Improving Life After Stroke

Victoria lawyer Chris Considine knew that he did not have an easy road ahead of him. It was the spring of 2004 and Chris was being released from the hospital after having had a stroke five days earlier. “My ability to walk was severely compromised. But I knew [former Premier] Mike Harcourt and that he had resolved he was going to walk out of hospital” after he had a serious accident. “I resolved to do the same,” says Chris.

Almost as soon as he returned home, Chris went to work, following a rehabilitation plan that he developed with a physician-friend and a human kinetics specialist. At first, he was able to very slowly walk down just one side of the block at a time before resting for 20 to 30 minutes and then walking back. It took a long time, but Chris was eventually able to improve his mobility, increase his energy and his range of activities to the point that now, eight years later, he is able to take annual mountain-climbing trips.

Patricia Pitcher, a retired Registered Nurse in Nanaimo, echoes Chris Considine’s experience. Pat had a stroke deep in her brain and medical staff at the hospital did not expect her to live. When she was released from hospital, Pat was paralyzed on her left side and had difficulty speaking, hearing, and vision due to paralysis on the rights side of her face. Like Chris, Pat knew she faced a long road to recovery. “When I got home from the hospital seven weeks later, I could hardly move,” Patricia says. “I sat there and I thought and I thought and I thought. As a nurse, I had made up thousands of care plans. I thought that I would make one for myself.”

Patricia took the care plan that was devised for her at the hospital and incorporated her own elements into it. After a year and half of exercising at home and at an out-patients rehab program, she felt that she had really made progress in recovering her mobility. “But,” Patricia says, “it got better and better because I never stopped doing things.”

What Chris and Patricia went through – and their struggles to recover – are not unusual. Each year, there are about 4500 acute strokes in BC. The majority of people who have had an acute stroke must deal with at least some impairment to their ability to walk. Many also have other kinds of physical impairment. Recovery can be a long, slow, and difficult process. But BC researchers in are funded by the Heart and Stroke Foundation to discover new ways to improve the chances of recovery from stroke.

The Warning Signs of STROKE

Weakness
Sudden loss of strength or sudden numbness in the face, arm or leg.

Trouble speaking
Sudden difficulty speaking or understanding, or sudden confusion.

Vision problems
Sudden trouble with vision.

Headache
Sudden severe and unusual headache.

Dizziness
Sudden loss of balance, especially with any of the above signs.

If you experience one or more of these symptoms, even temporarily, seek immediate medical attention. A stroke can destroy up to 2 million brain cells per minute.

Lose time, lose brain.

CALL 9-1-1 or your local emergency number.

For more information, go to www.signsofstroke.ca.

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that exercise is a key element in long-term stroke recovery and prevention of recurring strokes. Heart attack patients are often managed with long-term exercise to prevent a second attack. However, the same emphasis on exercise is not currently placed on stroke prevention.

Dr. Eng, a rehabilitation scientist at UBC and GF Strong Rehabilitation Centre, hopes to change this. Through a series of studies she has conducted over the past several years, Dr. Eng wants to introduce more exercise into ongoing stroke therapy by examining how aerobic activity affects patient recovery and ultimately the prevention of a second stroke. She has shown that reflex training improves patient coordination, lessening the likelihood of a fall and resulting bone fracture. These benefits carried on into the year after the training period ended. In another study called GRASP, Dr. Eng developed an exercise program for the arms and hands which led to improved arm function and lowered the number of depressive symptoms in stroke patients. Currently, Dr. Eng is developing another exercise program to help stroke patients train their legs. Like GRASP, the aim is to provide simple exercises that can be done at home as well as in a rehab program.

“Think of this as cross-training,” explains Dr. Zehr. “Endurance athletes can do a number of aerobic sports that will target their cardiovascular system,” he contends. “The same is true for walking training: the specific activation of muscles may be slightly different [using remote stimulation], but there are a common set of connections in the nervous system that are activated during any rhythmic movements. … These spinal cord connections are still intact following a stroke, and we need to tap into them.”

Dr. Zehr’s current research examines the specific regions of the body where remote stimulation will be the most effective. Ultimately he hopes to create a simple, cost-effective remote stimulation protocol that will complement a stroke patient’s rehabilitation program.

Meanwhile, Dr. Janice Eng, is showing...
A stroke happens when the blood supply to a part of the brain is blocked – either by a clot in an artery or a rupture of a blood vessel. Without a steady supply of blood, the brain cells are starved of oxygen and begin to die. The effects of the stroke depend on where it happens in the brain. But unless the blood flow is restored as soon as possible, stroke can result in long-term disability or even death.

Stroke is the third leading cause of death in Canada and globally. Stroke is also the leading cause of acquired adult disability.

A TIA or Transient Ischemic Attack, is a mini-stroke. The symptoms may go away quickly but a TIA is a warning sign that you have a higher chance of having an acute stroke.

If you have any of the warning signs of stroke, even temporarily, call 9-1-1 right away.

50,000 strokes happen every year in Canada – one every 10 minutes.

In 2008-2009, more than 5700 British Columbians were admitted to hospital for a major stroke or a TIA. Another 4900 people experienced minor strokes or TIAs but were not hospitalized.

