a chopping board, measuring cups and scrub brush to introduce their students to the foods. Based on its positive impacts – increases in the number of servings of fruits and vegetables consumed per day and the variety of fruits and vegetables consumed⁷ – Healthy Eating was incorporated into the provincial AS!BC program in 2009.

Despite the widespread success of the program, Dr. McKay is reluctant to take credit.

“It’s an idea that many people had. It was just getting those people in the room. What I did was serve as a catalyst for action. The fact that so many talented people were ready and willing to take action is the true success. I would not and could not have done this alone.”

THE VIEW FROM THE CLASSROOM

“MY SENSE IS THAT TEACHERS LOVE IT. MANY TEACHERS DON’T HAVE A LOT OF BACKGROUND IN PHYSICAL EDUCATION. THEY WANT TO DO PHYSICAL ACTIVITY AND THEY SEE THE IMPORTANCE OF IT, BUT THEY ARE PERSONALLY UNSURE HOW TO GO ABOUT IT. WE GIVE THEM TRAINING AND WE GIVE THEM RESOURCES. WE GIVE THEM LOTS TO CHOOSE FROM, SO THEY CAN PICK ACTIVITIES THEY’RE COMFORTABLE WITH THAT MATCH UP WITH THE KIDS IN THEIR CLASSROOM.” – DEBBIE KEEL, RECENTLY RETIRED ELEMENTARY SCHOOL TEACHER AND AS!BC REGIONAL TRAINER

FOR MORE INFORMATION

Canadian Physical Activity Guidelines and Canadian Sedentary Behaviour Guidelines. Available at the Canadian Society for Exercise Physiology website: www.csep.ca/english/view.asp?x=949.

Action Schools! BC website: www.actionschoolsbc.ca/Content/Home.asp.

BC Ministry of Education Daily Physical Activity Requirement: www.bced.gov.bc.ca/dpa/dpa_requirement.htm.

Action Schools! BC: A Socioecological Approach to Modifying Chronic Disease Risk Factors in Elementary School Children, *Preventing Chronic Disease: Public Health Research, Practice, and Policy* 3, 2:A60 (2006). Available at: www.ncbi.nlm.nih.gov/pmc/articles/PMC1563946/.

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- 3 Action Schools! BC: a school-based physical activity intervention designed to decrease cardiovascular disease risk factors in children, *Preventive Medicine* 46, 6 (2008): 525–31.
- 4 School-based physical activity does not compromise children’s academic performance, *Medicine and Science in Sports and Exercise* 39, 2 (2007): 371–76.
- 5 Lessons learned from Action Schools! BC – An ‘active school’ model to promote physical activity in elementary schools, *Journal of Science and Medicine in Sport* 9, 5 (2006): 413–23.
- 6 National Plan for Physical Activity: Education Sector, *Journal of Physical Activity and Health* 6, Suppl 2 (2009): S168–80.
- 7 Action Schools! BC Healthy Eating Pilot: Final Report Results and Recommendations. March (2009): www.actionschoolsbc.ca/Images/Top Menu/AS!BC HE Final Report FINAL March 31 2009.pdf.

THE AS!BC SUCCESS FACTORS

Why did AS!BC succeed so well in British Columbia?
Drs. McKay and Naylor cite these success factors:

- Gathering evidence – researchers regularly measured outcomes to assess impact and fed the results to the schools and stakeholders.
- Building partnerships – researchers worked hand-in-hand with the province, school boards, administration, teachers' groups and parent advisory councils.
- Supporting implementation – teachers received equipment, guidebooks and planning materials, as well as ongoing training.
- Managing change – policies such as a teacher-on-call service to cover for educators attending workshops were put in place to facilitate change.

MEASURES OF SUCCESS

- 400-500 AS!BC training workshops are held annually.
- 86% of schools have participated in AS!BC workshops.
- During the 2012–13 school year, 7,326 teachers, support staff and school administrators attended training workshops.
- Trainers have conducted more than 1,000 'student leader' workshops to show older students how to help younger kids be more active in the classroom, at lunch and recess.



EVIDENCE IN ACTION: A 20% IMPROVEMENT IN CARDIOVASCULAR FITNESS FOR BC ELEMENTARY SCHOOL STUDENTS

AFTER TWO YEARS IN THE AS!BC PROGRAM, STUDENTS SHOWED A SIGNIFICANT REDUCTION IN SYSTOLIC BLOOD PRESSURE AND A LOWER RISK FOR CARDIOVASCULAR DISEASE COMPARED TO THEIR PEERS.

