



## **Focus on Families & Stroke**

# Stroke leaves huge imprint on families

By Joe Sornberger

**A**s the pages of this issue of the *Canadian Stroke Network News Magazine* show, stroke may strike down one person, but it can also take the feet out from under everyone in their family.

Think of it this way: Every year, 50,000 Canadians suffer a stroke. That is about 10,000 more than the entire population of Brandon, Manitoba.

If each of those stroke survivors has just one family member—a spouse or a child—then stroke in Canada touches (or grabs, more likely) as many lives as people currently residing in Kelowna, British Columbia. Every year.

If every stroke survivor has two other family members in their lives—which would be fairly typical, given a spouse and a child—think of stroke as affecting each and every life in Greater Sudbury, Ontario. Three? Think of all the people living in and around St. John’s, Nfld. Then add 25,000 more.

That is not even considering the in-laws, grandchildren and siblings. Simply put, stroke makes a huge imprint on the lives of Canadian families. And different people react in different ways.

Lewis Crummey wanted to get well for his family. He simply did not want to make life a hardship for Gladys, his wife of 43 years. So he refused to do so.

“Does anyone,” asks Mr. Crummey, a 69-year-old who plays tambourine in his Shriners’ band in St. John’s, “want to be a burden?”

See **FAMILIES** on page 2



— Robert Teteruck, The Hospital for Sick Children

**Juliana Bottinga, 8, left, with Canadian Stroke Network researcher Dr. Gabrielle deVeber of the Hospital for Sick Children.**

## ‘Your child has had a stroke’

‘Adult’ illness affects three to four children per 100,000 each year

By Joe Sornberger

TORONTO, Ontario

**K**im Bottinga clearly remembers the winter day almost five years ago when her little girl had a stroke.

Juliana, a normally bouncy three-and-a-half-year-old child, had been running a

high fever for days and couldn’t keep down the antibiotic she had been prescribed at one of the four trips Kim had made seeking medical care.

Around supper time, shortly after Juliana had asked to be put to bed, Kim and her husband heard their daughter slide down the stairs to the main floor of their home. “I don’t know how she made it down the stairs,” said Ms. Bottinga. “She was like a rag doll.

See **CHILDREN** on page 3

# Families: Stories of courage ‘inspiring’

Continued from page 1

His courageous story of recovering from stroke “one inch at a time” so inspired a gathering of young scientists over the summer, many dedicated themselves to advancing stroke research after hearing him speak.

Stroke has turned Kim Bottinga who lives near Hamilton, Ontario, into a more assertive mother. “I used to be so passive and take everybody at their word and sit back. It has totally changed my personality,” says Ms. Bottinga, whose eight-year-old daughter had a stroke almost five years ago. “I’ve never been in this situation before, and now I am more concerned about the parents who are just starting to go through it.”

Merlin Bezanson, of Chester Basin, Nova Scotia, knows he owes his health to his wife Gwendolyn, who recognized he was having a stroke and immediately called 9-1-1. Her alertness allowed him to get the clot-busting drug t-PA in time, sparing him the paralysis so many stroke survivors must fight to overcome.

After Lise Rouleau returned home from her brief hospital stay for stroke (she too was lucky enough to get treatment in time), Jean-Guy Myrand, her husband of 40 years, feared life would never be the same for the Montreal couple. Could they travel like they had in the past, take the long walks they loved? He worked himself into such a state, he went to hospital with chest pains. The doctor, after giving him an antacid, urged him to relax and “to just act as it was before,” Mr. Myrand said. The couple is taking part in a Canadian Stroke Network study of almost 1,000 stroke survivors and caregivers in Montreal, London and Toronto, led by Dr. Sharon Wood-Dauphinee of McGill University.

A sense of isolation can be an after-shock to stroke—especially when the stroke survivor loses his or her driver’s

**There’s an extended family of stroke researchers, quietly working in laboratories, clinics and offices across Canada, some trying to make life easier and better for those who have survived stroke, others trying to prevent stroke and find cures for what causes it.**

licence and the caregiver is left to either provide transportation or arrange it. It adds a stress just when the family least needs it and presents a challenge—both physically and bureaucratically—to getting mobility back. CSN researcher Dr. Marie Vanier of Montreal is working to make that situation less of a problem with her study of a state-of-the-art simulator to better predict whether a person is capable of driving again.

Dr. Vanier is part of the extended family of stroke researchers, quietly working in laboratories, clinics and offices across Canada, some trying to make life easier and better for those who have survived stroke, others trying to push back the darkness and find cures for what causes

it. There is, as Ottawa’s Dr. David S. Park says in this edition, no place for ego in stroke research. “Stroke research is a field in which people are very collegial—particularly in the Canadian circle. This work is going on in labs from Victoria to St. John’s.”

Dr. Dale Corbett, the Canadian Stroke Network investigator who brought Mr. Crummey to speak to young scientists this summer at Memorial University, finds his inspiration in the way stroke survivors—with the help of their families—work to reclaim their lives. “These are real people who are suffering. I find these personal accounts of what happened to them, how they were written off by physicians, how they have struggled, come back and made significant improvements, quite inspiring. It keeps me thinking what the real purpose is behind what I’m doing.”

