



2014 STROKE REPORT



TOGETHER AGAINST A RISING TIDE: ADVANCING STROKE SYSTEMS OF CARE

Death rates from stroke have greatly decreased over the past 10 years. But with an aging population and an increase in younger people having strokes, can the system keep up?



Improvements in care mean more Canadians are surviving stroke.

STROKE CARE HAS COME A LONG WAY IN CANADA.

More is known about its causes and effects, and stroke services have improved and expanded in many regions. Patient outcomes are also much better. Now one-third fewer people admitted to hospital for stroke die, compared with 10 years ago. And on top of this, there are fewer hospitalizations from stroke in some provinces, as a result of both fewer strokes happening but also because people with mild strokes can now get appropriate services in the community.

Canadians are also understanding stroke better, recognizing its signs and how to prevent it.

However, this is only part of the story and only today's story. Stroke remains a serious health issue that affects thousands of Canadians and their loved ones. It is the second leading cause of death in the world. There are an estimated 50,000 strokes in Canada every year, or one every 10 minutes. And 315,000 Canadians are living with the effects of stroke, which can include a range of disabilities.

Gains that have been made in stroke treatment and care are about to be challenged by an aging

population, more stroke patients with more complex needs, and an increase in strokes among people under 70, as well as an increase in all stroke risk factors for younger adults (aged 30-50).

In this **2014 Stroke Report** from the Heart and Stroke Foundation, we take a close look at the state of stroke care and services across the country. Drawing on new data* from the Canadian Institute for Health Information and a Stroke Services Inventory carried out by the Heart and Stroke Foundation, the report reveals enhancements in stroke systems of care over the past decade, identifies gaps, and examines what needs to be in place to make sure the current system and services will be able to meet the coming demands.

“The data clearly show that Canadians are benefitting from improvements in stroke prevention, care and treatment,” says Ian Joiner, Director, Stroke, Heart and Stroke Foundation. “But this new information also tells us that there are opportunities for improvement in almost every point along the continuum of stroke care, from prevention through to rehabilitation.”

THE COMING **REALITY**

The Canadian population is aging, and stroke is an age-related disease. Put simply, as more people get older, there will be more strokes. And the profile of the typical stroke patient is changing. More stroke patients arrive at hospital with multiple conditions such as hypertension, diabetes, coronary artery disease and cancer, making their treatment more complex. In fact two-thirds of stroke patients now have one or more chronic conditions and this trend is only expected to increase.



Dr. Michael Hill

“We have seen great success when looking at stroke rates declining but as physicians, we do not treat rates, we treat patients,” says Dr. Michael Hill, Director of the Stroke Unit, Calgary Stroke Program and a Heart and Stroke Foundation spokesperson. “As our population gets older there will be more strokes and more patients to treat; many of these patients will be sicker, so there will be a bigger burden on the healthcare system, on society and on families.”

STROKE CAN HAPPEN **AT ANY AGE**

At the other end of the age spectrum, strokes among younger people are increasing. Most strokes occur in people over 70, but the escalation among those under 70 is alarming. According to the new data gathered for this report, over the past decade strokes in people in their 50s have increased by 24 per cent, and for those in their 60s by 13 per cent. Even more troubling, recent international studies predict a doubling of stroke rates among younger people (defined as ages 24-64) within the next 15 years.



**IN CANADA,
A STROKE
HAPPENS EVERY**

**10
MINUTES**

This poses some serious questions for our existing health system, services and resources. The Public Health Agency of Canada reports that stroke costs the Canadian economy \$3.6 billion a year in physician services, hospital costs, lost wages, and decreased productivity (even more when you count indirect costs). The anticipated increase in the number of strokes will place a bigger burden on the system and on families. As more stroke survivors are created, there will be a need for more services to support them throughout their recovery. Will we be able to keep up with increased demand and provide Canadians with the care and support they need?

ADVANCES CREATE **SURVIVORS**

The significant improvement in survival rates for stroke patients over the past 10 years is the result of many factors including advances in diagnosis, procedures, treatments and drug therapies, as well as the efforts of the Heart and Stroke Foundation and the Canadian Stroke Network in promoting better coordinated stroke care and best practices for healthcare professionals. In fact over the past 60 years, the death rates from cardiovascular disease and stroke have declined by more than 75 per cent. Last year this resulted in 165,000 survivors. More survivors also implies more Canadians living with different disabilities and an increased burden on the health system and caregivers.