In 2008-2009, more than 1,000 people on Vancouver Island were admitted to hospital for a major stroke or a TIA. Another 1200 people on the Island experienced minor strokes or TIAs but were not hospitalized.

To find our your risk, take the My Heart & Stroke Risk Assessment at www.heartandstroke.ca/risk.
People who have suffered impairment as the result of a stroke can often recover much of the function that was initially lost. However, this varies from person to person. Dr. Craig Brown, a researcher in the Division of Medical Sciences at the University of Victoria, wants to know how the stroke changes the brain and how these changes influence the amount of function that is later regained.

Using sophisticated imaging techniques, Dr. Brown looks at how the networks of brain cells, or neurons, and the surrounding blood vessels are altered by stroke. He also looks for differences in brain cell activity in the first few months following the stroke. “The first couple of weeks following a stroke are a critical time for recovery [of these networks],” Dr. Brown notes. His research has shown that patients with diabetes are less likely to recover the same amount of brain activity as otherwise healthy stroke patients. This finding may have implications for the way patients with diabetes are treated following a stroke.

In addition, Dr. Brown is also collaborating with engineers from UVic’s CanAssist, to develop peripheral nerve stimulation or PeNS therapy. This involves implanting a nerve stimulator device in the arm of a stroke patient. The device will provide constant stimulation to feed back to the brain and “wake up” regions that may have become inactive from the stroke even though the cells remain alive. This ongoing stimulation is meant to promote the development of new connections and the creation of new brain cell and blood vessel networks, which would in turn enhance stroke recovery.
Much of what happens in the brain during and after a stroke is still something of a mystery. But two Heart and Stroke Foundation scientists at the University of British Columbia are hot on the trail. Their object is to understand how brain cells communicate with each other through tiny proteins called membrane channels and how a stroke changes what they do.

Membrane channels act like doorways to our brain cells, opening and closing to enable ions and other molecules to move in and out of the cell. These molecules play an essential role in the brain’s wiring because they are the messengers that bring signals from one cell to the another. But if the channels start to malfunction, opening and closing too often or not enough, the brain’s wiring can be damaged, or even destroyed.

For Dr. Brian MacVicar, a Professor of Psychiatry who is based at the Brain Research Centre, a type of channel called pannexins offer an important clue about why brain cells die during a stroke. His research indicates that in normal conditions, pannexin channels don’t open all the way. However, when a stroke blocks the flow of oxygen into cells, pannexins start to open more and release molecules that can be damaging to other cells. Pannexin activation in conditions of stroke can lead to seizure activity and eventual cell death.

Dr. Christian Naus, at UBC’s Life Sciences Institute, is also tracking down the role of membrane channels in stroke. Dr. Naus wants to know how channels work together to form what are called gap junctions – two channels on adjacent cells that open at the same time to create a continuous pore from one cell to the next. When this happens in one cell after another, these gap junctions help to form large networks of cells in the brain through which molecules are able to flow.

During a stroke, such continuous network can help buffer the effects of the large amounts of molecules that are released in response to oxygen deprivation and which can otherwise cause serious damage to brain cells. But the network will not be created if the channels do not line up properly. Without this network, when a stroke happens, they will release large amounts of molecules that cause damage to the other cells rather than being absorbed and neutralized. The key puzzle Dr. Naus wants to solve is to identify the conditions in which gap junctions are formed.

By solving the mysteries of membrane channels, these researchers are leading the way for new therapies that could help us limit the damage to the brain and body caused by stroke.
The Stroke Recovery Association of BC (SRABC) is a non-profit organization. Through our regional stroke recovery branches we are committed to assisting stroke survivors and their caregivers throughout the province to improve their overall quality of life.

SRABC has around 40 local stroke recovery branches across the province. Branches provide a friendly place where stroke survivors, families, friends, and caregivers can get encouragement, help, and support. The Vancouver Island branches are listed below. To join a branch, please contact the branch coordinator directly.

**VANCOUVER ISLAND REGION**

**CAMPBELL RIVER**
St. Peter’s Anglican Church  
Coordinator: Sarah Sandholm  
Phone: 250-203-4082  
Email: campbellriver@strokerecoverybc.ca

**COMOX VALLEY**
Comox United Church  
Wednesday (1st & 3rd) 10:30am – 12:30pm  
Coordinator: Jenny Gohl  
Phone: 250-871-0553  
Email: jennyg33@hotmail.com

**DUNCAN**
(Cowichan Valley)  
Valley Seniors Centre  
Monday 12:00pm-2:00pm  
Coordinator: Barbara Park  
Phone: 1-250-246-4952  
Email: barb_p55@yahoo.com

**LADYSMITH**
Ladysmith Health Centre  
1111 4th Avenue, Ladysmith,  
Thursday 11:00am-1:00pm  
Coordinator: Connie Parman  
Phone: 250-924-7772  
Email: sea222burns@gmail.com

**NANAIMO**
Bowen Park Complex  
Friday 10:45am – 2:00pm  
Coordinator: Rose Zajonskowski  
Phone: 250-753-5328  
Email: daviesharold@live.com