A COMMUNITY EFFORT: PROVING THE POWER OF PARTICIPATORY RESEARCH

Diabetes prevention project succeeds when community and researchers work as equal partners

AT A GLANCE

WHO: DR. ANN C. MACAULAY, MCGILL UNIVERSITY

ISSUE: A DRAMATIC INCREASE IN TYPE 2 DIABETES AMONG INDIGENOUS PEOPLE HAS BEEN CALLED AN “EPIDEMIC IN PROGRESS” WITH PREVALENCE RATES ESTIMATED TO BE THREE TIMES HIGHER THAN IN NON-INDIGENOUS COMMUNITIES.¹

PROJECTS: BEGINNING IN THE MID-1980s, DR. MACAULAY, A PHYSICIAN ON THE KAHNAWAKE MOHAWK TERRITORY NEAR MONTREAL, COLLABORATED WITH HER MOHAWK COLLEAGUE, THE LATE DR. LOUIS T. MONTOUR, TO PRODUCE INITIAL STUDIES THAT INDICATED HIGH RATES OF TYPE 2 DIABETES AND OBESITY. ENCOURAGED BY COMMUNITY LEADERS TO HELP PREVENT YOUNG PEOPLE FROM DEVELOPING THE DISEASE, THEY BEGAN THE KAHNAWAKE SCHOOLS DIABETES PREVENTION PROJECT (KSDPP) IN 1994.

RESEARCH EVIDENCE: DR. MACAULAY AND HER COLLEAGUES HAVE PUBLISHED NUMEROUS PAPERS THAT ILLUSTRATE HOW TO IMPLEMENT PARTICIPATORY RESEARCH PROJECTS IN WHICH THE END USERS WORK IN EQUAL PARTNERSHIP WITH THE ACADEMIC INVESTIGATORS THROUGHOUT THE GATHERING, ANALYSIS, DISSEMINATION AND APPLICATION OF KNOWLEDGE.

EVIDENCE IN ACTION: BOTH KAHNAWAKE ELEMENTARY SCHOOLS HAVE INCORPORATED A CULTURALLY APPROPRIATE 10-WEEK COURSE ON THE IMPORTANCE OF HEALTHY EATING AND PHYSICAL ACTIVITY IN THEIR CURRICULA AND HAVE IMPLEMENTED HEALTHY NUTRITION POLICIES. KSDPP SUPPORTS DOZENS OF RECURRING INTERVENTIONS – FOOD-TASTING SESSIONS TO PROMOTE HEALTHY/TRADITIONAL COOKING, EMPOWERMENT WORKSHOPS, AND WALKING, CYCLING AND BOWLING EVENTS – TO MOBILIZE THE COMMUNITY TO REDUCE THE INCIDENCE OF DIABETES.

SOURCES: IMPLEMENTING PARTICIPATORY INTERVENTION AND RESEARCH IN COMMUNITIES: LESSONS FROM THE KAHNAWAKE SCHOOLS DIABETES PREVENTION PROJECT IN CANADA, *SOCIAL SCIENCE & MEDICINE* 56, 6 (2003): 1295–1305. TYPE 2 DIABETES MELLITUS IN CANADA’S FIRST NATIONS: STATUS OF AN EPIDEMIC IN PROGRESS, *CANADIAN MEDICAL ASSOCIATION JOURNAL* 163, 5 (2000): 561–66.

Dr. Ann Macaulay has seen first-hand how type 2 diabetes – which decades ago was a non-factor among Indigenous people² – has become a scourge of First Nations communities.

A general practitioner in the Kahnawake Mohawk Territory on the south shore of the St. Lawrence River since the 1970s, Dr. Macaulay and her colleagues began seeing more and more patients developing the type 2 diabetes and the heart disease, strokes and cardiovascular deterioration that come with it. In the mid-to-late 1980s, Dr. Macaulay and her Mohawk colleague Dr. Louis T. Montour conducted two studies that confirmed their observations. And while they eventually published their results in academic journals, their first commitment was to the people they served.

“The numbers were awful,” says Dr. Macaulay. “We were quite worried about going around with the results that indicated high rates of type 2 diabetes and obesity. Afterwards some of the Elders came to us and asked if we would do something to prevent this disease by focusing on the young. They felt that they were stuck in their lifestyles, but wanted to prevent the youth from carrying the same burden of disease.”

So began the Kahnawake Schools Diabetes Prevention Project (KSDPP). Funded since 1994, it is one of the longest-running community-based participatory research projects in Canada and serves as a model of how to do participatory research right.

Like many First Nations communities, the people of Kahnawake had a history of unsatisfying and sometimes stigmatizing experiences with researchers coming in from beyond their borders to perform research “on” them. A 1987 quote from Dr. Montour says it all: “Outside research teams swooped down from the skies, swarmed all over town, asked nosy questions that were none of their business and then disappeared never to be heard of again.”³

The guiding principle for KSDPP has been to include the community and the researchers as equal partners – even if it meant creating the process as they went along.