*Ottawa writer Joe Sornberger is former national coordinator of the National Post.*



**The Canadian Stroke Network**

David W. Scott, Chair, Board of Directors  
 Dr. Antoine Hakim, CEO and Scientific Director  
 Dr. Paul Morley, Deputy Scientific Director  
 Katie Lafferty, Executive Director  
 Dr. Kevin Willis, Director of Partnerships  
 Cathy Campbell, Editor

**Contact us at:**

University of Ottawa  
 451 Smyth Road, Ottawa, ON, K1H 8M5  
 Tel: 613-562-5696  
 Fax: 613-562-5631  
 Email: info@canadianstrokenetwork.ca  
 Website: www.canadianstrokenetwork.ca

**Publication Mail Agreement  
 Number 40609522**

*The contents of this publication may be reprinted or used on radio or television without permission. However, a credit is requested. In print, please send a copy to the Canadian Stroke Network.*

# Children: Diagnosis often delayed

Continued from page 1

“All her functions seemed to give way. It looked like a stroke, but I thought, ‘There’s no way a little pumpkin could ever have that.’

“Jack, my husband, who is a volunteer firefighter, said it looked like it could be a stroke. I’ve seen a lot of people with the symptoms too. My sister-in-law came over and said ‘Kim that’s what it looks like.’ We took her to the hospital immediately.”

Kim and Jack arrived at Hamilton’s St. Joseph’s Hospital within 15 minutes, where emergency medical staff took Juliana right away. “They didn’t say much. I remember them hooking her up to an IV. They did a CAT scan and it came back okay. It wasn’t until two days later that the pediatrician who was looking after her said, ‘she’s had a stroke’. He said he had never seen it before. They were all in disbelief. I think it was he who called Dr. deVeber.”

Dr. Gabrielle deVeber, a researcher with the Canadian Stroke Network and a neurologist with Toronto’s Sick Kids Hospital, has been studying stroke in children for 11 years.

“As a pediatric neurologist, I was seeing children with stroke and realizing there was very little understanding about any aspect of it: How common is it? How do you diagnose stroke in children? What are the reasons for it?” says Dr. deVeber, who is a scientist in the Research Institute, Director of the Children’s Stroke Program at the Hospital for Sick Children and an associate professor of pediatrics at the University of Toronto.

Delayed diagnosis of stroke in children often occurs because it is widely thought of as an old person’s affliction. According to Dr. deVeber, physicians who see children with one-side weakness, sometimes think the problem is a migraine or that



**Delayed diagnosis of stroke in children often occurs because it is widely thought of as an old person’s affliction.**

the child has suffered an injury. “We’ve heard of cases where a parent says ‘Could this be a stroke?’ and the doctor says, ‘No, children don’t have strokes.’”

But they do. Incidence of ischemic stroke, which occurs when the flow of blood to the brain is interrupted by a blood clot, is three to four children per 100,000 per year, says Dr. deVeber.

Because the diagnosis of stroke often comes long after the three-hour window for administering the blood-clot buster t-PA, few children receive the drug that has had such remarkable success in diminishing the paralyzing power of stroke. Juliana did not receive t-PA.

Congenital heart disease or sickle cell disease are risk factors for childhood ischemic stroke. Other possible triggers for pediatric ischemic stroke are chicken pox, iron deficiency, anemia and recent infection.

“Very little pediatric stroke research was done up to the last decade,” says Dr. deVeber, the principal investigator in a project funded by the Canadian Stroke Network to study lipoprotein (a) levels in children in with stroke.

Because of its effect on increasing atherosclerosis—the hardening, or narrowing of the arteries—lipoprotein (a) is widely regarded as a risk factor for heart attacks in adults. But it also causes blood clots to form. “It’s not a good thing if it’s in high levels,” says Dr. deVeber. “It probably causes stroke through a number of mechanisms.”

The role lipoprotein (a) plays in causing strokes in adults is largely related to atherosclerosis, but also has a direct effect on the blood-clotting system. Atherosclerosis is not present in children because hardening of the arteries only begins to show up in teenage years. “That’s one of the advantages of studying stroke in children,” says Dr. deVeber. “You can look at reasons for stroke in children that add on to atherosclerosis in adults. We have the opportunity to look at lipoprotein (a) in its role in causing blood clots.”

The CSN-funded study will investigate whether increased lipoprotein (a) levels trigger recurrent strokes in children. One-quarter of children with ischemic stroke have more strokes later on. “It’s important to find out how to prevent those strokes,” says Dr. deVeber. “We’re looking at lipoprotein (a) as one of the reasons.”

Dr. deVeber is the driving force behind the Canadian Pediatric Ischemic Stroke Registry, which, since 1992, has tracked children with stroke cared for at all 16 children’s hospitals in Canada and helped to place the country in the forefront of pediatric stroke research.

“The Canadian system allows us to do the kind of work, like the pediatric stroke registry, that other countries can’t,” she says. “We have national health care, as opposed to the U.S. with its private care. Also, we have a smaller, more collaborative research community,

**See CHILDREN on page 4**

## Children: 'Our future'

Continued from page 3

so it's feasible to get the 16 children's hospitals—every children's hospital in Canada—to co-operate and collaborate on one study."

Kim Bottinga praises the work of Dr. deVeber and sees research into pediatric stroke as crucial: "I hope this project gets lots of funding because little ones are our future. Without funding, the awareness won't be out there. This is where funding and research has to happen."

Juliana, now eight, has some paralysis and left-side weakness. "She uses her right hand, that and her teeth," says Kim. "She's trying to do whatever she can. She wears a leg brace."

But the major damage, Kim says, has been done to Juliana's way of thinking. "She doesn't think like you or me any more. She has Nonverbal Learning Disorder. She has no concept of time. And kids with Nonverbal Learning Disorder can go from happy to angry in a moment. If I say 'maybe later we will go here' and then we don't ... she will start screaming. They have to be in control of what's coming or else they get stressed out."