“The influence of the Canadian Stroke Network and its partner the Heart and Stroke Foundation on overall improvements in care cannot be overstated,” says Dr. Hill. “Stroke care is better because of their efforts. But, there is still so much more to do to make sure Canadians get the best treatment and care possible.”

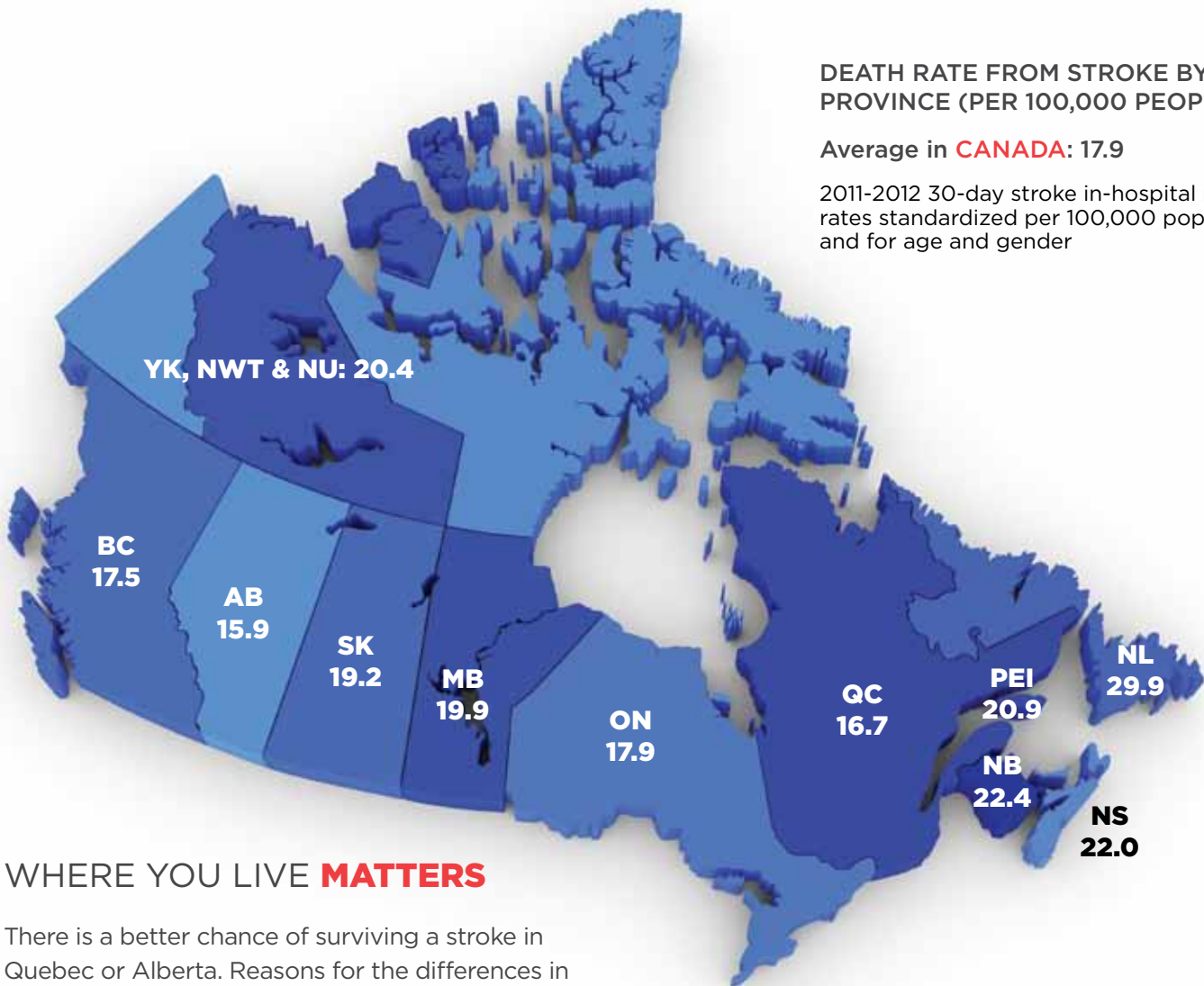
WHAT IS A STROKE?

