



Lisa Meeches, stroke survivor

Lives disrupted: The impact of stroke on women

Women are disproportionately affected by stroke throughout their lives and confronted with challenges across the health system

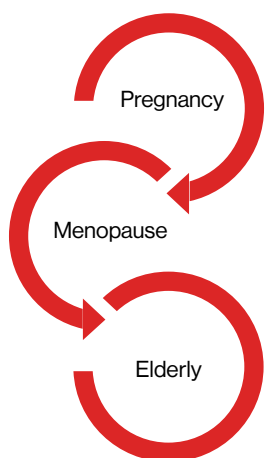
2018 Stroke Report



Heart&Stroke™

Women at the centre of stroke

Stroke affects women throughout their lives and they are the constant: whether they personally experience a stroke, or are caregivers to loved ones who have had a stroke. Stroke disrupts women's lives, affecting their roles at home, at work, and in the community, straining relationships and threatening their independence.



High risk stages for stroke in women.

Stroke can happen to anyone at any age, and vary in severity, type, cause and effect. Yet, stroke disproportionately affects women. More women die of stroke, women have worse outcomes after stroke, more women are living with the effects of stroke and they face more challenges as they recover.

Women's bodies are not the same as men's; stroke affects them differently and they are at higher risk at key stages. Pregnancy is both an empowering and vulnerable time for young women and is also a period when stroke risk is first

elevated. As women's bodies adapt to biological changes in menopause, stroke risk increases again. Elderly women are exceptionally touched by stroke; they are the most likely to have a stroke, their strokes are the most severe, their outcomes are the poorest and stroke can put an end to their independence.

Women's lives are also different from men's. Many are used to being caregivers, not being taken care of by others, and this is how others see them as well.

Women experiencing stroke are often at a disadvantage, similar to women who have heart disease. Many are under-aware of the signs and their personal risk factors. They do not always benefit equally from treatment and care, and they are under-supported in their recoveries with fewer opportunities for rehabilitation. They are also under-represented in stroke research, especially older women who face the greatest burden. Women of South Asian and African descent are at greater risk as are Indigenous women, who are also facing an increase in stroke rates and challenges to accessing adequate treatment and recovery support.

Significantly, stroke research is a relatively new field compared with heart disease research. Differences between women's and men's brain health are just starting to emerge. There is much to do to identify the differences, understand and address them.

Opportunities exist, and will only increase, to better support brain health for all women from awareness and prevention, through care, treatment and recovery. Everyone has a role to play: women and their families, health care practitioners, researchers, administrators and decision-makers at individual, community and health systems levels across the country.

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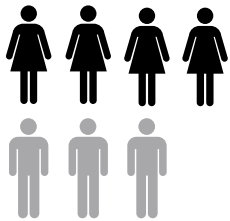
What is a stroke?

A stroke happens when blood stops flowing to any part of the brain. Strokes can be large or small, and the effects of stroke depend on the part of the brain affected and the extent of damage.

- Ischemic stroke is the most common form of stroke, caused by a blood clot.
- Hemorrhagic stroke occurs when a blood vessel ruptures, causing bleeding in or around the brain.
- A transient ischemic attack (TIA), sometimes referred to as a mini-stroke, is caused by a small clot that briefly blocks an artery and stops blood flow. TIAs are an important warning that a more serious stroke may occur.

The big picture

- More than 62,000 strokes occur in Canada each year; over 30,200 of these happen to women.
- One-third more women die of stroke than men in Canada; of all deaths from stroke, 59% are women, 41% are men.
- Women who have had a stroke have worse outcomes than men; there are more activity limitations and lower overall levels of mental and physical well-being.
- Women are less likely to go home after stroke; almost twice as many women as men go to long-term care instead.
- Approximately 405,000 people in Canada are living with the effects of stroke of which 214,000 are women and 191,000 are men.
- Less than half of stroke survivors who participate in rehabilitation are women (46%), putting them at a disadvantage for making the best recovery possible.
- Elderly women are particularly over-burdened by stroke and are missing out on access to treatment, care and rehabilitation.



One-third more women **die of stroke** than men.



Heart & Stroke campaign shines a spotlight on women's health

#TimeToSeeRed

is Heart & Stroke's powerful new awareness campaign to support women's heart and brain health, aimed at galvanizing Canadians to push for and make changes, and at a faster pace than we have seen in the past. Learn more at heartandstroke.ca/women.

A bigger share of the burden

A woman in Canada has a stroke every 17 minutes. This equates to 85 women every day, 18 of whom will die. Compared with men, women are 35% more likely to die within one year of a stroke and 24% more likely to die by five years after stroke, based on actual number of deaths. This disparity is mostly because women have strokes at an older age, but is also affected by other factors including increased stroke severity, greater physical or cognitive limitations before their stroke, and pre-existing atrial fibrillation, which can be associated with more severe strokes. Women do not realize this reality. According to a national poll we recently carried out, almost two-thirds of women do not know that more women die of stroke than men.

“We have seen amazing improvement in stroke awareness, care, treatment and research over the past 20 years,” says Yves Savoie, CEO, Heart & Stroke. “But unfortunately women are not benefitting equally from this progress. There are opportunities throughout women’s lives, depending on their risk, age and circumstances, where they can be better informed, receive more timely care and treatment and be strongly supported to recover to the fullest.”

Overall fewer women and men are dying of stroke compared to 15 years ago. This is great news but this improvement is happening faster for men; the reasons why are unclear.

Currently more women are living with the effects of stroke than men and in the next two decades, the number of people living with long-term stroke disability will increase by 80%, from 405,000 to 726,000. This will have a significant impact on women as both survivors and caregivers.

“There is a pressing need for more research on stroke in women, so that we can understand how sex and gender influence factors such as stroke presentation, diagnostic testing and response to treatment. Without this information, we can’t know whether we are providing the best care,” says Dr. Moira Kapral.



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Dr. Moira Kapral

Sex and gender: What’s the difference?

Sex and gender are different, and both affect women’s health. Here’s how the Canadian Institutes for Health Research explains the two terms:

- Sex refers to the biological attributes of humans and animals, including physical features, chromosomes, gene expression, hormones and anatomy.
- Gender means socially constructed roles, behaviours, expressions and identities of girls, women, boys, men and gender diverse people.

Gaps across the system for women

What are the risks?

A woman's overall risk of stroke is determined by all of her risk factors put together. Some of these factors can be controlled, but not all. Risk factors that can be controlled include high blood pressure (also known as hypertension), atrial fibrillation (irregular heart rhythm), high cholesterol, diabetes, unhealthy diet, physical inactivity, unhealthy weight, smoking, stress and excessive alcohol use and drug abuse. Those that cannot be controlled include age, gender, family history, South Asian and African descent, and Indigenous heritage.