Juliana is in Grade 3, where, Kim says, she is "in a little bit of a modified program." Juliana gets Botox injections in her arms and legs to ease stretching the muscles out for rehabilitation. "Thank goodness for my husband's drug plan, because the bills...you're looking at \$1,000 every three months just in Botox."

"She has a hand brace now that she is learning how to print. The future? It looks good. I have to be optimistic. With the Nonverbal Learning Disorder, they don't know if she can overcome that. It's so new to them, little kids and stroke. I want her to go to university and that's all you can hope for."



Stroke recoverer Lise Rouleau, right, and her husband Jean-Guy Myrand are part of a Canadian Stroke Network study on quality of life.

## Landmark study tracks stroke survivors, caregivers to examine quality of life

Montréal, London and Toronto researchers involved in major research project

By Lisa Fitterman

MONTREAL, Quebec

**O**n a cold, sunny afternoon last January, Lise Rouleau returned from an hour-long walk and lost the use of her right side. Half her face crumpled and she couldn't find the words to describe what she was feeling.

In the time it takes to snap two fingers, she'd suffered a stroke.

Today, Ms. Rouleau, 69, says she's near normal, although her right hand curls into a claw when she tires, she's sensitive to heat, has an occasional problem swallowing and suffers hot flashes

because doctors took her off hormones she was taking to combat menopausal symptoms. She thanks God, her fast-acting husband and the clot-busting drug t-PA for her recovery.

"It's almost a miracle," she said recently. "Jean-Guy called 9-1-1 at 3 p.m. and I was at the hospital by 3:25. They gave me the drug and even one hour later, my limbs began to move."

Over the past 10 months, Lise Rouleau and her husband Jean-Guy Myrand, 67, have been part of a landmark Canadian Stroke Network study in which researchers from Montreal, London and Toronto are tracking about 600 stroke survivors and 340 caregivers in order to explore and better define their quality of life.

See **STUDY** on page 5

# Study: Caregivers a focus of research

Continued from page 4

Even the concept, “quality of life,” is vague, said the study’s leader, Sharon Wood-Dauphinee. It’s important, to be sure, but how does one measure something that can’t be quantified, like cholesterol counts?

“We don’t have a lot of data, particularly on caregivers,” said Dr. Wood-Dauphinee, a professor in McGill University’s School of Physical and Occupational Therapy. “We know a lot about people with strokes. We know about their functional abilities. We know how society treats them sometimes, and we know that most of them don’t judge their quality of life as high as it was before they had a stroke. That’s it.”

Since an estimated 50,000 people are expected to suffer strokes in Canada this year, 60 per cent of whom will be left with some kind of disability, the study is timely—even more so when one considers that strokes should spike in the near future because of the sheer aging of the baby boomer generation.



Dr. Wood-Dauphinee warns that the first major papers won’t be out for about a year because, as with any study that involves large numbers of people and multiple sites, the process has been unwieldy. Some participants died. Others dropped out because they got ill, became tired of taking part in the study on a routine basis, or they recovered and simply don’t want to participate anymore.

Researchers screened over 2,000 candidates before settling on the study’s participants and have been checking in with patients and caregivers every three months. While data on the first group of patients and caregivers is now coming in, many of the findings are still anecdotal. “I get calls from patients saying, ‘I need to drive. I can’t get a licence. I have to rely on friends,’” said Lois Finch, a doctoral student at McGill who is helping coordinate the study. “Then, caregivers tell me their patients are not the same people they were before. They’re more aggressive, or less motivated. They want more sex or less sex.”

It appears that caregivers don’t mind doing routine things for elderly stroke patients, especially, such as washing, dressing and tying shoelaces. Problems arise when patients are in bad physical

shape, are depressed or have behavioral problems as a result of the stroke.

“That’s a real burden,” said Dr. Wood-Dauphinee. “Sometimes with older people, there’s a term that says they ‘lose their filter,’ and they say things and behave in ways that 10 years previously they wouldn’t have done. They are, what we say in good Canadian English, ‘not very nice.’”

Researchers are also finding that caregivers aren’t comfortable leaving their loved ones in the care of a respite worker whom they don’t know. Rather, they prefer to rely on family members who know the patient, say a daughter or a sister or brother.

“So getting people respite may not be as clear-cut as we have always thought it is,” Dr. Wood-Dauphinee said.

Ms. Rouleau spent six days in Montreal General Hospital’s neurology ward before returning home, where her husband of 40 years took over her care. At first, he was scared, not so much of his wife’s condition but the intangibles. What if she wasn’t the same as before? What if they couldn’t travel like they had in the past, or take long walks in their neighbourhood near the banks of the Rivière des Prairies?

After two weeks, Mr. Myrand worked himself into such a state, he went to hospital with chest pains. The doctor gave him an antacid and told him to relax.

“He told me to just act as it was before,” Mr. Myrand said. “And it is. Of course, if I had to completely take over her care, to clean and cook, I’d do it.”

Ms. Rouleau laughed. “Yes, he’s really good at steaks.”

