Canadian Stroke Best Practices™

Stroke Systems of Care

7th Edition, 2026

CANADIAN STROKE BEST PRACTICE RECOMMENDATIONS

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Canadian Stroke Best Practice Recommendations
Stroke Systems of Care, 7th Edition 2026

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INTRODUCTION AND OVERVIEW

Introduction to the Canadian Stroke Best Practice Recommendations

The Canadian Stroke Best Practice Recommendations (CSBPR) provide up-to-date, evidence-based guidelines for the prevention and management of stroke, to promote optimal recovery and reintegration for individuals with stroke and support their families and informal caregivers. The CSBPR are under the leadership of the Heart and Stroke Foundation of Canada (HSF) in collaboration with the Canadian Stroke Consortium, CanStroke Recovery Trials Platform, StrokeCog, and the Canadian Neurological Sciences Federation.

The theme of the 7th Edition of the CSBPR is building connections to optimize individual outcomes. Individuals with stroke often present to the healthcare system with multiple co-morbid conditions – some of which may have contributed to their stroke, some of which may be consequences of it, and some of which may be unrelated. Nelson et al. found that approximately 80% of individuals who survive a stroke have on average five other conditions and a range of psychosocial issues. [1] The interactions among complex co-morbid conditions must be considered to ensure treatment and ongoing care planning is personalized and person-centred.

The healthcare system is often designed in siloes, with planning and organization for different conditions operating independently, rather than being integrated and coordinated. Even within local and regional stroke systems of care, siloes can exist and continuity of care can be fractured. As individuals move through different settings and phases of care after a stroke, they often report feeling anxious and overwhelmed. Providing individualized care and ensuring connections are made across the care continuum have a significant impact on a person’s short and long-term outcomes.

The 7th Edition of the CSBPR takes a broad, wholistic focus and takes into consideration issues of multimorbidity and increasing complexity of individuals with stroke. In addition, a more purposeful review of sex and gender representation in the seminal clinical trials upon which the recommendations are based has been undertaken to determine whether the available evidence has included both male and female participants in sufficient proportions to generalize to a broader population. These findings are presented in the discussion sections of the module and integrated into the actual recommendations where appropriate. Accompanying performance measures have been expanded to include system indicators, clinical indicators and new person-reported outcome measures, supporting our wholistic focus.

The goal of disseminating and implementing these recommendations is to optimize evidence-based stroke care across Canada, reduce practice variations in the care of individuals with stroke, and narrow the gap between current knowledge and clinical practice. We aim to ensure alignment of recommendations across guidelines where possible and appropriate.

Disclaimer: The Canadian Stroke Best Practice Recommendations (CSBPR) are designed to support implementation of best practices in stroke care across Canada. Healthcare systems, health organizations and professional organizations, as well as legislation and standards, vary provincially. The CSBPR provide guidance on a national level; they do not, overall, account for provincial variations in legislation or standards. The CSBPR are not intended to supersede any provincial or local law or organizational or professional standard. In considering and implementing the CSBPR, users are encouraged to consult and follow all appropriate legislation or standards.

Overview of the Stroke Systems of Care Module

Stroke is on the rise in Canada due to an aging population, as well as an increasing incidence of younger individuals having strokes. Every year, over 108,000 strokes occur in Canada. [2] Stroke is a leading cause of adult disability, with 969,000 individuals estimated to be living with the effects of stroke in Canada in 2022-2023. [3] The total cost of stroke to the Canadian economy is over $3.6 billion per year. Organized stroke systems of care have been found to reduce rates of mortality and lead to an increased availability of resources including stroke units, specialized healthcare professionals, stroke prevention clinics, and virtual stroke care services. [4] This module applies to care provided to all stroke styles, including ischemic, TIA, hemorrhagic and cerebral venous thrombosis, as systems of care follow a similar path.

Ultimately, most individuals who experience a stroke will return to their community, to live independently or with some degree of support. The complexity and needs of individuals living in the community following stroke and their families has been increasing with shorter lengths of hospital stay and longer waits for community services. Individuals with stroke and their families have reported that coordination and integration of services are often major challenges as they try to navigate complex health care and social services, according to the Community Consultation and Review Panel, conducted in 2024. They reported “falling through the cracks” and not being able to meet their short and long-term recovery goals as a result. In addition, social determinant factors such as socio-economic status, education, and geographic location can also pose additional barriers to accessing care. Stroke systems of care need to be designed in partnership with individuals who have experienced stroke, themselves or as caregivers, and incorporate solutions to the barriers and challenges they identify.

This module synthesizes the current evidence for the development and implementation of integrated stroke systems of care and will serve as the foundation for other CSBPR modules by focusing on common, cross functional and higher-level principles and processes of stroke care planning and delivery across the continuum of care (Figure 2). It is critical that integrated and coordinated stroke systems are established locally, regionally and provincially/territorially to optimize timely access to care, optimize outcomes and meet the needs of individuals with stroke, families and caregivers. Healthcare providers and system leaders must work collaboratively with effective communication to ensure continuity of care for individuals with stroke and their families as they transition from one phase and setting of care to the next.

Topics addressed in this module are considered cross-functional and cross continuum. They include the application of core elements of a stroke system, general principles for integrated care, transitions of care, virtual stroke care, education and support for the individual experiencing a stroke, their family and caregivers, stroke care in long-term care settings, advance care planning, and palliative and end-of-life care across the continuum. While primary prevention is an important part of the continuum of care, recommendations related to primary prevention, beyond the importance of strong communication mechanisms, are out of scope for these guidelines.

Stroke best practice recommendations and clinical considerations related to Stroke Systems of Care were, in previous editions, included in other Canadian Stroke Best Practice modules, and for the Seventh edition have been brought together in this module to emphasize the importance of considering these from a more integrated perspective, across phases of care and across all possible settings where stroke care is provided, and where individuals with stroke continue their recovery and resume life roles and community participation. Specific recommendations related to each of these topics may be addressed in individual modules, [5-11] while the foundational recommendations and supporting materials will be focused on this module.

There is an urgent imperative for health systems of care to address the recovery needs of individuals with stroke, and ensure services and resources are in place and accessible to reduce complications and provide equitable opportunities for all individuals recovering from stroke to achieve optimal health outcomes. The physical, emotional, psychological, social and environmental needs of individuals with stroke are considered throughout this set of CSBP recommendations. Considerations for equity in accessing and receiving needed services and facilitating linkages to resources must be addressed at all stages of recovery.

CSBPR Stroke Systems of Care Framework

Canadian Stroke Best Practices Optimal Stroke Service Framework Overview

The Canadian stroke leaders, including collaboration between the CSBPR advisory committee, Heart and Stroke Foundation, Canadian Stroke Consortium, Canadian Neurological Sciences Federation, CanStroke Recovery Trials Platform and individuals with lived experience of stroke have developed a framework to drive timely and equitable access to stroke care and services across the continuum of care and facilitate system improvement through the adoption of evidence-based best practices and increased collaboration and integration. Stroke systems of care are driven by national efforts, and planned and implemented at the provincial, territorial and regional levels.

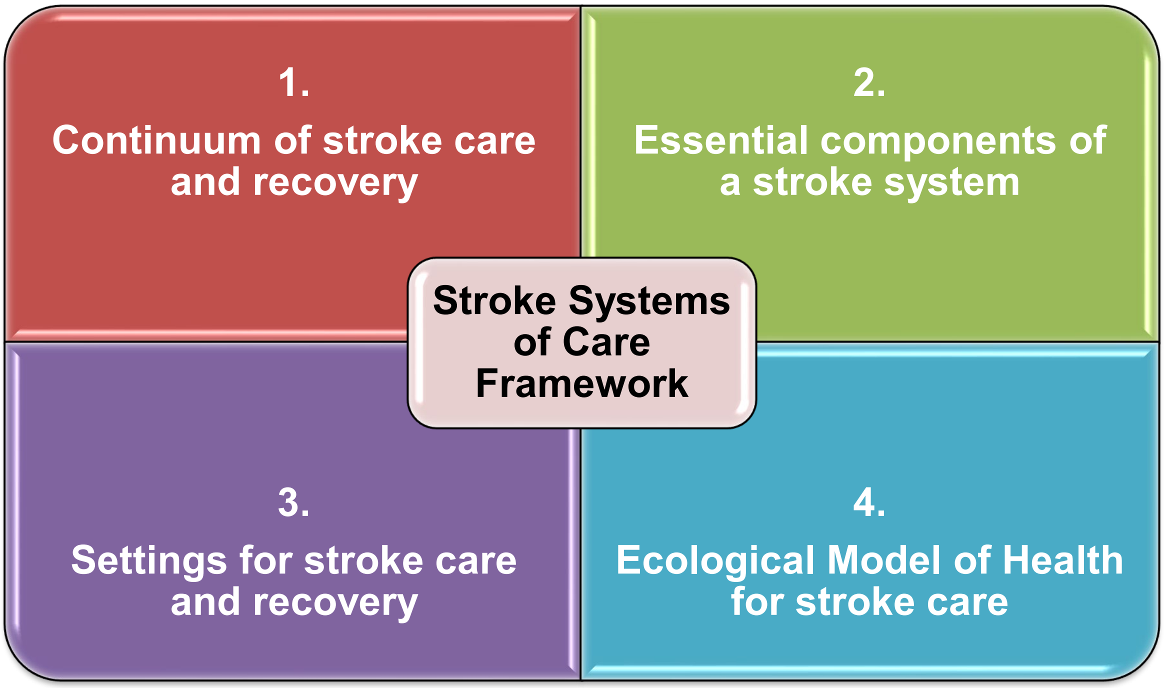
The goals of stroke systems of care are to provide timely and individualized care that is responsive to the needs of individuals with stroke, their family and caregivers, and to optimize short and long-term outcomes for individuals and the health system.

This may be accomplished by ensuring effective communication and continuity of care across all specialties and phases of care to provide collaborative integrated care, breaking down siloes, reducing delays and creating systems to address inequities based on geography, sex and gender, ethnicity, language, culture and other social determinants of health.

Within these goals it is recognized that the needs of individuals with stroke and their families are dynamic – they will change over time, and stroke systems need to be flexible and responsive and be able to support individuals with stroke and their families through these shifts. Support and management for individuals with stroke extends beyond the traditional healthcare system; it is imperative that strong collaborative relationships be built across sectors, including community services, education, leisure and vocations.

There are four components to be considered as part of the Canadian Stroke Systems of Care framework (Figure 1):

Figure 1: Stroke Systems of Care Framework



Stroke systems of care are defined as a comprehensive, diverse and longitudinal system that addresses all aspects of stroke care within an integrated, organized and coordinated approach. A stroke system spans the continuum of care from primary prevention to end of life. A stroke system ensures access to evidence-based care and therapies which optimize their survival and recovery.

Stroke systems are built and operate at several levels where planning, funding and operational management occur:

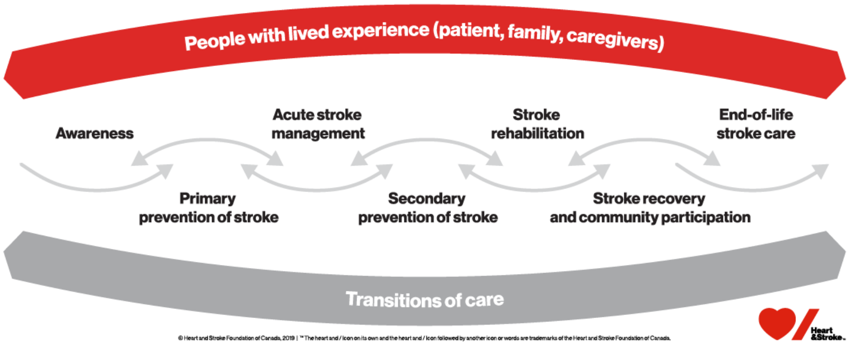
1. ***Nationally*** to address priority initiatives and support provincial and territorial work through coordination, content development, and professional communication. Work at this level generally includes establishing partnerships with national agencies including government, health charities, health professional organizations, research funding bodies, and other disease strategies with the goals of collaboration and alignment and strengthening advocacy of overlapping issues. National and international efforts also include increasing public awareness, knowledge sharing, and funding and promoting research.
2. ***Provincially or territorially*** to provide oversight and monitoring of provincial stroke systems of care, identify and address provincial/territorial priority initiatives including health system planning, funding allocations, provincial standardization of best practices, and quality improvement. Work at this level also includes collaboration and alignment with national and provincial/territorial partners such as government, health system partners, health charities, community service planners and providers, and people with lived experience. Provinces and territories also play a critical role in public awareness, prevention and health education.
3. ***Regionally and/or locally*** to provide oversight, monitoring and funding of regional stroke systems of care, and local care delivery across the continuum. Building partnerships in identifying provincial priority initiatives and aligning regional priorities. Regional and local focus on implementation of best practices, and quality improvement, supporting local public awareness and education, and outcomes for people with lived experience and the health system overall.

Integrated stroke systems take a comprehensive approach to planning and delivering care, encompassing access, assessment, treatment, clinical best practices, data collection, outcome measurement, benchmarking, guideline implementation, service organization, funding, and education.

1. Continuum of Stroke Care and Recovery

The stroke continuum of care in Figure 2 characterizes the stages that the general public and then individuals with stroke generally experience. All individuals in the general public will ideally be aware of risks for stroke and other vascular events and may consider primary prevention through routine healthcare and education interactions. Once a stroke event occurs, individuals with stroke may experience stages from acute care through to end-of-life. It is recognized that individuals who experience stroke may experience more than one stage simultaneously (e.g., secondary prevention and stroke rehabilitation) or move back and forth between stages over a period of time.

Figure 2: Stroke Continuum of Care



2. Essential Components of a Stroke System

There are key core elements that form the foundation of high-quality stroke systems of care across the continuum and in all settings where appropriate. The five pillars of the original Canadian Stroke Strategy have evolved over time into the current eight essential components of the Stroke Systems of Care framework, presented in Figure 3 and Table 1.

A critical element of the core components in stroke systems of care is accountability for disparities in care experienced by individuals and populations disproportionately impacted by inequities, such as in indigenous, racialized, rural, gender-diverse populations.

These components have matured and progressed over time as stroke knowledge, evidence, practice, technology and care have advanced. Elements within each component can be applied across the stroke continuum of care (as per Figure 2) where relevant, and all components are inter-related to each other.

Figure 3: Essential Components of a Stroke System

Refer to Table 1 for detailed descriptions of each component.

Table 1: Essential Components of a Stroke System

Stroke System Leadership • Provincial leaders, strategic and operational direction and authority for implementation • Federal structures for Indigenous Communities and programs, population health • Regional and local leadership • Policy and position statements (e.g., pharmacare, endovascular thrombectomy funding, virtual care access) • Dedicated funding models	***Engagement of Individuals with Stroke, Family and Caregivers*** • Person-centred care • People with lived experience (PWLE) as collaborators, advisors, community consultation panels • Peer support, story telling • Online support communities • Partners in all pillars • Cultural humility
Clinical Practice • Includes all stroke types – ischemic, TIA, hemorrhagic, cerebral venous thrombosis • Evidence-based • Individualized • Coordinated and integrated • Timely and accessible • Equitable • Technology enhanced	***Quality Monitoring and Improvement*** • High quality data at multiple integrated levels • Performance Measurement Framework: Key quality indicators, Structure, Process and Outcome measures, patient-reported experience and outcome measures (PREMS, PROMS) • National surveillance statistics (Public Health Agenncy of Canada, Stats Can, Canadian Institute of Health Information) and socio-economic data • Resource and Services Inventories (RaSI's) • Culture of continous improvement
Research • All areas from bench to bedside and Strategy for Patient-Oriented Research (SPOR) • Personnel awards • Impact grants • Networks and collaboratives • Training programs	***Knowledge Translation*** • Canadian Stroke Best Practice Recommendations • Professional Education • Health information and education for Individuals with stroke, their families and caregivers, Public • Resources and toolkits • Decision aids for shared decision-making
Advocacy and Awareness • FAST Campaign • Prevention – risk factor reduction • Personal stories • Partnerships and coalitions • Equity, diversity, Inclusion	***Partnerships and Relationships*** • Healthcare professionals across all disciplines • Collaborative groups (examples, C-Change, Brain-Heart Interconnectome, Diabetes Canada, Hypertension Canada, Thrombosis Canada) • Professional organizations • Healthcare Services • Health charities • Research funders • Service providers and NGOs (e.g., March of Dimes)

3. Settings for Stroke Care and Recovery

Settings for stroke care across the stroke continuum refers to the physical locations where care is delivered to and received by individuals who have experienced a stroke, their families and caregivers across the continuum of care (refer to Figure 2).

These settings may include:

- the prehospital phase with emergency medical services (ambulance),
- emergency department, acute stroke unit, other acute care hospital wards, intensive care unit (may also be transferred between acute care hospitals with different levels of stroke services - e.g., small community hospital to a comprehensive stroke centre)
- inpatient rehabilitation units and facilities
- outpatient clinics (e.g., secondary prevention and rehabilitation clinics)
- community nursing and health outpost stations (remote/ rural areas)
- a wide range of community-based facilities and services
- complex care
- long-term care
- an individual’s home and place of residence (consider unhoused situations and other challenges)
- respite care facilities/services
- palliative care, hospice care
- virtual healthcare delivery

The essential components of stroke systems should be considered and applied across all settings where relevant with appropriate nuances considered.

4. Ecological Model of Health Adapted for Stroke Systems of Care

Within stroke systems in Canada, the levels of the ecological model of health systems are also considered in health systems design and implementation (Figure 4). This model considers how individuals interact with increasingly broader levels of their community and environment as they address health behaviour change and experience specific health journeys such as dealing with a stroke event. The model in Figure 4 has been adapted for stroke, with input from system leaders, clinicians, researchers and importantly people with lived experience. It can be used to provide additional insights and considerations when planning and delivering high quality stroke care across the continuum.

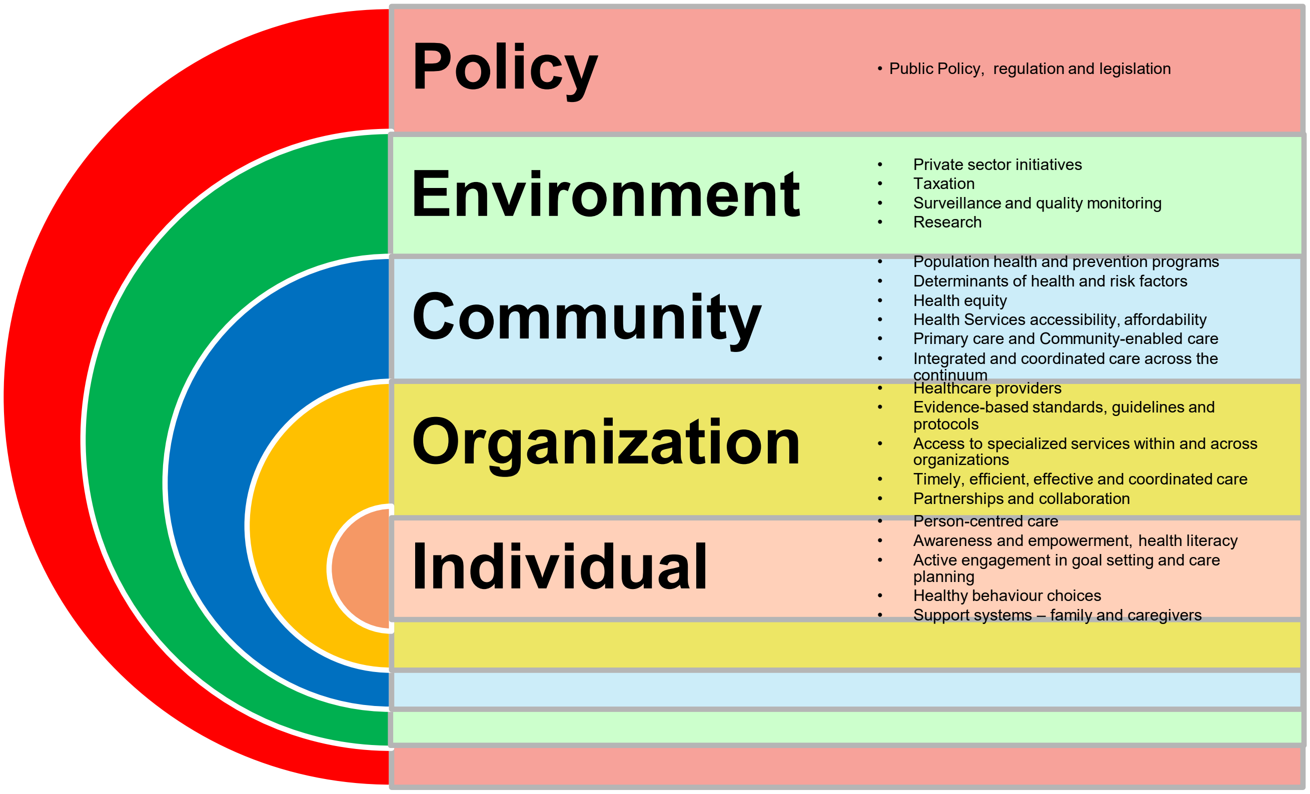


Figure 4: CSBPR Adaptation of Ecological Model of Health Systems for Stroke [12, 13]

Definitions and Descriptions

Advance Care Plan is defined as written communication by a competent individual imparting their preferences regarding potential future healthcare decisions. These plans are to be referred to in the event of future incapacity of the individual.

Advance Care Planning is a process of reflection and communication. It is a time for individuals to reflect on their values and wishes, and to communicate their preferences about future healthcare decisions if they were unable to speak for themselves. (Adapted from: https://www.advancecareplanning.ca/acp-basics/glossary/)

Caregiver refers to a family member or friend who is unpaid and involved in the care of an individual who has had a stroke across their illness and recovery trajectory. They assist with many aspects of care including activities and basic and instrumental activities of daily living, attending to healthcare needs, supporting emotional needs, advocacy, rehabilitation, and community re-integration and resuming life roles. As an integral member of the care team, they need to be recognized and supported in their caregiving role and their capacity to provide the many facets of care.

Community is defined as the physical and social care environment where individuals may live after having a stroke. It includes any non-healthcare setting, where one would reside and resume life roles and activities following a stroke, such as a family home, assisted living facility, long-term care, or other habitational settings.

Community Participation involves return to meaningful engagement in desired basic and instrumental activities of daily living, community interests and life roles, including vocational and educational, following a stroke. The term encompasses the return to active community living and contributing to one's social groups and family life. Community reintegration includes identifying meaningful goals and, through structured interventions, facilitates resumption of these activities to the best of the individual's abilities.

Continuity of Care is the delivery of healthcare services by different providers in a coherent, logical, and timely fashion across the continuum of stroke care. [14]

Goals of Care are the clinical and personal goals for individuals with stroke that are determined through a shared decision-making process. They reflect a shared understanding between individuals, family, caregivers, other support people and the clinical team. (Adapted from the Australian Commission on Safety and Quality in Health Care. [15])

Integrated Care is a coordinated approach that involves multiple providers from various specialties working together to support an individual's health and well-being over time. It's a person-centered approach that focuses on what matters to the individual, ensuring that care is continuous and seamless across different settings and providers, as defined by the International Foundation for Integrated Care.[16]

Self-management refers to the ability of individuals to manage their health following a stroke to optimize rehabilitation and recovery and prevent recurrent stroke. It includes knowledge, skills, attitudes and behaviours to enhance self-efficacy for managing physical, cognitive and lifestyle changes. It involves active participation of the individual and may include a plan developed collaboratively with healthcare providers, families, and caregivers.

Stroke System Navigation is a comprehensive and collaborative process that facilitates achieving optimal person-centred outcomes by overseeing, coordinating, and integrating care. This process involves continuous assessment of individual needs and providing wholistic support to individuals, families, and caregivers throughout the stroke recovery journey. By supporting timely access to healthcare services and resources, and mitigating barriers and challenges, stroke system navigation aims to enhance quality of life and promote the highest level of functioning and independence. This process is often overseen by roles such as case managers or stroke navigators, where such resourcing and capacity is available.

Stroke Rehabilitation is a progressive, dynamic, goal orientated process that addresses stroke-related impairments, activity limitations and participation restrictions to optimize individuals' physical, cognitive, emotional, communicative, and social functional levels. In the complex stage of stroke, rehabilitation may also focus on maintaining current functional abilities and preventing or slowing future functional decline and secondary health conditions (such as depression).

Support refers to providing direct care, access to required services, and facilitating linkages to resources to ensure individual, family and caregiver needs, and recovery goals are met throughout the continuum of stroke care. The goal is to manage recovery and optimize health outcomes, participation and fulfillment of life roles. Support needs can change across the illness and recovery trajectory and are most beneficial when closely matched to the individual, family, and caregiver's current needs.