A stroke is a sudden loss of brain function. Most strokes are caused by the interruption of blood flow to parts of the brain resulting from a clot (ischemic stroke); the rest are the result of a rupture in a blood vessel, causing bleeding in the brain (hemorrhagic stroke).

DEATH RATE FROM STROKE BY PROVINCE (PER 100,000 PEOPLE)

Average in **CANADA**: 17.9

2011-2012 30-day stroke in-hospital mortality rates standardized per 100,000 population and for age and gender



WHERE YOU LIVE **MATTERS**

There is a better chance of surviving a stroke in Quebec or Alberta. Reasons for the differences in death rates among provinces can be complex and depend on whether a location is more urban or rural, how well stroke services are coordinated, and the services available. “Healthcare is provincial, not national, and varies widely across the country, not just in stroke, but in multiple areas of medicine,” says Dr. Hill.

KNOW THE SIGNS AND TAKE ACTION

Stroke is a medical emergency. The faster someone who is experiencing stroke gets to the right hospital and receives appropriate treatment, the better their chances of survival and recovery — with little or no disability. There is a saying that “time is brain” or put

another way that “time lost is brain lost.” Brain cells die at a rate of two million per minute after stroke, so the sooner blood flow can be restored, the greater the likelihood of a good outcome.

Anyone witnessing or experiencing the signs of stroke should call 9-1-1 (or local emergency medical services) immediately so the person can arrive at hospital by ambulance. Although 70 per cent of stroke patients arrive at hospital by ambulance, 30 per cent still do not and are putting themselves at risk. These numbers have remained unchanged since 2006, pointing to an area requiring urgent attention.

A CATALYST FOR CHANGE

The Canadian Stroke Strategy was a partnership between the Heart and Stroke Foundation and the Canadian Stroke Network. The strategy was a catalyst for transforming stroke services across the country by supporting provincial efforts to improve prevention, care delivery and rehabilitation services. The introduction of guidelines for health professionals — the **CANADIAN BEST PRACTICE RECOMMENDATIONS FOR STROKE CARE** — is a major legacy.



Stroke survivor Lee Cayer

Lee Cayer was in her kitchen preparing to go out for a walk when she suffered a stroke — she was just 44 years old. Lee says it felt like ice cold and boiling hot water surging through her veins at once, completely paralyzing her right side. Fortunately, her family had just seen a Heart and Stroke Foundation

awareness campaign and recognized the signs of stroke. In most cases it is a family member or friend who calls the ambulance because the stroke itself makes the person unable to call for help.

“It was those ads that made my story of recovery possible,” Lee says. “If my family and I had not seen those ads, not known the signs — if we had waited just a few more hours before calling 9-1-1 — my outcome could have been vastly different.”

Fortunately for Lee, the ambulance was able to get to her ranch and transport her the 130 kilometres to Moose Jaw Union Hospital within two hours. There, she received a life-saving clot-busting drug. This made the difference between a lengthy hospital stay with months of rehabilitation, and Lee walking out of the intensive care unit on her own two feet, two days later.

COORDINATION IS CRITICAL

The decrease in rates of hospitalization for stroke is a welcome improvement as heart disease and stroke combined continue to be the leading cause of hospitalization in Canada, resulting in 350,000 visits annually.

Stroke experts stress that the best way to improve stroke care for all Canadians is to have a coordinated system in place. This is often referred to as having “the right resources, in the right place, at the right time.” Putting this idea into practice is of course complicated, but the philosophy speaks to what must be done to ensure stroke patients get the best care possible throughout their diagnosis, treatment and recovery journey.

SIGNS OF STROKE



WEAKNESS:

Sudden loss of strength or sudden numbness in the face, arm or leg, even if temporary.



TROUBLE SPEAKING:

Sudden difficulty speaking or understanding or sudden confusion, even if temporary.



VISION PROBLEMS:

Sudden trouble with vision, even if temporary.



HEADACHE:

Sudden severe and unusual headache.