“Remember, this was back in the mid-1990s, before all the current ethical guidelines had been developed,” says Dr. Macaulay. “We had to decide, ‘What are the obligations of the researchers to the project? What are the obligations of the community? How are these partners going to work together?’ We became leaders in developing a code of research ethics that combined science with cultural relevance and the respect of the community.”

THE COMMUNITY AS EQUAL PARTNER

In Kahnawake, the community is a full partner in KSDPP, from concept to completion. Through the volunteer Community Advisory Board, people take part in developing objectives, planning and implementing interventions and evaluations, collecting and interpreting data, reviewing all publications, and disseminating results. At the same time, the community takes responsibility for implementing and enforcing a healthy nutrition policy in schools, increasing physical resources through initiatives such as building recreation paths, and sponsoring social gatherings like fun runs, walking club events and food tasting events that promote a healthy lifestyle.⁴

Dr. Macaulay helped assemble a team that adopted the principles of participatory research from the outset. “We had limited expertise in collecting data, so we invited some top-notch researchers from McGill and the University of Montreal to join the team, which was made up of family physicians, the director of the hospital, the director of the education centre and the director of social services in the community.”

One of the first hires was Alex McComber, a former Kahnawake Survival School principal who has worked with the project for much of the past 18 years as its executive director and training co-coordinator.

“The researchers had done a good job of bringing the message of the problem to the community,” says Mr. McComber. “I read the proposal and thought, ‘We need to do this together with the community.’ We sent out invitations to the key stakeholders we identified – phys-ed teachers, school administrators, people from the hospital and the band council, the police, the ambulance service, community services, social services, the youth centre, all of the existing organizations. We had about 75 people attend a full-day meeting and engaged them in dialogue, saying, ‘This is the situation and these are the possible solutions. How do we go about doing this?’ We basically created the activities of the project from there.”

From those stakeholders, the KSDPP Community Advisory Board was assembled – volunteers who meet every month with the researchers and full-time project staff to guide the prevention project as interventions are developed and implemented.

Photo: Participants at the Echoes of a Proud Nation Powwow in Kahnawake, July 2012



WHAT IS PARTICIPATORY RESEARCH?

IN PARTICIPATORY RESEARCH, ACADEMIC INVESTIGATORS WORK IN FULL PARTNERSHIP WITH THOSE WHO ARE AFFECTED BY THE ISSUE OR WHO ULTIMATELY WILL USE THE RESEARCH RESULTS – PATIENTS, HEALTH PROFESSIONALS, ORGANIZATIONS, POLICY MAKERS AND COMMUNITY MEMBERS, OR, IN THE CASE OF KAHNAWAKE, ENTIRE COMMUNITIES. THE OVERRIDING GOAL, ACCORDING TO PARTICIPATORY RESEARCH AT MCGILL (PRAM), IS TO ANSWER IMPORTANT HEALTH QUESTIONS AND BENEFIT THE PARTNERS IN THE RESEARCH PROCESS, WHILE GENERATING KNOWLEDGE THAT ALSO CAN BE APPLIED ELSEWHERE.

EVIDENCE IN ACTION: A MODEL FOR PARTICIPATORY RESEARCH

THE GUIDING PRINCIPLE FOR KSDPP WAS TO TREAT THE COMMUNITY AND THE RESEARCHERS AS EQUAL PARTNERS. “WE BECAME LEADERS IN DEVELOPING A CODE OF RESEARCH ETHICS THAT COMBINED SCIENCE WITH CULTURAL RELEVANCE AND THE RESPECT OF THE COMMUNITY,” SAYS DR. MACAULAY.

“One of the key items is to keep scientific rigour, because shoddy research doesn’t benefit anybody. It certainly doesn’t benefit the community.” Dr. Ann Macaulay

PROFILE OF A COMMUNITY ADVISORY BOARD MEMBER

AMELIA TEKWATONTI MCGREGOR, A KAHNAWAKE HOMEMAKER AND SCHOOL VOLUNTEER, WAS ONE OF THE ORIGINAL COMMUNITY ADVISORY BOARD MEMBERS AND REMAINS ONE TODAY. SHE HAD A STAKE IN GETTING INVOLVED: HER MOTHER LIVED WITH DIABETES AND HER DAUGHTER WAS ONE OF THE ELEMENTARY SCHOOL CHILDREN TO BE TESTED AS PART OF THE PROJECT. “BEING A STAY-AT-HOME MOTHER, YOU’RE ALWAYS TRYING TO FIND WAYS TO KEEP THE KIDS HEALTHY.”