*Montreal writer Lisa Fitterman is a columnist with the Montreal Gazette who, at age 26, suffered a stroke.*

## IT’S A FACT

**Treatment with the clot-busting drug t-PA can dramatically lower the risk of a patient being left with irreversible brain damage following a stroke, but the drug must be used within three hours of stroke onset to be used safely. According to a national study of 8,000 patients in the Registry of the Canadian Stroke Network, 34.1% of stroke patients arrived within three hours of their stroke; 20.1% arrived within two hours; and 8.6 per cent of stroke patients received t-PA.**

– Canadian Stroke Network



## Loss of driver's licence like 'losing your best friend'

Study tests driving simulator to predict competency behind the wheel

By Joe Sornberger

MONTREAL, Quebec

In a society in which getting into your car and going somewhere every day is as common as getting out of the shower and into your clothes each morning, the loss of a licence because of a stroke can be devastating.

It isolates a stroke survivor and makes them dependent on others. Along with the other effects of the disease, it can trigger depression and set a person back in their efforts to reclaim the full life that the stroke took away.

But making sure stroke survivors are once again capable of being good drivers is crucial to keeping the streets and highways safe.

Dr. Marie Vanier, a Canadian Stroke Network researcher and associate professor at the Université de Montréal, is hoping to help ease the transition back to driving for those stroke survivors capable of getting behind the steering wheel.

In her two-year CSN-funded pilot study, investigators will determine if a driving simulator—developed in France by the Faros Group and distributed in Canada by the Quebec firm ErgoDrive—can better predict a stroke survivor's ability to drive safely. If it can be proven that the simulator effectively and reliably measures driving skills, it could help those capable stroke survivors to more easily regain the freedom and mobility the rest of us take for granted.

"The therapists are not satisfied with the current off-road tests," said Dr. Vanier. "They are not close enough to on-road conditions and there is always a kind of uncertainty zone. The goal is to demonstrate

that the simulator is so close to driving that it is a better predictor of on-road results. That if you fail on the simulator, you will fail on the road. Maybe we won't find that. But we have good reason to think it (the simulator) is the best one."

The software for the simulator Dr. Vanier is testing has been adapted for experienced drivers to make them aware of dangerous errors.

See LICENCE on page 7



Dr. Marie Vanier

# Licence: Loss symbolizes end of independence

Continued from page 6

“When you have a stroke, sometimes you have difficulty exploring the visual environment,” she said.

“Usually (that difficulty) is on one side, depending on the location of the brain lesion caused by the stroke.”

According to Dr. Bonnie Dobbs, a University of Alberta gerontologist, all provinces except Alberta, Quebec and Nova Scotia, require physicians to report any medical condition that might affect a person’s driving competence. Dr. Dobbs is conducting research with individuals who have lost their licences due to medical conditions such as Alzheimer’s disease or vascular dementia. A number of those with dementia say that losing their licence “was even more painful than learning that they had the disease,” said Dr. Dobbs. She and her co-investigators are half way into a two-year study to gauge the impact of interventions (regular group psychotherapy and psychoeducational sessions) on caregivers and those who have lost their driving licences.

“Losing a licence is a devastating loss for the patient, the spouse and the family. It becomes particularly difficult when the caregiver doesn’t drive. In older families, the caregiver, who is often the wife, has either never been licensed to drive or hasn’t done much in the way of driving recently and is reluctant to resume. It’s a common and serious problem for the caregiver.”

A driver’s licence holds symbolic value, says Dr. Dobbs, whose study is being funded by the Alzheimer Society of Canada. “We remember the day we received our driver’s

licence. Having it says that you are a fully competent member of society. Taking it away says you are no longer a fully competent member of society.”

Ralph, a 75-year-old former water inspector for the City of Edmonton, lost his licence about eight months ago and is attending sessions organized by Dr. Dobbs. He equates it to “losing your best friend...or your dog.”

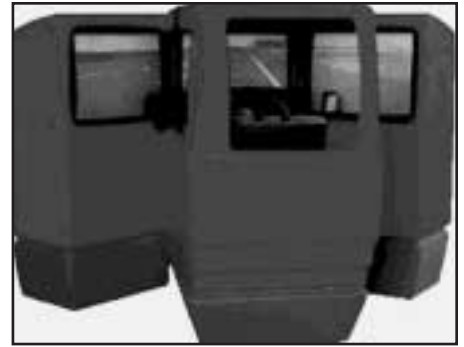
“Taking the driver’s licence away was a blow, absolutely,” he said. “There’s nothing you can do about it. You are sad, and you cry about it.” The group sessions helped him come to term with losing his licence.

After a stroke, getting a driver’s licence back is not an easy thing. While the process varies by jurisdiction, the Ontario procedure is typical: A doctor is required by law to submit a letter to the Ministry of

---

**“Losing a licence is a devastating loss for the patient, the spouse and the family. It becomes particularly difficult when the caregiver doesn’t drive. In older families, the caregiver, who is often the wife, has either never been licensed to drive or hasn’t done much in the way of driving recently and is reluctant to resume. It’s a common and serious problem for the caregiver.”**

---



**Driving simulator predicts on-road results.**

Transportation, alerting it to a patient’s stroke and medical condition. Based on the information the doctor supplies, the Ministry decides what course of action to take. If the doctor reports there are no concerns regarding cognitive or physical abilities, the licence is restored—usually after a retest. If there are problems, rehabilitation is required before a licence retesting can be done.

This is where the importance of Dr. Vanier’s study becomes apparent. Provincial retesting processes currently involve a battery of tests, including road tests and frustratingly long waiting lists. In essence, the process becomes another hurdle for the stroke survivor and his or her family to overcome during a particularly difficult and stressful time.