70% of women don't know any stroke **risk factors.**

Almost 75% of all men and women admitted to hospital for stroke have at least one stroke risk factor. Many women are

not aware of the risk factors; according to our poll 70% of women don't know any of them. Only 25% of women identified high blood pressure as a risk factor for stroke, when it is in fact the number one risk factor and less than 1% of respondents identified atrial fibrillation (Afib) as a risk factor, despite its significance to a woman's risk.

Atrial fibrillation

Atrial fibrillation (Afib) is a condition involving an irregular heart rhythm, known as an arrhythmia, and one of its main complications is stroke. Afib is a significant risk factor for stroke in women and yet they frequently miss out on important prevention, management and research opportunities.

Women experience more pronounced Afib symptoms compared to men, including more palpitations, laboured breathing, lightheadedness and dizziness, fatigue, and chest discomfort.

Generally, the risk of developing Afib increases with age and with other risk factors such as high blood pressure. Although the overall risk is higher in men than in women, because women live longer than men, there are more women living with Afib and women have a 15% higher likelihood of having Afib when admitted for stroke. Strokes caused by Afib happen more often in women and they are often more severe in women. More women than men die from Afib-related stroke or have more deficits and poorer quality of life.

Women can prevent or reduce their risk of stroke by:

- Maintaining a healthy blood pressure through lifestyle changes (such as increased physical activity and reduced salt intake) and when needed through medication.
- Being physically active for at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more.
- Eating a healthy, balanced diet focused on whole foods with lots of vegetables and fruit, limiting ultra-processed foods, avoiding sugary drinks, watching portion sizes, and cooking at home as often as possible.
- Becoming and remaining smoke free.
- Achieving and maintaining a healthy body weight.
- Using medications to reduce the risk of stroke as prescribed by their healthcare provider.
- Discussing their personal risks with their doctor before using birth control pills or hormone replacement therapy after menopause.

LYNNE'S STORY

A heartbeat away from stroke

Lynne Stacey, 77, had been diagnosed with Afib but did not realize it put her at risk for stroke. A physiotherapist who has been teaching aquafit classes to stroke and other patients for over 25 years, she had a stroke herself as she was getting ready to teach one of her classes. She was rushed to the hospital and received both alteplase, a clot-busting drug, as well as endovascular thrombectomy (EVT), which physically removes clots from large blood vessels in the brain.

Lynne has made a great recovery and considers herself lucky to have received timely life-saving treatment. But she believes women need to become more aware. "I had been diagnosed with atrial fibrillation but I did not realize it was a risk factor for stroke. We need to get more information out about personal risk factors and increase awareness of the signs of stroke."



Aging is a powerful risk factor for women when it comes to stroke.

Dr. Jodi Edwards

Lack of awareness

What happens in the first few hours after stroke onset is critical. The faster the signs of stroke are recognized and the person experiencing stroke gets to a hospital with acute stroke care services, the better their chances of survival and a good recovery.

According to our poll, only 60% of women know what a stroke is. Fewer still recognize the signs; 36% do not know any of the FAST signs of stroke (see page 7) and only 8% know all three FAST signs of stroke.

The implications are especially pronounced in young women experiencing stroke. Young women take the longest median time – nine hours – to arrive at the hospital when having a stroke. For older stroke patients, including older women, the median time is 7.5 hours.

"Women have so many pressures on them with work and family that they do not take enough time to put their own health first. When signs of stroke appear in a younger female, they are more likely to down-play what they are experiencing and waste valuable time before seeking medical help, putting them at risk for a worse outcome," says Dr. Patrice Lindsay, Director, Stroke, Heart & Stroke. "We must improve stroke awareness and make sure women get access to life-saving care as fast as possible."

Different TIA symptoms

Emerging research indicates that more women than men who show atypical TIA symptoms – signs of stroke that appear briefly – may actually be experiencing a full stroke once confirmed by MRI imaging. This ground-breaking research will help explain sex differences in how stroke presents and progresses for the first time.

"Women may present with different symptoms from men when they have a TIA. Symptoms we thought were benign – such as tingling, numbness, instability, vision disturbance, or speech and motor symptoms of shorter duration – are not so benign in women," says Dr. Shelagh Coutts.

"Aging is a powerful risk factor for women when it comes to stroke. Women are aging into conditions such as atrial fibrillation that disproportionately increase their risk of stroke and they fare much worse after Afib-related strokes," says Dr. Jodi Edwards. "And yet, in many women, these risks are not optimally managed or they do not have sufficient access to preventive care."

There are differences in how women with Afib are managed. Blood thinners are often prescribed for people with Afib as they greatly reduce stroke risk. Even though women with Afib are at higher risk of stroke, they are often prescribed lower, and potentially less effective, doses of blood thinner medication compared to men. Female Afib patients are also less likely to undergo some procedures to treat Afib including electric cardioversion, a brief electric shock that resets the heart back to a regular pattern, or to be referred for other treatments such as ablation, a procedure that destroys abnormal heart tissue that is interfering with a regular rhythm.

Despite these issues facing women with Afib and stroke, women have been under-represented in Afib research trials for decades. Women with Afib make up only 40% of participants in research trials on newer and possibly safer medications.

Motor and speech symptoms are typical of TIA and those who present with them are at highest risk of having another stroke. However, it does not mean that other symptoms should not be taken seriously.

“Because women present with other symptoms we consider benign or less high risk, they may be more likely to have a diagnosis missed,” says Dr. Coutts.

Improved stroke diagnosis, especially for women presenting with TIA symptoms, can be achieved with better access to MRI scans and expertise in stroke prevention clinics.

Learn the signs of stroke

Face is it drooping?

Arms can you raise both?

Speech is it slurred or jumbled?

Time to call 9-1-1 right away.

Act **F A S T** because the quicker you act, the more of the person you save.

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Treatment variations

In stroke care, time is of the essence. Brain cells die at a rate of 1.9 million every minute after stroke, so the sooner that blood flow can be restored, the greater the likelihood of a good outcome.

One important measure of stroke care is “door-to-needle” time: the time from when a patient arrives at an acute stroke hospital to the time they receive the clot-busting drug alteplase (also known as tPA), if eligible. Heart & Stroke looked at the latest available data and found that while door-to-needle times are improving, the median for women is 11% longer than for men.

Alteplase is effective for acute stroke in women and men, and roughly the same number of men and women receive the clot-busting treatment when diagnosed with ischemic stroke – the type caused by a clot. Even though not all women will have good outcomes there is evidence that women, on average, have worse disability after stroke than men. This may be related to women being older at the time of their first stroke compared to men. Without alteplase women would be even worse off, so it is critical that all women with stroke who are eligible receive it.