Types of individual, family and caregiver needs may include:

- Emotional (e.g., providing comfort, listening to problems, coping skills)
- Instrumental (e.g., providing training, organizing services, direct care, connection to required services, helping with household chores, financial support)
- Informational (e.g., providing information about illness and services)
- Appraisal (e.g., providing feedback about their caregiving activities)

Transition refers to the movement of individuals across various healthcare locations, services, settings, providers and stages of care and recovery (physical, psychological, emotional, social, environmental).

Transition Management includes working with individuals with stroke, their families, and caregivers to establish and implement a transition plan that includes goal setting which has the flexibility to respond to evolving needs. Successful transition management requires intersectoral collaboration and communication among healthcare providers, individuals with stroke, their families, and caregivers. It encompasses the organization, coordination, education, and communication required as individuals move through the stages and settings for stroke treatment, recovery, reintegration in the community, adaptation, and end-of-life care. Note that a transition plan includes discharge planning.

The goal of transition management is to facilitate and support seamless movement and continuity across the continuum of care, and to achieve and maintain optimal treatment, outcomes, adaptation, and quality of life for individuals with stroke, their families and caregivers. This incorporates physical, cognitive, communication, emotional, environmental, financial and social factors.

Virtual Health is a broad ‘umbrella term’ that encompasses all the ways healthcare providers remotely interact with and on behalf of their individuals with stroke that does not involve in-person contact.

Virtual Healthcare has been defined as any interaction between individuals and one or more members of their health circle of care, occurring remotely, using any forms of communication or information technologies with the aim of providing and for maximizing the quality and effectiveness of individual with stroke care.

- Virtual care encompasses all means by which healthcare providers interact with individuals separated by space (in different locations) and/or time (synchronicity) - often called virtual visits.
- A virtual visit is an electronic exchange via teleconferencing, videoconferencing, secure messaging, or audio digital tools, where one or more healthcare providers deliver healthcare services to an individual with stroke.
- Includes: Provider to an individual with stroke/Family, and Provider to Provider.

Notable Updates for CSBPR Stroke Systems of Care, Update 2026

1. Redevelopment of this module, bringing together topics that cross the continuum of care and provides the general principles and structural elements (Section 1) from a wholistic systems perspective, that other modules can then build on and specify for their topic area.
2. Stronger emphasis on people-centred care and working with individuals and their family across the full continuum of care and across all transition points.
3. Development of a comprehensive framework for education of individuals with stroke, their family and caregivers, that considers the individual’s abilities, health literacy, comprehension levels, values and preferences, and offered in a variety of languages. Further these recommendations highlight that all healthcare providers share a responsibility for providing education throughout the stroke journey.
4. Recognition of the important role of virtual care across the continuum and integration into routine care, where appropriate.
5. Focus on the importance of advance care planning, palliative and end-of-life care for individuals with stroke along the continuum of care, including consideration of MAiD when appropriate.

Guideline Development Methodology

The CSBPR present high-quality, evidence-based stroke care guidelines in a standardized framework. As healthcare providers across all disciplines implement these recommendations, it is expected that practice variations will be reduced and gaps between evidence and practice will start to close, leading to improved outcomes for individuals with stroke.

The methodology used to develop this module has followed our thorough and rigorous process. *Refer to CSBPR Overview of Methodology for additional detail.* [17] Key steps in our development process have included:

1. Establish an expert interprofessional writing group representing relevant disciplines across the continuum of care and a range of settings and striving for balance regarding gender and overall diversity. *Refer to Appendix One for a list of writing group members and affiliations.*
2. Consult with the *Stroke Systems of Care* Community Consultation and Review Panels, comprising individuals with stroke, informal caregivers, and family members.
3. Select clinical questions to address in the module using the population/problem, intervention or exposure, comparison, and outcome (PICO) format, where appropriate and applicable.
4. Conduct a systematic search and appraisal of research literature to June 2025 and update evidence summary. Refer to the assigning evidence levels section of this module for more information on the GRADE approach.
5. Conduct a systematic search and appraisal of external reference guideline recommendations.
6. Scientific writing group and the community consultation panels develop, review and finalize a set of recommendations, address clinical questions, review and discuss benefits, risks, and harms of proposed recommendations, and adhere to the elements of the Agree 2 criteria where appropriate. [18] This includes consideration of individual values and preferences, informed by the community consultation panels and available evidence.
7. Scientific Writing Group rates the strength of the recommendations and the quality of evidence following GRADE criteria.[19-21]
8. Review of the proposed module by the Canadian Stroke Best Practices Advisory Committee, and incorporation of edits as required, with further consideration of benefits, risks, and harms.
9. Review of the proposed module by external leading experts in Canada and internationally, and incorporation of edits as required. *Refer to Appendix Two for a list of External expert reviewers*
10. Obtain final approval and endorsement and undertake French translation.
11. Update educational materials and implementation resources.
12. Disseminate through publication and public release knowledge translation activities.
13. Continue with ongoing review and update process.

More detail for each of these steps is available in the CSBPR Overview, Methods and Knowledge Translation manual [17] *on the Canadian Stroke Best Practices website. www.strokebestpractices.ca*

Assigning Evidence Levels

The Grading of Recommendations, Assessment, Development and Evaluation (GRADE) [22] methodology and terminology has been applied throughout these guidelines. With GRADE, each recommendation was assessed for:

1. The strength of the guidance (strong or conditional), based on the balance of desirable and undesirable consequences, quality of evidence, values and preferences of those affected, and resource use.
    - A strong recommendation is one for which the guideline panel is confident that the desirable effects of an intervention outweigh its undesirable effects.
    - A conditional recommendation is one for which the guideline panel finds that the desirable effects probably outweigh the undesirable effects, but appreciable uncertainty exists.

    and

2. The quality of the evidence (high, moderate, low) upon which the recommendations are formulated: risk of bias, directness of evidence, consistency and precision of results, risk of publication bias, magnitude of the effect, dose-response gradient, and influence of residual plausible confounding.

The writing group was provided with comprehensive evidence tables that included summaries of high-quality evidence identified through the structured literature searches. The group discussed and debated the quality of the evidence and through consensus developed a final set of proposed recommendations. Each recommendation was assigned a rating as to the strength of the recommendation and the quality of the evidence. Where appropriate and feasible, full GRADE review and analysis using relevant GRADE tables has been conducted (GRADE Handbook).[22]

Clinical Considerations

The CSBPR uses the additional category of clinical considerations, consisting of expert opinion statements. These are included when it is determined that guidance related to common clinical issues would be helpful, but the topic lacked sufficient evidence to form an actual recommendation.

Conflicts of Interest

All potential participants in the recommendation development and review process were required to complete confidentiality agreements and declare all actual and potential conflicts of interest prior to participation. Declared conflicts of interest were reviewed by the co-chairs of the CSBPR Advisory Committee and Heart & Stroke staff to assess the potential impact. Those with significant conflicts with respect to the module topic were not selected for writing group or reviewer roles.

Participants who have conflicts for a particular topic area were identified at the beginning of discussions for that topic and were recused from voting. If a co-chair is in conflict, they were recused from their responsibilities for that discussion, and another non-conflicted participant assumes the role for that discussion and vote. Heart & Stroke senior staff members participated in all writing group discussions and intervene if they perceived an untoward bias by a writing group member.

Conflict of interest declarations for the *Stroke Systems of Care* module writing group members can be found in Appendix One.

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Community Consultation and Review Panel

Heart & Stroke is especially grateful to the members of the *Stroke Systems of Care* Community Consultation and Review Panel (CCRP) who worked in tandem with the scientific writing group for this module and shared their personal experiences and insights on living with stroke and optimizing recovery and health outcomes. CCRP members include Cyndi Barron, Barry Bowser, Patricia Bukowsky, Heather Quale Goranson, Sarah Lansdown, Cheryl Kimberly Ann MacKenzie, Akira Neeson, Matthew Ranta, and Sydney Reid Smith.

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English link: https://www.cambridge.org/core/journals/canadian-journal-of-neurological-sciences/article/canadian-stroke-best-practice-recommendations-stroke-systems-of-care-7th-edition-2026/3203476844458D1BFA16A7B40C631B0A

French link: Will be added once available (online supplement)

Comments

The Heart and Stroke Foundation of Canada’s stroke team invites your comments, suggestions, and inquiries about the development and application of the CSBPR at strokebestpractices@heartandstroke.ca.

STROKE SYSTEMS OF CARE MODULE, 7TH EDITION, 2026

Section 1 Core Elements of Stroke Systems of Care

1. Core Elements of Stroke Systems of Care Recommendations 2026

1.0 Structure of Stroke Systems of Care

i. All regions in Canada should have integrated and coordinated systems in place to ensure individuals with stroke receive timely acute stroke care and ongoing management to optimize recovery and outcomes [Strong recommendation; Moderate quality of evidence].

ii. A stroke system should support local and regional educational initiatives to increase stroke awareness (including stroke warning signs, risk factors, primary and secondary prevention, and recovery), aimed at the general population with enriched targeting of populations at increased risk for stroke and poor outcomes after stroke [Strong recommendation; Moderate quality of evidence].

iii. A stroke system should monitor the effectiveness of community education in improving behavioral responses to signs of stroke, stroke treatment rates, mortality, and other relevant outcomes [Strong recommendation; Moderate quality of evidence].

iv. A stroke system should support communities and providers in initiating prevention programs and services applicable to broad populations [Strong recommendation; Moderate quality of evidence].

1.1 Core Elements of a Stroke System

i. Organized and integrated stroke systems of care should be established and sustained with continuous quality improvement in every health region in Canada [Strong recommendation; Moderate quality of evidence].

ii. Components of an integrated stroke system should include:

   a. Leaderships and partnerships established in each region, including an oversight committee and coordinating body with interdisciplinary representation to oversee stroke systems [Strong recommendation; Low quality of evidence].

   b. Public awareness and education about the signs of stroke and actions to take [Strong recommendation; Moderate quality of evidence]. *Refer to Section 2 of this module for additional information.*

   c. Strategies and processes that are collaborative, co-developed and inclusive should be in place to identify and purposely address the needs of specific populations disproportionately impacted by health inequities and/or who face increased barriers to accessing care, such as Indigenous, South-Asian and Black populations, newcomers to Canada, and gender-diverse and 2SLBGTQIA+ communities [Strong recommendation; Moderate quality of evidence].

   d. Primary prevention strategies should be in place to screen those at highest risk for stroke using validated tools, clearly identifying lines of responsibility and appropriate time points (such as at periodic health exams, prenatal visits) [Strong recommendation; Moderate quality of evidence]. *Note: additional guidance on primary prevention of cardiovascular risk factors is out of scope for this set of recommendations.*

   e. Implementation mechanisms to support primary prevention treatment regimens [Strong recommendation; Moderate quality of evidence].

   f. Public emergency response system (e.g., 911) with specific protocols for stroke [Strong recommendation; Moderate quality of evidence]. *Refer to the CSBPR Acute*

Stroke Management Module, Section 3 for additional information on emergency medical systems for stroke.[7]

g. Emergency medical systems transport protocols and bypass agreements should be in place to ensure rapid access to closest most appropriate hospital with acute stroke management capability [Strong recommendation; Moderate quality of evidence]. *Refer to the CSBPR Acute Stroke Management Module, Section 3 for additional information.*[7]

h. A defined network of acute care hospitals that includes sites with emergent acute stroke management capability (comprehensive stroke centres and or district/secondary centres), including access to vascular imaging, acute thrombolysis, endovascular therapy, acute stroke, cerebrovascular surgery, and standardized inpatient protocols [Strong recommendation; High quality of evidence].

   Note, within the Canadian Stroke strategy, every hospital in Canada has been categorized within one of five levels of acute stroke management capability, ranging from full service comprehensive stroke centres (Level 5) to small remote and rural centres that do not have a CT scanner on premises (Level 1). Refer to the CSBPR Acute Stroke Management Module, Figure 2 for a detailed figure describing the criteria for each acute stroke management service level.[7]

i. Designated interprofessional team members with expertise and training in stroke management across each part of the continuum of care [Strong recommendation; Moderate quality of evidence].

j. Interprofessional care planning and effective communication to ensure continuity of care, safety, and to reduce risk of complications and adverse events during stroke care particularly at transition points [Strong recommendation; Low quality of evidence]. *Refer to Section 3 of this module for additional information.*

k. Stroke rehabilitation services that are able to meet individual care needs and goals in a timely basis [Strong recommendation; High quality of evidence]. *Refer to the CSBPR Rehabilitation, Recovery and Community Participation following Stroke modules, Parts One, Two and Three, for additional information.* [7,8,76]

l. Stroke prevention clinics (or similar vascular prevention clinics, services or models of care) that use standardized and evidence based referral processes to provide a comprehensive interdisciplinary approach to prevention of first or recurrent stroke, conduct detailed assessments by a range of healthcare disciplines and across specialties, facilitate timely access to appropriate diagnostic testing and interventions, and provide education to individuals and families [Strong recommendation; High quality of evidence]. *Refer to the CSBPR Secondary Prevention of Stroke module for additional information.* [6]

m. Mechanisms to promote continuity of care between acute care facilities, rehabilitation, prevention and community services, the individual with stroke, their family and caregivers, and primary care providers [Strong recommendation; Moderate quality of evidence].

n. Seamless and timely information flow with integrated clinical information systems across settings and care providers that enable rapid access to medical information to facilitate timely care, continuity, and safe transitions of care [Strong recommendation; Moderate quality of evidence]. *Refer to Section 3 of this module for additional information.*

o. Programs and services that raise awareness of, and assist in the management of mental health, psychosocial and emotional needs for individuals with stroke, their families and caregivers at all stages across the continuum of care [Strong recommendation; Moderate quality of evidence]. *Refer to the CSBPR Rehabilitation,* *Recovery and Community Participation following Stroke module, Part Three, Section 1 for additional information.* [9]

p. Organized community services and accessible resources to support optimum recovery, adaptation, and community participation (social, leisure); including access to supports and services at home to meet the individual needs of individuals with stroke and their family and caregivers [Strong recommendation; Moderate quality of evidence]. *Refer to the CSBPR Rehabilitation, Recovery and Community Participation following Stroke module, Part Three for additional information.* [9]

q. Longterm care/housing protocols, policies and staff training to facilitate access and effective stroke management that support ongoing individual needs following stroke. These should optimize the individual's quality of life by addressing continued rehabilitation needs, meaningful participation, and ensuring access to clinicians with stroke knowledge and expertise [Strong recommendation; Moderate quality of evidence]. *Refer to Section 7 of this module for additional information.*

r. Ongoing medical follow-up with primary care and other services for individuals in the community appropriate to their unique needs, which may address evaluating progress of recovery, preventing deterioration, maximizing functional and psychosocial outcomes, preventing stroke recurrence, and improving quality of life [Strong recommendation; Moderate quality of evidence].

s. Advance care planning, end of life, palliative care and MAiD support and services in place across the continuum [Strong recommendation; Moderate quality of evidence]. *Refer to Sections 8 and 9 of this module for additional information.*

t. Virtual stroke care services that enhance access and capacity through the integration of virtual technologies for assessment, treatment and care delivery [Strong recommendation; Moderate quality of evidence]. *Refer to Section 4 of this module for additional information.*

u. Data monitoring systems to collect and monitor health system performance and outcomes, effectiveness, appropriateness and equity, to inform ongoing care delivery and future planning, including standardized reporting to enable continuous surveillance and improvement [Strong recommendation; Moderate quality of evidence].

v. Education and training in shared decision-making skills and strategies for all healthcare professionals, individuals with stroke, families, and caregivers [Strong recommendation; Moderate quality of evidence]. *Refer to Section 5 of this module for additional information.*

Section 1 Clinical Considerations

1. Stroke systems of care should be designed to ensure equitable access to healthcare services for all individuals, regardless of race, ethnicity, gender, socioeconomic status, geographic location, disability, sexual orientation, or other social determinants of health. All facilities delivering care for individuals with stroke should proactively identify and address barriers to care, implement culturally and linguistically appropriate services, and integrate equity-focused strategies into quality improvement initiatives to promote fair and just health outcomes for all individual populations.
2. Healthcare systems are under considerable stress and access to services may be driven by capacity and resourcing, resulting in unjustified variations between centres. It is important to ensure that systems are in place to optimize access to the right care regardless of where an individual is geographically located at the time their stroke occurs.
3. Time sensitive care also extends beyond acute stroke management to the full continuum including access to rehabilitation and recovery care, secondary prevention services, as well as community and long-term care supports.

4. Interprovincial and interregional collaboration in place to develop processes to increase access to services and resources where they may not be available in an individual region or province.

Rationale

Worldwide, stroke is a leading cause of death and disability. Every year, over 108,000 strokes occur in Canada. [2] Stroke is a leading cause of adult disability, with 969,000 individuals estimated to be living with the effects of stroke in Canada in 2022/23. [3] The lifetime risk of stroke has also increased over the last 20 years by 50% and is now one in four individuals. [23] Projections of stroke burden up to 2050 are estimated to include 21.43 million stroke cases globally, 159.31 million survivors, 12.05 million deaths, and 224.86 million disability-adjusted life years due to stroke.[24] The public health implications and significant financial burden of these projections, highlight the urgent need for effective, integrated accessible, equitable and affordable coordinated systems of stroke care. In 2004 the Canadian Stroke Strategy (CSS) was launched, calling on every province and territory in Canada to build an integrated approach to stroke care from public awareness through emergent and acute care, rehabilitation, prevention, and long-term recovery, and end-of-life care. The national CSS leadership provided tools and resources to support provincial, territorial, and regional efforts including the Canadian Stroke Best Practice Recommendations, signs of stroke campaigns, performance measures and active data collection mechanisms. Each province, territory and region has evolved access and quality of stroke services at different paces, and vary based on available leadership, funding, capacity, and resources.

Integrated and coordinated stroke systems of care, established locally, regionally and provincially/territorially have been shown to optimize timely access to care, increase equity and reduce disparities in access to stroke services across the continuum, optimize outcomes and better meet the needs of individuals with stroke, their family and caregivers. Healthcare providers and system leaders must work collaboratively with effective communication to ensure continuity of care for individuals with stroke and their families as they transition from one phase and setting of care to the next. Health equity is a foundational principle of high-quality healthcare. Disparities in access can lead to poorer health outcomes and perpetuate systemic inequalities. By embedding equity into clinical practice, healthcare systems uphold ethical standards, enhance individual trust and satisfaction, and contribute to the reduction of health disparities.

Individuals with lived experience of stroke describe navigating the stroke care system as complex and at times, challenging. They emphasize that the time following a stroke can be difficult and confusing for the individual with stroke as well as their family and caregivers, making navigating the system that much harder. They further stress that the system can be made more difficult to navigate because of such factors as accessibility and availability of local support services, services that are not provided in a preferred language, services that are not culturally sensitive, relevant and appropriate and communication challenges that exist across the continuum of care. The importance of considering sex/gender differences in stroke care is also highlighted, as part of providing person-centred care. They encourage healthcare providers to work collaboratively with the individual with stroke, family and caregivers in stroke system planning and care delivery.

System Implications

To ensure individuals experiencing a stroke receive timely stroke assessments, interventions and management, interdisciplinary teams need to have the infrastructure and resources required. These may include the following components established at a systems level.

1. Stroke systems of care are recognized as a priority program in all provinces and territories with appropriate dedicated funding and human resource planning.
2. Coordination and collaboration among healthcare partners across the continuum to deliver seamless and timely care.
3. Elimination of siloes within healthcare services to increase efficiency and enable individuals with stroke to access needed services in a timely way.

4. Stroke systems have dedicated leadership and governance responsible for leading and coordinating acute, rehabilitation and recovery stroke services across the stroke system of care.
5. The health system engages with urban and rural populations to understand and identify barriers that prevent their timely access to coordinated acute and rehabilitation stroke services (AC standards).
6. Conduct regular assessments to identify gaps in stroke care access and outcomes across the continuum.
7. Provide staff training on implicit bias, cultural responsiveness, and health equity.
8. Processes for incorporating individual circumstances, such as social determinants of health, into stroke clinical workflows.
9. Engage with communities to co-design solutions that address local access barriers to stroke services across the continuum of care.
10. The development and implementation of an equitable and universal pharmacare program, implemented in partnership with the provinces, designed to improve access to cost-effective medicines for all individuals in Canada regardless of geography, age, or ability to pay. This program should include a robust common formulary for which the public payer is the first payer.

Performance Measures

System indicators:

1. The number and proportion of acute care hospitals participating in a regional or provincial stroke network.
2. The proportion of all hospitals in a province affiliated with a secondary or tertiary stroke centre that provides acute stroke treatment.
3. The presence of an integrated evidence-driven emergency medical services stroke alert and response system in each region.
4. Proportion of the population who live within 4.5, 6 and 24 hours by ground transportation of an acute stroke-enabled hospital (I.e., CSBPR stroke services level 3, 4, or 5; with CT scanner on-site and ability to deliver intravenous thrombolysis).
5. The number and proportion of geographic regions in Canada with access to stroke neurology, neurosurgical, neurointerventional and stroke rehabilitation clinical experts within guideline informed timelines to access required stroke care.
6. The number and proportion of stroke centres regularly submitting data to a stroke quality improvement database which is regularly accessed to inform planning and care delivery.
7. The amount of research funding directed towards stroke annually across Canada.
8. Number of stroke centres that actively participate in clinical stroke research trials annually.
9. Proportion of stroke centres operating with a broad team of interdisciplinary stroke expert healthcare professionals; and the proportion with extended vacancies or gaps in expertise.
10. Availability and use of stroke clinical pathways/protocols across stroke centres, aligned to the CSBPR modules (e.g., EMS triage and transportation, initial emergency assessment and imaging, intravenous thrombolysis, stroke unit care, rehabilitation assessments).

Process indicators:

1. Time from publication to integration of new technologies and therapies for stroke (e.g., late window thrombolysis, wearable monitoring) into care pathways.
2. Staff participation in continuous professional development related to stroke.

3. Proportion of stroke centres in Canada with a designated stroke coordinator or system navigator.

Person-oriented outcome and experience indicators:

1. Proportion of individuals with stroke enrolled in stroke research studies in Canada annually among centres actively engaged in research.
2. Quality of life of individuals after discharge for an acute stroke event, measured at transition points and routinely throughout recovery (for example, at 60, 90, 180 days and 1 year following discharge).

Implementation Resources and Knowledge Transfer Tools

Resources and tools listed below that are external to Heart & Stroke and the Canadian Stroke Best Practice Recommendations may be useful resources for stroke care. However, their inclusion is not an actual or implied endorsement by the Canadian Stroke Best Practices or Heart & Stroke. The reader is encouraged to review these resources and tools critically and implement them into practice at their discretion.

Healthcare Provider Information

- Heart & Stroke: Taking Action for Optimal Community and Long-Term Stroke Care: A resource for healthcare providers: https://www.strokebestpractices.ca/resources/professional-resources/tacls
- CorHealth Ontario: Smart Tips for Stroke Care: A healthcare providers guide to caring for a person with stroke. https://www.corhealthontario.ca/resources-for-healthcare-planners-&-providers/stroke-general/smart-tips-for-stroke-care

Resources for Individuals with Stroke, Families and Caregivers

- Heart & Stroke: Signs of Stroke: http://www.heartandstroke.ca/stroke/signs-of-stroke
- Heart & Stroke: FAST Signs of Stroke…what are the other signs?: https://www.heartandstroke.ca/stroke/signs-of-stroke/fast-signs-of-stroke-are-there-other-signs
- Heart & Stroke: Your Stroke Journey: https://www.heartandstroke.ca/-/media/pdf-files/canada/your-stroke-journey/en-your-stroke-journey-v20.pdf
- Heart & Stroke: Post-Stroke Checklist: https://www.heartandstroke.ca/-/media/1-stroke-best-practices/resources/patient-resources/002-17_csbp_post_stroke_checklist_85x11_en_v1
- Heart & Stroke: Enabling Self-Management Following Stroke Checklist: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbpr-enabling-self-management-following-stroke-checklist-jan2021-final.pdf?rev=03b045c41df04abfb7f4cb652869f031
- Heart & Stroke: Virtual Healthcare Checklist: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbp-infographic-virtual-healthcare-checklist.pdf?rev=bf2f5b0e9e4a49cfbfc251208b6a15e2
- Heart & Stroke: Recovery and Support: https://www.heartandstroke.ca/stroke/recovery-and-support
- Heart & Stroke: Online and Peer Support: https://www.heartandstroke.ca/heart-disease/recovery-and-support/the-power-of-community

- Heart & Stroke: Services and Resources Directory: https://www.heartandstroke.ca/services-and-resources
- Stroke Engine: http://www.strokengine.ca/

Summary of the Evidence

In Canada, there is no national legislation specifically mandating or regulating stroke systems of care, unlike in some countries where legislation explicitly governs stroke networks. However, stroke systems of care are strongly supported through national frameworks, provincial health authorities, and evidence-based clinical guidelines. Key governance mechanisms include 1) the Canadian Stroke Best Practice Recommendations (CSBPR), 2) provincial and territorial stroke strategies, such as the Ontario Stroke System (Ontario Health) and the Alberta Stroke Program, which coordinate stroke care delivery, regional stroke centres, EMS protocols, and quality improvement initiatives, 3) standardized performance measurement frameworks and data monitoring mechanisms, such as CIHI stroke special projects, 4) Accreditation Canada, whereby hospitals, whose participation is voluntary, are assessed on their adherence to best practices, and 5) EMS bypass protocols that support stroke-specific bypass protocols, ensuring individual with stroke are transported to facilities with appropriate levels of care (e.g., PSC or CSC).