SHE POINTS TO THE END-OF-SCHOOL-YEAR RACERS FOR HEALTH EVENT, WHEN SCHOOLS FROM OTHER MOHAWK COMMUNITIES VISIT KAHNAWAKE FOR A SERIES OF FUN RUNS, AS A PARTICULARLY POPULAR INTERVENTION. KSDPP HOSTS SADIE’S WALK AND MOTHER’S DAY WALKS, AND SUPPORTS KAHNAWAKE YOUTH CENTRE INITIATIVES SUCH AS MOHAWK MILES, AND THE WINTER CARNIVAL.

“THE COMMUNITY ADVISORY BOARD USUALLY SUPPLIES HEALTHY SOUPS AND SANDWICHES FOR THE PEOPLE WHO JOIN IN,” SHE SAYS. “PEOPLE LIKE SOCIALIZING AND COMPETING WITH EACH OTHER IN A FRIENDLY WAY.”

At the two Kahnawake elementary schools, the implementation of ten 30-minute lessons on the themes of nutrition, fitness and lifestyle, and diabetes has been central to the project’s enduring success. KSDPP initially helped train teachers in delivering the program, which was developed by local school nurses and a nutritionist. The project also promotes school nutrition policies and helps organize school activities such as in-class walking programs and extracurricular events.⁵

“We’ve learned a lot of lessons in terms of keeping things fresh and relevant,” says Mr. McComber.

On the research side, evaluation is also ongoing. Researchers – several of whom are from Kahnawake, received training through KSDPP and have completed master’s and doctoral programs – periodically assess elementary school children on their height and weight, fitness, eating habits, physical activity and TV watching.⁶

KSDPP hasn’t eradicated type 2 diabetes in Kahnawake, but it has helped keep it from running rampant as it has in many Indigenous communities.

“The data show that the incidence decreased from 1986–2003,” says Dr. Macaulay. “The prevalence of type 2 diabetes is increasing across Canada, and the rate of increase in Kahnawake is between that of Canada and Indigenous communities – as opposed to the massive increase in other Indigenous communities.”

One of the project’s greatest successes, says Mr. McComber, is raising awareness. “The awareness of diabetes and the importance of diabetes prevention and healthy lifestyle are there throughout the community. Getting people to make changes: that can be painstakingly slow. It’s very much an individual thing and there are a lot of considerations working against that. But the fact that the recognition is there, that’s a success.”

FOR MORE INFORMATION

Kahnawake Schools Diabetes Prevention Project website: www.ksdpp.org/.

Kahnawake Schools Diabetes Prevention Project Code of Research Ethics: www.ksdpp.org/elder/code_ethics.php.

Participatory Research at McGill (PRAM) website: pram.mcgill.ca/.

Young et al, Type 2 diabetes mellitus in Canada’s First Nations: status of an epidemic in progress, *Canadian Medical Association Journal* Sept. 5, 2000. Available at www.cmaj.ca/content/163/5/561.

Video with Dr. Macaulay: www.youtube.com/healthresearchcanada.

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WITHIN OUR GRASP: PATIENT-LED STROKE RECOVERY

Aerobic Exercise and Strength Training Can Restore Muscle Mobility and Functionality

AT A GLANCE

WHO: DR. JANICE ENG, UNIVERSITY OF BRITISH COLUMBIA

ISSUE: EVERY 10 MINUTES SOMEONE IN CANADA HAS A STROKE. MORE THAN 300,000 CANADIANS CURRENTLY LIVE WITH A STROKE, MANY OF WHOM HAVE DIFFICULTY WITH BASIC FUNCTIONS SUCH AS GETTING DRESSED AND MAKING A MEAL. OUR AGING POPULATION, WITH ITS INCREASED RISK OF STROKE, HAS MADE STROKE REHABILITATION AND RECOVERY AN INCREASINGLY URGENT HEALTH CARE CONCERN.

PROJECTS: FUNDED BY CIHR AND THE HEART AND STROKE FOUNDATION OF BC AND YUKON, DR. ENG HAS SPENT MUCH OF THE PAST DECADE RESEARCHING THE IMPACT OF AEROBIC AND STRENGTH-BUILDING EXERCISE ON STROKE RECOVERY. HER WORK HAS CHALLENGED THE CONVENTIONAL BELIEF THAT PEOPLE WHO HAVE SUFFERED STROKES ARE INCAPABLE OF VIGOROUS EXERCISE AND THAT IT WOULD EXACERBATE SPASTICITY – INVOLUNTARY MUSCLE CONTRACTIONS CAUSED BY DAMAGE TO THE BRAIN.