Challenges accessing life-saving treatment

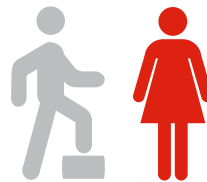
Endovascular thrombectomy (EVT) is a breakthrough procedure that uses a retrievable stent to physically remove large clots. It saves lives and reduces disability and is now considered the gold standard for treatment of patients – both women and men – with major ischemic strokes. EVT is recommended for eligible patients within six hours of stroke onset, or even up to 24 hours in select patients. However, the faster it can be initiated, the better.

Endovascular intervention programs require specialized expertise and a critical mass of patients. In Canada, 95% of the population is currently within a six-hour drive of one of the 23 existing EVT stroke centres. However, women experience challenges accessing this treatment: recent Canadian Institute for Health Information (CIHI) data reveals that fewer women are transferred to EVT-enabled centres from centres that do not perform EVT, and women wait longer before they are transferred, potentially reducing access to timely treatment.

The differences in women’s experiences in acute stroke treatment, whether resulting from biological differences, the realities of their living situations or barriers in the healthcare system, should be explored and resolved.

Bigger recovery challenges

The brain has the ability to learn to compensate for physical, mental and communication losses, and recovery can continue for months and years. Yet women are not benefitting from stroke rehabilitation to the same degree as men; they participate less and do not improve to the same extent. As women are generally older when they have their stroke, recovery is more of a challenge, but women of all ages face obstacles.



Fewer women participate in stroke rehabilitation than men.

More men than women were discharged to inpatient rehabilitation after stroke in 2016. Of all the stroke patients in Canada who entered rehabilitation in 2015–16, 54% were men yet only 46% were women.

Women have more functional limitations both when they are admitted to and when they are discharged from inpatient stroke rehabilitation compared to men, and they make fewer overall gains. Research has shown that women are 60%

less likely to regain independence in their daily activities compared to men and not surprisingly, as a result, they report worse quality of life.

Barriers to rehabilitation

“The reasons why men and women do not participate in rehabilitation can be different. We need to fully understand these differences to ensure women are given an equal opportunity to benefit from stroke rehabilitation,” says Dr. Anita Mountain.

Motivation to participate in and continue therapy can vary between men and women. “While there are individual differences, women as a group tend to be more externally driven,” says Dr. Gail Eskes. “They like being in groups, having someone provide instruction, and they like the external motivation of having other people around them doing the same thing and talking about what they are doing.”

Women do not always have the support they need from those around them to participate in rehabilitation. For men, the women in their lives – wives, daughters, mothers – will often motivate them to attend rehabilitation, help get them

Identifying women most likely to benefit from rehabilitation

Dr. Lara Boyd, a Heart & Stroke Foundation Canadian Partnership for Stroke Recovery-funded researcher, is in the early stages of a longitudinal study of people with severe stroke, including more women around the age of menopause. This group is under-researched and often not offered rehabilitation as it is predicted to have poor potential for recovery.

“A number of these individuals will show a degree of partial recovery that is clinically meaningful. Given this we are identifying a biomarker that could be used to determine who is likely to show at least partial recovery in the acute stage after stroke. This will allow us to identify these people – many of whom are women – and provide access to aggressive rehabilitation so that their recovery can be optimized.”

The Heart & Stroke Foundation Canadian Partnership for Stroke Recovery (canadianstroke.ca) brings together the top researchers to collaborate, advance discovery, catalyze and test new approaches, conduct clinical trials and deliver new knowledge to the people who can apply it.

there and organize appointments for them. For women, the reciprocal is often not the case.

“Fewer women participate in the most optimal types of intensive rehabilitation, and they get less assistance and encouragement from friends and family to attend follow-up medical appointments after their stroke,” says Dr. Thalia Field. “They can also be less comfortable playing the ‘sick’ role and being taken care of. They want to move on with recovery and resume their many other roles and responsibilities.”

Recovery challenges for all women

Stroke affects women of all ages. Even younger women recovering from stroke are at a disadvantage; they are two to three times more likely to have poor functional outcomes compared to men.

Women in their middle years who experience stroke also experience unique challenges to recovery around loss of independence, work, caring for children and older parents, and other responsibilities in the home and community.

“Women are often concerned about the amount of time required to optimally participate in a rehabilitation program when their energy is needed elsewhere, especially if they have young children and other responsibilities at home. It is also tough for single women who are used to being independent, and now need assistance to attend rehabilitation programs,” says Dr. Field.

A key factor in recovery after stroke for older women is that many live alone, and are often widowed. Among older stroke survivors, women had a two-fold higher risk of poor functional outcomes at three months and at one year after stroke compared with men.

Left out of rehabilitation research

A systematic review of stroke rehabilitation literature that examined ageism in trial participation also revealed a sex discrepancy: 57% of the patients included in rehabilitation studies were male and only 43% were female.

Dr. Anita Mountain is aware that women are under-represented in stroke rehabilitation research, but says the reasons why are not clear.

“The time required for women to participate could be problematic because of all their other responsibilities and commitments. As well, consent forms are very detailed, outlining every possible adverse effect, and this may deter more women as they are generally less comfortable taking risks than men. For medication studies, there are limitations for women of childbearing age – anyone pregnant or planning on getting pregnant will be excluded for safety,” says Dr. Mountain.

Strategies should be developed to ensure women of all ages are represented in rehabilitation trials and to facilitate enrollment and continued participation in inpatient and community-based rehabilitation. Women's life circumstances, unique needs and preferences should be considered.

JULIE'S STORY

Choreographing her own recovery

Julie Tomaino, was a fit, healthy 38 year-old choreographer and dance instructor when both of her inner carotid arteries dissected, resulting in a massive stroke on both sides of her brain.

She experienced "locked-in syndrome" for over a week – she was not able to move any part of her body except her eyes, make sounds or react to anything. Where most people would panic in this situation, Julie describes it as a peaceful time when she knew her body needed to rest and heal. This strength and resilience served her well and eventually she was able to transfer to the Toronto Rehabilitation Institute for more intense therapy.

On arriving, Julie was clear about her goals: "I am a dance teacher and choreographer; I want to get back to that." Her therapy team responded: "Ok, we can be your dancers." And just like that, the student became the teacher, and dancing became part of her therapy.

Her team included a physiotherapist (PT), occupational therapist (OT), speech language pathologist, rehabilitation therapist, OT-PT assistant, and nurse. All aspects of her therapy were integrated into planning and organizing a dance to Queen's hit "We Will Rock You," which was performed for an audience.

Julie is back to being a choreographer full-time, working on several productions, but she has scaled back her schedule and brought more balance to her life. The notion of balance infuses her message for other women recovering from stroke: "My biggest message is you have to do the work. No one can do that for you. But also take the time that you need. Only in the time you give yourself can you give back to others – you have to take care of yourself first."