Dr. Vanier’s work could not be more timely. Stroke primarily affects older adults who are making up a larger segment of the population as the baby boomers age. And while senior drivers have fewer accidents than other age groups that is only because they drive less frequently. Per kilometre, they have the same number of accidents as the high risk 16-to-24-year-olds. Accurate testing of the senior portion of the population, especially those who have survived stroke and want to get back on the road, is going to be very important over the next two decades.

# Survivor's story moves young researchers to tears

Summer training program put basic scientists in touch with human side of stroke

By Joe Sornberger

ST. JOHN'S, Newfoundland

The room went very quiet when Lewis Crummey, Lew to his many friends in St. John's, set aside his cane and began telling a gathering of some of Canada's brightest young scientists how he reclaimed his life "one inch at a time" after surviving a massive stroke.

"I told them all the procedures I had to go through with therapy," said Mr. Crummey, a 69-year-old retired personnel manager. "I had it committed to memory. I had a standing ovation when I finished."

Mr. Crummey's tale of tenacity—he has come back from having to be strapped into a wheelchair to prevent him falling out after his stroke in November 2000 to recently getting back on the golf course with his buddies—moved to tears many of the 45 mostly graduate and post-doctoral students attending July's Summer Program in Neuroscience (SPIN).

More than that, it drove home the message that the main reason for research is to help people like Mr. Crummey overcome this terrible disease.

"The students and researchers get caught up in the business and busyness of the lab," said Dr. Dale Corbett, the Canadian Stroke Network investigator who organized SPIN at Memorial University, where he is a professor of neurosciences and holds the Canada Research Chair in Stroke and Neuroplasticity.



**Lew Crummey of St. John's, Newfoundland, shared his tale of tenacity with Canadian Stroke Network trainees. They learned that he fought back from stroke for his wife Gladys, right, and his family.**

"Researchers are concerned with getting more publications out. We're often working with models—from cell culture to whole animal models—that never really capture the human aspect, the emotional aspect, of what it's like to live with stroke."

"We have a growing number of people living with a horrible problem. So it's not about getting another grant approved or a paper published in *Nature*. These are real people who are suffering."

Mr. Crummey does not exaggerate when he describes his recovery in increments of inches. "The therapists would sit me down and ask me to move my foot across the floor. They even put a cloth under my foot, to make it easier to slide on the floor. The first time I made it maybe three inches. That was as far as I could move my foot. Things were pretty grim."

He told the students about his first attempt at walking. "The therapists stood me up and draped me over one of the dinner tables on wheels that you have in your hospital room. Two therapists held me in place. A third one moved my feet. Those were my first steps."

For many of the students attending SPIN—a four-day course designed to expose them to the different factors to consider in stroke research—working with rats and mice was more of a common experience than coming face to face with the real-life impact of a devastating disease.

"For most of them, they probably had never encountered someone who had had a stroke," said Dr. Corbett. "Most were young students. They were mostly early to mid-20s. Their parents would be still pretty young. Unless their grandparents had had a stroke, they wouldn't have had such an experience."

See **STORY** on page 9

# Story: “Fathers of families don’t give up”

Continued from page 8

Mr. Crummey, whose left side was paralysed by the stroke, told a story of courage and determination. And of just not wanting to miss out on life: “I told them, I fought all the way,” says the man who had his pilot’s licence when he was just a teenager in Grade 11. “I’m not a quitter.”

“I couldn’t put my wife through having to look after someone who couldn’t sit up,” said Mr. Crummey, who has been married to his wife Gladys for almost 44 years. “I was doing it for my wife. And I have grown children and they were all behind me and supporting me. I was the father of the family and fathers of families don’t give up.”

“I knew I was going to make it from the beginning. When these girls, the therapists, said ‘Mr. Crummey, you can do it,’ I knew I was going to do it. I would make a step and they’d clap. Can you imagine? An old man like me and I’d make a few steps and they’d clap. It’s like a little baby learning to walk all over again.”

“I want to be as independent as I can. Does anyone want to be a burden?”

The Canadian Stroke Network provided the airfare for students to travel from across Canada to attend SPIN. Beyond putting the young scientists in touch with the ultimate beneficiaries of their work, the conference will help raise the quality of stroke research being done in Canada and foster more collaboration among labs in CSN, says Dr. Corbett.

The students, all of whom come from a variety of scientific back-

---

**When the therapists, said ‘Mr. Crummey, you can do it,’ I knew I was going to do it. I would make a step and they’d clap. Can you imagine? An old man like me and I’d make a few steps and they’d clap. It’s like a little baby learning to walk all over again.”**

---

grounds, heard lectures each morning by some of the leading experts in stroke research, then attended practical lab sessions in the afternoons. They visited a rehabilitation centre to see stroke patients receiving their therapy sessions.

“I sent two of my students to Dale Corbett’s summer course,” said Dr. Campbell Teskey, a CSN investigator at the University of Calgary, “and the students came back feeling

enthusiastic. They re-evaluated some of their techniques. And they shared what they learned with others.”

Participant Karine Lortie praised the “great organization of the program.”

“We were exposed to the different factors to consider when doing stroke research as well as to the future of stroke research, allowing us to focus on the right path.”

It wasn’t all work. The students were treated to a whale watching trip shortly after they arrived in Newfoundland and “the humpbacks and the minke put on a pretty good show,” said Dr. Corbett.

He also said some of the participants found their way to the heart of Newfoundland nightlife. “We have George Street in St. John’s where there are a lot of pubs and restaurants. Rumour has it a lot of students and some instructors may have ended up there, but I won’t mention any names.”