DIZZINESS:

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

If you experience any of these symptoms, call 9-1-1 or your local emergency number immediately.

This process begins as soon as someone calls 9-1-1. If all the right systems are in place, calling emergency medical services means a patient will arrive at the “right” hospital — a facility with stroke services. This means that the ambulance could bypass a closer hospital if there is an agreement in place within the region to take suspected stroke patients to a hospital that is equipped to provide emergency stroke care. It also means the hospital will be notified and prepared for the patient’s arrival. Currently almost half of hospitals across the country with stroke services have a system in place to notify them that an ambulance is arriving with a stroke patient.

“What we need to work on is educating the public so that they recognize stroke symptoms instead of ignoring them, and call 9-1-1,” says Dr. Hill. “The

emergency medical staff and paramedics are the stroke patient's best advocate and they play a critical role before a suspected stroke patient reaches the hospital."

Patients are examined once they arrive at the emergency department, and if stroke is suspected, they should be taken directly to a CT scanner which produces a computer processed x-ray of the brain. This is a crucial step as important treatment decisions will be based on the scan. If the CT scan reveals that a patient needs a clot-busting treatment (a thrombolytic drug such as tPA), it must be given as soon as possible, within 4½ hours of experiencing stroke symptoms, in order to stop or reverse the effects of a stroke.

The new data collected for this report reveal that at the best performing hospitals, more than 90 per cent of stroke patients are getting access to a CT scan within 24 hours after arrival at hospital. But across all hospitals only 69 per cent of patients are getting a CT scan within 24 hours. This is an improvement over five years ago, yet it still leaves almost one-third of patients not getting access to this diagnostic tool quickly enough. The data also revealed that less than one-third of hospitals that provide stroke services provide tPA.

It is important to set targets for how quickly stroke patients should receive diagnosis and treatment once they arrive at hospital. However, the time it takes patients to arrive at the hospital can make an even bigger difference to their recovery.

Half of stroke patients take almost six hours after symptom onset to arrival at hospital. Times are



More patients are getting faster access to diagnostic tools like CT scans.

longest for younger stroke patients, with half of those aged 20 to 39 taking on average 8½ hours – well outside the 4½-hour window to benefit from tPA. The bottom line is the faster stroke signs are recognized and patients get to the hospital and receive treatment, the greater their chances of a better outcome. There is still much improvement to be made.

IMPROVEMENTS IN STROKE CARE OVER THE PAST FIVE YEARS

The Stroke Services Inventory carried out by the Foundation reveals that 303 hospitals improved their stroke services between 2009 and 2013*, including:

- 51 more hospitals are designated as stroke centres
- 70 more hospitals have identified stroke teams
- 31 more hospitals have designated stroke units
- 12 more hospitals provide the clot-busting drug tPA
- 48 more hospitals have telestroke capacity (see p. 9)

* 612 hospitals responded to the 2013 survey of which 303 had also participated in the 2009 survey, thus allowing for comparisons of only those hospitals which had participated in both surveys.

SPECIALIZED UNITS, **SPECIALIZED CARE**

As a means of organizing individual points of service, coordinated care is not only more effective for stroke patients, it is also the most efficient way to make use of stroke care resources — including health professionals, infrastructure, and technology.

“Coordinated stroke systems of care enable stroke patients to have access to the best treatment, from

“Stroke units have been shown to reduce death and disability post-stroke.” - Dr. Devin Harris

prevention all the way to rehabilitation post-stroke,” says Dr. Devin Harris, Medical Advisor, Stroke Services BC, and a Heart and Stroke Foundation spokesperson. “Stroke units, consisting of a designated ward with specially trained physicians, nurses, and therapists, have been unequivocally shown to reduce death and disability post-stroke.”

The CANADIAN BEST PRACTICE RECOMMENDATIONS FOR STROKE CARE stress the need for coordination of patient care among all hospital departments and services, and the strength of organized stroke teams. There is strong evidence that patients who are cared for on a dedicated stroke unit with a specialized stroke team have better outcomes. (Where stroke units are not available, stroke patients can still receive effective care from staff trained in stroke best practices.) But according to the new data only one-quarter of hospitals providing stroke services have a designated stroke program and only 17 per cent have a designated stroke unit, resulting in less than optimal care for many Canadians.