Julie's therapy team getting ready to dance

Dance as rehabilitation

According to Dr. Kara Patterson, a Heart & Stroke Foundation Canadian Partnership for Stroke Recovery-funded researcher, dance has unique potential for stroke rehabilitation. As a form of exercise, dance has the potential to be helpful for neuroplastic change – the ability of the brain to reorganize itself by forming new connections – which can lead to improvement in balance and memory. Dance is also a social activity that is both motivating and enjoyable.

Dr. Patterson and her colleague Dr. Dina Brooks are currently studying whether dance can improve balance and walking for people following their stroke, as well as boost confidence and decrease feelings of social isolation, leading to improved overall quality of life.

"Dance helps increase the ability to move and keep balance and an increase in skills equals an increase in confidence. One woman I worked with related that she now has the confidence to go out more on her own and even take the subway," says Dr. Patterson. "Others have expressed their appreciation for the classes because they felt they were participating as dance students, not as people who have had strokes."

Stroke and Indigenous women in Canada

Although the rate of stroke and heart disease has been declining in Canada among most age groups, the opposite is happening in Indigenous populations where prevalence and mortality are increasing. Rates of cardiovascular disease among Indigenous women in Canada are rising and are nearing or surpassing those of non-Indigenous women. First Nations, Métis and Inuit peoples are more likely to have high blood pressure and diabetes – both risk factors for stroke – and are at greater risk of stroke than the general population, and twice as likely to die from it.

Access to diagnosis, treatment and support is a major issue. Remote and isolated communities face real challenges accessing timely life-saving acute stroke treatment as well as recovery support. Social determinants of health such as poverty, education, access to affordable food and safe drinking water, and unsafe living conditions have created a widening health gap.

Lori Davis Hill, Director, Health Services at Six Nations of the Grand River Health Services in southwestern Ontario, explains that her department offers a wide range of services and programs within a culturally safe space taking a holistic approach, where everyone belongs and has value. Demand is high and there are gaps. “Even though we offer many services and we are surrounded by big cities with services, our people still experience health disparities in terms of access and inequities. Some people have to go off-reserve for services, and some people do not get them at all.”

Indigenous communities and women in particular can face specific challenges when it comes to stroke recovery. Generational trauma and stress created by the impacts of historical policies, such as the legacy of residential schools, has influenced a disparate burden of risk factors, heart disease and stroke in Indigenous women. They can be further affected by income inequalities and consequences of racism.

“Something I think about as an Indigenous woman and because I am a speech language pathologist is the importance of having a voice. With a stroke there is always that risk of loss of communication and how do you stay connected and maintain relationships if you cannot speak?” says Lori Davis Hill. “For Indigenous women, for Indigenous people, having a voice has been a gap for a very long time. We struggle with having good relationships and strong identities before a stroke. Sometimes after a stroke we are not rebuilding we are building.”

There are also research gaps: lack of data for Indigenous communities, lack of inventories of accessible services, and

little Indigenous-led, community-driven, culturally appropriate research. There is an urgent need for further study and a better understanding of the brain and heart health of Indigenous women.

Traditional medicine looks at the whole person and includes a strong preventive component.

Lori Davis Hill

Traditional healing practices

Western medicine definitely played a role in Lisa Meeches' healing journey (see facing page), but traditional medicine gave her the strength to heal.

Spirituality is an integral part of Indigenous culture. Traditional medicine healing practices and beliefs are unique among First Nations, Métis and Inuit people. Health and wellness is based on a holistic approach that embodies the physical, emotional, mental and spiritual self and treats the whole person.

Traditional medicine centres on spirituality and the sacred connection that exists among people and the earth. The knowledge of healing practices is a verbal tradition that is taught and passed on through the generations. Traditional medicine has been practiced and proven by Indigenous people through time immemorial, and includes prevention, diagnosis and treatment through ceremonies and customs. The historical knowledge of plants, animals and energy continue to be passed on to new generations of Indigenous healers.

“Traditional medicine looks at the whole person and includes a strong preventive component,” says Lori Davis Hill. “We need to look at pre-contact foods and what the creator put on the earth to sustain us and support us and return to traditional medicines, using food as medicine and ceremony as medicine. We need to connect with our own identities and decolonize how we make choices and how we look at the world.”

LISA'S STORY

Coming together for recovery

Lisa Meeches, Ojibway from Long Plain First Nation in Manitoba, and a busy and successful film and television producer, had taken the summer of 2016 off to attend powwows with her family, and to perform fancy shawl dance – a physically demanding dance similar to ballet. When they reached Lethbridge, Alta., she had a strong headache that would not go away. They set up their trailer at Siksika First Nation close to Strathmore. Rather than visit family in Calgary with her husband, she stayed in their trailer with their three-year-old daughter to rest. She took a shower after her husband left but remembers nothing after that.

Lisa experienced a hemorrhagic stroke – a brain bleed – and it was seven hours before she was discovered by powwow security as her shower had drained the trailer's water tank and set off the alarm system. An ambulance was called and she was taken to the closest stroke centre where her odds of surviving looked dire. She was in a coma for five days, her right side was paralyzed, she could not talk for three months, and she spent 3½ months in hospital.

Her full recovery is nothing short of miraculous, for which she credits first responders at the powwow who recognized her stroke and acted quickly, medical staff at the hospital, her family, her culture and traditions, and her own strength.

"I was at one of the best stroke hospitals in the country and saw how well the system can work, including the nursing staff and my physiotherapy team who were so crucial. I have enormous respect for everyone in the healthcare system, especially when you have a stroke or are dealing with heart disease."

She also acknowledges the essential role the community of Siksika, traditional culture and prayers from across the nation played in her recovery. Her shawl sisters – the women in her dance group – raised money in a blanket dance to send a healer to her hospital bed while she was in a coma in intensive care.

"The Indigenous community knows how to come together in time of distress and we have the answers for our own healing and our own therapy. We just haven't been asked. When we talk about healing and the power of prayer and ancestral song and dance, it is a combination of all of these things. Without my culture and my prayers, I would not have recovered."

Lisa has made, in her words, a full recovery. She has returned to work full-time, producing and hosting *Taken*, a true crime series about murdered and missing Indigenous women and girls. She has also resumed dancing.

"I was danced back into the powwow circle last summer with my daughter by my side. This summer I am returning to the powwow where I had my stroke, with my family and my chief, to finish my dance and to acknowledge and honour the first responders who helped save my life."



Stroke in women across the ages

Unique to women, there are various life stages where they are at increased risk of stroke: during pregnancy, after menopause and, most critically, when they are elderly. Other risk factors specific to a woman's age include use of oral contraception and hormone replacement therapy.

Early risks

Stroke in younger adults is on the rise. Causes for stroke in young people are not always known, but young women face unique risks as well as distinct challenges coping with the effects.

"When a woman has a stroke at a younger age she has many more years to live with the resulting disability," says Dr. Lara Boyd.