A clearly defined network of acute care hospitals is essential for the delivery of timely and effective stroke care. In Canada, the network includes 1) comprehensive stroke centres (CSC, n=42), which provide advanced neuroimaging (CT/MRI, perfusion, angiography), 24/7 endovascular thrombectomy (EVT) services, neurosurgery and neurocritical care, acute stroke units, rehabilitation, and secondary prevention, 2) Primary Stroke Centres (PSCs), which can deliver emergent stroke care, including 24/7 access to CT imaging and interpretation, intravenous thrombolysis, and can admit individual with stroke to an acute stroke unit or designated stroke beds. In PSCs, individual with stroke requiring EVT or neurosurgical intervention may be transferred to a CSC, and 3) District Stroke Centres (DSCs), capable of proving an initial assessment and stabilization, particularly in rural or smaller communities, but which may not have full imaging or thrombolysis capability but are integrated within a stroke referral network with EMS bypass protocols and telemedicine support.

An ideal stroke system of care is defined as one that is comprehensive, diverse and longitudinal, one that addresses all aspects of stroke care within an integrated, organized and coordinated approach. A stroke system spans the continuum of care from primary prevention to end of life and is composed of many components. Specific key elements of an acute system include the provision of care on a stroke unit, the availability of CT or MRI and carotid doppler imaging for individual with stroke, and access to neurosurgical services. The ideal system also incorporates performance monitoring, continuous quality improvement, and structured transitions from acute care to rehabilitation and long-term recovery, with a focus on secondary prevention and community reintegration. The benefit of the application of this bundle of acute stroke services was examined in a retrospective study including data from 319,972 individuals hospitalized for stroke/transient ischemic attack (TIA) in Canada over a 10-year period (2003/04 to 2013/14). Provinces with integrated stroke care systems were identified using pre-specified criteria. The adjusted incidence rate ratio for 30-day mortality was 0.96 (95% confidence interval [CI] 0.89–1.04) was significantly lower for provinces with integrated systems of stroke care (British Columbia, Alberta, Ontario, Quebec, Nova Scotia, and Prince Edward Island) compared with those without such systems.[4] In a systematic review including the results from 99 studies, Eustace et al.[25] reported that integrated stroke care was associated with significantly reduced risk of recurrent stroke (relative risk [RR]=0.79, 95% CI 0.63–1.00), significant improvements in quality of life (standardized mean difference [SMD]=0.41, 95% CI 0.26–0.56), and a reduced incidence of depression (RR= 0.95, 95% CI 0.92–0.99), with no significant reductions in mortality (at 90 days, one year or >one year), major bleeding or unplanned readmissions. Interventions assessed within the individual studies were wide ranging. Examples included screening for complications, quality of life, and depression, counselling for lifestyle changes, secondary prevention counselling, medication adherence, interviews and education (web-based training) for caregivers and individual with stroke, standardized care pathway, very early mobilisation, early supported discharge, telerehabilitation exercise, individualised transitional care model based at home, patient/family education, and an interdisciplinary poststroke consultation team, among others.

In another systematic review including the results of 19 RCTs, Liu et al. [26] examined the effectiveness of stroke-specific integrated care (IC) models defined by 10 core principles, in comparison to conventional care. Examples of interventions included very early supported discharge programs, a virtual interdisciplinary stroke care clinic, integrated palliative care, an integrated interdisciplinary geriatric rehabilitation programme, stroke secondary prevention, combining hospital and community resources, an integrated primary care management programme, and a transitional care program for individuals with strokes. Integrated care was associated with significant improvements in health-related quality of life (SMD= 0.69, 95% CI 0.35 to 1.02), activities of daily living performance (SMD=0.95, 95% CI 0.48 to 1.43) and depression (SMD=-1.02, 95% CI -1.77 to -0.26).

Public awareness and emergency response are important components of stroke systems, as early recognition of symptoms and timely response can significantly reduce stroke-related disability and death. Since 2014, the Heart & Stroke Foundation of Canada has led a nationwide FAST (Face, Arm, Speech, Time) campaign to improve recognition of stroke symptoms and encourage immediate action. Awareness in Canada has roughly doubled over ten years, with nearly 60% of Canadians now able to recall at least two FAST signs, and 80% reporting that they would call 911 if they suspected a stroke. [27] Adaptations of the campaign have also been developed for populations disproportionately impacted by inequities. A 3-year community engagement FAST campaign, initiated by the Northwestern Ontario Regional Stroke Network, was adapted for Indigenous children to raise awareness of stroke symptoms and the importance of prompt response. The centerpiece of the campaign was a creative educational product in the form of an 11.5-minute DVD titled Act F-A-S-T 1-2-3! featuring an indigenous elder in the role of a storyteller.[28]

Emergency Medical Services (EMS) transport protocols and bypass agreements ensure that individual with stroke are rapidly transported to the most appropriate hospital with the capabilities to manage their specific needs. These protocols help EMS personnel identify potential cases of stroke in the field, assess stroke severity using standardized tools, and determine whether to bypass local hospitals in favor of a CSC or thrombectomy-capable hospital. Bypass agreements reduce treatment delays for individual with stroke eligible for procedures such as endovascular thrombectomy (EVT), by streamlining prehospital triage and transport. For example, the Acute Stroke Medical Redirect Paramedic Protocol (ASMRPP), legally empowers paramedics to bypass local hospitals and transport individuals with stroke directly to designated stroke centres when time and geography allow, significantly improved triage accuracy and treatment delivery. [29] Direct transport by EMS to hospitals with on-site revascularization capability has been shown to improve treatment rates among eligible individual with stroke in other countries. [30, 31]

Stroke rehabilitation is a vital component of a comprehensive stroke system of care, as it facilitates recovery, reduces long-term disability, and improves overall quality of life for individuals recovering from strokes. Rehabilitation begins in the acute phase, ideally within dedicated stroke units, where early mobilization and therapy assessments are associated with improved outcomes. [32] Following discharge, individual with stroke may transition to inpatient rehabilitation facilities, outpatient programs, or home-based services depending on their needs and functional status. Regardless of the setting, an extensive array of rehabilitation interventions has been shown to improve functional outcomes, psychosocial and participation outcomes, communication and cognition, and reduce medical complications. [33, 34] Within a stroke system of care, the inclusion of standardized rehabilitation pathways and assessments, coordinated discharge planning, and timely follow-up ensures continuity across care settings and supports patient-centered recovery goals. This continuum is particularly important in Canada, where geography and access disparities make organized, tiered systems of stroke care—including specialized rehabilitation units—essential for equitable service delivery.

Stroke secondary prevention services aim to reduce the risk of recurrent events. The risk of a stroke following TIA or stroke were estimated to be 5% and 9%, respectively within 90 days. [35, 36] Effective secondary prevention requires coordinated interdisciplinary care, emphasizing aggressive risk factor management (e.g., hypertension, atrial fibrillation, diabetes), and patient education. Patients who have experienced a minor stroke or TIA are unlikely to be admitted to hospital and will receive preventative care in stroke prevention clinics (SPC), during primary care visits with their family physician or through community-based programs. The use of rapid TIA clinics has been associated with a decreased risk of stroke recurrence. [37, 38] Across Canada, there are approximately 119 SPCs offering rapid outpatient assessment and management following a TIA or minor stroke. In Ontario there are 41 SPCs, and 29 across the three prairie provinces, serving as key access points within the provincial stroke system.[39] These clinics are located across all regions to ensure that nearly 87% of Canadians live within a one-hour drive of an SPC; however, only 69.2% have access to a service that operates 5-7 days a week. For individuals with stroke admitted to hospital, there are regional stroke centres with embedded SPCs, and inpatient and outpatient programs have been integrated into some inpatient rehabilitation settings, where individuals with stroke can receive tailored counseling on diet, exercise, smoking cessation, and medication adherence. In all of these settings, individuals with stroke may also receive services using virtual technologies. For example, Ontario Telemedicine Network (OTN) and BC Virtual Health support secondary prevention outreach in remote communities. Some SPCs also offer virtual consultations and follow-up.

As a component of a comprehensive stroke system of care, advance care planning (ACP) ensures that individual with stroke' values, goals, and preferences guide medical decisions throughout the care continuum. Integrating ACP into stroke care allows healthcare providers to align treatments with patient wishes, avoid unwanted or non-beneficial interventions, and improve satisfaction among individual with stroke and families. In the broader stroke system, standardized processes for ACP promote consistency, support ethical decision-making, and help coordinate care across settings, from acute management to rehabilitation and long-term support. ACP interventions have been associated with higher levels of self-reported ACP engagement and increased ACP documentation in the electronic health record. [40] Despite its importance, ACP engagement was reported to be low in a telephone survey of 50 patients who had experienced stroke or TIA, and 17 surrogates, in the United States. Engagement across individual 4 ACP behaviors ranged from 10% to 50%, including naming a surrogate decision-maker (46%), discussing wishes with a surrogate (50%), discussing wishes with a clinician (10%) and completing an advance directive (34%).[41]

Early integration of palliative care can reduce emotional distress, and facilitate informed decision-making, especially in cases where prognosis is uncertain or complex. Within a coordinated stroke system, access to palliative care ensures a patient-centered approach across all phases of care, including the transition to end-of-life support when needed. Lank et al. [42] reported that both informal and formal/ACP interventions were both associated with a shorter time to "comfort measures only' status following stroke compared with no intervention.

Canada provides palliative care services through multiple settings. Care is delivered in home-based programs, in hospitals, where many institutions have designated palliative care units and consultation teams that address complex symptom management and end-of-life care, and in residential hospices and long-term care homes offer 24/7 specialized or shared palliative care in a supportive, home-like environment, often staffed by care providers and volunteers. Provincial organizations such as Hospice Palliative Care Ontario often coordinate these services, fostering integration between primary and specialist palliative care. Despite these programs, access varies widely across Canada, which averages fewer than four hospice beds per 100,000 people, well below recommended benchmark of 7 beds. [43] People in rural and remote regions face the greatest service shortages. The 2019 Federal Action Plan seeks to address these gaps by improving data collection, expanding services (especially in underserved communities), and reinforcing culturally safe care. [44] Five years later, progress continues to be made, but more work is needed. [45]

Sex & Gender Considerations

There are sex differences in stroke risk factors and outcomes. Traditional risk factors including atrial fibrillation, hypertension, diabetes, hyperlipidemia have been shown to confer a higher stroke risk in women, when present. [46-48] Sex-specific risk factors such as pregnancy-related factors, oral contraceptive use, and hormone replacement therapy increases a women's risk of stroke. The prevalence of stroke mimics is also higher in women. [49] Women tend to be under-represented in stroke clinical trials. [50] In terms of stroke outcomes, there is conflicting evidence as to whether there is a sex difference in case fatality, after adjusted for comorbidities, stroke severity and age, although more women die of stroke than men. [51] Women tend to experience worse functional outcomes, higher levels of disability, and lower quality of life after stroke compared with men.[52-54] As stroke systems of care are developed and the key components implemented, it will be important to take into account and integrate sex and gender as well as other equity-deserving groups.

Evidence Table and Reference List

Section 2 Stroke Awareness, Recognition and Response

2. Stroke Awareness, Recognition and Response Recommendations 2026

i. Organized and integrated stroke systems of care should be established and sustained in every health region in Canada to enable rapid emergency stroke management, including a public awareness campaign, public emergency system (such as 9-1-1), and monitoring systems that consider social determinants of health, age, sex, and gender diverse populations and should be made available and adapted in an accessible and culturally appropriate manner [Strong recommendation; Moderate quality of evidence]. *Refer to the CSBPR Acute Stroke Management Module, Section 3 for additional information.* [7]

ii. All members of the public and all healthcare providers should be educated that stroke is a medical emergency [Strong recommendation; Low quality of evidence].

   a. Education for the public and healthcare providers should include information that stroke can affect persons of any age [Strong recommendation; Low quality of evidence].

   b. Education for the public and healthcare providers should emphasize the benefits of early recognition and emergency management, even if symptoms begin to resolve [Strong recommendation; High quality of evidence].

iii. Awareness campaigns and education for the public and healthcare providers should emphasize recognition of the signs and symptoms of stroke, including the use of an acronym such as FAST (Face, Arms, Speech, Time) to facilitate awareness of and easy recall of these signs [Strong recommendation; High quality of evidence].

   a. The public and healthcare providers should respond immediately when someone experiences signs or symptoms of stroke by calling 9-1-1 or their local emergency number [Strong recommendation; Moderate quality of evidence], even if the signs or symptoms resolve.

   b. The public should be aware of the importance of following instructions from the emergency medical services, such as ambulance and dispatch [Strong recommendation; Low quality of evidence].

iv. Ongoing assessment and monitoring of public awareness of the signs of stroke should be implemented in all regions [Strong recommendation; Moderate quality of evidence].

Rationale

Although stroke is a medical emergency, many individuals do not recognize it as such, or they attribute the signs and symptoms to a less serious health issue and delay seeking medical attention. Prompt recognition of stroke symptoms is critical for timely activation of emergency medical services and access to time-sensitive treatments such as thrombolysis or thrombectomy. Public awareness campaigns, such as those promoting the FAST (Face, Arm, Speech, Time) acronym, have been shown to improve knowledge and increase the likelihood of rapid response. On average, two million neurons die with every minute that elapses following symptom onset, leading to permanent damage to the brain. [55] Delays in recognizing stroke symptoms are associated with worse functional outcomes and increased mortality, underscoring the need for sustained public education efforts. Individuals who experience a TIA are also considered a medical emergency and require rapid assessment and treatment. These recommendations apply across all geographic regions in Canada, and education should be available uniformly, with targeted approaches for diverse populations, including cultural and language considerations, and regardless of local issues related to time to access care.

Individuals with lived experience of stroke emphasize the importance of recognizing stroke signs, symptoms and risk factors both for community members and for healthcare providers. They believe the FAST signs are critically important to know as well as the importance of knowing other potential signs and symptoms. They stress the importance of ongoing research, particularly for women and for different age groups. Ongoing targeted education about stroke signs and symptoms is critical to support access to appropriate care and should be available in culturally appropriate contexts. Emphasis is placed on the need to destigmatize stroke and acknowledge that stroke can happen at any age.

System Implications

To ensure individuals experiencing a stroke receive timely stroke assessments, interventions and management, interdisciplinary teams need to have the infrastructure and resources required. These may include the following components established at a systems level.

1. Government funding and support for awareness initiatives to improve the recognition and recall of the signs of stroke (e.g., FAST, which is a global best practice) and the importance of contacting 9-1-1 immediately. Awareness and education campaigns should prioritize reaching communities who are less aware of the signs of stroke and most at risk of stroke and should be informed collaboratively through community engagement activities with those audiences.
2. Enhanced collaboration among community organizations and healthcare professionals to ensure consistency in public education of the signs of stroke with a strong emphasis on the urgency of responding when the signs of stroke are recognized.
3. Equity focused awareness campaigns and stroke education that is culturally appropriate to the target populations.
4. Training and education for EMS, emergency department and all in-hospital staff, medical and nursing students, physicians in primary and acute care as well as specialists, nurses, and allied health professionals to increase their ability to recognize potential individual with stroke to support rapid assessment and management.
5. Comprehensive systems in place to ensure all individuals in Canada have access to timely and appropriate emergency medical services, including ambulatory services (e.g., outpatient services, emergency department, community health centres, nursing stations) without financial burden, and quality stroke care regardless of geographic location.
6. Enhanced monitoring and awareness of stroke among all individuals in Canada. Healthcare systems and provincial/territorial and federal governments should generate linked health and social surveillance population-based and regional data and use it to drive quality improvement through better understanding of the health and social issues facing individuals in Canada.

Performance Measures

System Indicators:

1. Proportion of individuals with suspected stroke or TIA transported to hospital by paramedics.
2. Proportion of EMS services that use a two-stage screening for stroke that includes both FAST signs of stroke and screening for possible large vessel occlusion.

Process Indicators:

1. Proportion of individuals with stroke who contact any member of the healthcare system within 4.5, 6, and 24 hours of stroke symptom onset.
2. Median (and interquartile range) time lapse between stroke symptom onset and first contact with EMS, defined as time call placed to 9-1-1 or local emergency medical system dispatch.
3. Proportion of individuals with stroke who arrive to hospital by ambulance following onset of stroke symptoms.
4. Median time (hours) from stroke symptom onset to arrival at an emergency department for all suspected individual with stroke presenting to hospital.

5. Median time (hours) from arrival at an emergency department for all suspected individual with stroke to administration of intravenous thrombolysis (door-to-needle time).
6. Median time (hours) from arrival at an emergency department for all suspected individual with stroke to arterial access for endovascular thrombectomy (door-to-puncture time). Median time from arrival in one emergency department to transfer to a higher-level stroke hospital for endovascular thrombectomy (Door in – Door out time).

Patient Oriented Outcomes and Experience Indicators:

1. Proportion of the population (and specific population subgroups) aware of the signs of stroke (as presented in FAST/VITE).

Implementation Resources and Knowledge Transfer Tools

Resources and tools listed below that are external to Heart & Stroke and the Canadian Stroke Best Practice Recommendations may be useful resources for stroke care. However, their inclusion is not an actual or implied endorsement by the Canadian Stroke Best Practices or Heart & Stroke. The reader is encouraged to review these resources and tools critically and implement them into practice at their discretion.

Healthcare Provider Information

- Heart & Stroke: Signs of Stroke: http://www.heartandstroke.ca/stroke/signs-of-stroke
- Heart & Stroke: FAST Signs of Stroke…what are the other signs?: https://www.heartandstroke.ca/stroke/signs-of-stroke/fast-signs-of-stroke-are-there-other-signs
- World Stroke Organization: http://www.world-stroke.org/
- Stroke Engine: http://strokengine.ca/

Resources for Individuals with Stroke, Families and Caregivers

- Heart & Stroke: Acute Stroke Management infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbpr7_infographic_acutestrokemanagement_en_final.pdf
- Heart & Stroke: Secondary Prevention of Stroke infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbpr7-infographic-secondaryprevention-final.pdf
- Heart & Stroke: Signs of Stroke: http://www.heartandstroke.ca/stroke/signs-of-stroke
- Heart & Stroke: FAST Signs of Stroke…what are the other signs?: https://www.heartandstroke.ca/stroke/signs-of-stroke/fast-signs-of-stroke-are-there-other-signs
- Heart & Stroke: What is Stroke?: https://www.heartandstroke.ca/stroke/what-is-stroke
- Heart & Stroke: Transient Ischemic Attack: https://www.heartandstroke.ca/stroke/what-is-stroke/types-of-stroke/tia?_ga=2.260911109.98775338.1657032029-2092542146.1608572095
- Heart & Stroke: Your Stroke Journey: https://www.heartandstroke.ca/-/media/pdf-files/canada/your-stroke-journey/en-your-stroke-journey-v20.pdf
- Stroke Engine: http://www.strokengine.ca/

Summary of the Evidence

Failure to recognize the signs of an acute stroke, either by the persons witnessing one, or the person experiencing one can delay the time to contact emergency services, which may in turn decrease a patient's opportunity to receive time-sensitive treatments. The results from many cross-sectional surveys indicate that, among members of the general public, knowledge of the signs and symptoms associated with stroke remains disappointingly low. Lundelin et al. [56] conducted telephone surveys of 11,827 adults living in Spain who had participated in the Study on Nutrition & Cardiovascular Risk in Spain to assess their ability to identify stroke symptoms, including sudden confusion or trouble speaking, numbness of face, arm or leg, sudden trouble seeing in one or both eyes, sudden chest pain (decoy), sudden trouble walking, dizziness or loss of balance or severe headache. 65.2% of the participants could correctly identify 4-6 symptoms of stroke, although only 19% could identify all 6 symptoms correctly and 11.4% were unable to identify a single symptom. 81.1% of participants indicated that they would call an ambulance if they suspected someone was having a stroke. Persons who could identify more stroke symptoms were more likely to call for an ambulance. Mochari-Greenberger et al. [57] surveyed 1,205 women aged ≥25 years living in the United States, who had participated in the American Heart Association National Women's Tracking Survey. Participants were contacted by telephone and asked standardized questions related to stroke warning signs and actions to take in the event of stroke. Sudden weakness and/or numbness of the face or limb of one side was the most commonly cited symptom (51%). Loss of/trouble with understanding speech was also frequently recognized as a symptom among 44% of respondents, while headache, unexplained dizziness and loss of vision in one eye were recognized by fewer women (23%, 20% and 18%, respectively). One in 5 women could not name a stroke warning sign. In a survey of 790 respondents who were friends and family members of patients at a Canadian vascular outpatient clinic waiting room, who were sampled on two occasions 5 years apart, over 80% of participants were able to identify ≥1 stroke risk factor. [58] Trouble speaking and weakness, numbness or paralysis were the signs identified most frequently. The results of surveys conducted by random sampling of members of the general community in Saudi Arabia [59] and New Zealand [60] also indicate that most people were familiar with at least one stroke risk factor and almost 80% recognized slurred speech and weakness as stroke symptoms. In Thailand, 133 of 281 survey participants (47%) had good knowledge of stroke awareness and were able to identify 3-5 signs of stroke based on the BE FAST mnemonic; however, only 65% of participants responded "immediately" when questioned how fast they should come to the ER if they suspected an acute stroke. [61]

The number of public health campaigns designed to increase the recognition of the signs and symptoms of stroke has increased over the past decade. One of the most recognized programs is FAST. The results of several studies indicate that persons exposed to these campaigns become more aware of the signs and symptoms of stroke. Response to the FAST campaign (television + public transit displays), which ran from 2009 intermittently though 2014 in the UK [62] was associated with significantly increased use of EMS services for major stroke (58.8% before April 1, 2009, vs. 78.9% after April 1, 2009) and first medical attention was sought more quickly (within 3 hours) after April 1, 2009 (67.6% vs. 81.3%; OR=2.08; 95% CI, 1.40-3.11). The effect of a 27-month long public awareness campaign, designed to increase knowledge of the Swedish translation of FAST was less successful. [63] From pre-campaign (survey 1) to end of the campaign (survey 8), the number of persons who had heard of FAST increased from 15%-50%. The percentage of respondents who could recall all keywords in the mnemonic increased from 0.3% to only 2%, while those who could recall some/all keywords in the mnemonic had increased from 4% to 14%.

Bray et al. [64] surveyed 12,439 individuals ≥40 years of age from the general population in Australia and reported that from 2004 to 2010, there had been a significant increase in the number of respondents who were aware of the national multimedia stroke awareness campaigns (31% vs 50%), which included FAST and in the number or participants able to name ≥1 (69% vs 81%), ≥2 (43% vs 63%), and ≥3 (19% vs 32%) warning signs of stroke. Respondents who could identify ≥2 warning signs were significantly more likely to be aware of the campaign (odds ratio [OR]= 1.88, 95% CI 1.74 to 2.04). Bray et al. [65] reported increases in the monthly volumes of ambulance dispatches for stroke associated with

12 National Stroke Foundation multimedia regional public awareness campaigns (2004-2014). The increases ranged from 1.0 to 9.9%. In one year (2006) there was a decrease of 2.2% in call volumes.

Trobbiani et al. [66] compared public stroke awareness campaigns in Australia (FAST), England (Act FAST), and Canada (Heart and Stroke Foundation's campaign) to evaluate their structure, delivery, and messaging. Using a qualitative review of campaign materials and implementation strategies, the study assessed the consistency and emphasis of stroke warning signs and emergency response messages. The authors found that while all three campaigns used similar core messages based on the FAST acronym, their delivery varied in intensity, duration, and use of mass media. Sixty-eight per cent of people in Australia and 57% in Canada could name two or more signs of stroke. After the campaign, knowledge of each of the FACE elements was significantly greater in England than in Australia. A high proportion of participants reported that they would call emergency services in the event of a stroke (97% in England, 90% in Australia, and 67% in Canada). In Quebec, among 2,451 unique respondents, after four waves of public health campaigns, there was a 26% improvement in FAST stroke sign knowledge, although 30.5% of participants were still unable to name a single FAST sign. Lower socioeconomic status (education and income) was associated with poorer performance as was male sex. [67]

Hickey et al. [68] evaluated the impact of Ireland's FAST public health campaign on population awareness of stroke warning signs, risk factors, and emergency response behavior. Using data from national cross-sectional telephone surveys conducted before and after the campaign, the authors compared responses from over 2,000 adults. There was a significant increase in recognition of stroke warning signs (particularly facial weakness and speech problems) and appropriate action (calling emergency services) following the campaign; however, the ability to identify 2 or more stroke risk factors did not improve.