RESEARCH EVIDENCE: DR. ENG'S GRADED REPETITIVE ARM SUPPLEMENTARY PROGRAM (GRASP), WHICH PATIENTS CAN COMPLETE ON THEIR OWN IN ADDITION TO STANDARD PHYSIOTHERAPY, HAS BEEN PROVEN TO IMPROVE ARM AND HAND FUNCTION SIGNIFICANTLY. HER FITNESS AND MOBILITY EXERCISE (FAME) PROGRAM HELPS STROKE SURVIVORS IMPROVE MOBILITY, LEG STRENGTH AND CARDIO-RESPIRATORY FITNESS.

EVIDENCE IN ACTION: DOWNLOADABLE AT NO CHARGE FROM THE UBC'S NEUROREHABILITATION RESEARCH PROGRAM WEBSITE, GRASP IS BEING USED ACROSS CANADA AND THE UNITED STATES, THE UNITED KINGDOM, FRANCE, CHINA, SWEDEN, GREECE AND SEVERAL OTHER COUNTRIES. MORE THAN 2,000 VISITORS FROM 223 CITIES IN 35 COUNTRIES HAVE ACCESSED FAME AT THE SAME SITE.

SOURCES: A SELF-ADMINISTERED GRADED REPETITIVE ARM SUPPLEMENTARY PROGRAM (GRASP) IMPROVES ARM FUNCTION DURING INPATIENT STROKE REHABILITATION: A MULTI-SITE RANDOMIZED CONTROLLED TRIAL, *STROKE* 40, 6 (2009): 2123–28. A COMMUNITY-BASED FITNESS AND MOBILITY EXERCISE PROGRAM FOR OLDER ADULTS WITH CHRONIC STROKE: A RANDOMIZED, CONTROLLED TRIAL, *JOURNAL OF THE AMERICAN GERIATRICS SOCIETY* 53, 10 (2005): 1667–74.

EVIDENCE IN ACTION: AFFORDABLE, CONVENIENT STROKE REHABILITATION

GRASP CONSISTS OF A SERIES OF SIMPLE EXERCISES THAT PATIENTS CAN PERFORM ON THEIR OWN, USING SIMPLE HOUSEHOLD OBJECTS AND ITEMS THAT CAN BE PURCHASED AT DOLLAR STORES. THE PROGRAM IS IN CLINICAL USE IN AT LEAST 100 SITES SPREAD ACROSS 10 COUNTRIES.

When Dr. Janice Eng first began investigating the impact of vigorous exercise on stroke recovery, she was advised to back off.

“When I published one of my early papers, one of the leading experts in stroke rehabilitation said, ‘You shouldn’t be trying to get these people to exert themselves. It will exacerbate spasticity.’ The belief at the time was, ‘Don’t do this; it will make them worse.’ The thinking has changed drastically.”

The University of British Columbia’s Dr. Eng has been a leading force behind that change in thinking and the subsequent paradigm shift in stroke therapy. Over the past 10 years, she has demonstrated that aerobic and muscle-strengthening exercises not only improve stroke survivors’ mobility, they enhance cardiovascular health, strengthen bone density and enrich quality of life.

Making strong use of information technology, she has also translated her findings into clinical practice: two exercise programs she created to help stroke survivors regain strength and muscle function are now in use around the world.

With more than 50,000 strokes in Canada each year – one every 10 minutes – improving all aspects of life after stroke is an increasingly urgent concern. More than 300,000 Canadians currently live post-stroke lives,¹ a number that will most likely grow given our aging population and the fact that incidence of stroke doubles each decade after age 55.²

After a stroke, people typically avoid using their weakened arm and hand, leading to a further loss in strength, decreased range of motion, and deterioration of fine motor skills. To overcome this, Dr. Eng developed the Graded Repetitive Arm Supplementary Program (GRASP).

Ideally begun within four weeks of the stroke as an hour-a-day complement to routine physiotherapy, GRASP consists of a series of simple exercises that, when repeated dozens or perhaps hundreds of times daily, can significantly improve arm and hand function for basic tasks, such as buttoning up a shirt, unscrewing the lid of a jar or brushing teeth.³ Stroke survivors can do their GRASP exercises at home, using simple household objects and items that can be purchased at dollar stores.

“In occupational therapy and physiotherapy, the number of repetitions can be low – maybe 30 to 50 times – because there are so many things to do in a session,” says Dr. Eng. “But the number of repetitions needs to be very high to change the brain. With GRASP, if you do it over an hour, you’re getting 900 repetitions of hand and arm movements.”

GRASP has proved remarkably popular, adopted by clinics from Abbotsford Regional Hospital in BC to Western General Hospital in Edinburgh, Scotland,

“I don’t know the exact number of users, but I believe it is in operation in at least 10 countries and 100 sites,” says Dr. Eng. “I gave a talk at the American Congress of Rehabilitation Medicine in Vancouver in October 2012 and when I asked how many of the clinicians had used GRASP, the majority of people put up their hands – at least 40 in just that room. I had a similar response for a talk I did in Melbourne.”