Oral contraceptives

Modern oral contraceptives are much safer than the forms used decades ago. However, certain oral contraceptives can increase the risk of high blood pressure and blood clots, raising the risk of stroke. This risk can be three to four times higher in women who also have additional risk factors such as smoking, high blood pressure or high cholesterol, or who are over the age of 40.

Several recently published studies on stroke risk factors unique to women note that oral combined contraceptives (containing estrogen and progestogen) – increase the risk for ischemic stroke. These studies found that women who used estrogen-containing oral contraceptives had more than twice the risk for ischemic stroke, but progestogen-only contraceptives did not increase the risk. Thus, women

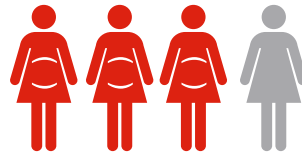
EVA'S STORY

A new mother knows her body

Eva Apatsidou, 35, had normal blood pressure during her pregnancy, but it became elevated during and after delivery. She felt something was not quite right during delivery and over the next two weeks she was exceptionally tired, had a continuous bad headache, arm weakness and vision problems. The symptoms continued and she became confused and had problems speaking. She had had a stroke.

According to Dr. Swartz, many women have headaches and feel tired when they have a new baby, but Eva's persistent and worsening symptoms (weakness, vision problems and eventually trouble speaking) highlights how stroke is different. It is important for women to advocate for themselves and seek help if they experience unusual symptoms that do not go away.

"I know my own body and I knew something was wrong but I was confused. I was tired and trying to focus on the baby," says Eva. "Women should know about the signs of stroke, and so should the people around them."



Stroke in pregnant women **is three times higher** than stroke in non-pregnant women.

considering oral contraceptives need to be aware of their own personal risks of stroke and discuss the best options for them with their primary healthcare provider.

Stroke and pregnancy

Pregnancy is a time of first major stroke risk experienced by young adult women. A recent systematic review funded by Heart & Stroke revealed that stroke in women during pregnancy is three times higher than stroke in non-pregnant women of the same age. During pregnancy, 30 out of 100,000 women will experience a stroke, with risk highest just before or following birth. Pregnancy-related stroke can happen at any stage of pregnancy.

"Pregnant women are at an increased risk of stroke, but it is important to stress that the risk is still very low," says Dr. Richard Swartz. Dr. Swartz also emphasizes that collaboration between stroke specialists and experts in obstetrics and maternal-fetal medicine is needed, so they can work together to ensure the



best outcomes for mothers and their babies. Healthcare systems should be organized to enable this collaboration.

Pre-eclampsia and eclampsia – problems in pregnancy involving high blood pressure and other symptoms – are the strongest risk factors for stroke in pregnancy, accounting for up to half of all strokes that occur in pregnancy.

Not only is pregnancy an early risk factor for stroke in women; pregnancy-associated blood pressure disorders put women at risk for developing stroke and heart disease later in life, and double their risk of dying prematurely from stroke and heart disease. One Ontario study revealed that women with pre-eclampsia had a higher 10-year risk of developing heart disease or stroke and a higher lifetime risk. Right now, however, it's difficult to accurately predict which women with pre-eclampsia have the highest risk of stroke. A female-specific cardiovascular risk assessment tool is needed to account for these risk factors and help women manage their vascular risk.

Dr. Kara Nerenberg works with women who are pregnant and have high blood pressure, helping them lower it and improve outcomes for both mothers and their babies. "While hypertension in older women may be linked to menopause, the reasons for high blood pressure in younger women are still not well understood," says Dr. Nerenberg.

Pregnancy presents an ideal time to identify, educate and support young women who are at risk of developing vascular disease such as heart disease or stroke, as they are accessing the healthcare system regularly.

As they transition to new motherhood, continued attention to their own health needs should be a priority. This is often challenging for new mothers as their babies take precedence over healthy behaviour changes they personally need to make to address issues such as hypertension. For women with high blood pressure during pregnancy, their own follow up after the baby is born is poor: often one quarter will not show up for the first post-partum visit and of those who do go, half will not attend subsequent visits.

Women tell us they are not coming back to clinic because **it is difficult for them to prioritize themselves first** and this is really gender behaviour.

Dr. Kara Nerenberg

"The feedback they give us is that it is too difficult to come to clinic, they have competing interests focusing on their young families and it is difficult to get childcare. They do not understand why they need to come for these vascular appointments because they feel well," says Dr. Nerenberg. "They tell us that they are not coming because it is difficult for them to prioritize themselves first and this is really gender behaviour. We would like to change these gender roles through health coaching and see if we can find ways to encourage women to put their health first."

The Heart & Stroke Canadian Stroke Best Practice Recommendations (strokebestpractices.ca) released the first comprehensive consensus statement on managing women with stroke related to pregnancy.

Migraine

There is an association between migraine headaches and stroke. In women, the link between stroke and migraine, especially migraine with aura (visual or sensory disturbances), is stronger than in men. Migraine with aura is a common condition in younger women, and the risk of stroke in patients with migraine with aura is increased two-fold. Women with migraine who also use combined oral contraceptives have a further increased risk of ischemic stroke and women who have migraine with aura, use combined oral contraceptives and smoke have an elevated risk for stroke.

Mid-life issues

The number of people in mid-life who experience a stroke is higher than ever before, with 25% of all strokes in women occurring between the ages of 50 and 69 years. The reasons for this increase need to be examined along with strategies for preventing strokes in this female population.

Menopause and hormone replacement therapy

The overall risk of stroke increases when women reach menopause. As natural estrogen levels drop after menopause the risk of developing high cholesterol and hypertension increases. Early menopause in particular is a risk factor for stroke.

Hormone replacement therapy (HRT) has been found to increase the risk of stroke up to 30% in women, and the risk increases when HRT is used continuously over a longer duration. After three years of HRT use, stroke risk increases from 6 to 12 per 1,000 treated women; after seven years the risk increases to 25–40 per 1,000 women.

Depression and dementia: Need to know more

Although the evidence is not yet clear it does suggest that depression and dementia may be greater issues for women. Depression is a common effect of stroke. Women are potentially more likely to suffer from depression after stroke compared with men, which can impede recovery and quality of life. Women may be at increased risk of dementia after stroke since onset occurs at an older age in women than in men, and they are already at increased risk due to other age-related conditions such as atrial fibrillation.

The later years

Long lives

Women live longer than men, and tend to be older when they have a stroke. Age is a risk factor for having a stroke and the chance of dying from stroke increases with age.

Elderly women represent a large proportion of the total population with stroke, and have more severe strokes and poorer outcomes. Most stroke patients have several additional health problems, usually referred to as co-morbidities, and this is especially the case for older women. This makes their care more complicated in hospital, during rehabilitation, and once they are discharged.