Of 174 participants in the United States who were randomized to an educational session on either FAST or BE FAST, a significantly higher percentage of participants recalled all items in the FAST group (75% vs. 30.2% at 3-5 minutes; 70.5% vs. 41.9% 60 minutes and 51.1% vs. 24.4% at 30 days). [69]

A systematic review & meta-analysis including the results from 13 studies including 113,592 adults recruited from the general population. The effects of stroke education using mass media campaigns on stroke symptom recognition and intention to call emergency medical services, were evaluated. Pooling the results from 5 studies, mass media campaigns increased the likelihood of symptom recognition compared with pre-campaign by 20%. Mass media campaigns also increased the likelihood that people would call EMS, by 19%. [70]

Mass media campaigns have also been shown to be associated with increases in the use of thrombolytic agents following acute stroke. Advani et al. [71] reported the average number of patients treated with alteplase increased significantly from 7.3 to 11.3 patients per month (an increase of 54.7%, p=0.02) during the period from the 12 months preceding the mass media intervention, featuring the FAST mnemonic, to the 6 months afterwards. The average number of patients treated in the ER increased significantly from 37.3 to 72.8 patients per month (an increase of 95.7%, p<0.001) during the same period. Although the mean number of patients treated with t-PA dropped to 9.5 per month after the first 6 months of the campaign, it was still significantly higher than the preceding 12 months. In a telephone survey including 1,400 participants, the number of people who could name any stroke symptom increased from 66% to 75%. Of those who could name a symptom, 52% recognized facial droop, 42% named speech difficulties and 42% named arm weakness.

Sex & Gender Considerations

Women have been reported to have better knowledge of stroke symptoms and stroke risk factors and learn more from public stroke awareness campaigns. [72] Marx et al. [73] reported that prior to a mass media campaign designed to improve stroke recognition and response, significantly more women than men could correctly answer the question "where does stroke happen in the body?" and knew the stroke emergency call number to call. Following the intervention, while the number of men and women who could answer the two questions correctly increased, although the percentage change from pre to post intervention was higher for women. There were increases in the mean number of stroke warning signs that could be named before and after the intervention (women: 5.4 to 6.2; men: 5.1 to 5.9). Following a public health campaign conducted in Ontario, significantly more women could identify ≥2 stroke warning signs.[74]

Evidence Table and Reference List

Section 3. Integrated Stroke Planning, Transitions of Care and Communication

3. Integrated Stroke Planning, Transitions of Care and Communication Recommendations 2026

Notes:

- *Successful integrated care requires interdisciplinary communication, coordination, and comprehensive planning with the individual, caregivers, and supports. Working together creates a shared accountability as the individual with stroke moves across transitions of care and care settings. (https://www.who.int/)*
- *When gaps occur in care transitions, individuals are susceptible to fragmentation in care, delayed care, poor quality of care, unfavorable experiences, compromised safety, and adverse medical events. https://cihr.ca/*
- *Individualized assessment and care planning in stroke refers to a tailored approach that focuses on the unique needs, preferences, and goals of each individual recovering from a stroke.*
- *This module focuses on two types of transitions: 1) transition from one healthcare provider/team/setting to another (e.g., acute inpatient care to inpatient rehabilitation; repatriation to a different acute care hospital); 2) transition to community-based setting (e.g., return home with or without homecare support services; to long-term care or assisted living).*
- *Refer to Introduction- Definitions and Descriptions section for additional information.*

Refer to Box 3 in this section for a Checklist of Core Transition Summary Information and CSBPR Rehabilitation, Recovery and Community Participation following Stroke publication: Part One.[8]

3.0 General Principles of Integrated Stroke Care

i. Integrated care planning and effective communication are essential in stroke care and should be part of all stroke care planning and delivery to address individual needs, promote continuity of care, safety, optimal recovery, shared decision-making, and reduce the risk of complications and adverse events at all transition points [Strong recommendation; Moderate quality of evidence].

ii. Integrated care and transitions of care are the responsibility of all members of the designated interdisciplinary stroke team. Roles among the team should be clarified to ensure lines of responsibility related to managing transitions and eliminating potential gaps in care [Strong recommendation; Moderate quality of evidence].

iii. The interdisciplinary team should actively engage the individual with stroke, family members and caregivers to review and update the care plan, and to discuss progress, concerns and transition planning [Strong recommendation; Moderate quality of evidence].
   a. This should occur regularly and should be updated to reflect changes in functional or medical status [Strong recommendation, Low quality of evidence].
   b. Virtual modalities to support participation may be considered [Strong recommendation, Low quality of evidence].

iv. The following components of effective and integrated transitions should be considered for individuals with stroke:
   a. A comprehensive assessment of the individual with stroke’s medical history, physical and cognitive abilities, emotional well-being, cultural and linguistic needs, environmental and social circumstances [Strong recommendation; Moderate quality of evidence].
   b. A goal-oriented transition plan should be developed and revised with the individual with stroke, family, and caregivers [Strong recommendation; Moderate quality of evidence].

c. Interdisciplinary communication and care coordination with shared responsibility for timely transfer of information, support for transitions, and ensuring continuity in development and implementation of individual plans of care [Strong recommendation; Moderate quality of evidence].

d. Inclusion of transition planning and processes into routine workflows, with clear allocation of roles and responsibilities for members of the interdisciplinary team for successful transitions of care across all stages and settings [Strong recommendation; Moderate quality of evidence].

e. Effective processes and adequate resources to ensure timely transitions within evidence-based benchmarks, and built-in flexibility for individuals to re-access care or adapt individual care plans as circumstances evolve [Strong recommendation; Moderate quality of evidence].

f. Structured tools and processes to ensure seamless transfer of information between transition points and teams of providers [Strong recommendation; Low quality of evidence].

g. Protocols that enable rapid assessment and provision of all medications, equipment, aids (including communication aids) and structural adaptations needed by individuals with stroke to facilitate smooth and timely transitions [Strong recommendation; Low quality of evidence].

h. Education to build skills and competency among stroke team members to ensure the transition needs of individuals with stroke and their families are met across the continuum of care, in a variety of settings [Strong recommendation; Moderate quality of evidence].

i. Education to build skills and competency among individuals with stroke and their family on an ongoing basis [Strong recommendation; Moderate quality of evidence]. *Refer to Section 5 of this module for additional information.*

j. Access to a designated contact person (such as a navigator role) who is able to provide ongoing support, access to community resources and initiation of re-assessments by healthcare providers as needed (e.g., home care services, access to primary care physician, driving assessments) [Strong recommendation; Moderate quality of evidence].

k. Assessment of caregiver ability to meet the specific needs of the individual with stroke [Strong recommendation; Low quality of evidence]. *Refer to CSBPR Rehabilitation, Recovery and Community Participation following Stroke Module, Part One: Stroke Rehabilitation Planning for Optimal Care Delivery (2025), Sections 7, 8 and 9 for additional information.*[8]

l. Optimal use of current and emerging technology to access care, resources and information along the continuum of care [Strong recommendation; Moderate quality of evidence]. *Refer to CSBPR Virtual Stroke Care Implementation Toolkit for additional information.*[75]

m. Functional integrated electronic medical records (EMRs) across the continuum of care with access for all healthcare providers involved in stroke care, and access for individuals with stroke [Strong recommendation; Moderate quality of evidence].

n. Robust data collection mechanisms to monitor quality of care and performance against benchmarks, with processes in place to review data and integrate improvements into ongoing care delivery [Strong recommendation; Moderate quality of evidence]. *Note, each set of recommendations across the CSBPR suite of modules also includes a set of specific structure, process, outcome and patient-oriented performance measures to support quality monitoring and improvement.*

v. Stroke clinicians should support individuals with stroke to actively participate in decision-making about their care, ideally by using evidence-based decision support tools in preparation for, and during consultations to facilitate the shared decision-making process [Strong recommendation; Moderate quality of evidence].

vi. The health care team should review care plans with the individual with stroke, and their family at least weekly and at transition points, updating the care plan to reflect changing needs, which may include evolving needs and goals, progress through recovery and changes in health status [Strong recommendation; Moderate quality of evidence].

vii. Family meetings with the integrated care team should be considered to discuss the care plan, treatments, and other relevant information to support person and family-centred care and transitions of care [Strong recommendation; Moderate quality of evidence].

viii. Mechanisms should be in place to promote continuity of care between healthcare facilities and services, such as between acute care facilities, rehabilitation, prevention, primary care, community-based services, long-term care, the individual with stroke, their family and caregivers [Strong recommendation; Moderate quality of evidence].

ix. Individuals with stroke, their family and caregivers should be provided with sufficient information about which services are available and how to access them at all stages of the pathway of care. All information should be provided in a format accessible to those with communication disabilities [Strong recommendation; Moderate quality of evidence].

Section 3.0 Clinical Considerations

1. Individuals at risk of suboptimal transitions may include populations disproportionately impacted by inequities such as Indigenous peoples, newcomers to Canada, gender diverse individuals, residents from remote and rural locations, unhoused individuals, and older adults.
2. The individual care plan should be initiated at the first point of contact with the healthcare system, such as the emergency department, and be refined and updated as the individual progresses through transitions along the continuum of care.

3.1 Transitions across the Stroke Care Continuum

i. Transition discussions, decisions, and activities should occur as soon as possible and throughout the care and recovery process to reflect changing and evolving needs, goals, and progress of the individual with stroke [Strong recommendation; Low quality of evidence].

ii. The following should be considered throughout transition planning:

   a. Members of the healthcare team should manage expectations regarding discharge or transfer dates and communicate in a timely manner with individuals with stroke and their family [Strong recommendation; Low quality of evidence].

   b. Potential issues that may delay discharge/transition for the individual with stroke and their family should be identified early and mitigated [Strong recommendation; Moderate quality of evidence].

   c. Referrals and/or appointments should be arranged prior to the individual with stroke leaving their current setting, especially short stay settings including emergency department and acute care for those discharged directly back to the community [Strong recommendation; Low quality of evidence].

   d. Virtual care modalities should be used where appropriate to facilitate transition planning and increase access to timely and optimal stroke care follow-up [Strong recommendation; Moderate quality of evidence]. *Refer to CSBPR Virtual Stroke Care Implementation Toolkit for additional information.* [75]

iii. Specific transition planning activities that should be completed include:

   a. Provide written and verbal discharge instructions with demonstrations of skills as needed to the individual with stroke, their family and caregivers. Ensure instructions are tailored to their needs and characteristics (communication, culture, cognition, sensory - including hearing and vision, and health literacy) [Strong recommendation; Moderate quality of evidence]. *Refer to Clinical Consideration 1 and Sections 5 and 6 for additional information. Refer to the CSBPR Rehabilitation, Recovery and Community Participation Following Stroke Part One: Stroke Rehabilitation Planning for Optimal Care Delivery for additional information.*[8]

   b. A post-discharge follow-up plan should be initiated by designated team members before discharge from the current or referring site and at the receiving site to ensure continuity of care [Strong recommendation; Moderate quality of evidence].

Section 3.1 Clinical Considerations

1. When providing instructions at care transitions, healthcare team members should address the following:
   a. Any risks and safety considerations relevant to the individual's recovery;
   b. Clear individualized instructions and tailored resources to support the recovery process;
   c. Medications education including instructions for use, indications for use, duration of treatment, any adjustments, renewals and clarity on who will provide ongoing medication management;
   d. Details of follow-up care and appointments and contact information for follow-up care providers;
   e. A designated point of contact for any questions or concerns.

3.2 Health Management Following Stroke

i. All individuals with stroke who transition across settings should be assessed for mobility, activities of daily living (ADL) and instrumental ADL (IADL) prior to discharge (including a community skills evaluation and home assessment as needed) [Strong recommendation; Moderate quality of evidence].

ii. Individuals living in the community following stroke should have access to regular and ongoing healthcare follow-up appropriate to their specific needs, which may address evaluating progress of recovery, preventing deterioration, maximizing functional and psychosocial outcomes, preventing stroke recurrence, and improving quality of life [Strong recommendation; Moderate quality of evidence].

   a. Initial review with primary care providers would ideally occur within the first month following hospital discharge and address key factors in secondary prevention, medical and functional issues, and establish cadence for ongoing follow-up as required [Strong recommendation; Low quality of evidence]. *Refer to CSBPR Secondary Prevention of Stroke module* [6] *for additional information and the CSBPR Post-Stroke Checklist.*

iii. Individuals with stroke living in the community who experience a decline in functional status should have access to additional rehabilitation therapy and receive targeted interventions as appropriate [Strong recommendation; Moderate quality of evidence] even if the change occurs many months/years post-stroke. *Refer to CSBPR Rehabilitation, Recovery and Community Participation following Stroke module: Part Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery for targeted interventions.*[76]

iv. Processes should be in place for individuals following a stroke to re-access rehabilitation, secondary prevention services, or other supports and services as required during longer-term recovery [Strong recommendation; Moderate quality of evidence].

v. Individuals with stroke or TIA should be screened for any changes in cognition following stroke at transition points and when there is a change in health status [Strong recommendation; Moderate quality of evidence]. *Note, changes can be reported by the individual, family members, caregivers or clinicians. Refer to CSBPR Vascular Cognitive Impairment module Appendix Three for more information on the presenting signs and symptoms of VCI.* [5]

vi. Individuals with stroke or TIA should be screened for any changes in mood and anxiety following stroke compared to their pre-stroke mental health status at transition points and when there is a change in health status [Strong recommendation; Moderate quality of evidence]. *Refer to CSBPR Rehabilitation, Recovery and Community Participation following Stroke module: Part Three: Optimizing Activity and Community Participation following Stroke.* [9]

3.3 Healthcare Provider Communication

Note: Communication may take place between healthcare providers along the continuum of care, healthcare providers and other service providers (e.g., transportation, meal services), and between healthcare providers and individuals with stroke, their family and caregivers.

i. All members of the interdisciplinary stroke team should share timely and up-to-date information with the individual with stroke, their family and caregivers as appropriate, and with healthcare providers at the current and next stage of care [Strong recommendation; Moderate quality of evidence].

ii. The transferred information should be:

   a. Comprehensive and timely, occur before or during transitions, and include all relevant information on the individual with stroke, their medications, and progress to date, planned appointments, ongoing recovery needs and goals [Strong recommendation; Moderate quality of evidence].

   b. Coordinated transfer of information to optimize consistency of information from the interdisciplinary team to the individual with stroke, their family and caregivers [Strong recommendation; Moderate quality of evidence].

   c. Provided to the primary care practitioner in a formal, detailed, discharge summary prepared by the most responsible healthcare provider [Strong recommendation; Moderate quality of evidence]. *Refer to Box 3 for core content to be considered for inclusion in transition summaries.*

   d. Available through electronic health records that are accessible across settings and healthcare providers [Strong recommendation; Low quality of evidence].

   e. Available in multiple formats including the use of virtual modalities when appropriate [Strong recommendation; Moderate quality of evidence]. *Refer to Section 4. Virtual Stroke Care, and the CSBPR Virtual Stroke Care Implementation Toolkit for additional information.* [75]

   f. A transition summary written in plain language, appropriate for aphasia and other communication issues, and culturally responsive to increase understanding, and given to the individual with stroke [Strong recommendation; Moderate quality of evidence].

Section 3.3 Clinical Considerations

1. Not all individuals with stroke may have a primary care provider, and if not, this should be addressed prior to discharge or transitions.

Box 3 Checklist of Core Transition Summary Information

Transition Summary to next care setting and primary care provider should include:

- ☐ Stroke diagnosis, etiology and date of stroke
- ☐ Stroke risk factors
- ☐ Past medical history
- ☐ Medications
- ☐ Summary of hospital course including secondary complications, co-morbid illnesses, relevant investigations (e.g., labs and diagnostic imaging) and any follow up appointments planned/pending
- ☐ Summary of stroke impairments, treatments/therapies and education received
- ☐ Level of function on transition for ADLs, functional mobility, functional communication, swallowing and diet needs, bladder and bowel function, and instrumental activities of daily living (iADLs) including any supervision or assistance required
- ☐ Secondary prevention strategies (and referrals to clinics) and include secondary stroke prevention targets for the individual with stroke
- ☐ Mental health, psychological and emotional support needs and access to services
- ☐ Social and family history
- ☐ Identification of urgent care needs and priority issues
- ☐ Advance care plan status
- ☐ Community resources and home care services arranged as required
- ☐ Crisis placement recommendations if required
- ☐ Ongoing and long-term goals
- ☐ Recommended future management plan, including rehabilitation therapies, home program, community resources, activities and programs, social and life roles, and outstanding medical consultations
- ☐ Equipment and resources prescribed, including what has been provided, and what is pending
- ☐ Return to driving recommendations/plan if applicable
- ☐ Return to sexual health and meaningful relationships
- ☐ Return to vocation (e.g. paid or volunteer employment, or education) recommendations/plan if applicable
- ☐ Specific identification of primary care provider follow-up responsibilities
- ☐ Means for direct communication between most responsible physician and the primary care provider when needed

Rationale

Effective transition planning are critical components of high-quality stroke systems based on the principles of person-centered care given that one in 8 readmissions to hospital post stroke may be preventable. [77] They ensure continuity, safety, and coordination of services as individuals with stroke move within and between care settings—particularly from emergency services to inpatient hospital care, rehabilitation and return to home or community care. Poorly coordinated transitions from hospital to home or other care settings are associated with increased risk of medication errors, preventable readmissions, patient dissatisfaction, and adverse events. This is particularly critical for individuals with complex health needs, such as individuals with stroke, who often require coordinated rehabilitation, follow-up care, community support, and education.

Strong interprofessional communication ensures that all team members—physicians, nurses, therapists, social workers, and primary care providers—are informed about the individual with stroke's condition, treatment plan, goals of care, and follow-up requirements. This communication reduces fragmentation, avoids duplication of services, and ensures individuals with stroke, their family and caregivers are prepared and supported during their transition.

Discharge planning should begin early during hospitalization and involve individuals with stroke and families in shared decision-making to align care with individual needs, preferences, and social determinants of health. When healthcare teams collaborate and communicate effectively across settings, they improve patient outcomes, reduce avoidable healthcare utilization, and enhance the overall experience of care.

Individuals with a lived experience of stroke have reported that the healthcare system can seem siloed between different specialties or systems of care, with limited integration and interaction between healthcare settings or practitioners. These experiences cause frustration, feelings of being overwhelmed and add burden to individuals with stroke and families to share relevant information as they transition away from acute inpatient to inpatient rehabilitation settings and into the community. These concerns emphasize the importance of communication between healthcare team members and settings throughout the transitions of care.

Individuals with lived experience of stroke describe the importance of early stroke recognition and immediate connection into the stroke care system. They highlight that transition points, such as discharge from hospital or rehabilitation, can either create opportunities for connection or become moments where individuals risk falling through the cracks. They share challenges faced during transitions, including communication gaps, and emphasize the importance of clear communication between individuals with stroke, family, caregivers, and healthcare providers throughout these points and during all transition planning. Communication gaps between providers, lack of follow-up, and the absence of a clear point of contact can leave individuals and their families feeling uncertain and unsupported. They encourage the development of clear, established communication pathways to help prevent this.

Individuals with lived experience also share challenges related to lack of support, particularly when entering back into the community where they may or may not have the support of family and caregivers. They encourage thorough and detailed conversations to understand the individual’s goals and support needs when transitioning back to the community. They discuss the difficulty in re-engaging with the stroke system once no longer formally connected with a stroke care team and enthusiastically support greater access to care such as through a stroke prevention clinic. Streamlining transitions and improving communication can ensure smoother and more supportive stroke care experiences where individuals feel informed, connected and supported throughout their recovery.

System Implications

Integrated Stroke Planning, Transitions of Care and Communication support and actions are applicable across the continuum of stroke care, including in primary care, the emergency department, acute care, rehabilitation settings, complex care/transitional bed settings, long-term care and community settings. Processes and mechanisms should be in place in all these settings to address efficient communication between settings and healthcare providers, including:

1. Strong relationships and formal agreements among healthcare providers within and across regions to increase the efficient and timely transitions.
2. Development of processes across healthcare institutions and settings for the coordination of transitions and discharge planning and ongoing medical management through to primary care, community services, follow-up, and access to required healthcare services (e.g., ongoing rehabilitation or acute care).
3. Resource capacity to enable appropriate and timely access to services at the next stage of care with the required specialties, intensity, and frequency.
4. Processes, protocols, and resources for conducting home assessments by interprofessional team members prior to discharge.

5. Access to self-management and caregiver training and support services as required ensuring a smooth transition.
6. Implementation of standards, processes, and tools to ensure timely discharge summaries sent to primary care and other relevant healthcare professionals and/or agencies to facilitate continuity of care at transition points.
7. Processes in place to support data collection and reporting and integration of findings processes to monitor quality of care and performance against benchmarks.
8. Adequately resourced community health and support services for individuals with stroke.
9. Processes in place for individual to re-access stroke care or other support services as goals or function change and evolve throughout recovery.
10. Capacity for case management or healthcare personnel with dedicated responsibilities for discharge planning and transition support.
11. Staff who are aware of person's right to privacy and who comply with privacy legislation and preferences when releasing an individual with stroke's information.

Performance Measures

Transition Planning:

1. Median length of stay of individuals with stroke in acute inpatient care (core).
2. Readmission rate for individuals with stroke discharged from hospital for all reasons, within 90 days, 6 months and one year.
3. Proportion of individuals with stroke who receive a referral to inpatient rehabilitation.
4. Proportion of individuals with stroke who receive a referral to outpatient rehabilitation.
5. Median time from acute care discharge to start of inpatient or outpatient rehabilitation services.
6. Proportion of individuals with stroke who receive a referral to a stroke prevention clinic at discharge from the emergency department or inpatient care.
7. Proportion of individuals with stroke who are discharged directly from inpatient care to long-term care.
8. Admission to long-term care within one year of being discharged back to the community following a stroke event.

Interprofessional Communication:

1. Proportion of individuals with stroke who are given a copy of their completed care plan and discharge summary at the time of discharge from acute inpatient care or inpatient rehabilitation.
2. Proportion of individuals with stroke for whom a discharge summary is completed prior to or within 48 hours of discharge from one care setting to the next and received by the care provider at the next stage of care.
3. Proportion of individuals with stroke who are provided a booklet or information on strategies for stroke secondary prevention.

Person-Oriented Measures (PREMS, PROMS):

1. Proportion of individuals with stroke who are given a copy of their completed discharge plan at the time of discharge from acute inpatient care or inpatient rehabilitation.
2. Proportion of individuals with stroke who return to the hospital post-discharge.

3. Distribution of reasons for readmission to hospital following an admission for acute stroke.
4. Median Modified Rankin score for individuals with stroke at time of discharge from acute care.
5. Quality of life of individuals after discharge for an acute stroke event, measured at transition points and routinely throughout recovery (for example, at 60, 90, 180 days and 1 year following discharge).
6. Proportion of individuals with stroke driving prior to their stroke and have a goal to return to driving who receive return to driving instructions prior to discharge.
7. Proportion of individuals with stroke who were working prior to their stroke, and have a goal to return to work, who receive vocational advice prior to discharge.

Implementation Resources and Knowledge Transfer Tools

Resources and tools listed below that are external to Heart & Stroke and the Canadian Stroke Best Practice Recommendations may be useful resources for stroke care. However, their inclusion is not an actual or implied endorsement by the Canadian Stroke Best Practices or Heart & Stroke. The reader is encouraged to review these resources and tools critically and implement them into practice at their discretion.