Visitors from 488 cities in 49 countries have accessed GRASP more than 17,000 times since it went online at UBC’s Neurorehabilitation Research Program website in the spring of 2012. The GRASP patient books have been translated into Chinese, Hindi, Punjabi, Farsi and Vietnamese.

Sarah Rowe, Physiotherapy Practice Coordinator for GF Strong Rehab Centre and Vancouver General Hospital, says GRASP should be the standard of care for stroke patients who fit the criteria – those who have some muscle activation of the wrist extensors – because it gets results. “That’s what we’re trying to promote. For those who meet those criteria, you can see improvement.”

She says GRASP is particularly useful to motivated patients and their families. “There is a population of patients who have high motivation and are able to participate. It really meets their needs. It also gives family members something they can do to assist the patients. They feel a bit helpless, and this gives them a really clear idea of what they can do.”

In fact, stroke survivors with family or caregivers who help them with GRASP do significantly better than those who do not have the same support.⁴

Based on the GRASP results, the Canadian Best Practice Recommendations for Stroke Care, a joint initiative of the Canadian Stroke Network and the Heart and Stroke Foundation of Canada, now recommend that sub-acute stroke patients receive a supplementary upper extremity program.

The GRASP program grew out of early research Dr. Eng undertook to help people get moving after the “brain insult” of stroke.

“We wanted to look at improving walking ability. The majority of stroke survivors go on to walk – 90% have some degree of ambulation – but not that well. We wanted to create a program that would improve people’s walking ability.”

Her Fitness and Mobility Exercise (FAME) program, similar to a circuit-training fitness routine, requires participants do a series of tasks to improve balance, increase walking speed and strengthen muscles. Unlike most stroke rehab regimens, which are one-on-one sessions with a physiotherapist or occupational therapist in a hospital in the days and weeks after a stroke, FAME can be led by trained fitness instructors working with small groups of stroke survivors in community settings.

Dr. Eng has demonstrated that FAME improves cardio-respiratory fitness, mobility, strengthens leg muscles and is effective at preventing secondary conditions such as additional strokes, heart attacks and injuries from falls.⁵

Freely downloadable from the UBC website, it has been accessed by more than 2,000 visitors from 223 cities in 35 countries. Communities across Canada and around the globe have since taken up the thrice-weekly, instructor-led FAME program.

As successful as FAME has been, its uptake in Canada has been limited by how stroke rehabilitation is funded, says Dr. Eng. “One of the major constraints is the way our health care system is structured. We cover one-on-one care to our stroke patients, which is effective and personalized though not sustainable, but health care doesn’t cover group exercise provided in community settings.”

Meanwhile, Dr. Eng continues to innovate. Her current work in progress is SPIRAL – the Supplementary Program in Repetitive Activity of the Leg, a series of lower limb exercises that stroke patients can do at home to get stronger and more mobile. It’s hoped that SPIRAL will do for the legs what GRASP has shown it can do for the arms.

“It’s a work in progress,” says Dr. Eng. “We will have the results from the clinical trial next year.”

1 Canadian Stroke Network. Centre for Stroke Recovery Begins National Expansion, *press release* (Oct. 29, 2012).

2 Stroke epidemiology: a review of population-based studies of incidence, prevalence, and case-fatality in the late 20th century, *Lancet Neurology* 2, 1 (2003): 43–53.

3 A self-administered Graded Repetitive Arm Supplementary Program (GRASP) improves arm function during inpatient stroke rehabilitation: a multi-site randomized controlled trial, *Stroke* 40, 6 (2009): 2123–28. doi: 10.1161/STROKEAHA.108.544585.

4 The role of caregiver involvement in upper-limb treatment in individuals with subacute stroke, *Physical Therapy* 90, 9 (2010): 1302–10. doi: 10.2522/ptj.20090349.

5 A community-based fitness and mobility exercise program for older adults with chronic stroke: a randomized controlled trial, *Journal of the American Geriatrics Society* 53, 10 (2005): 1667–74.