Women experiencing stroke may be frailer than men, meaning they are older, less physically active, weaker, more prone to exhaustion and have a slower gait.

Elderly women may not have the same access to care as other age groups or men. According to the latest Canadian health systems data analyzed by Heart & Stroke, fewer older women were cared for on stroke units which are best equipped to provide stroke care, compared with men and younger women.

Ageism in research

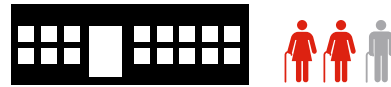
Evidence shows that stroke research often excludes those over 80 and those with other existing health conditions even though strokes more often happen to this group. One study found a significant difference in the mean age of people participating in the studies (64 years) compared with the mean age of people who have a stroke (72 years). That research trials are not adequately including the elderly is troubling as stroke is predominantly a disease of older people, especially older women. The result is a lack of understanding

about which therapies will most benefit elderly women, but it also means these stroke survivors are not able to access emerging treatments.

We need to fully understand the reasons why women have lower levels of participation in stroke research overall, and specifically elderly patients. As our population ages, the proportion of elderly women with stroke will continue to increase, making it crucial to identify and address these disparities, and ensure that this particularly burdened demographic receives optimal treatment and care.

Lack of support at home

Men (60%) are more likely to get discharged directly home after stroke than women (46%). This is true for all women but more pronounced for older women. Almost twice as many women as men go to long-term care after their stroke.



Almost **twice** as many women as men go to long-term care after stroke.

“Women are less likely to return home and live on their own again after a stroke compared to men,” says Dr. Anita Mountain. “This is not because men are making more functional gains but because they are more likely to have a caregiver such as a spouse at home. This is very significant because the main goal for most people following stroke rehabilitation is to be able to go home.”

Our poll also confirms these findings: over half of men (55%) but less than half of women (47%) say their spouse would care for

RITA'S STORY

Adapting after stroke

Rita Lussier had a stroke at 94. She has had high blood pressure since her 20s and was recently diagnosed with Afib, but otherwise was in good health. Her son Denis, who lived with her, heard the alarm she rang from her room. Denis contacted the medical emergency company and they called for an ambulance. Rita was treated with alteplase (a clot-busting drug) when she arrived at the hospital. Initially she was paralyzed on her left side and she could not walk for a few weeks.

After several weeks in acute care she went home for a few days before there was a space available in inpatient rehabilitation. Initially she did not want to go to the rehabilitation facility but with the support of family and drawing on her own resolve and motivation to recover, she relented. “I went for one simple reason – I did not want to stay in the state I was in. It helped me regain my mobility,” says Rita.

She has some weakness on her left side but is walking again with the aid of a walker that she was using before her stroke. And she continues to make progress. “You need to adapt and pay attention to what is happening to your body. You need to change your plans. Having a stroke made me less of a perfectionist, it made me more patient, more accepting.”





them after they had a stroke. This may be related to perceived gender roles: women tend to see themselves as caregivers and they provide more practical help than men. Our poll also indicated that women's biggest worry after a stroke would be to lose their mobility and their independence and not be able to live on their own anymore.

When older women are sent home after stroke, they are more likely to be provided with homecare services (16% versus 12% for men); highlighting again that many women do not have anyone at home to look after them.

"The fact that women are more likely to be caregivers has major ramifications not just in terms of who is available to help them when they go home after a stroke, but when a woman

is already a caregiver and then has a stroke, the impact on her role and willingness to do rehabilitation is significant. This puts women more at risk, when they already have worse outcomes than men," says Dr. Gail Eskes.

More palliative care for women

Palliative or end-of-life care focuses on comfort and quality of life for those with life-limiting illnesses. It aims to prevent and relieve physical, social, psychological, or spiritual suffering of stroke patients, their families and informal caregivers. Over 25% more women admitted to hospital with stroke were referred to palliative care than men, further emphasizing that women have worse outcomes.

Some women are at even higher risk

Most Canadian women have at least one risk factor for stroke and heart disease, but certain ethnic groups have a greater prevalence of risk factors. South Asian women are more likely to have type 2 diabetes and women of African descent are more likely to have high blood pressure and obesity.

"The levels of awareness of unique ethnic risk factors can vary," says Dr. Sonia Anand. "It also depends on acculturation to the 'Canadian' lifestyle; risk factor profiles change with time spent living in Canada."

Other vulnerabilities can place women at higher risk including low socio-economic status, low sense of control or high stress, lack of family support and social background.

The intersection between ethnicity, gender and socio-economic status must be considered when looking at women's cardiovascular health. A multi-pronged approach to prevention should consider these factors and include risk factor monitoring, and timely, accurate and contextually-tailored prevention programs, services and treatments.

Stroke and the lives of women

Women as caregivers

Stroke is a sudden event for both the person experiencing the stroke but also those closest to them. Unlike other more gradual illnesses, stroke happens abruptly and the caregiving learning curve is steep. Family members – more often women – are key facilitators of stroke recovery and in a caregiving role.

Women caregivers tend to find physical deficits in their partners less difficult to deal with. They have more difficulty with emotional or behavioural issues and generally express the need for respite when faced with these situations. Male caregivers are more likely to look for outside help – such as hiring someone to help with housekeeping and meals, or finding programs to take their partner to for the day. They are no less caring; they just find it more practical to have help.

“Adult children, particularly daughters, are increasingly becoming caregivers for their parents who experience a stroke. This can lead to ‘role overload’ as they juggle other

aspects of their often busy lives such as children, work and other responsibilities,” says Dr. Jill Cameron.

Women’s caregiving roles will only continue to increase as the Canadian population ages and care burden shifts away from overcrowded hospitals. Unfortunately they are more likely to ignore their own health to care for others and not surprisingly experience more stress, and lower well-being and physical health.

Women’s changing roles

Women play many roles at home, at work and in the community. Women work significantly more unpaid hours than men including housework, shopping and caring for others in the household.

When asked which of their roles and responsibilities they would be most concerned about being affected by a stroke and

CAROLE’S STORY Parenting after stroke

“Being a mother is what strongly motivated me to be committed to my recovery. I did not want my children to take on the responsibility of being caregivers,” says Carole Laurin who had several strokes when she was 42 and her daughter was six and her son was 16.

Stroke recovery is a lifelong journey that can come with a price. “For the first two years I felt like I took a leave of absence from being my children’s mom,” says Carole. “I had to be 100% focused on recovery and trying to get back to work. Although this could be viewed as selfish I decided it was necessary even though it was difficult for me to do. In hindsight, I feel I did the right thing because 14 years later I have happy relationships with my children.”

Women can also experience loss of identity when their working lives change. “I lost my identity as an income earner when stroke permanently changed my ability to work. This affected my self-esteem, the part of my identity that was tied to my career,” says Carole, who was a teacher at the time of her strokes.