“Stroke care benefits from expertise, so imagine a city of one million people with an annual rate of about 1,500 strokes,” says Dr. Hill. “One large or two medium-sized hospitals or stroke programs can manage this number relatively comfortably. This concentration of care allows expertise and programs, and systems of care to develop. If stroke care is spread out thinner than this, to multiple hospitals, the quality of care suffers and patients do not do as well.”

CELEBRATING SUCCESS

TREATING PATIENTS FASTER

In **Nova Scotia** all districts have been participating in an ongoing quality improvement initiative since late 2011 to improve how quickly patients who need it receive clot busting tPA, as well as how quickly they received the required tests to determine if tPA was appropriate. Acute stroke protocols have been implemented, lab and diagnostic imaging processes reviewed, and data is now reported regularly to local teams. The initiative has seen positive results with a 30 per cent increase in patients getting CT scan in less than 25 minutes after arriving at hospital and a 16 per cent increase in patients receiving tPA in less than 60 minutes.

IMPROVING ACCESS

Evidence shows that stroke patients who receive care on a stroke unit by an experienced and specially trained team have the best outcomes in terms of reduced mortality and disability. **Stroke Services BC**, reacting to a 2011 national stroke services report that placed the province well below the national average of the number of stroke patients who were admitted to a stroke unit, identified increasing access to stroke units as a priority. Teams focused on creating new stroke units and improving existing ones. They followed a structured seven-step framework to create new stroke units starting with understanding current volumes, through to establishing teams, implementing best practices, improving communications and engaging patients. Results included 75 new dedicated stroke beds across the province, enhanced interdisciplinary teams, increased team collaboration and communication, and active engagement with patients and families.



Some stroke services can be provided in prevention clinics outside hospitals.

THINKING OUTSIDE **THE HOSPITAL**

Hospitals are certainly the best providers of most specialized acute stroke services, but some services are more efficiently delivered in other ways. One example is treatment for “mini-strokes” (called transient ischemic attacks or TIAs). These mini-strokes display the same symptoms but resolve quickly and are an important warning sign of a future, more extensive stroke.

While still urgent, these milder cases can be treated effectively outside of a standard in-patient acute care unit or emergency department, for example in a secondary stroke prevention clinic. These clinics — located in a hospital or in the community — have been developed specifically to help those who have experienced signs of a mild stroke, reduce their risk.

CELEBRATING SUCCESS

MAXIMUM CARE FOR MINI-STROKES

The **Transient Ischemic Attack and Minor Stroke (TAMS) Unit** at the Toronto Western Hospital takes a collaborative team approach involving many healthcare practitioners. A stroke nurse practitioner does a detailed assessment and patients are also seen by a doctor who specializes in stroke (stroke neurologist). During a TAMS Unit visit medical imaging, diagnostic tests, and treatments are completed the same day. Patients may also see a rehabilitation specialist. The TAMS Unit provides education about stroke and stroke prevention, including treatments for stroke risk factors and adopting healthy behaviours. Patients continue to get follow-up care when they need it. Similar stroke prevention services are available at the **McGill University Health Centre** in Montreal and in Victoria, Calgary, Edmonton, Ottawa and other regions.

THE POWER OF TECHNOLOGY

When stroke experts are not available within a facility, patients can benefit from their expertise through telestroke. Telestroke uses various types of technology to link healthcare sites, providing diagnosis and treatment recommendations and services to stroke patients wherever they are. Currently telestroke is primarily being used for urgent cases to increase access to clot-busting drugs through consulting neurologists, and this has proven to be very effective.

“Telestroke is not being used to its full potential.... We should be making better use of this technology.”

- Dr. Frank Silver

But there are great opportunities to use it at any point in stroke care including secondary stroke prevention and rehabilitation. Telestroke can also be used to provide access to other specialists, for example, speech-language pathologists.

Telestroke has numerous benefits to both stroke patients and the health system. It has been shown to support better outcomes in patients including reducing effects of stroke, and increasing patient satisfaction. It can address regional inequities in access to and standards of care, and reduce costs for health care and long-term social support.