**OCEANSIDE**
(Meets in Parksville)  
St. Columba Presbyterian Hall  
Friday 11:00am – 1:30pm  
Coordinator/Fax: Kathleen Falvai  
Phone/Fax: 250-752-9796  
Email: kathleenfalvai@shaw.ca

**SAANICHTH**
(Peninsula Branch)  
Seventh Day Adventist Church  
Monday 11:00am – 2:00pm  
Coordinator: Lyall Copeland  
Phone: 250-652-3016  
Email: copel@shaw.ca

**VICTORIA**
Knox Presbyterian Church  
Friday 10:30am–1:30am  
Coordinator: Zoe Friesen  
Phone: 250-383-2623  
Email: zoefriesen9@gmail.com
You’d normally think of hypothermia as something to avoid because it’s dangerous to our health. Or you might see it used in a science fiction show, where a character’s body is frozen, only to be revived later after light-years of space travel.

Now it’s turning out that hypothermia, far from being the stuff of science fiction, can actually have a beneficial role in protecting the brain during a stroke. Research conducted by Dr. Tim Murphy, a neuroscientist at UBC’s Brain Research Centre, is looking at the protective effects of hypothermia on brain cells during and after stroke-simulating oxygen deprivation.

Using advanced imaging techniques to visualize specific cells in the brain, Dr. Murphy has found that cooling brain tissue before a stroke results in less cell damage than if the brain tissue is kept at normal body temperature.

Dr. Murphy’s current work, supported by the Heart and Stroke Foundation, examines the effect of deep hypothermia on the structure of brain cells to help us understand what temperatures are the most protective.

These results could be applied to patients who are undergoing procedures that may place them at an increased risk for a stroke, such as heart surgery. “Hypothermia is already used in some types of surgery but we don’t know how it works,” explains Dr. Murphy. In order to make better use of hypothermia in these kinds of procedures, we need to identify exactly how it protects brain tissue during a stroke, as well as finding the optimal temperature for protecting brain cells without causing more damage.

In addition to this work, Dr. Murphy also plans to look at the use of hypothermia as a potential treatment after a stroke has occurred, and whether or not this may improve a patient's prognosis or ability to recover functions that could otherwise be lost.

Can Cool Temperatures COMBAT STROKE?

Hypothermia is already used in some types of surgery...
Your support to the Heart and Stroke Foundation of BC & Yukon (HSF) combats stroke and heart disease through prevention, early intervention, and effective treatment. Investing your support in the HSF helps people of all ages and walks of life. Here are just a few things we are doing with families and communities on Vancouver Island:

**INSPIRING THE NEXT GENERATION OF RESEARCHERS**

Over the past 10 years, 27 outstanding Vancouver Island students have participated in HSF’s High School Summer Research Program. Students learn advanced techniques in research through hands-on laboratory work with leading scientists in cardiovascular research. Many go on to careers in healthcare or research.

**CLINICS PREVENT FULL BLOWN STROKES**

As part of the BC Stroke Strategy, lead by the Heart and Stroke Foundation, the Vancouver Island Health Authority expanded the TIA Rapid Assessment Clinic at Victoria General Hospital and launched a new one at the Campbell River and District Regional Hospital. These clinics identify and treat TIsAs, helping patients decrease disability and avoid future strokes. Early assessment and patient education can reduce the risk of a full-blown stroke by as much as 80%. In 2009, more than 1600 patients went through Vancouver Island’s TIA Rapid Assessment Clinics.

**GIVING CHILDREN THE TOOLS FOR LIVING HEALTHIER LIVES**

Since 1995, your donations helped certify 1,229 Vancouver Island teachers as HeartSmart Kids™ instructors. In 2010, alone, we reached over 20,000 elementary school children on the Island, teaching them about healthy food choices, exercise, and risks of smoking. In 2009, HSF partnered with the BC Pediatrics Society to launch the Sip Smart! Program to help kids learn about the impact and risks of sugary drinks. Already 93 Vancouver Island educators are teaching kids about the benefits of making healthy beverage choices.

**PROMOTING HEALTHY COMMUNITIES THROUGH PHYSICAL ACTIVITY AND MUTUAL SUPPORT**

HSF supports seven Hearts in Motion™ walking clubs on Vancouver Island, encouraging people to participate in regular exercise. As a partner in the Physical Activity Strategy of the BC Healthy Living Alliance, HSF worked with partners to develop tools and programs designed to get inactive adults moving and improve the use of community facilities. Twenty-nine groups on Vancouver Island participated in the physical activity strategy, including the municipalities of Victoria, Saanich, Campbell River, and Cumberland, Social Planning Cowichan, the Kwakuitl Indian Band, and the Tsartlip First Nation.

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I would like to volunteer for the Heart and Stroke Foundation.

In Victoria, please contact Connie Bergeron at 250-382-4035
e: cbergeron@hsf.bc.ca

On Vancouver Island/Powell River/Gulf Islands, please contact Marica Benvin at 250-754-5274 or 888-754-5274
e: mbenvin@hsf.bc.ca

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