Young stroke researchers at the Summer Program in Neuroscience, above, attended practical lab sessions to learn new techniques.

# Nova Scotia man credits speedy reactions for stroke recovery

By Elaine Flaherty

CHESTER BASIN, Nova Scotia

**M**erlin Bezanson blamed his boots. “I had a new pair of boots and I couldn’t get used to them. I was staggering a lot.”

It was blazing hot, early September weather in Chester Basin, N.S., and the then 70-year-old Mr. Bezanson was shearing trees on his brother-in-law’s Christmas tree farm. He noticed nothing wrong with his work, but his brother-in-law called his wife Gwendolyn to say Merlin seemed disoriented.

When he sat at the supper table, reached for his pocket handkerchief and tumbled off of his chair, Merlin began to realize something wasn’t right. “That scared my wife and she called 9-1-1.”

One of the firefighters, a neighbour of the Bezansons, immediately recognized that Merlin had a stroke and he was rushed to the Queen Elizabeth II Health Sciences Centre in nearby Halifax. Despite the terror, a number of things went right for Merlin and his family.

His wife’s instant 9-1-1 call, the quick diagnosis by the firefighter and the speedy ambulance ride to Halifax made

Merlin a candidate for the clot-busting (thrombolytic) drug, t-PA.

In order to be a candidate for t-PA, patients must make it to hospital within the first two hours of the onset of the stroke, says Canadian Stroke Network researcher Dr. Stephen Phillips, director of the acute stroke program at the Queen Elizabeth II Health Sciences Centre and a professor of neurology at the Dalhousie University medical school. “The drug has to be given within three hours but it takes about an hour to do the pre-treatment assessment,” he says.

“Unfortunately, it’s the minority of the time when this happens,” he says.

Only about 35 per cent of stroke victims get medical attention within the first three hours, considered the critical time frame.

Dr. Phillips says often people don’t realize they are having a stroke, or have no one to ask for help even if they realize they are. Others may guess it’s a stroke, but may not seek immediate medical help.

A study done for the Heart and Stroke Foundation found nearly one-third of



people older than 45 could not name even one of the five warning signs of stroke—sudden dizziness, headache, vision problems, weakness and difficulty speaking.

In a report released last year, the Nova Scotia Integrated Stroke Strategy Committee urged a province-wide education campaign to warn of the disabling impact of strokes, their warning signs and the urgency of seeking medical help.

Calling 9-1-1—as Merlin’s wife did—is the best way to get immediate assistance for someone with a suspected stroke, says Dr. Phillips.

Patients arriving at hospital in Halifax are first seen by emergency room staff who determine if a stroke has occurred, then by neurologists who assess if they are candidates for the drug.

“They explained to me about this blasting drug,” recalls Merlin. “And it sounded pretty good to me.”

His stroke occurred on Sept. 4, 2002 and after time in both the hospital and rehab, he was back home with his wife on Nov. 1.

## IT’S A FACT

**Based on a study of 8,000 patients in the Registry of the Canadian Stroke Network, after stroke admission to hospital, 58% of stroke patients were discharged home and 24% went to inpatient rehabilitation facilities. At the time of discharge, 57% had a Rankin score < 3 (slight or no disability), 15% had a score of 3 (moderate disability), 21% a score of 4 (moderate to severe disability) and 6% had a score of 5 (severe disability.)**

– Canadian Stroke Network

See **RECOVERY** on page 11

# Recovery: Halifax to be part of worldwide study

Continued from page 10

A year later, celebrating his 72<sup>nd</sup> birthday at the end of October, Merlin feels great.

“I don’t have an ache or a pain,” he says. He’s now on a strict diet, “all of the good stuff is gone,” he says. “And I’m out doing my walking every day.”

The QE II has been using t-PA for stroke since 1996 and has now treated 130 patients, says Dr. Phillips. About seven per cent of patients with acute ischemic strokes treated at the QE II receive t-PA.

Not every stroke sufferer is a candidate for the drug, and there is a wide range of outcomes after it’s been administered.

“At the good end, the person starts to improve within several minutes after injection,” says Dr. Phillips.

“The other extreme is that hours after the infusion, the person deteriorates. In between, we have a whole range of outcomes.”

---

**A study of the drug’s effectiveness in Halifax leads Dr. Stephen Phillips to believe it is the right choice of treatment for some patients. “When patients are treated with thrombolysis they are functionally better when they leave and their time in hospital is shorter than people who don’t get the treatment.”**

---



**Dr. Stephen Phillips**

Thrombolysis is not without its critics who worry about the risk of bleeding, he says.

The hospital is about to be part of a world-wide study of the drug’s risks and benefits. While institutions from many countries will participate, in other nations the drug has not been approved for use, partly because of the concerns about bleeding.

But study of the drug’s effectiveness in Halifax leads Dr. Phillips to believe it is the right choice of treatment for some patients.

“When patients are treated with thrombolysis they are functionally better when they leave and their time in hospital is shorter than people who don’t get the treatment,” he says.

“On a net basis, we’re doing more good than harm with the treatment and that’s what you want.”