However, telestroke is being underutilized. The technology infrastructure is in place in more than 80 per cent of hospitals but only 44 per cent are using it for care related to stroke patients.

“Telestroke is not being used to its full potential,” says Dr. Frank Silver, Medical Director, Ontario Telestroke Program and a Heart and Stroke Foundation spokesperson.

“It allows physicians and other specialists to provide care to patients who can be hundreds of miles apart. In a country as big as Canada this is an efficient and effective way to provide care for more stroke patients and we should be making better use of this technology.”



Dr. Frank Silver

CELEBRATING SUCCESS

PUTTING TELESTROKE TO WORK

The **Ontario Telestroke Program**, pioneered with support from the Heart and Stroke Foundation, provides care to stroke patients far from major urban centres. Originally introduced as a pilot project in 2002, the program is supported by a team of neurologists who provide consulting services to hospitals across the province.

Using a web-based communication system the program supports discussions between emergency department physicians and consulting neurologists regarding stroke treatment, including administering clot-busting tPA. Between 2002 and 2012, the program provided neurologist consultation to about 3,000 patients with stroke, 30 per cent of whom received tPA.

In the **eastern region of Quebec**, a telestroke pilot project was rolled out in early 2014 to support administering tPA. Staff members were trained and technology was put in place to support consultation from stroke specialists from Hôpital de l'Enfant-Jésus, recently designated as a comprehensive tertiary stroke program by the Ministry of Health and Social Services. This region is a leader in the province and access to tPA has increased and competency in stroke care has improved.



Too few stroke patients have access to the rehabilitation services they need.

REHABILITATION SPEEDS **RECOVERY**

Because timely treatment is linked with better outcomes in stroke patients, the recovery process starts the moment that emergency medical services arrive or a patient is seen by a stroke expert. Recovery is an ongoing process that includes a range of activities in many settings over months or years.

Rehabilitation is key to recovery for survivors, and the earlier it starts, the better. There have been improvements over the past decade in how quickly patients in hospital are getting access to in-patient rehabilitation, but with half of stroke patients receiving services in 13 or more days after their stroke when the ideal is closer to five to seven days, there is much room for improvement. In many cases, rehabilitation starts in hospital and continues with services in the community after a patient is discharged.

Unfortunately there are many gaps in rehabilitation for stroke survivors. Not enough stroke patients in any setting, in or out of hospital, have access to the rehabilitation services they need to make the best recovery possible. Only 16 per cent of all stroke

patients go to in-patient rehabilitation, when recent evidence shows this number should be closer to 40 per cent based on patient outcomes and needs.

“One of the bigger challenges is the lack of data on stroke rehabilitation including information on the quality of services. This is our biggest research opportunity,” Dr. Hill says. “We need to identify new, specific and targeted therapies for stroke survivors, and we need data to be able to do this.”

Early supported discharge is another stroke care concept that has shown some success and offers even more potential, allowing stroke patients to return home or to their previous living setting as early as possible with rehabilitation services and supports in place. The benefits to this approach include better quality of life for patients and a decreased burden on the health system. The catch is that there must be services in place in the community to support patients in their recovery journey, and these are lacking in many regions. Currently 60 per cent of all stroke patients who leave hospital return home, and of these only 11 per cent have home support services organized before they leave hospital.



A healthy lifestyle can reduce risk factors for stroke and heart disease.

PREVENTION IS A PRIORITY

Prevention is critical in any discussion about stroke. Not all risk factors can be controlled but up to 80 per cent of premature heart disease and stroke can be prevented. It is never too early to adopt healthy behaviours to decrease the risk of ever having a stroke, and never too late to make healthy changes — even after a stroke. The risk of having another stroke is high for five years following a first stroke, with 30 per cent of survivors having a second stroke.

Rehabilitation for stroke survivors not only helps them regain their independence. It also supports

them to make and maintain the healthy changes they need to avoid a subsequent event and recover to the fullest extent possible.

“A great deal of the potential burden we are facing depends upon the health of the current baby boomers as they age, and whether they can better control their stroke risk factors,” says Dr. Hill. “There will always be risk factors we cannot control such as family history and age, but there is so much that we can do to prevent heart disease and stroke. By making healthy changes, Canadians can make a real difference to their odds of having a first incident or of having another one.”