She misses the collegiality and stimulation of a professional environment and her students. “I was a teacher before my stroke and now I am a learner – always discovering how to rebuild a new body and a new life. My self-esteem no longer needs a career identity. I have come to value being me, my inner strength and self-awareness.”





Women juggle **many** different roles.

recovery time, as part of our poll, most women cited not being able to live alone, not being able to care for children, and losing their independence. On the other hand, more men identified not being able to work and to contribute financially to the household, and the impact on other family members.

Marriage and relationships

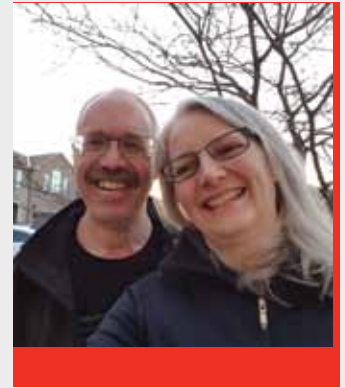
Not surprisingly, a strong, long-established marriage can be a benefit after a major illness such as stroke. The risks of dying after stroke are significantly higher for those who were never married, remarried, divorced, or widowed than for those who had been continuously married, and a higher quality marriage increases survival.

At the same time, illness can create stress in marriages, disrupting routines and altering roles, and can result in separation and divorce. Stroke is a particularly difficult challenge to marital stability. Women can feel these effects more significantly. Stress in the relationship affects wives' mental and physical health more than husbands'.

"There is a higher risk of marriage break-up after a stroke for younger couples and also if it is the woman who had the stroke," says Dr. Sharon Anderson. "Roles can change significantly after stroke, and women have different roles; they are spouses and mothers and these roles need to be reorganized after stroke."

JANE'S STORY **Partner and caregiver**

Jane Dobie's husband, Scott, experienced a stroke at 43 when their kids were five and two years-old. Jane had a supportive employer and was able to take time off work to be with Scott



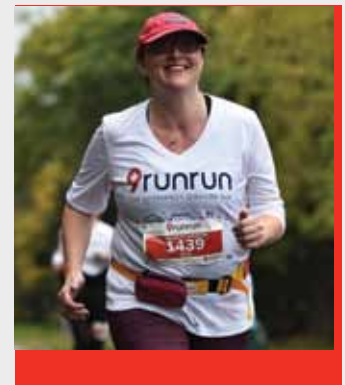
during his early days in the hospital and then to set up support once he was home. Jane credits the fact she was still young as being instrumental to her ability to cope.

"Other caregivers, other wives were mostly older. I felt more able to handle the situation; I was not in my 80s. Also, Scott and I had been partners so I knew how to do everything that needed to be done, from our finances to our car maintenance. I saw older caregivers who had more established gender roles and it was more difficult for them."

Jane observes that the caregiver role affects women differently. "We tend to nurture and take on more. We need support, including helping us understand what is reasonable and how much we can do. I always use the analogy that you need to put on your own oxygen mask before you put one on others. We need to think of both the patient and the caregiver, and be conscious of women wanting to do everything."

ERIN'S STORY **Relationship changes after stroke**

Erin Zuber was a stay-at-home mom with a four-year-old and a one-year-old when she had a stroke at 32. Her children were her motivation for



recovery and she credits her fitness level and personal determination for her success. A former triathlete, she ran a 2K a year after her stroke and has since completed two 10K races.

Unfortunately her marriage did not survive. "I knew half way through my recovery things would not be the same. The expectation was that they would be the same, but my role in the marriage as the person who took care of the house was taken away as I was recovering," says Erin. "We separated a year and a half after my stroke and it was challenging but it was for the best."

Supporting women's heart and brain health

Opportunities exist, and will only increase, to better support brain health for all women from awareness and prevention, through care and treatment and recovery. Everyone has a role to play, including: women and their families, organizations, healthcare practitioners, researchers, administrators and decision-makers at individual, community and health systems levels across the country.

What is Heart & Stroke doing?

To improve women's heart and brain health, Heart & Stroke will:

1 Encourage and invest in research for and about women.

- Leverage Health Canada's \$5 million investment in women's heart and brain health research to grow this pool of funding and maximize impact.
- Require research to address sex and gender as appropriate, including clinical trial enrollment.
- Translate knowledge to enable the development of better prevention, diagnosis, treatment, recovery and support for women.
- Increase support for the current and future generations of women scientists and Indigenous scientists in research.
- Bring together the best researchers and clinicians in women's heart and brain health, as well as individuals with lived experience and community leaders, to accelerate best-in-class research collaboration across Canada through:
 - the Heart & Stroke Women's Heart and Brain Health Research Network.
 - the Canadian Women's Heart Health Summit (co-hosted by Heart & Stroke and University of Ottawa Heart Institute's Canadian Women's Heart Health Centre).

2 Partner with system leaders, healthcare providers and people with lived experience to improve women's diagnosis and treatment.

- Ensure stroke best practice recommendations are written with a sex and gender lens and specifically address evidence-based women's brain health issues, and are widely disseminated.
- Educate healthcare providers on the risk of stroke in pregnancy and advocate for systems to ensure coordinated and timely interdisciplinary care in accordance with Heart & Stroke consensus statements on Stroke in Pregnancy.
- Advocate for training and continuing education of healthcare professionals to increase their knowledge of women's brain health and reduce the systemic bias women face in health care.

3 Facilitate connections for people with lived experience, caregivers and families.

- Nurture and build a community of peer-to-peer support, so that women living with stroke and their caregivers can connect, share resources and offer mutual support regardless of geography and income.

4 Build awareness and understanding of women's heart health.

- Educate people in Canada about the FAST signs of stroke, and differences in women-specific risk factors and prevention across the lifespan.

5 Mobilize people in Canada to take action in support of better women's brain health.

- Inspire women to be self-advocates, ask questions of their healthcare provider, learn about their personal risk, share stories, talk with other women and support collective action for improvements in women's brain health.
- Engage people with a passion for women's heart and brain health, including women living with heart disease and stroke, to influence our research, programming and advocacy efforts.
- Work with the federal government to develop an equitable and universal pharmacare strategy that improves access to cost effective medicines for all people in Canada, including women and children, regardless of geography or ability to pay.
- Work to address the needs of Indigenous women by reviewing the drugs and pharmacy products covered by the Non-Insured Health Benefits Program to enhance access to medicines and traditional healing practices.

6 Prioritize health reconciliation in our organization to build internal capacity and positively influence external networks and partners to help close the gap in Indigenous and ethnically diverse women's health.

- Work with Indigenous organizations to support and advocate for critical priorities for Indigenous women as identified by Indigenous people.
- Continue to develop the Heart & Stroke Partners Roundtable on Reconciliation to facilitate collaboration of health and Indigenous partners to build on joint strengths to address the Truth and Reconciliation Commission of Canada Calls to Action.