Healthcare Provider Information

- CSBPR Stroke Systems of Care Module: Box 3: Checklist of Core Transition Summary Information
- Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery and Community Participation following Stroke, Part One: Rehabilitation Planning for Optimal Care Delivery; Part Two Delivery of Stroke Rehabilitation to Optimize Functional Recovery and Part Three: Optimizing Activity and Community Participation following Stroke
- Canadian Stroke Best Practice Recommendations: Secondary Prevention of Stroke Module: https://www.strokebestpractices.ca/recommendations/secondary-prevention-of-stroke
- Canadian Stroke Best Practice Recommendations: Vascular Cognitive Impairment Module: Appendix 3: Signs and Symptoms of Vascular Cognitive Impairment: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/vascular-cognitive-impairment/csbpr7-vci-appendix3.pdf?rev=7bf2d0a9a1d64bba99e137225b1fa419
- Accreditation Canada: Accreditation Canada Stroke Distinction Program: https://accreditation.ca/stroke-distinction/
- RNAO: Registered Nurses' Association of Ontario: Developing and Sustaining Interprofessional Health Care: Optimizing patients/clients, organizational, and system outcomes: http://rnao.ca/bpg/guidelines/interprofessional-team-work-healthcare
- RNAO: Transitions in Care and Services Best Practice Guideline: http://rnao.ca/bpg/guidelines/care-transitions
- RNAO: People-Centred Care Best Practice Guideline: https://rnao.ca/bpg/guidelines/people-centred-care
- Health Quality Ontario: Transitioning Between Hospital to Home: https://www.hqontario.ca/evidence-to-improve-care/quality-standards/view-all-quality-standards/transitions-from-hospital-to-home
- McMaster Physician Assistant Student Resource: Discharge Summary Outline: http://mcmasterpa.weebly.com/how-to-discharge-summaries.html
- CACHE: Centre for Advancing Collaborative Healthcare & Education (University of Toronto): http://www.ipe.utoronto.ca

- CIHC: Canadian Interprofessional Health Collaborative: http://www.cihc-cpis.com/
- CAIPE: Centre for the Advancement of Interprofessional Education: http://www.caipe.org.uk/
- AHRQ: Agency for Healthcare Research and Quality: Re-Engineered Discharge (RED) Toolkit: http://www.ahrq.gov/professionals/systems/hospital/red/toolkit/index.html
- GTA Rehab Network: Inter-Organizational Transfer of Accountability Guidelines: https://gtarehabnetwork.ca/
- Return to Vocations Post Stroke Toolkit for Providers – from Central East Stroke Network and West GTA Stroke Network. https://cesnstroke.ca/wp-content/uploads/2024/03/Return_To_Vocations_-FINAL_March-2024.pdf

Resources for Individuals with Stroke, Families and Caregivers

- Heart & Stroke: Acute Stroke Management infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbpr7_infographic_acutestrokemanagement_en_final.pdf
- Heart & Stroke: Secondary Prevention of Stroke infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbpr7-infographic-secondaryprevention-final.pdf
- Heart & Stroke: Signs of Stroke: http://www.heartandstroke.ca/stroke/signs-of-stroke
- Heart & Stroke: FAST Signs of Stroke…what are the other signs?: https://www.heartandstroke.ca/stroke/signs-of-stroke/fast-signs-of-stroke-are-there-other-signs
- Heart & Stroke: Your Stroke Journey: https://www.heartandstroke.ca/-/media/pdf-files/canada/your-stroke-journey/en-your-stroke-journey-v20.pdf
- Heart & Stroke: Post-Stroke Checklist: https://www.heartandstroke.ca/-/media/1-stroke-best-practices/resources/patient-resources/002-17_csbp_post_stroke_checklist_85x11_en_v1
- Heart & Stroke: Transitions and Community Participation Infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/transition-of-care-nov2019/csbp-infographic-transitions-and-participation.pdf?rev=595e990a17e14232aa3b1c731d983ce3
- Heart & Stroke: Enabling Self Management Following Stroke Checklist: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbpr-enabling-self-management-following-stroke-checklist-jan2021-final.pdf?rev=03b045c41df04abfb7f4cb652869f031
- Heart & Stroke: Virtual Healthcare Checklist: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbp-infographic-virtual-healthcare-checklist.pdf?rev=bf2f5b0e9e4a49cfbfc251208b6a15e2
- Heart & Stroke: Recovery and Support: https://www.heartandstroke.ca/stroke/recovery-and-support
- Heart & Stroke: Online and Peer Support: https://www.heartandstroke.ca/heart-disease/recovery-and-support/the-power-of-community
- Heart & Stroke: Services and Resources Directory: https://www.heartandstroke.ca/services-and-resources
- AHRQ: Agency for Healthcare Research and Quality: Taking Care of Myself: A Guide for When I Leave the Hospital: http://www.ahrq.gov/patients-consumers/diagnosis-treatment/hospitals-clinics/goinghome/goinghomeguide.pdf

- Stroke Engine: https://strokengine.ca/en/

Summary of the Evidence

Discharge planning should begin as soon as possible during each phase of care and should involve the patient, family/caregivers, and all members of the interprofessional team. The goal of discharge planning is to ensure a safe and efficient transition between care settings while maintaining a continuity of care and coordination of services that optimize recovery and secondary prevention, as appropriate. Discharge planning activities should include a pre-discharge needs assessment, home visits, meetings between the care team, patient, and family/caregivers, a post-discharge follow-up plan, and communication with team members at the next phase of care. Johnson et al. [78] recruited 1,239 individuals with stroke from 10 comprehensive stroke centres in Florida between 2018 and 2023, who were discharged to either home or an inpatient rehabilitation facility. The association between a composite measure of adequate transition of care (ATOC) score (range of scores 0-100%) during the first 30 days following discharge and 90-day death or readmission, was examined. Patients were discharged home (76.2%) or to inpatient rehabilitation (18.2%). 163 (13%) participants experienced the primary outcome (157 were readmitted to hospital, 3 patients died, and 3 were readmitted to hospital and died). Among patients with an ATOC score ≥75%, the risk of the primary outcome was reduced significantly. In a subgroup of 550 patients who completed a structured telephone interview at 30-day post discharge, 67% achieved an adequate ATOC score.[79]

In a recent Cochrane review Gonçalves-Bradley et al. [80] identified 33 RCTs including individual with stroke admitted to any type of hospital (acute, rehabilitation or community) with any medical or surgical condition. Among the included trials, one (Sulch et al. [81]) included individual with a diagnosis of stroke. Trials evaluated discharge plans from hospital that included assessment, planning, implementation and monitoring components, initiated at some point prior to discharge. Hospital length of stay (mean difference [MD]= -0.73, 95% CI -1.33 to -0.12) and unscheduled three-month readmissions (RR=0.87, 95% CI 0.79 to 0.97) were both found to be significantly reduced for elderly patients with a medical condition who received discharge planning, compared to care as usual. No significant differences between groups were reported in terms of discharge destination or mortality. In the only RCT identified in the Cochrane review, Sulch et al. [81] randomized 152 patients within two weeks of stroke onset to receive discharge planning according to an integrated care pathway or care as usual. No significant differences between groups were reported with respect to 6-month mortality (13% vs. 8%), institutionalization (13% vs. 21%), or length of stay (50 vs. 45). However, those randomized to receive conventional care experienced significantly greater change on the Barthel Index from 4 to 12 weeks (median change = 6 vs. 2, $p<0.01$) and reported significantly greater scores on the EuroQol at six-months (72 vs. 63, $p<0.01$). Markle-Reid et al. [82] randomized 90 adults, recruited from 2 outpatient rehabilitation programs in Ontario who were discharged from hospital to the community with stroke and multimorbidity (≥2 chronic conditions), with planned discharge back to the community to receive usual care (control group) or usual care plus a Transitional Care Stroke Intervention (TCSI) for 6 months. The core components of the intervention included: 1) a post-discharge telephone follow-up call within 2 days of hospital discharge by the care coordinator, 2) up to 6 virtual visits delivered by phone or videoconference by a member of the interprofessional team, lasting an average of one hour, 3) monthly team conferences in which an individualized patient-centred plan of care was developed and evaluated, 4) ongoing care coordination/system navigation support provided by the care coordinator, and 5) an online resource to support self-management and system navigation. Eleven participants were lost to follow-up. The risk of the primary outcome (hospital readmission within 6 months) was not reduced significantly in the TCSI group (3/39 vs. 5/40; RR=0.62, 95% CI 0.16- 2.40); however, there were significant group differences favouring the TCSI group on the SF-12 Physical Component Summary Score (MD=5.10, 95% CI 1.58–8.62), the Southampton Stroke Self-Management Questionnaire (MD=6.00, 95% CI 0.51–11.5), and the Person-Centred Coordinated Care Experience Questionnaire (MD=2.64, 95% CI 0.81- 4.47). There were no significant differences between groups on the SF-12 Mental Component Summary Score or the Centre for Epidemiological Studies Depression Scale 10-item tool. O'Callaghan et al. [83] reported significantly higher mean Barthel Index scores at 3 and 6 months in participants who were randomized to a transitional care program compared to usual care in a systematic review including 17 RCTs of persons returning home after admission to an acute or rehabilitation stroke service.

Healthcare Provider Interprofessional Communication

Transitions between and within health care settings pose a safety and quality of care concern for patients recovering from stroke. A consensus policy statement by the American College of Physicians in 2009 highlighted concerns of patient safety at transition points, particularly between inpatient and outpatient care. [84] A individuals with stroke is vulnerable to many of these transition points as they progress through the acute, sub-acute and chronic stages of recovery, interacting with a range of physicians in several different health-care settings. Communication between these physicians and care settings is critical for ensuring patient safety and quality of care. A systematic review authored by Mitchell et al. [85] sought to assess the impact of co-ordinated interdisciplinary care in primary care, represented by the delivery of formal care planning by primary care teams or shared across primary-secondary teams, on outcomes in stroke, relative to usual care. The authors reported the involvement of a general practitioners (GP) was of uncertain benefit, while also noting that few studies described the tasks and roles GPs. In a systematic review, Kattel et al. [86] included 19 studies which described hospital discharge communication between hospital-based providers and primary care physicians (PCPs). While a median of 55.1% of hospital discharge communications were transferred to the PCP within 48 hours, 8.5% of discharge summaries never reached the PCP. Information that was absent from discharge summaries included diagnostic test results (61%), pending tests at discharge (25%), and follow-up plans (41%). PCP received notification of discharge in only 23% of cases. In a controlled study of 3,248 hospitals, Mitchell explored the association between physician/nurse communication with the patient regarding discharge instructions and readmission. An average of 84% of patients reported receiving discharge instructions. [87] Hospitals that had smaller bed numbers, were non-profit and located in non-urban areas were more likely to provide discharge instructions. Patients reported that, on average, nurses and doctors communicated well with them 78% and 82% of the time. Controlling for other factors, increasing frequency of communication surrounding discharge instructions was associated with significantly lower number of 30-day hospital re-admissions.

Areas of communication deficits were reported in a systematic review by Kripalani et al. [88] which included the results of 73 studies examining communication deficits between hospitals and primary care providers, and interventions to improve communication during this transition. While a median of 53% of discharge letters had arrived at the physician's office within one week of discharge, only 14.5% of discharge summaries were received the same timeframe. However, 11% of discharge letters and 25% of discharge summaries never reached the primary care physician. Discharge letters were missing a main diagnosis in 7%-48% of cases, hospital treatment details in 22%-45% of cases, medications at discharge for 7%-48% of cases, plans for follow-up in 23%-48% of cases, and notes on patient or family counselling in 92%-97% of cases. In terms of effectiveness of interventions, a significantly higher percentage of discharge summaries that were hand delivered (compared with mailing) were received by week 4 following discharge (80% vs. 57%, $p<0.001$). The overall quality of the summaries was perceived to be higher, and the summaries were longer when computer generated, using a standard template, and were received by the primary care physician sooner.

Halasyamani et al. [89] described the development of a discharge checklist, based on a literature review, expert committee and peer review, designed to identify the critical components in the process when discharging elderly patients from hospital. The final checklist includes 3 types of discharge documents: the discharge summary, patient instruction and communication on the day of discharge to the receiving care provider. Data elements included on the final checklist were: problem that precipitated hospitalization, key findings and test results, final primary and secondary diagnoses, condition at discharge (functional and cognitive), discharge destination, discharge medications, follow-up appointments, list of pending lab results and person to whom results will be sent, recommendations of sub-specialty consultants, documentation of patient education and understanding, identification of atypical problems and suggested interventions, 24/7 call-back number, identification of referring and receiving providers, resuscitation status.

Sex & Gender Considerations

Sex and gender differences may play a role in interprofessional communication across healthcare settings, influencing team dynamics, collaboration, and patient care; however, the topic has not been well researched within interdisciplinary teams. In a qualitative study of operating room personnel in Ontario [90] traditional gender roles, norms and stereotypes were reported by both men and women, with potentially negative consequences including a breakdown in communication, and poor team morale.

Evidence Table and Reference List

Section 4 Virtual Stroke Care

4. Virtual Stroke Care Recommendations 2026

Notes:

- *For details in setting up virtual stroke care programs, refer to the CSBPR Virtual Stroke Care Implementation Toolkit.*[75]
- *Please refer to each other CSBPR module for details on specific application of virtual care relevant to that topic area (e.g., acute stroke care, stroke rehabilitation, secondary prevention).* [5-11,76]
- *Note, provincial virtual care frameworks and implementation processes may vary across jurisdictions.*

4.0 General Principles of Virtual Stroke Care

i. Virtual stroke care should be available as an alternative or adjunct to in-person stroke care for individuals with stroke across the continuum of care as appropriate when in-person care is not available [Strong recommendation; Moderate quality of evidence]. *Refer to Heart & Stroke virtual care decision framework for additional information.* [91]

ii. All stroke care providers should consider the use of virtual care technology for assessment and management of individuals with stroke [Strong recommendation; Low quality of evidence].

iii. Virtual care modalities should be integrated into stroke systems of care planning and service delivery across the continuum (i.e., from pre-hospital to acute stroke care, stroke prevention, stroke rehabilitation and self-management, home-based therapy, and ambulatory care) to support optimal recovery of individuals with stroke, provide support for families, and ensure equitable access to care throughout Canada [Strong recommendation; Moderate quality of evidence].

iv. Virtual stroke care should be offered to eligible individuals and when an in-person visit is not feasible or not available, and the goals of the visit can be achieved virtually [Strong recommendation; Moderate quality of evidence].

v. Clearly defined criteria, protocols and algorithms should be available to help referring stroke providers determine when and how individuals with stroke may benefit from virtual care~~,~~ in consideration of individual preferences [Strong recommendation; Low quality of evidence]. *Refer to Heart & Stroke virtual care decision framework for additional information.*[91]

vi. Healthcare providers and individuals with stroke should be aware of available virtual care resources to support competency in operating these resources for clinical care [Strong recommendation; Low quality of evidence].

vii. Individuals with stroke who have functional or sensory limitations such as communication or visual, should not be excluded from consideration for virtual care encounters [Strong recommendation; Low quality of evidence].

Section 4.0 Clinical Considerations

1. Personal and cultural preferences should be considered when an individual with stroke is eligible for both virtual and in-person stroke care, and the clinician is able to offer either one or a combination of both options.

4.1 Planning Delivery of Virtual Stroke

i. Preparations for implementing a virtual stroke care program should involve:
   a. A clear identification of program goals [Strong recommendation; Low quality of evidence].
   b. A needs assessment to identify local barriers and enablers to offering virtual stroke care [Strong recommendation; Low quality of evidence].
   c. An implementation plan to address barriers and incorporate enablers [Strong recommendation; Low quality of evidence].
   d. A process for continuous quality improvement [Strong recommendation; Moderate quality of evidence].

4.2 Technology for Virtual Stroke Care

i. Technologies including internet, hardware (e.g., computers, mobile devices, telephones), video-conferencing platforms, and remote monitoring devices, can be used to enable virtual consultations and/or virtual care delivery and support self-management [Strong recommendation; Low quality of evidence].

ii. Asynchronous modalities, such as emails, texts and online learning modules, may be considered where appropriate and permitted for communication, education, scheduling, and planning of care [Strong recommendation; Low quality of evidence].

iii. Documentation and transfer of relevant health information in virtual care should meet the same standards as in-person care [Strong recommendation; Low quality of evidence].

4.3 Consent and Privacy

Note, no evidence-based recommendations available for inclusion in this section.

Section 4.3 Clinical Considerations

1. Clinicians should follow discipline-specific and organizational virtual healthcare guidelines, policies and other mandates, as well as those established by their professional regulatory organizations, when providing virtual stroke care.
   a. This includes requirements related to consent and privacy when delivering virtual stroke care within clinicians’ jurisdictions and the jurisdiction where the individual with stroke is receiving virtual healthcare.
2. For individuals with stroke who do not have access to the technology required for virtual care, or did not consent to virtual care, organizations should have alternate processes available to ensure access to care.
3. Established privacy procedures should be followed when providing virtual stroke care, such as confirming the person’s identity at the beginning of the virtual encounter and ensuring that all participants are in an appropriate setting, where privacy can be optimized.
4. Process in place to deal with emergencies or safety issues that may occur during virtual visits.

4.4 Training and Competency

i. Interdisciplinary team members should maintain the necessary competencies to provide safe and appropriate virtual stroke care using designated virtual healthcare platforms [Strong recommendation; Low quality of evidence].

ii. Referring and consulting service providers should be trained in using virtual stroke care systems and understand their roles and responsibilities for technical and clinical aspects of a virtual stroke care consultation [Strong recommendation; Low quality of evidence].

Section 4.4 Clinical Considerations

1. Individuals with stroke and their families and caregivers should receive advanced education about optimizing participation in virtual care sessions. Areas to address may include:
    a. Access and use of digital technology and web platforms
    b. Health literacy
    c. Language and communication limitations
    d. Preparation for virtual stroke care sessions, including appropriate clothing, lighting, and equipment that are needed to facilitate the encounter.
    e. Alternate means of contact should the system be interrupted, or a safety issue occur.

Rationale

Virtual care offers a flexible and accessible approach to managing stroke across the continuum of care, from acute treatment to rehabilitation and long-term follow-up. It enables timely access to specialists, particularly in underserved or remote areas, supporting rapid assessment and triage in the hyperacute phase (e.g., telestroke for thrombolysis decisions). During rehabilitation, virtual platforms can facilitate interdisciplinary therapy, promote continuity of care, and enhance patient engagement through home-based monitoring and exercise programs. In the long term, virtual care supports ongoing management of risk factors, medication adherence, and patient education, contributing to secondary prevention and reducing the likelihood of recurrent stroke. By bridging geographical and logistical barriers, virtual care strengthens the coordination and quality of stroke care across all stages.

Individuals with stroke value the flexibility and accessibility that virtual stroke care can support, including more equitable access to care and resources, especially when access to in-person services may not be available or feasible. They recognize that there may also be benefit to combining virtual and in-person visits to help meet differing needs of the individual with stroke, at different points of their recovery. For example, they reflect on the benefit that in-person visits provided, particularly at the beginning of recovery, to provide reassurance and motivation. They stress the importance of collaborative decision making when determining when to utilize virtual stroke care and that use may depend on the type of therapy being provided, comfort level of the individual receiving care with virtual modalities, familiarity and skill level of the healthcare provider with virtual modalities, and safety cautions that need to be considered. Equitable access to necessary infrastructure, such as internet connections and technology is also a factor. The potential challenges for those engaging in virtual stroke care have been identified as discomfort with use of technology and low digital literacy, being unfamiliar with what virtual care is and how it can be used, as well as cognitive and/or visual changes that may increase difficulty of participating in virtual rehabilitation.

Individuals with stroke stress that virtual modalities should not replace all in-person visits and emphasize that different individuals will prefer a different style of visit, pending on the goal of the encounter. They also encourage options, where appropriate, for individuals to participate virtually in groups, so that they can build connections with other individuals also recovering from stroke. By integrating virtual stroke care that is tailored to the unique needs and preferences of each individual, while ensuring a balanced approach that maximizes the benefits of both virtual and in-person interactions throughout the recovery journey, the stroke care system can support diverse individual needs.

System Implications

To ensure that as many of these virtual stroke care recommendations as possible are implemented across Canada, health system leaders, funders, and administrators at all levels of government and in all regions need to be actively engaged in and committed to building sustainable models for virtual stroke care. Many of the enablers listed below are beyond the scope of direct clinical care providers and many health professional groups.

Health system leaders, funders and administrators should ensure that all healthcare providers have the necessary tools, resources, and processes to provide high-quality, evidence-based stroke care across the full continuum of care.

For virtual stroke care, the following actions, structures, resources, and processes need to be considered:

1. The need for appropriate technology and access to stable internet and phone services to support virtual stroke care for healthcare providers and individuals with stroke.
2. The need to train and support healthcare providers and individuals with stroke on how to use virtual stroke care technologies.
3. Virtual stroke care should be integrated and seen as part of larger regional or provincial stroke delivery plans that decentralize expertise to support clinical care in less well-resourced areas. Inherent in such a system are clear criteria, protocols, algorithms, and service agreements for the transfer and repatriation of individuals with stroke when clinically indicated.
4. A governance structure with a clear framework of accountabilities for virtual stroke care services is required. This includes facility, regional and/or provincial levels of governance.
5. The considerable human resource implications include establishing the appropriate number of healthcare providers to participate in virtual encounters, and right-sizing the work force to take into account the time taken away from the in-person clinical duties of consulting clinicians at their places of work.
6. Clear guidelines and processes for healthcare provider reimbursement need to be established as part of the development of a virtual stroke care program.
7. The need for service agreements that address the availability of maintenance and technical support to ensure the clinical requirements of virtual care are met.
8. The need for all users of a virtual stroke care system to be aware of their roles and responsibilities and know how to use the technology. This includes regular updates to maintain competence.
9. The need for agreements and protocols for interprovincial and territorial consultations where appropriate and time efficient, and where service gaps exist.
10. Processes need to be established to monitor and evaluate virtual stroke care services, including the use of validated data collection mechanisms and the establishment of standardized key quality indicators.
11. Provincial healthcare administrators need to work together to build sustainable models for cross-border care delivery. Licensing requirements for virtual healthcare vary among provinces and territories. Healthcare professionals may have to be licensed in multiple jurisdictions, possibly both in their location and in the location of the individual with stroke receiving care. In addition, special requirements and/or conditions on the provision of services may be required in some jurisdictions. Privacy legislation should also be followed in each applicable jurisdiction.
12. Virtual stroke care may present challenges with consent. In addition to obtaining informed consent for the proposed treatment, healthcare professionals may want to ask individuals with stroke to read and accept standard terms and conditions for virtual stroke care and services and document the consent and any discussion.

Performance Measures

Refer to other CSBPR modules for additional virtual stroke care performance measures relevant to those specific topic areas (e.g., acute stroke care, stroke rehabilitation, secondary prevention).

System indicators:

1. Cost effectiveness of virtual stroke care compared to in-person stroke care, within each setting where virtual care is provided.
2. Proportion of individuals with stroke who have access to virtual care modalities regardless of geography, income, age, or disability (e.g., internet, devices, digital literacy).
3. Proportion of individuals with stroke with access to appropriate technology (internet, device).
4. Proportion of individuals with stroke in underserved populations accessing virtual care (e.g., rural, Indigenous).
5. Proportion of stroke care providers using evidence-based virtual care guidelines and protocols with appropriate documentation of each visit.

Process indicators:

1. Median wait times from referral to first appointment for a scheduled virtual stroke care encounter.
2. Proportion of individuals with stroke who receive stroke assessment and/or management through virtual healthcare modalities.
3. Proportion of individuals with stroke who underwent a virtual care session indicated by the presence of the virtual care consultant’s note in the person’s health record.
4. Median duration of scheduled virtual stroke care encounters, with values reported separately for each service (e.g., physician, nursing, allied health).
5. Proportion of virtual stroke care encounters requiring urgent transfer of individuals with stroke to an in-person healthcare visit.
6. Proportion of virtual stroke care encounters disrupted by technical difficulties faced by the healthcare provider.
7. Proportion of virtual stroke care appointments provided using synchronous two-way video conferencing compared to by telephone only.
8. Proportion of virtual stroke care visits with documentation in the individual’s health record.

Patient Oriented Outcomes and Experience Indicators:

1. Clinical outcomes for virtual vs. in-person care (e.g., BP control, stroke risk factors).
2. An individual with stroke’s reported experience with virtual stroke care related to attributes such as feasibility, satisfaction, quality, sound, visual clarity, reliability of technology, and ease of use.
3. Proportion of virtual stroke care encounters disrupted by technical difficulties faced by healthcare provider or individual with stroke.
4. Median time from referral for virtual stroke care to first virtual stroke encounter.
5. Proportion of individuals with stroke who report they were able to communicate effectively with provider.
6. Proportion of individuals with stroke who report feeling involved in decision-making during virtual visit.
7. Patient-reported experience of their safety during virtual stroke care encounters, including prevention of risks.
8. Proportion of virtual stroke care encounters that included family members and/or caregivers who

were in a different location from the individual with stroke.

Implementation Resources and Knowledge Transfer Tools

Resources and tools listed below that are external to Heart & Stroke and the Canadian Stroke Best Practice Recommendations may be useful resources for stroke care. However, their inclusion is not an actual or implied endorsement by the Canadian Stroke Best Practices or Heart & Stroke. The reader is encouraged to review these resources and tools critically and implement them into practice at their discretion.