HEALTHY BEHAVIOURS ALL CANADIANS CAN ADOPT TO MAKE HEALTH LAST

- **EAT A HEALTHY DIET** high in vegetables and fruits, and lower in fat, sodium and sugar. Follow the recommendations in Canada’s Food Guide.
- **BE PHYSICALLY ACTIVE.** Accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more.
- **BE SMOKE FREE.**
- **KNOW AND CONTROL YOUR BLOOD PRESSURE.**
- **MANAGE DIABETES.**
- **LIMIT ALCOHOL.** Women should limit themselves to no more than two drinks a day, to a weekly maximum of 10; and men to three drinks a day or a weekly maximum of 15.
- **MANAGE STRESS.** Identify the source of your stress, talk to friends, family, and your healthcare provider. Be sure to take time for yourself.
- **TAKE THE HEART&STROKE RISK ASSESSMENT** at heartandstroke.ca.

INVOLVING PATIENTS **AND FAMILIES**

Patients and their families should be at the centre of stroke care. They should be directly involved in decision making, goal setting, and care planning throughout the care process. A well coordinated system facilitates better participation and a smoother journey for patients and their families, allowing them to move more easily between healthcare locations, services and providers.

Healthcare providers have an important role to play in educating patients and families around stroke, including understanding the nature and causes of stroke, recognizing the signs, being aware of the impact and ongoing needs of the patient, and promoting self-management. They are also in the best position to ensure care is patient-centred.

It took a nurse's pair of keen, knowledgeable eyes to recognize that Chris and Chelsea Bohemier's newborn son, Alex, was having seizures, the day after he was born on Sept. 8, 2012. Luckily, they were still at the hospital and Alex was admitted to the neonatal intensive care unit, where he continued to have more seizures. A few days later, Alex was diagnosed with having a stroke at birth due to a blood clot. Alex is now almost two and is doing very well, and Chris credits his son's early diagnosis as a determining factor in his recovery. He readily admits that he did not know that babies could have strokes. He also stresses the importance of families being involved in every aspect of stroke care.

"It became obvious to us early on that stroke is a complex medical issue, affects everyone in different ways, and requires different levels of treatment. It was so important that we had a good understanding of what had happened to our son, what we could expect and who needed to be involved," says Chris. "There is a partnership between those impacted by stroke and the medical team to ensure the best possible recovery. Having the right people involved from the start has been instrumental to Alex's recovery."

A STROKE SYSTEM **FOR THE FUTURE**

On the surface the concept of organizing a stroke system to support the best possible outcomes for stroke patients may not seem complicated. But in practice having the right resources, in the right place at the right time requires a lot of time, resources, long-term planning and commitment from individuals, organizations and governments at all levels across the country.

We have made great progress in stroke care in Canada as attested to by decreased rates of stroke, increased services, improved coordination and better outcomes for stroke patients. More than 80 per cent of Canadians who have a stroke and make it to hospital will now survive.

But there is still much room for improvement, from prevention through to care and recovery, to ensure the system continues to provide the best services possible — both for today's stroke patients and for the growing numbers of Canadians who will experience stroke in the future.



With early detection and excellent care, Alex Bohemier is doing very well today.

WHAT THE **HEART AND STROKE FOUNDATION** IS DOING

At the Heart and Stroke Foundation, we have made it our mission to prevent disease, save lives and promote recovery. Our vision is to create a world where Canadians live healthy lives free of heart disease and stroke. To tangibly improve the lives of Canadians, we have outlined two main goals that we are striving to achieve by 2020:

- 1) Significantly improve the health of Canadians by decreasing their risk factors for heart disease and stroke by 10 per cent
- 2) Reduce Canadians' rate of death from heart disease and stroke by 25 per cent.

The Heart and Stroke Foundation is working hard to achieve these goals through numerous initiatives, including:

- Providing Canadians with health information and fostering the creation of supportive environments which enable them to make healthy changes to prevent heart disease and stroke, and raising awareness around the signs of stroke;
- Taking a leadership role in stroke and managing the **CANADIAN BEST PRACTICE RECOMMENDATIONS FOR STROKE CARE** as well as the Canadian Stroke Congress, the largest annual stroke research and professional education event in the country;
- Advocating for stroke-related public policies, program funding, public awareness, treatments and improved post-stroke support services.