What can people in Canada do?

- Learn the signs of stroke and act FAST by calling 9-1-1 or local emergency medical services immediately. heartandstroke.ca/FAST
- Know and manage your stroke risk factors. Take the Heart & Stroke Risk Assessment at heartandstroke.ca/risk.
- Participate in peer-to-peer networking and support groups.
- Join the Heart & Stroke Community of Survivors and/or the Community of Care Partners. To register, go to heartandstroke.ca/connect
- Use the Heart & Stroke resources listed in the resource section (see page 21) to learn more.
- Familiarize yourself with stroke resources (see page 21) and supports within your community.

What can researchers and educational institutions do?

- All funders of health research should adopt policies which require that researchers collect, analyze and report data by sex, gender and race.
- Funders, researchers and academic institutions should develop strategies to understand and increase participation of women in stroke research.
- Researchers should develop sex- and gender-sensitive risk tools to identify lifetime stroke risk.
- Researchers should engage with the Heart & Stroke Women's Heart and Brain Research Network to increase collaboration towards better women's heart and brain health.
- Indigenous researchers and Indigenous communities should have leadership over the identification of unique health issues facing Indigenous women and have access to funding to work with non-Indigenous health researchers and others to address health inequities.
- Universities, including medical schools and continuing medical education, should deliver, as a requirement, training on sex, gender and Indigenous per Truth and Reconciliation Commission Call to Action number 24.
- All academic institutions should work to remove barriers to the advancement and leadership of women and Indigenous scientists in research.

What can healthcare systems and providers do?

- Healthcare systems should continue to implement the Canadian Stroke Best Practice Recommendations, and evaluate the quality of stroke care with a sex and gender lens. Implementation and evaluation should address the full continuum of stroke care (diagnosis, treatment, rehabilitation and prevention) across the lifespan.
- Healthcare systems should expand infrastructure and technology (such as telestroke) to provide access to optimal stroke services across the continuum of care to all people in Canada including those in rural, remote and Indigenous communities.
- Healthcare providers should deliver patient-centred, culturally appropriate, wholistic and clearly communicated risk factor and chronic disease management that meets the physical, social and emotional needs of women along the life course, especially in high risk periods such as pregnancy and postpartum.
- Healthcare systems and the federal government should expand inpatient and community-based rehabilitation and recovery services which are accessible and culturally relevant.
- Healthcare providers should create positive environments and encourage open dialogue with all women, contributing to increasing health literacy and outreach regarding brain health, and should work to support survivors, spouses, caregivers and families throughout recovery and beyond.
- Healthcare systems should recognize the importance of Indigenous traditional medicine practices and work with Indigenous communities to include wholistic approaches that address mental, spiritual, physical and emotional well-being in system planning, resource allocation and service delivery.

What can governments do?

- All funders of health research including provincial/territorial and federal governments should invest in women's brain health research, and in building capacity across all pillars including basic biomedical, clinical, health systems and population health.
- Provincial/territorial governments should ensure healthcare systems deliver individualized medicine and patient-oriented services, across the continuum of care.
- Provincial/territorial governments should continue to invest in the development of coordinated systems of stroke care that provide access to time-sensitive life-saving treatments to all Canadians regardless of geographic location, and in accordance with the Canadian Stroke Best Practice Recommendations.
- Governments should support FAST campaigns in all provinces and territories to ensure all people in Canada recognize the signs of stroke and know to call 9-1-1 or emergency medical services immediately; they should ensure FAST is communicated and/or translated into more languages.
- The federal government should work with stakeholders to develop an equitable and universal pharmacare strategy which improves access to cost effective medicines for all people in Canada, including women and children, regardless of geography or ability to pay.
- The development of a pharmacare strategy should include a review of the Non-Insured Health Benefits (NIHB) Program.
- Provincial governments and healthcare facilities should fund or subsidize stroke rehabilitation and create innovative approaches to increase access and reduce cost, so that cost and geography are not barriers for women.
- Provincial/territorial and federal governments should recognize the importance of caregivers, including those who live apart from the stroke survivors and younger caregivers, by providing increased funding and support to caregivers. Homecare services should also be enhanced through increased funding and should incorporate cultural safety training.
- All governments and health institutions should implement the recommendations from the Truth and Reconciliation Commission report, especially the Calls to Action on Health (numbers 18–24).

Resources

Heart & Stroke provides resources to support stroke survivors and their families, most of which are available at heartandstroke.ca/stroke.

- **FAST Signs of stroke.**
- **Your Stroke Journey** – This comprehensive handbook explains stroke and the recovery process.
- **Living with Stroke™** – This community-based program is designed for stroke survivors and their caregivers. It is interactive and focuses on building skills, sharing experiences and support.
- **Taking Charge of Your Stroke Recovery: A Survivor's Guide to the Canadian Stroke Best Practice Recommendations** – This resource offers stroke survivors and families information about evidence-based stroke best practices at each stage from emergency and acute care to long-term recovery. Available at strokebestpractices.ca.
- **Stroke in Young Adults: A resource for patients and families** – Developed by the Heart & Stroke Foundation Canadian Partnership for Stroke Recovery for young adults, their families and caregivers.
- **Heart & Stroke Risk Assessment** – This e-tool helps people understand and manage stroke risk factors.

- **Heart & Stroke Post-stroke checklist** – A two-page list of common issues and concerns after stroke for healthcare professionals, stroke survivors and family members.
- **Communities of Support** – Those living with the effects of stroke – or caring for someone who is – can join one of our members-only Facebook groups or sign up for our survivor-focused monthly e-news. heartandstroke.ca/connect

Additional resources

- **Canadian Stroke Best Practice Recommendations** provide comprehensive guidelines for healthcare professionals working with stroke patients and their families; patient and professional education resources have also been developed. strokebestpractices.ca
- **Stroke Engine** – Funded by the Heart & Stroke Foundation Canadian Partnership for Stroke Recovery, it provides information about rehabilitation and recovery after stroke and delivers the latest reviews on interventions and assessments for clinicians working in the field. strokeengine.ca

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Rita Lussier

Lisa Meeches

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Lynne Stacey

Julie Tomaino

Erin Zuber

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Data sources

- The poll with Canadians was conducted by Environics Research Group. A total of 2,850 respondents 18 years and older were interviewed by telephone January 2–15, 2018.
- Information in the report was identified through structured literature reviews of online medical research databases, up to March 2018, and identified through expert interviews with stroke researchers and clinicians.
- Administrative data was obtained from the Canadian Institute for Health Information (CIHI) and analyzed by Heart & Stroke. Parts of this material are based on data and information provided by the Canadian Institute for Health Information. However, the analyses, conclusions, opinions and statements expressed herein are those of the author and not those of the Canadian Institute for Health Information.

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