Healthcare Provider Information

- CSBPR Virtual Stroke Care Implementation Toolkit: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/csbpr-virtual-stroke-toolkit-final.pdf?rev=e545b3d0a8394ca18586090a74cdcf49
- Heart & Stroke: Virtual Care Decision Framework: https://www.heartandstroke.ca/-/media/1-stroke-best-practices/csbp-f20-virtualcaredecisionframework-en
- Canadian Stroke Best Practice Recommendations: Acute Stroke Management Module: https://www.strokebestpractices.ca/recommendations/acute-stroke-management
- Canadian Stroke Best Practice Recommendations: Secondary Prevention of Stroke Module: https://www.strokebestpractices.ca/recommendations/secondary-prevention-of-stroke
- Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery and Community Participation following Stroke, *Part One: Rehabilitation Planning for Optimal Care Delivery Module*: https://www.strokebestpractices.ca/recommendations/stroke-rehabilitation-planning
- Heart & Stroke: Post-Stroke Checklist: https://www.heartandstroke.ca/-/media/1-stroke-best-practices/resources/patient-resources/002-17_csbp_post_stroke_checklist_85x11_en_v1
- Stroke Engine: https://strokengine.ca/en/

Resources for Individuals with Stroke, Families and Caregivers

- Heart & Stroke: Signs of Stroke: http://www.heartandstroke.ca/stroke/signs-of-stroke
- Heart & Stroke: FAST Signs of Stroke…what are the other signs?: https://www.heartandstroke.ca/stroke/signs-of-stroke/fast-signs-of-stroke-are-there-other-signs
- Heart & Stroke: What is Stroke?: http://www.heartandstroke.ca/stroke/what-is-stroke
- Heart & Stroke: Your Stroke Journey: https://www.heartandstroke.ca/-/media/pdf-files/canada/your-stroke-journey/en-your-stroke-journey-v20.pdf
- Heart & Stroke: Post-Stroke Checklist: https://www.heartandstroke.ca/-/media/1-stroke-best-practices/resources/patient-resources/002-17_csbp_post_stroke_checklist_85x11_en_v1
- Heart & Stroke: Virtual Healthcare Checklist: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbp-infographic-virtual-healthcare-checklist.pdf?rev=bf2f5b0e9e4a49cfbfc251208b6a15e2
- Heart & Stroke: Recovery and Support: https://www.heartandstroke.ca/stroke/recovery-and-support
- Heart & Stroke: Online and Peer Support: https://www.heartandstroke.ca/heart-disease/recovery-and-support/the-power-of-community
- Heart & Stroke: Services and Resources Directory: https://www.heartandstroke.ca/services-and-resources

- CanStroke Recovery Trials: Tools and Resources: https://canadianstroke.ca/tools/
- Stroke Engine: https://strokengine.ca/en/
- CESN Journey to Recovery after Stroke resource. https://cesnstroke.ca/clinical-resources-tools/journey-to-recovery/#caregiver

Summary of the Evidence

Telestroke, or virtual interventions, care can be used to enhance stroke care delivery across the entire continuum—from acute diagnosis and triage to rehabilitation and secondary prevention.

Virtual Care for Acute Ischemic Stroke

Acute virtual stroke care – or Telestroke - can be used to increase access to thrombolytic treatment at facilities that lack 24 hour, 7 days a week onsite stroke expertise, using 2-way audiovisual equipment to carry out a detailed stroke examination, combined with a system to reliably transmit CT scan results. The safety, feasibility and efficacy of the “hub & spoke” model, which connects a tertiary stroke center to one or more distant primary care centers, has been established in many studies conducted in Europe and North America. In some of these studies, although minor technical difficulties were reported, the number of patients treated with intravenous thrombolysis increased at the spoke sites where telestroke systems were implemented and the symptom onset-to- treatment time decreased. The outcomes of 153,272 patients treated at hospitals with and without telestroke capacity following admission for acute ischemic stroke in the United States, were compared. [92] The frequency of reperfusion therapies received was significantly higher at telestroke hospitals (6.8% vs 6.0%; difference, 0.78 percentage points; 95% CI 0.54-1.03, p < .001). The likelihood of receiving thrombolysis and thrombectomy, were both significantly higher at telestroke enabled hospitals (RR=1.12, 95% CI 1.08 to 1.17 and RR=1.42, 95% CI 1.25 to 1.62, respectively). Both 7 and 30-day mortality was significantly lower in the telestroke hospitals (7-day: 6.03% vs. 6.33%; RR=0.95, 95% CI 0.92 to 0.99, 30-day:13.1% vs 13.6%; RR=0.96, 95% CI 0.94 to 0.99).

In a systematic review, Mohamed et al. [93] compared the outcomes of patients who received thrombolysis with alteplase via telemedicine consultation to those who were treated through conventional, in-person care. The results of 33 studies (2 RCTs) and 12,540 patients were included, of whom 7,936 (63.9%) were thrombolyzed. Mean times from symptom onset to thrombolysis administration and door-to-needles times were similar between the groups. The odds of a good clinical outcome were not significantly higher in patients treated conventionally. The odds of 90-day mortality were not increased significantly in patients treated with telemedicine, nor were the odds of symptomatic intracerebral hemorrhage significantly higher in the telemedicine group. In Ontario, Porter et al. [94] conducted an audit to determine whether the safety outcomes of 214 patients treated using the Ontario Telestroke Program with intravenous thrombolysis over a two-year period were comparable with those of 1,885 patients treated at regional stroke centres, district stroke centres and non-designated centres. The administration of alteplase using telestroke was not associated with an increased risk of death within 7 or 90 days (adjusted hazard ratio [HR] =1.29, 95% 0.68- 2.44 and adjusted HR=1.01, 95% CI 0.67-1.50, respectively), nor was its use associated with an increased risk symptomatic intracerebral hemorrhage (ICH) or poor outcome (adjusted HR= 0.71,95% 0.29-1.71 and adjusted HR=0.75, 95% CI 0.46-1.23, respectively). Also using data from Ontario, Ho & Fawcett [95] compared the outcomes of patients who were treated with either intravenous thrombolysis with alteplase or endovascular thrombectomy (EVT) who were assessed after a telemedicine or an in-person assessment. There were no significant differences between the groups in median door-to-needle times for alteplase administration, door-to-puncture time for EVT, or in the percentage of patients with early symptomatic intracranial hemorrhage, or 3-month mortality.

Virtual Stroke Rehabilitation

The results from a rapidly expanding volume of literature suggests that virtual stroke rehabilitation can be both feasible and effective compared with in-person encounters. The authors of recently published systematic reviews examining remotely delivered therapy reported that measures of balance, upper and lower extremity motor function, mobility, and performance of activities of daily living, were not significantly different compared to those of persons receiving conventional rehabilitation, and in some cases, were superior.[96-101] In the Cochrane review authored by Laver et al., [97] virtual care was also used successfully to treat persons with speech and language impairments and low mood post stroke. Knepley et al. [102] reported that functional outcomes among those that received virtual stroke rehabilitation were equivalent or better compared with those that received in-person therapy, as was patient satisfaction. Additionally, some virtually provided therapies were less costly than in-person therapy.

Several recent RCTs have examined virtual therapies for both upper and lower-limb rehabilitation. Late-Life Function and Disability Instrument scores were improved in both the virtual care group and the usual care group that received standard rehabilitation therapies, following hospital discharge in the Singapore Tele-technology Aided Rehabilitation in Stroke (STARS) trial in which 124 patients were randomized to receive 3 months of physiotherapy (PT) and occupational therapy (OT) via a tele-rehabilitation system using an iPad based system to provide exercises 5 days a week. [103] In the Augmented Community Telerehabilitation Intervention (ACTIV) trial, [104] a structured 6-month program using face-to-face sessions, telephone contact, and text messages to augment stroke rehabilitation was compared with usual care. The ACTIV focused on two functional categories: “staying upright” and “using your arm” and was provided to patients with a stroke occurring an average of 6 months previously, by physical therapists. There were improvements in both groups in the physical subcomponent of the Stroke Impact Scale (SIS 3.0), the primary outcome at 6 months, and the SIS subcomponents, with no significant differences between groups. The outcomes of patients who received virtual rehabilitation services have also been shown to be better than those who received conventional outpatient therapy. The Fugl-Meyer Assessment scores of patients who received a 12-week telerehabilitation program were significantly higher compared to those who received the same duration of outpatient therapy. [105] In the same study, telerehabilitation was found to be non-inferior for the modified Barthel index.

Adaptation of existing rehabilitation programs may offer alternative solutions to in-person therapy. Yang et al. [106] provided a virtual version of the Graded Repetitive Arm Supplementary Program (GRASP) over 10 weeks, to 9 persons with residual difficulty using their affected upper extremity following remote stroke. There were significant improvements over time for all outcome measures, which included the Arm Capacity and Movement test (ArmCAM), a new assessment tool developed for online use.

Assessment of performance-based measures in a virtual setting has not been well studied and poses challenges. Some previously validated outcome measures may not be appropriate, feasible or valid for virtual use. It remains to be determined whether new assessment tools will need to be developed and validated for virtual use. In some cases, adaptation of an existing measure may be sufficient. For example, Peters et al. [107] developed a version of the Fugl-Meyer (FM) assessment, suitable for virtual care use (FM-tele) and demonstrated its feasibility. In addition, although the sample size was small (n=5), the proportional agreement between the FM-tele conducted in person and conducted remotely by the same assessor, one week apart, was good. Both patients and assessors reported some issues with technical difficulties, a common complaint when using virtual platforms. Inter-rater reliability of the Balance Scale, Fugl-Meyer Assessment and the Action Research Arm Test has been shown to be good to excellent when comparing in-person assessments with those conducted virtually through videoconference.[108, 109]

Stroke Prevention

There are several ways in which virtual care can be used to facilitate secondary prevention interventions. Telehealth consultations with physicians, including neurologists or primary care providers, enable timely medication management, risk factor control (e.g., hypertension, diabetes, atrial fibrillation), and individualized patient counseling without requiring in-person visits. Remote monitoring technologies can track blood pressure, glucose levels, and heart rhythms (e.g., for atrial fibrillation detection), allowing for prompt response to abnormal readings. Virtual self-management programs and mobile health apps can also provide reminders for medication adherence, lifestyle modification tools (e.g., smoking cessation, diet, physical activity), and stroke warning sign recognition.

Virtual care interventions (remote monitoring and telephone-based counselling or support, or web-based interventions), were associated with significant reductions in both systolic and diastolic blood pressure (MD= -4.37 mm Hg, 95% CI -5.50 to -3.24 and MD= -1.72 mm Hg, 95% CI -2.45 to -0.98, respectively) in a systematic review of 13 RCTs including 3,803 participants with a history of stroke or TIA +/- hypertension.[110] Telehealth interventions were also associated with better medication adherence (SMD=0.52, 95% CI 0.03 to 1.00). In the SPRINT INDIA trial, 4,298 patients, recruited from 31 centres, following a first stroke were randomized between 2 days and 3 months after symptom onset to an intervention group that received 68 regular short SMS messages and 6 short videos that promoted risk factor control and medication adherence, or to a usual care group. At one year, there was no significant difference between groups in the primary outcome (a composite of recurrent stroke, high-risk TIA, acute coronary syndrome, or death) or any of its components; however, patients in the intervention group were more likely to reduce or quit drinking alcohol, reduce smoking and be more compliant with medications. [111] In a systematic review by Deng et al. [112] that included 32 randomized controlled trials of patients with established arteriosclerotic cardiovascular disease, outcomes were compared between those randomized to a telemedicine-based secondary prevention (TOSP) group and those receiving usual care. Participants in the TOSP group received remote interventions delivered through telemedicine modalities such as phone calls, text messages, mobile apps, emails, and remote monitoring. Phone-based telemedicine interventions significantly improved body mass index, blood pressure, and enhanced exercise capacity. The effects on medication adherence, diet, knowledge, self-efficacy, depression, anxiety, and safety were inconsistent across studies. Combined remote monitoring and consultation was associated with a significant reduction in the risk of cardiovascular mortality and a reduction in the risk of cardiovascular hospitalisation, in patients with heart failure who received telehealth interventions.

Virtual interventions can also be used in primary prevention to improve cardiovascular risk factors. Jaén-Extremera et al. [113] included 28 studies including 5,460 persons from the general public with one or more of the following conditions or habits: diabetes, hypertension, obesity, hypercholesterolemia, sedentary lifestyle and smoking. Telemedicine and e-health interventions were targeted at ≥1 of the 6 conditions. E-health interventions were associated with a significant decrease in hemoglobin A1c in persons with diabetes, a significant decrease in systolic and diastolic blood pressure in persons with hypertension, and a significant decrease in weight in those who were overweight. Salisbury et al. reported that monthly phone calls with a health advisor resulted in significantly lower systolic and diastolic blood pressures in participants with a 10-year cardiovascular disease risk of 20% or more, no previous cardiovascular event, at least one modifiable risk factor, and was also associated with significant improvements in diet, physical activity, drug adherence, and satisfaction with access to care, compared with usual care. [114] Digital health interventions including telemedicine, web-based strategies, email, mobile applications, text messaging, and monitoring sensors significantly reduced the risk of cardiovascular events including myocardial infarction, stroke, or revascularization, hospitalizations, and all-cause mortality (RR=0.61, 95% CI, 0.46–0.80, p<0.001) in a systematic review of 51 studies (n=23,962 participants).[115]

Sex & Gender Considerations

Research in this area is limited. Pérez-Sánchez et al. [116] compared the outcomes of 3,009 men (57.3%) and women (42.7%) with suspected stroke, attended to in a telestroke network over two years. There were no significant differences in the proportions of men vs. women who received treatment with thrombolytics, thrombectomy, or both interventions, nor were there differences in process times between the groups (time from symptom onset to Emergency Department arrival, door-to-needle time, or door origin-to-arterial puncture time). There were no significant differences between groups in 90-day or 3-month mortality, or good function (modified Rankin Scale ≤2) outcome at 3 months. Women may be less likely to consent to receiving thrombolytics. [117]

Evidence Table and Reference List

Section 5 Education for Individuals with Stroke, Family and Caregivers

5. Education for Individuals with Stroke, Family and Caregivers Recommendations 2026

Notes

1. *Inclusion of family and informal caregivers in stroke education is valued and encouraged. Consent is required from the individual with stroke for involvement of family and caregivers in education sessions and training.*

2. *Education and training recommendations apply to all settings across the continuum. In settings such as ambulatory care and emergency departments, there is shorter interaction time and greater risk of learning needs being unmet. Strategies to address these issues should be in place such as written information resources and handout packages.*

3. *Refer to CSBPR Stroke Systems of Care module, Appendix Three: Stroke Education Framework for additional details.*

5.0 General Principles of Stroke Education

i. Education for individuals with stroke, their family and caregivers, is an integral part of stroke care that should be included as part of all healthcare encounters, and during transitions [Strong recommendation; High quality of evidence].

ii. Individuals with stroke, their family and caregivers should be active participants in planning, delivery and evaluation of education related to stroke and recovery [Strong recommendation; Moderate quality of evidence].

iii. All healthcare providers maintain responsibility for education for individuals with stroke and their family [Strong recommendation; Low quality of evidence].

iv. Dedicated staff should be assigned in each setting to ensure education is being provided with a consistent approach [Strong recommendation; Moderate quality of evidence].

v. Stroke programs should have policies in place regarding stroke education and comply with the documentation practices that are outlined in the policy [Strong recommendation; Low quality of evidence]. [118]

5.1 Assessment of Learning Needs

i. Individualized learning needs and goals should be assessed and documented by members of the healthcare team [Strong recommendation; Moderate quality of evidence].

    a. Learning needs and goals should be updated regularly as individuals with stroke move through the stages and settings for care to tailor an individualized education plan [Strong recommendation; Moderate quality of evidence].

ii. Areas of learning needs to be assessed may include:

    a. Readiness for receiving education [Strong recommendation; Moderate quality of evidence].
    b. Health literacy [Strong recommendation; Low quality of evidence].
    c. Cultural considerations and language barriers [Strong recommendation; Low quality of evidence].
    d. Preferred format for receiving education (in-person vs virtual; synchronous vs asynchronous; written and oral) [Strong recommendation; Low quality of evidence].

   e. Cognitive, psychological, sensory and communication abilities [Strong recommendation; Moderate quality of evidence].
   f. Specific content learning needs (as defined in Box 5) [Strong recommendation; Low quality of evidence].
   g. Self-management skills level [Strong recommendation; Moderate quality of evidence]. *Refer to Section 5.3 below for additional information.*

5.2 Delivery of Education

i. An individualized education plan should be developed and implemented based on the assessment of learning needs and goals of individuals with stroke and their families, and their readiness to learn [Strong recommendation; Moderate quality of evidence].

ii. It is recommended that individualized stroke education:
   a. Be goal-oriented and facilitate shared decision-making regarding care and recovery [Strong recommendation; Moderate quality of evidence].
   b. Cover all aspects of stroke care and recovery and align to individual educational needs [Strong recommendation; Moderate quality of evidence].
   c. Facilitate shared decision-making and be aligned to individualized goals [Strong recommendation; Low quality of evidence].
   d. Be interdisciplinary, evidence-based, and consistent in content, and across providers and settings [Strong recommendation; Moderate quality of evidence].
   e. Be interactive and encourage active participation of individuals with stroke and their family [Strong recommendation; Moderate quality of evidence].
   f. Combine skill building (e.g., problem solving, stress management, goal setting) with psycho-educational strategies instead of psycho-educational strategies alone [Strong recommendation; High quality of evidence].
   g. Be available in accessible formats, based on individual circumstances [Strong recommendation; Moderate quality of evidence].
   h. Include repetition and reinforcement of information that has not been retained (e.g., medication information and management) [Strong recommendation; Moderate quality of evidence].
   i. Be provided both formally and informally in individual and group settings as appropriate [Strong recommendation; Moderate quality of evidence].
   j. Consider optimal method of education delivery including virtual options [Strong recommendation; Moderate quality of evidence].

iii. Education provided should be documented in the health record and accessible by members of the healthcare team [Strong recommendation; Low quality of evidence].

iv. Retention of information should be regularly assessed and levels of understanding documented [Strong recommendation; Moderate quality of evidence].

v. Education and training should be offered to family and caregivers to participate in and to provide safe stroke care using an interdisciplinary approach based on the individual’s learning needs [Strong recommendation; Moderate quality of evidence].

5.3 Supporting Self-Management following Stroke through Skills Training

Refer to Definitions and Descriptions within the Introduction and Overview for the definition of self-management.

i. Individuals with stroke, their families and caregivers should be provided with resources and information which will enable self-management and the ability to navigate through the health care and social system [Strong recommendation; Moderate quality of evidence].

ii. Self-efficacy and quality of life should be supported by providing opportunities to learn and master self-management skills [Strong recommendation; Moderate quality of evidence]. *Refer to Box 5 and the CSBPR Enabling self-management following stroke Checklist for additional information regarding self-management topics for individuals who had a stroke, their family and caregivers*.

iii. With consent from the individual with stroke, family members and caregivers may be invited and encouraged to attend care and therapy sessions to support self-management for individuals with stroke [Strong recommendation; Low quality of evidence].

iv. All care settings should have up-to-date inventories of community resources available to support self-management and offer guidance and assistance in obtaining needed services [Strong recommendation; Low quality of evidence].

Box 5 Self-Management Checklist

Education topics:

- secondary stroke prevention
- medication management
- risk factor management (including adherence to pharmacotherapy)
- role and importance of exercise, information on community-based exercise programs
- symptom and stress management techniques
- fatigue, sleep management, and energy conservation strategies
- nutrition, managing dysphagia, healthy eating strategies
- coping with physical changes
- coping with emotions such as fear, anger and depression
- coping with cognitive and memory changes
- coping with perceptual deficits
- managing communication impairments
- health-related problem-solving and decision making
- relationships, intimacy and sexuality
- community participation and resuming valued activities
- leisure and social participation
- supports available in the community, such as housing/supported living options
- driving regulations and rehabilitation, and community-based transportation services
- considerations and strategies related to return to work
- financial resources
- advanced care planning, end-of-life and palliative care options

- respite care options
- peer support

Skills training and self-management topics:

- Self-management education to encourage independence, increase confidence and develop skills to better manage their health
- Personal care techniques (e.g., feeding and bathing techniques)
- Communication strategies and supportive communication
- Safe transfers, lifts, and repositioning (e.g., transfers from bed to chair, positioning of a hemiplegic limb)
- Food preparation and modifications for dysphagia
- Cognitive strategies such as problem-solving techniques
- Stress management techniques (e.g., exercise, mindfulness and meditation)
- Accessing community services and resources, including exercise programs
- Ongoing health system navigation
- Caregiver awareness of the importance of self-care and caregiver burnout
- Leisure activity adaptations or modifications

Rationale

Education is an ongoing and vital part of the recovery process for individuals with stroke, family members and caregivers. Following stroke, individuals with stroke generally retain less than 25% of the information that is provided during their inpatient stay; [119] therefore, it needs to be reinforced consistently across care transitions. Active education interventions help to equip both individuals with stroke and caregivers with the tools to manage the rehabilitation process. The information provided at each phase of acute care, rehabilitation, community participation, long-term recovery and end-of-life should be relevant to the individuals with stroke and the family's changing needs. Education interventions should be interactive and adapted to the cognitive and communication challenges, as required. Skills training for caregivers, is also an important component, which helps to empower individuals with stroke and their families to take an active role in the recovery process, improving quality of life and contributing to better long-term outcomes.

Individuals with stroke highly value and appreciate accessible, timely and person-centred education and information following stroke for themselves and for their caregivers. They highlight the importance of tailoring education to each person's stage of recovery and unique needs. Peer support is seen as a particularly meaningful source of learning, offering encouragement, shared understanding, and practical insights that help individuals feel less alone and more hopeful.

While more formal education may take place in acute care and through rehabilitation, individuals with stroke emphasize the ongoing need for credible and relevant information after transitioning back to the community. Finding support in the community, however, can be challenging. While some individuals access private providers or community programs, others face barriers such as financial constraints, limited awareness of available resources, or difficulties with virtual formats. Individuals with lived experience encourage healthcare providers to take an active role in working collaboratively with the individual with stroke, their caregivers, and families to understand their education needs and facilitate appropriate connections as part of transition planning. This approach helps ensure that individuals remain supported even after they are no longer connected to their stroke team.

System Implications

Actions that support the transition of care and are applicable across the continuum of care, including in primary care, the emergency department, acute care, rehabilitation settings, complex continuing care/transitional bed settings, long-term care and community settings. Processes and mechanisms should be in place in all these settings to address educational needs of the individual with stroke, their family and caregivers, including:

1. Coordinated efforts among stakeholders such as the Heart and Stroke Foundation, Canadian Partnership for Stroke Recovery, public health agencies, ministries of health, non-government organizations (NGOs), hospitals and clinics, and individual care providers across the continuum of stroke care to produce education materials with consistent information.
2. Coordinated processes for ensuring access to and awareness of educational materials, programs, activities and other media related to stroke by healthcare professionals, individuals with stroke and caregivers, including advertising the availability of educational material, effective dissemination mechanisms and follow-up.
3. Community resources, such as stroke recovery support groups, to provide ongoing support and education following hospital discharge.
4. Coordinated processes for ongoing communication between teams of learning needs and education that has been provided.
5. Coordinated process for providing training for team members in educational techniques and best practices for stroke care and recovery.
6. Access to training for care providers to gain knowledge and learn skills in self-management, to support the individual with stroke's unique care needs, and adapt to communication, sensory and perceptual challenges as appropriate.
7. Access to educational resources that are culturally safe, relevant and appropriate, and where possible available in the individual's preferred language.
8. Processes in place to monitor available education and resources to support individuals with stroke, families and caregivers so that appropriate resources can be recommended.
9. Access to self-management support services through virtual healthcare technologies, especially in rural areas and where there are local resource gaps.
10. The development and implementation of an equitable and universal pharmacare program, implemented in partnership with the provinces, designed to improve access to cost-effective medicines for all individuals in Canada regardless of geography, age, or ability to pay. This program should include a robust common formulary for which the public payer is the first payer.

Performance Measures

System Indicators:

1. Availability of standardized and consistent stroke education materials and resources at each stroke centre.
2. Proportion of stroke centres with stroke education integrated into their electronic health record.
3. Resources and services available that are adapted for communication and other impairments (such as aphasia, vision loss).

Process indicators:

1. Proportion of individual with stroke with documentation of education provided at each stage throughout the stroke management and recovery process.
2. Total number of encounters focused on education for each individual with stroke, and the time spent on education during a healthcare encounter for stroke.
3. Percentage of individual with stroke discharged with a copy of their discharge plan and educational materials.
4. Change in self-management behaviour at 6 weeks, 3 months and 6 months following stroke, using validated measurement tools.

Person-oriented outcome and experience indicators:

1. Change in individual with stroke and family knowledge of stroke-related content before and after teaching session.
2. Changes in quality of life measured at regular intervals using a validated measure during recovery and participation, and reassessed when changes in health status or other life events occur (e.g., at 60, 90- and 180-days following stroke).
3. Percentage of individual with stroke who reported feeling adequately prepared for self-care and self-efficacy.