The Heart and Stroke Foundation was a key partner and funder of the Canadian Stroke Strategy with the Canadian Stroke Network. The Foundation continues to support provinces as they develop and implement and sustain their stroke strategies.

Since the Foundation was established in 1952, we have invested more than \$1.39 billion in vital heart and stroke research, making us the largest contributor in Canada after the federal government. Our research grants have led to breakthroughs such as a hormone that revolutionized how we can control blood pressure, the leading risk factor for stroke, and identification of the risk factors accounting for 90 per cent of all strokes. Most recently, the Foundation and the HSF Canadian Partnership for Stroke Recovery have invested \$1.3 million in a national initiative to improve access to stroke recovery services.

The Heart and Stroke Foundation has worked tirelessly with our partners, volunteers and supporters year after year. Since our inception, the death rate from cardiovascular disease has declined more than 75 per cent.

We are committed to continuing to increase our knowledge through research, to educating Canadians and building a better environment in which they can live in excellent health, and to creating more survivors. But we can't do it alone. We need your continued help, through your generous donations, to keep doing this important work. Visit heartandstroke.ca for information or to make a donation.



**PREVENT
DISEASE**



**SAVE
LIVES**



**PROMOTE
RECOVERY**

WHAT CAN CANADIANS DO?

- Make and maintain healthy changes to reduce your risk of stroke: be physically active, eat a healthy diet, be smoke-free, manage stress and limit alcohol consumption.
- Know and control your blood pressure.
- Understand that stroke is a medical emergency and can happen at any age. Know the symptoms of stroke and call 9-1-1 or emergency medical services immediately.
- Become actively involved in all decisions around stroke care, treatment and rehabilitation for yourself and your loved ones.
- Advocate for improvements to stroke systems to ensure that well-resourced and coordinated systems are in place for every Canadian, regardless of location.
- Visit heartandstroke.ca for more information.

WHAT CAN GOVERNMENTS AND HEALTHCARE SYSTEM DECISION MAKERS DO?

- Take a leadership role in stroke care and continue to fund and support provincial stroke strategies leveraging the **CANADIAN BEST PRACTICE RECOMMENDATIONS FOR STROKE CARE**.
- In provinces without a stroke strategy, the government in collaboration with regional authorities should develop a comprehensive strategy, which includes an integrated approach covering prevention, treatment, rehabilitation and community re-engagement.
- Support the development of coordinated systems of stroke care including stroke units and stroke care teams.
- Implement and support 9-1-1 systems across each province to ensure access to timely life-saving services for all residents.
- Develop coordinated regional bypass systems so emergency medical services can bypass non-stroke hospitals and get stroke patients to the right hospitals with the appropriate level of stroke services in a timely manner.
- Expand telestroke infrastructure and utilization to provide access to optimal stroke services across the continuum of care (diagnosis, treatment, rehabilitation and prevention), to all Canadians including those in rural and remote regions.
- Create more secondary prevention clinics using new and existing facilities as well as telestroke infrastructure.
- Expand rehabilitation services for stroke patients both in hospital and in the community.
- Develop detailed and coordinated provincial surveillance systems and other data and information infrastructure which allow for continuous tracking to address gaps across the system from prevention to treatment and care through to rehabilitation.

WHAT CAN HEALTHCARE PROVIDERS DO?

- Train all emergency medical staff to recognize the signs of stroke and carry out stroke protocols.
- Implement the **CANADIAN BEST PRACTICE RECOMMENDATIONS FOR STROKE CARE**.
- Promote and implement coordinated systems of stroke care working across interdisciplinary teams.
- Put patients and families at the centre of stroke care to increase patient satisfaction and improve outcomes.
- Take a leadership role and advocate for stroke systems improvement, enabling all patients to receive optimal stroke care regardless of location.

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* Data sources include Canadian Institute for Health Information (CIHI) Discharge Abstract Database (2003-2013), CIHI Stroke Quality Special Project 340, CIHI National Rehabilitation Reporting System (NRS) and Heart and Stroke Foundation 2013 Stroke Services Inventory of 612 Canadian hospitals.