FOR MORE INFORMATION

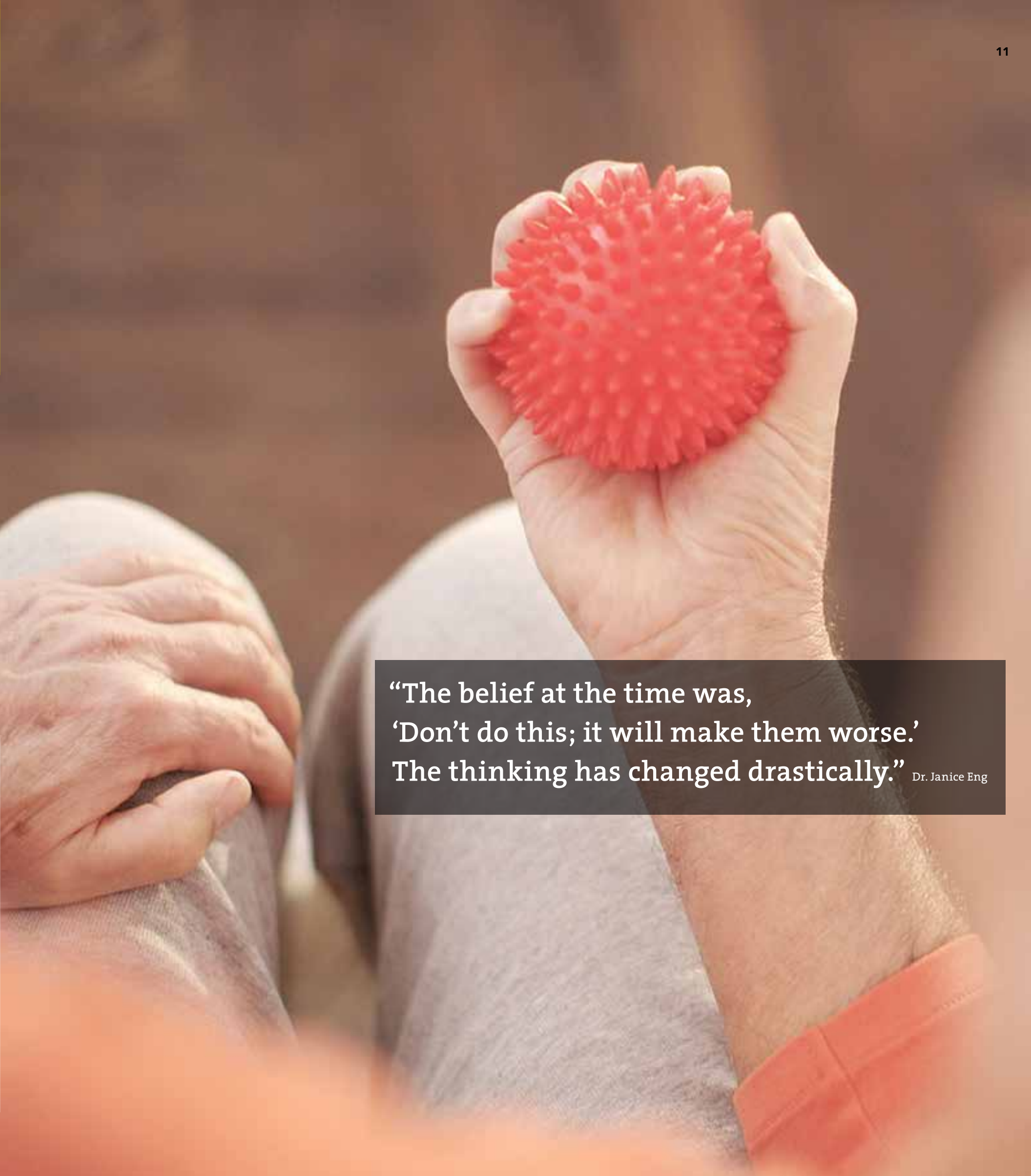
GRASP resources materials. Available at the UBC Neurological Research Program website: neurorehab.med.ubc.ca/grasp/.

FAME instruction manuals. Available at the UBC Neurological Research Program website: neurorehab.med.ubc.ca/fame/.

Canadian Best Practice Recommendations for Stroke Care: www.strokebestpractices.ca/.

Canadian Stroke Network’s Stroke 101: www.canadianstrokenetwork.ca/index.php/about/about-stroke/stroke-101/.

Video with Dr. Eng: www.youtube.com/healthresearchcanada.



“The belief at the time was, ‘Don’t do this; it will make them worse.’ The thinking has changed drastically.” Dr. Janice Eng

WHAT THE WORLD’S THERAPISTS SAY ABOUT GRASP

“It’s a wonderful technique, sometimes magical ... we’ve been using this in our hospital.” Bangalore, India

“I have used this program before and feel that it is very beneficial. I have had positive patient outcomes.” Melbourne, Australia

“I love the manuals and have used them in the acute and community settings and completed training sessions on them.” London, England

“The GRASP program gives the much-needed structure of upper extremity exercise that patients and family members can use.” Medicine Hat, Alberta

WHAT THE EXPERTS SAY

“Programs like GRASP are the future, allowing patients to continue their recovery using scientifically proven therapeutic approaches in their own homes and communities with little cost to the health care system. It does not require expensive equipment and has been proven to be highly effective. As such, it is quickly being adopted around the country, and international interest and use continue to grow.”