*Halifax writer Elaine Flaherty is a journalism instructor and former Atlantic Canada correspondent for Southam News.*

## CSN Board of Directors

**David W. Scott**, (Chair of the Board of Directors) Q.C., Borden Ladner Gervais LLP

**Howard Alper**, PhD, Vice-Rector, Research, University of Ottawa

**Sally Brown**, CEO, Heart and Stroke Foundation of Canada

**Dr. Alastair Buchan**, MD, University of Calgary

**Joy Calkin**, PhD, (Deputy Chair)

**Arthur J. Carty**, PhD, President, National Research Council Canada

**Anthony Di Monte**, Emergency Medical Services, Ottawa

**Dr. Gregory Del Zoppo**, Scripps Research Institute

**Eric Elvidge**, Blake, Cassels & Graydon LLP

**Antoine Hakim**, MD, PhD, University of Ottawa

**George Jackowski**, PhD, Chief Scientific Officer and Vice-Chair, SYN-X Pharma Inc.

**Katherine Lafferty**, BSc, MBA

**Gerald McDole**, President and CEO, AstraZeneca Canada

**Paul Morley**, PhD, National Research Council Canada

**Frank Nieboer**, Stroke Recovery Association of Alberta

**Louise Nieboer**, Stroke Recovery Association of Alberta

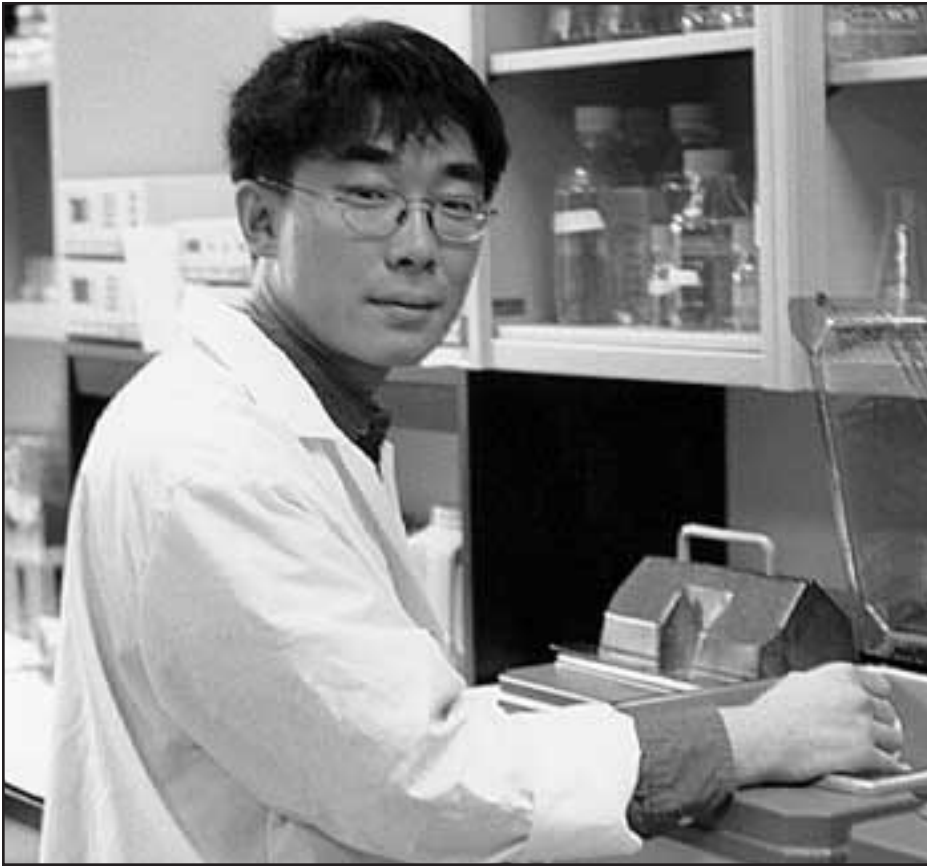
**Louise Poulin**, Networks of Centres of Excellence

**Dr. Richard Riopelle**, MD, McGill University

**Dr. Aubrey Tingle**, President and CEO, Michael Smith Foundation for Health Research

*Member Emeritus*

**Dr. H.J.M. Barnett**, University of Western Ontario



Dr. David S. Park of the University of Ottawa says understanding stroke is ‘sophisticated and complicated.’

## Team seeks ways to shield brain from damage of stroke

By Joe Sornberger

OTTAWA, Ontario

**T**his is your brain: Signals are happily travelling along molecular pathways, sensory information is being processed, receptors are receiving, thoughts are forming, memories are being revisited. It’s all good.

**This is your brain having a stroke:** Dramatic biochemical changes—a lack of oxygen supply or some other trauma—are triggering multiple signals to the brain cells. Those signals, travelling a variety of molecular paths, are all screaming the same simple message: It’s time to die!

And that, says, Dr. David S. Park, a Canadian Stroke Network researcher based at the University of Ottawa, explains why so many breakthrough “neuroprotective” drugs that extend cell life in laboratory tests ultimately fail when they go into clinical trials.

“It’s a lack of understanding of the sophisticated, complicated nature of stroke,” says Dr. Park. “There are many, many things going on. The chance of one therapy succeeding by itself is small.”

Dr. Park is part of a team of researchers in laboratories across Canada conducting a two-year Canadian Stroke Network study into neuroprotection.

**The project is trying to figure out how brain cells die during stroke and how to shield the brain from this damage. Scientists are trying to sort out the many “death” messages sent to brain cells. Instead of focusing on one single message sent along one pathway, they are looking at what they think are the key ones.**

Simply put, the project is trying to figure out how brain cells die during stroke and how to shield the brain from this damage. The difference is, these scientists are trying to sort out the many “death” messages sent to brain cells. Instead of focusing on one single message sent along one pathway to the brain cell, they are looking at what they think are the key ones.