Implementation Resources and Knowledge Transfer Tools

Resources and tools listed below that are external to Heart & Stroke and the Canadian Stroke Best Practice Recommendations may be useful resources for stroke care. However, their inclusion is not an actual or implied endorsement by the Canadian Stroke Best Practices or Heart & Stroke. The reader is encouraged to review these resources and tools critically and implement them into practice at their discretion.

Healthcare Provider Information

- CSBPR Stroke Systems of Care Module: Box 5 Self-Management Checklist
- Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery and Community Participation following Stroke, *Part One: Stroke Rehabilitation Planning for Optimal Care Delivery*: https://www.strokebestpractices.ca/recommendations/stroke-rehabilitation-planning
- Heart & Stroke: Taking Action for Optimal Community and Long-Term Stroke Care: A resource for healthcare providers: https://www.strokebestpractices.ca/resources/professional-resources/tacls
- NCBI: "Timing It Right": a conceptual framework for addressing the support needs of family caregivers to individuals with strokes from the hospital to the home (Cameron & Gignac, 2008):: https://pubmed.ncbi.nlm.nih.gov/18155388/
- Aphasia institute: https://www.aphasia.ca/

Resources for Individuals with Stroke, Families and Caregivers

- Heart & Stroke: Signs of Stroke: http://www.heartandstroke.ca/stroke/signs-of-stroke
- Heart & Stroke: FAST Signs of Stroke…what are the other signs?: https://www.heartandstroke.ca/stroke/signs-of-stroke/fast-signs-of-stroke-are-there-other-signs

- Heart & Stroke: Your Stroke Journey: https://www.heartandstroke.ca/-/media/pdf-files/canada/your-stroke-journey/en-your-stroke-journey-v20.pdf
- Heart & Stroke: Post-Stroke Checklist: https://www.heartandstroke.ca/-/media/1-stroke-best-practices/resources/patient-resources/002-17_csbp_post_stroke_checklist_85x11_en_v1
- Heart & Stroke: Enabling Self Management Following Stroke Checklist: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbpr-enabling-self-management-following-stroke-checklist-jan2021-final.pdf?rev=03b045c41df04abfb7f4cb652869f031
- Heart & Stroke: Virtual Healthcare Checklist: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbp-infographic-virtual-healthcare-checklist.pdf?rev=bf2f5b0e9e4a49cfbfc251208b6a15e2
- Heart & Stroke: Recovery and Support: https://www.heartandstroke.ca/stroke/recovery-and-support
- Heart & Stroke: Online and Peer Support: https://www.heartandstroke.ca/heart-disease/recovery-and-support/the-power-of-community
- Heart & Stroke: Services and Resources Directory: https://www.heartandstroke.ca/services-and-resources
- CanStroke Recovery Trials: Tools and Resources: https://canadianstroke.ca/tools/
- Stroke Engine: https://strokengine.ca/en/
- CESN Journey to Recovery after Stroke resource. https://cesnstroke.ca/clinical-resources-tools/journey-to-recovery/#caregiver
- Inspiring Hope page on the Central East Stroke Network website including Power of Hope Videos. https://cesnstroke.ca/patient-family-resources/inspiring-hope/

Summary of the Evidence

The educational needs of individuals recovering from stroke and their informal caregivers changes across the continuum of care. In preparation for discharge from acute care, education focuses on understanding the stroke event, early warning signs, and vascular and medical risk factors, with an emphasis on promoting adherence to treatments and secondary prevention measures. Secondary prevention will also be the focus of education at visits to TIA or outpatient prevention clinics. During inpatient rehabilitation, the focus shifts to teaching individuals and their families about functional recovery, mobility strategies, use of adaptive equipment, and managing common complications such as spasticity or dysphagia. In long-term care or community reintegration, educational priorities include stroke self-management, medication adherence, lifestyle modification, emotional adjustment, and return to work or social roles. Tailoring education to the individual's stage of recovery and functional capacity ensures that information is relevant, understandable, and actionable.

A scoping review [120] included the results from 36 articles of individuals who had suffered a stroke or TIA within the previous 5 years, and focused on the information needs of both patients and their informal caregivers across care settings. Fourteen domains of information needs were identified. Among the most frequently cited were a need for information about treatment, the etiology of stroke, personalized information, community/social support availability, prognosis, the effects of stroke, and the care role for patients living at home. The need for information on specific topics changed across the recovery process. The primary information source was healthcare professionals, followed by written information, family and friends, and the internet, with information provided directly by healthcare professionals being preferred.

Self-Management Programs

Self-management programs empower individuals with strokes by teaching problem-solving, goal-setting, and decision-making skills for active recovery. These programs can also provide education about stroke and its effects. A Cochrane review, authored by Fryer et al. [121] included the results from 14 RCTs of patients recovering from stroke who were living in the community. Trials compared interventions composed of ≥1 component of self management or targeted more than a single domain of change, or both, with a control intervention (either an inactive control such as waiting list or usual care or an active control such as education only). Interventions were provided by allied health professionals either on a one-to-one basis or as a group, and all were delivered face-to-face except one. Self-management programs were associated with a significant improvement in quality of life (SMD=0.20, 95% CI 0.00 to 0.41; low quality of evidence) and self-efficacy (SMD=0.33, 95% CI 0.04 to 0.61; low quality of evidence). Self management programs were not associated with significant improvements in activity limitations or impairment. Two trials of nurse-led stroke self-management programs were associated with significant improvements in Stroke Self-Efficacy Questionnaire scores. [122, 123] Lennon et al. [124] conducted a systematic review of studies (including randomized and non-randomized controlled trials) that assessed "self-management" interventions for patients recovering from stroke. Interventions included in the review were quite variable, ranging from group programs to one-on-one interventions consisting of workbooks, DVDs or exercise sessions. Several interventions were based on the Stanford Chronic Disease Self-Management programme, which consisted of workshops, a companion book and a relaxation CD. Although pooling of results was not possible, in some of the largest RCTs included in the review, significant improvement in physical domains, quality of life, and dependency were reported in the active intervention groups.

Patient & Caregiver Education

The benefit of family and caregiver involvement was assessed in a Cochrane review, authored by Crocker et al. [125] which included the results of 33 RCTs. Neither passive (leaflet or pamphlet), nor active (lecture) interventions were associated with significant improvements in caregiver's knowledge of stroke and stroke services, compared with usual care, although only 3 to 4 trials assessing this outcome were included. Conversely, active interventions were associated with the patient's stroke knowledge (SMD=0.41, 95% CI 0.17-0.65, GRADE: low quality), but not with anxiety or depression. Several randomized trials have evaluated the effects of information and support packages for patients and their caregivers following stroke. Those trials that simply provided participants with written information as the intervention tended to be less effective compared with programs that included additional components. Eames et al. [126] randomized 138 patients and their carers to receive an individually tailored education and support package with verbal reinforcement for 3 months, or to a usual care group, which received unstructured, informal education. Patients in the intervention group reported significantly greater self-efficacy (access to stroke information domain, $p<0.04$), feeling of being informed ($p<0.01$), and satisfaction with medical ($p<0.001$), practical ($p<0.01$), service/benefit ($p<0.05$), and secondary prevention ($p<0.001$) information received.

Caregiver Education

In the Organising Support for Carers of Stroke Survivors (OSCARSS), cluster RCT, Patchwood et al. [127] randomized 414 carers within 35 clusters to an intervention group or usual care group. The intervention, the Carer Support Needs Assessment Tool for Stroke was a staff-facilitated, carer led approach to help identify, prioritise and address the specific support needs of carers, requiring at least one face-to-face support contact dedicated to carers, typically provided in the home, with reviews as required. There was no significant adjusted mean difference in 3-month caregiver strain, the primary outcome, assessed using the Family Appraisal of Caregiving Questionnaire (−0.04, 95% CI −0.20 to 0.13), or in any of the secondary outcomes (subscales of the primary outcome, anxiety, depression or satisfaction with stroke services). Additionally, the intervention was not cost-effective. Studies assessing the impact of caregiver education and skills training have also reported the benefits of active or "hands-on" interventions. A randomized controlled trial by Kalra et al. [128] allocated patient/caregiver dyads to receive structured caregiver training (hands-on training in basic nursing techniques that emphasized skills essential for daily management of ADL) or conventional instruction (information and advice). The length of the intervention was dependent on patient need, ranging from three to five sessions in the inpatient rehabilitation setting. Patients experienced significant reductions in anxiety and depression at 12 months and increased quality of life at 3 and 12 months. No differences in mortality, institutionalization or functional ability were reported between intervention and control groups. Using a similar intervention, Forster et al. [129] randomized 928 patients, expected to return home following acute stroke, to participate in the London Stroke Carers Training course (LSCTC) (same protocol as Kalra et al. 2004), or to usual care. At 6 months there was no significant difference in the mean patient Nottingham EADL scores between groups (27.4 vs. 27.6, p=0.866) or Caregiver Burden Scores (45.5 vs. 45.0, p=0.660). While the intervention did not appear to be effective, the authors speculated that the timing, in the immediate period after stroke, might not be ideal.

Patient Education

Education received in the acute stage of stroke can help to enhance understanding of the condition, promote adherence to secondary prevention strategies, and reduce the risk of recurrent events. Benoit et al. [130] randomized 199 patients with an acute TIA or minor stroke admission to receive a 2-hour interactive group session conducted by a vascular neurologist or a nurse trained in stroke and therapeutic education, focused on stroke education, within the stroke unit before hospital discharge or to usual care. The 3-month improvement in stroke knowledge scores (range of possible scores 0-29) was significantly greater in the intervention group (mean baseline-adjusted between-group difference=1.6 points, 95% CI 1.4 to 1.9) and the proportion of patients who were unable to name any risk factor was significantly lower after intervention at 3 months (13.2% vs. 3.4%) but not at 12-months (2.4% vs. 3.6%). In a study nested within the STANDFIRM trial (Shared Team Approach between Nurses and Doctors For Improved Risk Factor Management, a cluster-randomized controlled trial designed to evaluate whether an individualized, interdisciplinary secondary prevention program led by nurses, in collaboration with stroke specialists and general practitioners, improved cardiovascular risk factor control), 268 patients with minor stroke or TIA were randomized to an intervention group or usual care group. [131] Overall, 34% of participants were unable to name a single risk factor. However, participants in the intervention group named significantly more risk factors (incidence risk ratio=1.26, 95% CI 1.00 to 1.58) at 24 months.

Sex & Gender Considerations

Health educational approaches need to account for sex and gender differences, as men and women may differ in their health beliefs, learning preferences, communication styles, and responsiveness to specific educational strategies. Tailoring content and delivery to address these differences can help improve patient engagement and understanding; however, little research has been conducted in this area.

Evidence Table and Reference List

Section 6 Support for Individuals with Stroke, Their Family and Caregivers

6. Support for Individuals with Stroke, Their Family and Caregivers Recommendations 2026

6.0 General Principles

i. Individuals with stroke, their family and caregivers should be supported through all transitions of care by an interdisciplinary team of healthcare providers with expertise in stroke [Strong recommendation, Moderate quality of evidence].

ii. Individuals with stroke and their family should be assessed for their support needs; provided with individualized psychosocial supports, mental health supports, education, skills training and competency building; and, provided information about accessing community-based services and resources to meet their needs [Strong recommendation, High quality of evidence].

6.1 Screening and Assessment for Support Needs following Stroke

i. Individuals with stroke should be screened for levels of coping, depressive symptoms, and other physical and psychological issues using validated tools, and access to caregiver support across the continuum of care [Strong recommendation; High quality of evidence].

ii. Individuals without access to caregivers, should be provided with information and referrals to community support resources as needed to optimize recovery and self- management ability [Strong recommendation; Moderate quality of evidence].

iii. When issues are identified through screening, timely assessments and referrals to appropriate specialists and services to support recovery and optimize outcomes should be initiated by the healthcare team [Strong recommendation, Moderate quality of evidence].

iv. Individuals with stroke, families and caregivers should be provided with information on how to access peer support programs including caregiver support groups or services, descriptions of the services and benefits they offer, locations and potential costs, and be encouraged to consider participation [Strong recommendation, Moderate quality of evidence].

v. Resource issues such as financial situation, housing, transportation, insurance, healthcare benefits, medication and equipment cost coverage should be discussed with individuals with stroke and actions identified to reduce barriers to ongoing care and recovery [Strong recommendation, Moderate quality of evidence].

vi. Assessments of supports (family and/or caregivers) on discharge should include the following areas regarding ability to support the individual with stroke throughout their recovery experiences and transitions back to community:

   a. Level and type of support from other family members, relatives and social networks [Strong recommendation, Low quality of evidence].

   b. Current health status of the caregiver, employment and social responsibilities, and how those will be managed in supporting the individual with stroke [Strong recommendation, Low quality of evidence].

   c. Caregiver willingness, capacity for skills acquisition, and experience for providing care and recovery support to the individual with stroke [Strong recommendation, Low quality of evidence].

   d. Caregiver ability to cope and manage the stress of providing rehabilitation and recovery support for the individual with stroke [Strong recommendation, Moderate quality of evidence].

6.2 Addressing Support Needs following Stroke

i. Support should be initiated from the onset of stroke and continue throughout all transitions and stages of care [Strong recommendation, Moderate quality of evidence]. *Refer to Box 6 for additional information on areas of support for individuals with stroke.*

ii. Communication and approaches to care should be tailored to and consider the individual's cognitive, sensory and communication abilities (such as aphasia-friendly formats) and be appropriate to the health literacy of individuals with stroke, their family and caregivers [Strong recommendation, Moderate quality of evidence].

iii. The use of virtual technology (e.g., video, and web-based technologies and services such as web-based support groups), should be considered to increase access to ongoing support services, healthcare services, and educational information; especially in settings where individuals with stroke and their family members are unable to travel to access care and services [Strong recommendation, Moderate quality of evidence]. *Refer to Section 4 in this module, and CSBPR Virtual Stroke Care Implementation Toolkit for additional information.*[75]

Box 6 Support for Individuals with Stroke, Their Family and Caregivers Checklist

This checklist is provided as a guide to help ensure evidence- and consensus- based recommendations are applied to develop an action plan for each individual with stroke as they transition to different settings and phases of care. This checklist is applicable to all care settings and should enable the health care team member to work with the individual with stroke, their family and caregivers to have meaningful conversations regarding appropriate supports and services to ensure positive and successful care transitions

Support for individuals with stroke, their families, and caregivers should include:

- ☐ Communication that is tailored to the individual's cognitive, sensory, and communication abilities (such as aphasia-friendly formats) as required and appropriate to the health literacy of individuals with stroke, their families and caregivers.
- ☐ Shared decision making and participation regarding transitions across stages of care.
- ☐ Accurate and up to date information about the next care setting, what can be expected, and how to prepare.
- ☐ Access to restorative care and active rehabilitation to improve and/or maintain function based on the individualized care plan.
- ☐ Counseling, preparation and ongoing assessment for adjustment to change of: living setting; abilities; social roles and relationships; participation, leisure and vocational activities; and home environment. Also consider impact on family (e.g., spouse or partner, children); potential resource issues (financial), and independence (e.g., driving).
- ☐ Written discharge instructions including follow-up care, and recommendations that reflects goals for recovery.
- ☐ Access to a designated contact for ongoing questions, education, and support post-hospital discharge.
- ☐ Access to specialist and social services, including peer support organizations, appropriate to needs and stage of transition and recovery.
- ☐ Information and guidance on advance care planning, palliative care, and end-of-life care as appropriate.

Rationale

Stroke often brings profound changes to daily life, and caregivers frequently assume demanding roles that can lead to physical, emotional, and financial strain. Without adequate support, caregivers may experience burnout, depression, or anxiety, which can negatively affect the care they provide and their own health. This increases the caregiver burden, which can result in depression among caregivers of individual with stroke (as high as 60% has been reported). Families may also struggle with adjusting to new caregiving responsibilities, navigating healthcare systems, and understanding the long-term needs of the individuals with stroke. Providing education, and access to support groups can help alleviate these burdens, while also fostering better communication between caregivers, healthcare professionals, and the patient.

Individuals with lived experience of stroke emphasize that stroke recovery is a continuum in which resource and support needs change over time. They stress the importance of having the right support in place to promote safety, participation, and well-being throughout recovery and particularly when transitioning back to the community. Understanding the environment that the individual is returning home to, and what support is available or missing, is seen as essential. Mismatches between available support and actual needs can lead to safety risks or reduced participation. Individuals stress the value of being asked directly about their needs and goals, and caution against a one-size-fits-all approach to support. They highlight the need for education and support not only for themselves, but also for family, friends, and caregivers. Peer support is seen as a particularly meaningful source of support, offering encouragement, shared understanding, and practical insights that help individuals feel less alone and more hopeful.

Mental health support is described as just as important as physical recovery yet sometimes overlooked. Individuals note that challenges with mental health can affect every other aspect of recovery, including motivation, participation, and relationships. Accessing psychological support can be difficult, especially without guidance or resources, and individuals often feel left to navigate this on their own. They emphasize that for those who experience stroke at a younger age or during complex life stages, mental health support is critical as they work to re-establish roles and responsibilities. Individuals express a need for mental health services that are accessible, proactive, and integrated into stroke care.

Healthcare providers are encouraged to work collaboratively with the individual with stroke, family and caregivers to identify support that reflects their life stage, personal context and that support is culturally appropriate and relevant. They call for healthcare providers to play an active role in connecting them, and their support networks, to appropriate resources.

System Implications

Care transitions take place across the stroke continuum, including primary care, the emergency department, acute care, rehabilitation settings, complex continuing care/transitional bed settings, long-term care and community settings. Processes and mechanisms should be in place in all these settings to address individuals with stroke, family and caregiver support using an individual approach, including:

1. Protocols to involve individuals with stroke and families in healthcare team transition planning meetings and collaborative decision-making regarding goal setting at all transition points.
2. Resources and mechanisms to plan and deliver community-based services which consider the needs of the individual with stroke and family/caregiver (e.g., home care services, psychological support).
3. Models of care that include technology such as virtual care, regular telephone follow-up and web-based support.
4. Appropriately resourced hospitals, rehabilitation facilities, home care services, long-term care and other community facilities that care for individuals with stroke, with identified contact people and case managers/system navigators to coordinate manage stroke care transitions.

5. Ongoing education and training of healthcare professionals on person- and family-centred stroke care in all settings that care for individuals with stroke.
6. Ongoing support in the form of community programs, respite care, and educational opportunities available to support caregivers who are balancing personal needs with caregiving responsibilities.
7. Processes in place to determine the fit between level of support that an individual has in the community and the level of support that the individual needs to work towards their goals, so that service can be matched to their needs.
8. Opportunities for education and training for individuals with stroke, families and caregivers to provide peer support when requested.
9. Access to self-management support services through virtual care technologies, especially in rural areas and where there are local resource gaps.

Performance Measures

System indicators:

1. Proportion of stroke programs that provide transitional supports, including community stroke navigator programs, peer support groups, and ongoing recovery supports.
2. Proportion of organizations using standardized, evidence-based care pathways for stroke care.

Process indicators:

1. Proportion of individuals with stroke with a documented discharge plan that includes referrals to community-based support or rehabilitation services before hospital discharge.
2. The number and frequency of individuals with stroke readmitted to an emergency department or acute inpatient care for reasons related to physical decline or failure to cope, following an initial stroke hospital stay.

Person-oriented outcome and experience indicators:

1. Proportion of individuals with stroke who report confidence in managing their recovery.
2. Proportion of individuals with stroke who have access to peer-support programs in hospital, and community -based programs following discharge.
3. Percentage of individuals with stroke readmitted to hospital within 30 days of discharge.
4. The change in burden of care for family members and caregivers measured at transition points throughout the recovery period and following changes in individual with stroke health status.
5. Proportion of individuals with stroke with access to community stroke navigator programs, peer support groups, and ongoing recovery supports.
6. Changes in quality of life measured at regular intervals using a validated measure during recovery and participation, and reassessed when changes in health status or other life events occur (e.g., at 60, 90- and 180-days following stroke).

Implementation Resources and Knowledge Transfer Tools

Resources and tools listed below that are external to Heart & Stroke and the Canadian Stroke Best Practice Recommendations may be useful resources for stroke care. However, their inclusion is not an actual or implied endorsement by the Canadian Stroke Best Practices or Heart & Stroke. The reader is *encouraged to review these resources and tools critically and implement them into practice at their discretion.*

Healthcare Provider Information

- Canadian Stroke Best Practice Recommendations: Stroke Systems of Care Module: Box 6 Support for Individuals with Stroke, Their Family and Caregivers Checklist
- Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery and Community Participation following Stroke, *Part One: Stroke Rehabilitation Planning for Optimal Care Delivery* : https://www.strokebestpractices.ca/recommendations/stroke-rehabilitation-planning
- Heart & Stroke: Taking Action for Optimal Community and Long-Term Stroke Care: A resource for healthcare providers: https://www.strokebestpractices.ca/resources/professional-resources/tacls
- NCBI: "Timing it Right": a conceptual framework for addressing the support needs of family caregivers to individuals with strokes from the hospital to the home (Cameron & Gignac, 2008): https://pubmed.ncbi.nlm.nih.gov/18155388/
- RNAO: Transitions in Care and Services Best Practice Guideline: http://rnao.ca/bpg/guidelines/care-transitions
- RNAO: People-Centred Care Best Practice Guideline: https://rnao.ca/bpg/guidelines/people-centred-care

Resources for Individuals with Stroke, Families and Caregivers

- Heart & Stroke: Signs of Stroke: http://www.heartandstroke.ca/stroke/signs-of-stroke
- Heart & Stroke: FAST Signs of Stroke…what are the other signs?: https://www.heartandstroke.ca/stroke/signs-of-stroke/fast-signs-of-stroke-are-there-other-signs
- Heart & Stroke: Your Stroke Journey: https://www.heartandstroke.ca/-/media/pdf-files/canada/your-stroke-journey/en-your-stroke-journey-v20.pdf
- Heart & Stroke: Post-Stroke Checklist: https://www.heartandstroke.ca/-/media/1-stroke-best-practices/resources/patient-resources/002-17_csbp_post_stroke_checklist_85x11_en_v1
- Heart & Stroke: Transitions and Community Participation Infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/transition-of-care-nov2019/csbp-infographic-transitions-and-participation.pdf?rev=595e990a17e14232aa3b1c731d983ce3
- Heart & Stroke: Enabling Self Management Following Stroke Checklist: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbpr-enabling-self-management-following-stroke-checklist-jan2021-final.pdf?rev=03b045c41df04abfb7f4cb652869f031
- Heart & Stroke: Virtual Healthcare Checklist: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbp-infographic-virtual-healthcare-checklist.pdf?rev=bf2f5b0e9e4a49cfbfc251208b6a15e2
- Heart & Stroke: Recovery and Support: https://www.heartandstroke.ca/stroke/recovery-and-support
- Heart & Stroke: Online and Peer Support: https://www.heartandstroke.ca/heart-disease/recovery-and-support/the-power-of-community
- Heart & Stroke: Services and Resources Directory: https://www.heartandstroke.ca/services-and-resources
- CanStroke Recovery Trials: Tools and Resources: https://canadianstroke.ca/tools/

- American Stroke Association: https://www.stroke.org/
- World Stroke Organization: https://www.world-stroke.org/
- Stroke Engine: https://strokengine.ca/en/

Summary of the Evidence

Following stroke, patients, families and informal caregivers are typically faced with multiple life changes and challenges as the patient transitions between the stages of recovery. Gallacher et al. [132] reviewed 69 qualitative studies examining the concept of patient burden following stroke, highlighting the impact it may have on the effectiveness of interventions and patient satisfaction with health care services. The authors identified the components of stroke recovery that were particularly burdensome to patients including receiving information, interacting with others, comparing treatment options, managing in different environments (acute care, inpatient rehabilitation, community, society) and adjusting to daily activities. Caring for a person following a stroke may also have a considerable impact on the health and vocational status of caregivers. Caregivers reported spending significantly longer periods of time providing caring for individuals with strokes, relative to pre-stroke levels. [133] Depression and anxiety may also be increased. Loh et al.[134] estimated the prevalence of depressive symptoms and anxiety among stroke caregivers to be 40.2% and 21.4%, respectively. Hayes et al. [135] conducted telephone interviews with 275 veterans who had sustained a first-ever stroke and their informal caregivers to explore the association between caregiver characteristics and the development of injuries. Caregivers who reported a physical injury were more likely to report higher levels of burden, provided more hours of care per week, exhibited more depressive symptoms and fewer healthy days per month compared to carers reporting no injury. The most common type of injury reported was a back injury and 53% of injured carers stated that the injury interfered with their ability to provide care. Significant predictors of injury were higher caregiver burden (OR=1.62, 95% CI 1.14-2.31) and depression (OR=1.10, 95% CI 1.04-1.17). Ko et al.[136] interviewed 132 caregivers and reported that while 52% were working full time or part-time, prior to the stroke, the majority of working caregivers reported reducing their hours of paid work, or missing work, while 9 caregivers retired or resigned. Rochette et al. [137] reported that 6 months following stroke, 35.2% of spouses (19/54) had a high level of burden (Caregiver Strain Index score ≥7) and 17% were identified with possible depression (Beck Depression Inventory BDI score ≥10).