Dr. Robert Teasell, Medical Director, Stroke Rehabilitation Program, Parkwood Hospital, St. Joseph’s Health Care London

“GRASP is a feasible, cost-effective way of enhancing stroke recovery. In the cash-strapped health care system, GRASP demonstrates that extra practice can enhance stroke recovery without excessive burden on busy rehabilitation therapists.”

Dr. Mark Bayley, Medical Director of the Neuro Rehabilitation Program at Toronto Rehab



GATHERING MORE EVIDENCE

FOR MORE INFORMATION

Roadmap Signature Initiatives: www.cihr-irsc.gc.ca/e/43567.html.

CIHR Strategic Initiatives: www.cihr-irsc.gc.ca/e/12679.html.



FUTURE RESEARCH INITIATIVES TO REDUCE HEALTH DISPARITIES

REDUCING HEALTH INEQUITIES IS AN IMPORTANT PRIORITY FOR CIHR. TO BETTER FOCUS INVESTMENTS, THE ORGANIZATION HAS RECENTLY LAUNCHED A NUMBER OF MAJOR RESEARCH INITIATIVES TO INCREASE RESEARCH ACTIVITY IN THIS AREA. THESE STRATEGIC INVESTMENTS WILL HELP CIHR ALLOCATE ITS RESOURCES TO MAKE THE STRONGEST POSSIBLE IMPACT ON HEALTH AND HEALTH CARE – TODAY, TOMORROW AND WELL INTO THE FUTURE.

STRATEGY FOR PATIENT-ORIENTED RESEARCH

CANADA'S STRATEGY FOR PATIENT-ORIENTED RESEARCH (SPOR) IS A COLLABORATION OF RESEARCHERS, PROVINCES, PARTNERS, HEALTH CARE PROVIDERS, PATIENTS AND FAMILIES WORKING TOGETHER TO IMPROVE HEALTH OUTCOMES. SPOR AIMS TO BETTER ENSURE THE TRANSLATION OF INNOVATIVE DIAGNOSTIC AND THERAPEUTIC APPROACHES TO THE POINT OF CARE, AS WELL AS TO HELP THE PROVINCES AND TERRITORIES MEET THE CHALLENGE OF DELIVERING HIGH QUALITY, COST-EFFECTIVE HEALTH CARE.

PATHWAYS TO HEALTH EQUITY FOR ABORIGINAL PEOPLES

THROUGH THE PATHWAYS TO HEALTH EQUITY FOR ABORIGINAL PEOPLES SIGNATURE INITIATIVE, CIHR WILL FUND RESEARCH TO FIND OUT HOW WE CAN BRING TOGETHER WESTERN SCIENTIFIC KNOWLEDGE AND THE TRADITIONAL KNOWLEDGE OF FIRST NATIONS, INUIT AND MÉTIS PEOPLES TO IDENTIFY HEALTH INTERVENTIONS THAT WORK. THE INITIATIVE AIMS TO FIND WAYS TO ADAPT EXISTING HEALTH RESEARCH TO THE DIVERSE NEEDS OF ABORIGINAL COMMUNITIES, WHERE VALUES, TRADITIONAL KNOWLEDGE AND HISTORY VARY GREATLY.

CANADIAN LONGITUDINAL STUDY ON AGING

THIS STUDY WILL FOLLOW APPROXIMATELY 50,000 CANADIAN MEN AND WOMEN BETWEEN THE AGES OF 45 AND 85 FOR A PERIOD OF AT LEAST 20 YEARS. THE STUDY WILL COLLECT INFORMATION ON THE CHANGING BIOLOGICAL, MEDICAL, PSYCHOLOGICAL, SOCIAL AND ECONOMIC ASPECTS OF PEOPLE'S LIVES. THESE FACTORS WILL BE STUDIED TO PROVIDE AN UNDERSTANDING OF HOW THEY HAVE AN IMPACT, BOTH IN MAINTAINING HEALTH AND IN THE DEVELOPMENT OF DISEASE AND DISABILITY AS PEOPLE AGE.

NEED MORE EVIDENCE?

Thank you for reading **Issue No. 4** of *Show me the Evidence*. We hope that you enjoyed learning more about the impact of Canadian health researchers and encourage you to visit CIHR's website (www.cihr-irsc.gc.ca) and social media sites (www.cihr-irsc.gc.ca/e/42402.html) to learn about other CIHR-funded success stories.

IN ISSUE NO. 5 OF *SHOW ME THE EVIDENCE* WE WILL BE LOOKING AT HEALTH RESEARCH EFFORTS FOCUSED ON THE CHALLENGE OF DELIVERING PATIENT-ORIENTED CARE.

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