The research project will compare three major cell death pathways to see if additive or synergistic effects can be obtained by blocking them in combination. It could point the way to the need for a “cocktail” approach to neuroprotective therapy.

Think of stroke, Dr. Park says, as an overflowing sink. When the sink overflows, the cells die and the brain is damaged, causing the neurological problems—reduced motor co-ordination, aphasia, impairment of thought processes—that make life such a challenge for stroke survivors. So find a way to shut the faucet off, right? Except for one thing: this overflowing basin has five faucets.

**See DAMAGE on page 13**



**Continued from page 12**

“You can liken it to five spigots, five faucets emptying into the one sink,” he says. “Inhibit just one of the faucets and the sink will still fill up. It will just take longer because you’ve only turned off one of the faucets. Four are still going.”

“That’s why we’re bringing together a group of scientists. Each group is studying its own spigot. Then we get together and figure out how important each spigot is...which ones we have to shut off.”

Almost one year into the study, Dr. Park says the results from tests on laboratory rats are promising.

“We think we have two spigots. Maybe that’s enough...maybe it’s not. We have found one combination (of drug therapies) that appears to be quite effective: a common anti-inflammatory, and a specific drug that targets neuron death in the brain. Just by combining two things together we get much better protection. And that’s just two. Whether it’s the best, we don’t know yet and we are looking at other combinations.”

“It’s quite exciting. We are starting to come to the table with better strategies. With the next level of trials, chances are much better to come away with more positive results. We are now finally getting to the point that we know what to

---

**“The Network was formulated with one goal in mind: Do whatever it takes to beat stroke. Egos should play no role. Stroke research is a field in which people are very collegial—particularly in the Canadian circle. This work is going on in labs from Victoria to St. John’s. They all want to get to the heart of the matter.”**

---

ask and we know what criteria to fulfil to go to the clinic—to test it on humans.

Dr. Park says the collegial, cooperative nature of the Canadian Stroke Network is driving this kind of cross-Canada co-operation that ultimately will improve the lives of stroke survivors.

“The Network was formulated with one goal in mind: Do whatever it takes to beat stroke. Egos should play no role. Stroke research is a field in which people are very collegial—particularly in the Canadian circle. This work is going on in labs from Victoria to St. John’s. They all want to get to the heart of the matter.”

That co-operation is essential, given how little we actually know about the brain and how it functions, says Dr. Park.

“We have a general framework. We have the scaffolding up, but that’s about it. We’ve put the framework in the house but we know so little of what’s inside, so little of the intricacies.”

# Electrical stimulation boosts stroke recovery, study finds

By **Cathy Campbell**

CALGARY, Alberta

Imagine speeding up recovery from stroke. Imagine helping a 40-year-old stroke victim regain the use of an arm or a leg or a hand with only weeks or months of physiotherapy, instead of years. Imagine helping a stroke patient return to a normal lifestyle faster, and more fully.

Canadian Stroke Network scientists hope that their research into a new, and novel, way to jump-start stroke recovery will, someday, turn imagination into reality.

CSN scientists in Calgary and Lethbridge have found that a ‘boost’ of electrical current to the brain during physiotherapy helps animals regain the movement lost following stroke. Studies conducted in the laboratory of Dr. G. Campbell Teskey of the University of Calgary show that, according to Dr. Teskey, “when rats get electrical stimulation in combination with rehabilitative training, they do better and get better faster than they normally would.”

He calls the research, funded in part by the Canadian Stroke Network (CSN), “a North American first.” Dr. Teskey collaborates with CSN investigator Dr. Jeff Kleim of the University of Lethbridge, as well as with U.S. researchers Dr. Randy Nudo of the University of Kansas and Dr. Theresa Jones of the University of Texas.

As part of this research, Dr. Teskey implants customized stimulating electrodes on the outer surface of

the brains of rodents who have had stroke-like lesions. These electrodes correspond to areas of the brain where the stroke lesion has affected motor skills. The electrodes are connected to lead wires that permit the delivery of electrical currents during rehabilitation therapy.

To test recovery, rats are required to perform a reaching task that they had been trained to do before creation of the stroke lesion. Dr. Teskey has found that electrical stimulation in combination with rehabilitation enables rats to regain better use of their impaired limbs than through rehabilitation therapy alone.

Research is now moving into investigational human clinical trials sponsored by Northstar Neuroscience, a Seattle, Washington-based company.

Every year, about 50,000 Canadians suffer a stroke and, of those, 60 per cent are left with a disability, such as impaired movement in a hand, arm or leg.

The Canada-U.S. research team is studying the affects of brain stimulation in animal models by measuring ways that neurons communicate with one another and reorganize themselves to restore function. The hope is that, by understanding the process, researchers will be able to manipulate it to improve recovery post-stroke.

Dr. Teskey says that scientists have known for some time that the brain has the capacity to rewire itself after



**Dr. G. Campbell Teskey of the University of Calgary.**

stroke. That is, the brain can signal a new area to take over from a damaged area.

This phenomenon, called ‘neuroplasticity’, helps stroke patients naturally regain movement and recover the ability to speak or understand language.

Dr. Teskey says that, based on animal research, the use of electrical stimulation, in conjunction with rehab treatments, accelerates or magnifies this plasticity effect.

Work is still underway by the CSN team to optimize the therapy. “This work wouldn’t get done without CSN support,” Dr. Teskey says.

*Cathy Campbell is the Canadian Stroke Network’s Communications Director.*