The needs of patients and their informal caregivers has been explored in several qualitative studies using in-person or telephone interviews. Similar themes emerged across studies. Cameron et al. [138] included 16 patients recruited from an inpatient rehabilitation stroke facility and 15 informal caregivers, who were interviewed following their first weekend pass from inpatient rehabilitation and again 4 weeks following discharge home. Twenty health-care professionals (HCP) were also interviewed. Three key themes emerged including issues surrounding preparing patients for safe return home. Patients discussed the need to feel safe in the home environment while caregivers discussed their need to feel supported. Assessing the patient for readiness was a key theme discussed by HCPs. Patients noted gaining insight into what life would be like, and caregivers evaluated their abilities to care for stroke survivor. Patients and caregivers discussed the range of emotions they experienced and how their experienced changes before and after the weekend pass. In a similar study including 24 informal caregivers to individuals with stroke and 14 HCP, [139] the themes emerged from both the caregivers and the HCP concerned the type and intensity of support needed, who was to provide support and the method of providing support and the primary focus of care. Creasy et al. [140] interviewed 17 family caregivers close to the point of discharge from hospital and the again within 4 months of discharge. In the first interview, caregivers expressed information needs related to their role as caregiver in preparation for discharge home and expressed concerns for their own emotional support needs and their ability to provide emotional support. During the second interview, caregivers discussed their experiences with caregiver-provider interactions, some of which were positive, others, negative. The caregivers of 90 patients were interviewed one year following stroke. [141] Caregivers reported delays and barriers waiting for applications/funding for alterations to make the home more accessible, having to provide care in the immediate post-discharge period with no skills training and lack of follow-up with GPs. They also described difficulties coping with patients' quick anger and emotional lability and lack of attention to their physical and emotional ability to provide care. Semi-structured interviews (conducted by Zoom) were used to explore the experiences of 19 young individuals with stroke (aged 18 to 55 years) during their recovery. [142] Four themes emerged; (1) the need for longitudinal medical follow-up and information provision; (2) the need for psychological/psychiatric care; (3) the need to adapt community supports and resources to young survivors; and (4) the need to centralize and integrate community stroke services and resources.

Interventions to provide support to patients, family and caregiver were examined in a systematic review, which included the results from 18 studies of caregivers of patients recovering from stroke or patient/caregiver dyads. [143] Participants were recruited from acute hospitalization and from the community. Most caregivers were spouses. The interventions included elements of skills building, psychoeducation and support and were provided mainly face-to-face (group or individual) with some telephone and web-based elements. In studies that recruited family members, both patients and family members in the intervention group experienced significantly greater improvements in measures of depression, anxiety and quality of life. In studies that included patient/caregiver dyads, there was significantly greater improvement in one or more of the outcomes, including life satisfaction. Anxiety and depression were also decreased significantly in another systematic review [144] that included 16 trials composed of stroke survivor/caregiver dyads discharged home from rehabilitation hospitals. Intervention in these trials included a written guide for individuals with stroke, and/or video training, group discussions and face-to-face consultations, which were implemented in a hospital setting. Trials also included telephone support after discharge, an educational intervention and support with home visits or telephone support following discharge.

Sex & Gender Considerations

There are distinct sex and gender differences in post-stroke informal caregiving. Women caregivers often provide more extensive day-to-day assistance and report higher caregiver burden than men, particularly when caring for individual with stroke with greater disability. [145] In contrast, men may be less likely to take on caregiving roles, and when they do, they may face challenges in navigating the emotional and physical aspects of care. Tailored support that acknowledges gender differences can help diminish the strain on family members and improve the overall care environment.

Evidence Table and Reference List

Section 7 Stroke Management in Long-term Care

7. Stroke Management in Long-term Care Recommendations 2026

Note:

These recommendations apply specifically to individuals with stroke living in or transitioning to long-term care, complex or continuing care settings, including those who were already living in long-term care at the time of their stroke. These recommendations are intended to be implemented in addition to standard care (e.g. physical, functional, emotional, cognitive, communication and social needs) provided in complex, continuing or long-term care.

Also refer to recommendations in CSBPR Secondary Prevention of Stroke, [6] Vascular Cognitive Impairment [5] and Rehabilitation, Recovery and Community Participation following Stroke: Part One [8] modules for additional information on management of individuals with stroke living in long-term care settings.

7.0 General Principles

i. Interdisciplinary care planning in long-term, complex and continuing care should involve all members of the healthcare team, individuals with stroke, their family and caregivers in shared decision-making [Strong recommendation; Moderate quality of evidence].

ii. Healthcare providers who care for individuals with stroke living in long-term care, complex and continuing care and similar settings should be knowledgeable in all aspects of stroke care and participate in ongoing stroke-related professional education [Strong recommendation; Moderate quality of evidence].

7.1 Transition Planning and Assessment in Long-term Care

i. A discharge summary, along with the care plan, should accompany the individual to a long-term or complex continuing care setting [Strong recommendation; Low quality of evidence].

ii. All individuals who transition to a long-term, complex and continuing care setting following a stroke should have an initial medical and functional assessment as soon as possible after admission [Strong recommendation; Low quality of evidence]. *Refer to Section 3.1 for additional information.*

    a. The initial assessment of functional, physical, emotional, cognitive, communication and perceptual status should align with current evidence-based recommendations for assessment of individuals with stroke and local protocols where possible [Strong recommendation; Moderate quality of evidence].

iii. Assessment results should be used to inform individualized care plans to meet the needs and goals of individuals living in long-term or complex continuing care following a stroke and optimize rehabilitation, recovery, and quality of life [Strong recommendation; Moderate quality of evidence].

iv. Individualized care plans should address high risk areas of nutrition, oral care, mobilization, and incontinence, and reduce the risk of complications such as urinary tract infection (UTI), aspiration pneumonia, and venous thromboembolism [Strong recommendation; Moderate quality of evidence].

v. Individualized care plans should be updated to reflect changes in functional status and goals of the individual with stroke [Strong recommendation; Moderate quality of evidence]. *Note, such changes may be improvements or declines in various domains of health.*

vi. Individuals with stroke living in long-term, complex and continuing care setting should be referred to appropriate healthcare professionals for further consultation when changes in functional status are identified if within goals of care [Strong recommendation; Moderate quality of evidence].

7.2 Rehabilitation and Restorative Care

i. Individuals admitted to a long-term care setting with ongoing rehabilitation goals post-stroke should continue to have access to specialized stroke services (such as physiotherapy, occupational therapy, recreation therapy and speech-language therapy) [Strong recommendation; Moderate quality of evidence]. *Refer to CSBPR Rehabilitation, Recovery and Community Participation Following Stroke Part One, Section 5 for additional information.*[8]

ii. Individuals with stroke who live in long-term or complex continuing care should also have access to other health disciplines and services that can support recovery, social engagement and spiritual and emotional well-being [Strong recommendation; Low quality of evidence].

iii. At any point in their recovery, individuals with stroke living in long-term care who have experienced an improvement in functional status and who may benefit from new or additional rehabilitation services should be assessed and considered for a trial of higher intensity inpatient or outpatient rehabilitation [Strong recommendation; Low quality of evidence].

7.3 Support and Education for the Individual with Stroke, their Family and Caregivers

i. To facilitate active participation in care-planning in long-term or complex continuing care settings, individuals living with stroke, their family and caregivers should be provided with training, education and support on:

   a. How to participate in care planning and to be involved in shared decision-making. [Strong recommendation; Low quality of evidence].

   b. The process for appointing a substitute decision-maker (proxy or agent), developing advance directives for care, and palliative care options as appropriate [Strong recommendation; Low quality of evidence]. *Refer to Sections 8 and 9 below for additional information on advance care planning and palliative care.*

   c. How to access appropriate assessments for rehabilitation and restorative care [Strong recommendation; Low quality of evidence].

   d. How to advocate for any concerns with their care [Strong recommendation; Low quality of evidence].

   e. How to monitor changes in health-related quality of life [Strong recommendation; Low quality of evidence].

ii. Long-term care services who serve individuals with stroke should provide access to high quality end-of-life care for those who need it [Strong recommendation; Moderate quality of evidence].

Rationale

The transition from hospital to long-term care for individuals with stroke can be a difficult step for those who cannot return to their previous living arrangements in the community, due to significant impairments or complex medical needs. It can be a stressful and challenging time for individual with stroke, families and caregivers. The move requires careful coordination to ensure continuity of care, with staff who are knowledgeable and competent in caring for both the medical needs and rehabilitation goals of individual with stroke.

Individuals with stroke strongly express that those living in Long-term Care (LTC) or complex continuing care (CCC) should have the same access to stroke services as others living in other settings. They emphasize that care plans in LTC/CCC should reflect and address the individual's needs and goals related to their stroke care. It can be difficult for those living in LTC/CCC to advocate for access to rehabilitation services, and they stress the importance of receiving support and champions to ensure rehabilitative needs of individuals living in LTC/CCC are being met. Access to recreation and leisure activities in LTC/CCC is also an important aspect of health and well-being.

They also highlight the importance of mental health support during the transition to LTC/CCC and value peer support programs that pair new residents with experienced ones for guidance. They highlight the significant impact that the LTC/CCC environment may have on recovery and mental health and encourage strong mental health support to be available and easily accessible.

System Implications

Successful transition to long-term care and complex continuing care (LTC/CCC) for individuals with stroke, their families, and caregivers requires system leaders, planners and healthcare providers across the continuum of care to work together to ensure:

1. Processes to support timely and efficient transfer from settings across the stroke care continuum including acute care or inpatient rehabilitation to long-term care or complex continuing care, avoiding multiple transfers before reaching planned destination.
2. Appropriate follow-up by healthcare providers to support ongoing access to all needed stroke services including secondary prevention and rehabilitation services during transition to LTC/CCC settings; and while in LTC/CCC settings to support stroke recovery goals, including rehabilitation goals for individuals with stroke, their family and caregivers.
3. Inclusion of individuals with stroke, their family and caregivers as key participants in an evolving care plan and regular follow-up assessments as appropriate.
4. Communication strategies and processes to ensure timely sharing of information across all healthcare providers, including between long-term care team and community/hospital healthcare teams.
5. Programs that support timely and affordable access to mobility, communication, sensory and other assistive devices for individuals with stroke in long-term care.
6. Ongoing stroke specific education and training for healthcare professionals, individuals with stroke and their family and caregivers in the community and LTC/CCC settings to increase stroke care expertise. Training to be provided by a range of healthcare disciplines, such as physiotherapy, occupational therapy, speech-language pathology, and dietitians.
7. Strategies and services to assist individuals with stroke to maintain, enhance, and develop appropriate social support, and to re-engage in desired and or personally valued social and recreational activities.

Performance Measures

System Indicators:

1. Proportion of long-term care homes where clinical staff receive annual stroke-specific education.
2. Proportion of long-term care residents with stroke who have access to physiotherapy, occupational therapy, speech-language pathology, and social work support.
3. Proportion of long-term care homes that have protocols for stroke management (e.g., for secondary prevention, mobility, communication, and nutrition).

Process indicators:

1. Proportion of individuals with stroke who were living independently (e.g., at home) prior to stroke who are admitted to long-term care following stroke.
2. Proportion of readmissions to acute care for stroke-related causes following discharge to long-term care, stratified by type of stroke.
3. Proportion of individuals with stroke in long-term care who receive a standardized assessment within 7 days of LTC admission (e.g., mobility, cognition, communication, swallowing).
4. Proportion of individuals with stroke in long-term care with documented, individualized care plans addressing stroke-related impairments and goals.

5. Changes in functional status from time of admission to LTC compared at 3 months, 6 months and one year following admission to long-term care.
6. Number of visits to an emergency department within 3 months, 6 months and one year following admission to long-term care, stratified by reason for visit or hospital admission.

Person-Oriented Measures (PREMS, PROMS):

1. Measure of burden of care for family and caregivers living in the community and change in burden scores from before long-term care admission, and at 3 months, 6 months and one year following admission to long-term care. Standardized assessment tools should be used.
2. Changes in quality of life measured at regular intervals during recovery and participation, and reassessed when changes in health status or other life events occur (e.g., at 60, 90- and 180-days following stroke).
3. Proportion of individuals with stroke in long-term care whose mobility or self-care function is maintained or improved at 3- and 6-months post-transfer.
4. Rate of hospital transfers within 90 days and one year of admission for preventable stroke-related complications (e.g., falls, seizures, infections).

Implementation Resources and Knowledge Transfer Tools

Resources and tools listed below that are external to Heart & Stroke and the Canadian Stroke Best Practice Recommendations may be useful resources for stroke care. However, their inclusion is not an actual or implied endorsement by the Canadian Stroke Best Practices or Heart & Stroke. The reader is encouraged to review these resources and tools critically and implement them into practice at their discretion.

Healthcare Provider Information

- Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery and Community Participation following Stroke, *Part One: Stroke Rehabilitation Planning for Optimal Care Delivery:* https://www.strokebestpractices.ca/recommendations/stroke-rehabilitation-planning
- Canadian Stroke Best Practice Recommendations: Secondary Prevention of Stroke Module: https://www.strokebestpractices.ca/recommendations/secondary-prevention-of-stroke
- Canadian Stroke Best Practice Recommendations: Vascular Cognitive Impairment Module: https://www.strokebestpractices.ca/recommendations/new-vascular-cognitive-impairment
- RNAO: Registered Nurses' Association of Ontario: Long-Term Care Best Practices Program: http://rnao.ca/bpg/initiatives/longterm-care-best-practices-initiative
- RNAO: Registered Nurses' Association of Ontario: Positioning Techniques in Long-Term Care: http://rnao.ca/sites/rnao-ca/files/Positioning_Techniques_in_Long-Term_Care_-_Self-directed_learning_package_for_health_care_providers.pdf
- Stroke Engine: The Functional Independence Measure (FIM®): https://strokengine.ca/en/assessments/functional-independence-measure-fim/
- Stroke Engine: Chedoke-McMaster Stroke Assessment Scale: https://strokengine.ca/en/assessments/chedoke-mcmaster-stroke-assessment/

Resources for Individuals with Stroke, Families and Caregivers

- Heart & Stroke: Signs of Stroke: http://www.heartandstroke.ca/stroke/signs-of-stroke

- Heart & Stroke: FAST Signs of Stroke…what are the other signs?: https://www.heartandstroke.ca/stroke/signs-of-stroke/fast-signs-of-stroke-are-there-other-signs
- Heart & Stroke: Your Stroke Journey: https://www.heartandstroke.ca/-/media/pdf-files/canada/your-stroke-journey/en-your-stroke-journey-v20.pdf
- Heart & Stroke: Post-Stroke Checklist: https://www.heartandstroke.ca/-/media/1-stroke-best-practices/resources/patient-resources/002-17_csbp_post_stroke_checklist_85x11_en_v1
- Heart & Stroke: Enabling Self-Management Following Stroke Checklist: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbpr-enabling-self-management-following-stroke-checklist-jan2021-final.pdf?rev=03b045c41df04abfb7f4cb652869f031
- Heart & Stroke: Virtual Healthcare Checklist: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbp-infographic-virtual-healthcare-checklist.pdf?rev=bf2f5b0e9e4a49cfbfc251208b6a15e2
- Heart & Stroke: Recovery and Support: https://www.heartandstroke.ca/stroke/recovery-and-support
- Heart & Stroke: Online and Peer Support: https://www.heartandstroke.ca/heart-disease/recovery-and-support/the-power-of-community
- Heart & Stroke: Services and Resources Directory: https://www.heartandstroke.ca/services-and-resources
- Heart & Stroke: Leaving the Hospital: https://www.heartandstroke.ca/stroke/recovery-and-support/stroke-care/leaving-the-hospital
- Stroke Engine: https://strokengine.ca/en/

Summary of the Evidence

Following a stroke, high levels of disability may warrant admission to a long-term care (LTC) institution. Independent predictors of discharge to a nursing home have been identified and include increasing age, increasing dependency for ADLs and absence of availability of a caregiver. [146-150] Pooling the results from 18 studies, Burton et al. [147] reported that a median of 17% of individual with stroke were transferred directly to an LTC facility following discharge from an acute care hospital with a diagnosis of stroke. Approximately 10% to 11% of individual with stroke admitted to an acute care hospital were residing at an LTC facility at one, three- and 6-months following stroke. [151] Brodaty et al. [149] followed 202 participants, mean age of 72 years, without dementia who had suffered an ischemic stroke. Among those who survived, nursing home admission rates were 24% at 5 years and 32% at 10 years. Walsh et al. [152] reported that among a group of 136 patients admitted to a stroke unit of a single hospital (median age was 77 years), 40.3% of individual with stroke were institutionalized at 4 years.

Patients discharged to a LTC facility require discharge planning much like individuals returning to their own homes. Several studies have examined factors for effective discharge communication between inpatient hospital care and institutional care facilities. Clear communication between facilities regarding nutritional needs, functional status, communication abilities, risk assessment, and medical management is necessary for an optimal transition.[153, 154]

Individuals residing in skilled nursing facilities with staff trained in stroke management, and who have access to post stroke therapy resources, may experience better quality of life. In a study examining individuals living in a nursing home who received 24-hour care including access to psychiatric care, physician visits, daily physiotherapy, and weekly massage services, nursing home residents experienced greater quality of physical, psychological, social, and environmental quality of life scores compared with individuals living in their own homes receiving many of the same services.[155] Individuals residing in nursing homes also experienced better perceived quality of life and health status than their residentially residing counterparts. However, the authors of a Cochrane review (Fletcher-Smith et al. [156])

stated there was insufficient evidence to support or refute the efficacy of occupational therapy (OT) interventions for improving, restoring or maintaining independence in ADL for individuals with stroke residing in care homes. In the OCTH trial, Sackley et al. [157] also examined the potential benefit of OT provided in long term care homes to residents with a history of stroke. 1,042 care home residents from 228 facilities, who were elderly (mean age 83 years) and with a high proportion who were severely disabled were randomized to an individualized program with a focus on improvement or maintenance of functional capacity, adaptations to the environment and included an education component for the care home staff, or to usual care. The median length of stay between care home admission and trial randomization was 2.2 years. The mean number of OT visits was 5.1 per participant. There was no significant difference in mean Barthel Index scores (primary outcome) between groups at 3, 6 or 12 months, or in any of the secondary outcomes. The authors concluded there was no evidence of benefit of the program.

Sex & Gender Considerations

The literature regarding sex and gender differences in the rehabilitation outcomes of residents of LTC facilities following stroke, is limited. Some studies exist that address sex differences in residents with mixed medical diagnoses. For example, Davilla et al. [158] reported that among 64 nursing home residents who were interviewed, men reported significantly lower quality of life compared with women. Men were less satisfied with life, had fewer and weaker social connections and reported being less able to rely on family for support.

Evidence Table and Reference List

Section 8 Advance Care Planning

8. Advance Care Planning Recommendations 2026

Note: These recommendations apply to all individuals with stroke regardless of stroke type or their stage along the stroke continuum of care and regardless of setting.

i. Individuals with stroke, as well as their families and informal caregivers, should be approached by the interdisciplinary stroke team to participate in advance care planning (ACP) [Strong recommendation; Moderate quality of evidence].

ii. Advance care planning should be integrated as part of a comprehensive care plan, taking into consideration the individual's capacity for understanding and decision-making, their values and preferences, information regarding the individual's health trajectory, understanding, prognosis, medically appropriate treatments and future medical care [Strong recommendation; Moderate quality of evidence].

iii. Advance care planning should include identifying a substitute decision-maker (proxy, agent, or power of attorney) and discussing the individual with stroke's personal values and preferences to be applied in future if the need arises to make healthcare decisions [Strong recommendation; Moderate quality of evidence].

iv. Advance care planning discussions should be encouraged, documented, and reassessed regularly with the active care team and substitute decision-maker, especially when there is a change in the individual's health or functional status [Strong recommendation; Low quality of evidence].

v. In the community, advance care planning decisions should be reviewed periodically (e.g., annually) or when there is a change in health status and updated when needed [Strong recommendation; Low quality of evidence].

Section 8 Clinical Considerations

1. The interdisciplinary stroke care team should have the appropriate communication skills and knowledge to respectfully address the physical, spiritual, cultural, psychological, ethical, and social needs of the individual with stroke and their family and informal caregivers.
2. Ensure advance care planning discussions are individualized and consider the physical, spiritual, cultural, psychological, ethical, and social needs of the individual with stroke and their family and informal caregivers.
3. Processes should be established to support individuals with stroke, family and healthcare staff who are experiencing conflicts over advance care decisions being made by the individual or substitute decision maker. Referrals can be made to social work, palliative care, spiritual care, and ethics as appropriate.
4. Consider use of validated decision aides to support shared decision making and documentation in the health record.
5. When individuals are deemed incapable of making specific decisions regarding their personal care or financial capacity, advance care planning should include a substitute decision-maker following provincial legislation.
6. For individuals with stroke where cognition may be a factor, initiate ACP discussions as early as possible. *Refer to CSBPR Vascular Cognitive Impairment module for additional information.*[5]
7. Healthcare providers should use standard and specific language to carefully document ACP conversations and decisions.

8. When requested by individuals with stroke who meet regulatory criteria and retain decision making capacity, provide education and referral to local medical assistance in dying (MAiD) consultants.

Rationale

Advance care planning (ACP) is a process through which a patient, in consultation with healthcare providers and family members, states their preferences about future healthcare decisions if the patient become incapable of participating in decision-making regarding their healthcare needs. It promotes patient autonomy, facilitates informed decision-making, and fosters communication among individual with stroke, families, and healthcare providers. ACP also improves alignment between patient wishes and the care received, reduces decisional conflict, and can lessen emotional burden on surrogate decision-makers. By clarifying treatment preferences in advance, ACP also contributes to more appropriate resource use and enhances the overall quality of end-of-life care.

Individuals with lived experience of stroke stress the importance of advance care planning with family members and loved ones and discuss how the concept may not be well-known. They explain that although these types of conversations may be new or challenging, they ultimately allow the individual to have some control and allow their voice to be heard during difficult medical times. These conversations can also support family members when they are faced with stressful decisions about the individual's health. Individuals with lived experience also emphasize the importance of having advance care planning conversations throughout the course of one's life, and to be aware that one conversation may not be enough as wants and wishes can change over time. They emphasize the importance of timely and comprehensive discussions about ACP, including legal considerations and the role of substitute decision makers. They value the supportive environment of peer support groups for facilitating non-judgmental discussions about ACP.

Individuals with lived experience express that normalizing the process of developing an advance care plan is helpful. They also state the value of having a resource to guide these discussions, especially for those who haven't considered advance care planning previously.

System Implications

Following stroke, systems should be in place to optimize successful transitions and return to life roles, health management, activities and social participation. These may include:

1. Education and training in person-centred care and shared decision-making skills and strategies for all healthcare professionals, individuals with stroke, families, and caregivers.
2. Process in place to ensure Advance Care Plans are reviewed and updated if needed, periodically with the individual with stroke. Family and caregivers as appropriate.
3. Protocols for advance care planning to elicit patient and family goals for care preferences and ensuring these are documented and communicated to decision-makers and healthcare team members.
4. Information on advance care planning and links to local stroke support organizations and their services for staff to share with individual with stroke and families.
5. Communication and skills training for physicians, nurses, and allied health professionals that addresses supporting individual with stroke and their families through advance care planning and dealing with potential conflicts over a patient's wishes and decisions.

Performance Measures

System Indicators:

1. Proportion of healthcare organizations with formal policies or protocols in place to guide ACP discussions.

2. Proportion of healthcare staff who have completed training in culturally sensitive, values-based advance care planning discussions.
3. Proportion of organizations with standardized fields in the electronic medical record (EMR) for documenting ACP discussions and advance directives.

Process indicators:

1. Proportion of individuals with stroke who have been approached to participate in advance care planning and/or who have a documented conversation with a healthcare provider.
2. Proportion of individuals with stroke who identify and have documented a substitute decision-maker.
3. Proportion of individuals with stroke who complete a personal or advance care plan and have it documented on their chart.

Person-oriented outcome and experience indicators:

1. Percentage of individuals who, through surveys, report understanding their options for future care and feel their values are respected.
2. Proportion of individuals with stroke with advance care plans whose actual care was consistent with the care defined in their plan.
3. Family-reported experience (via post-death or discharge surveys) with communication about care goals and advance planning.

Implementation Resources and Knowledge Transfer Tools

Resources and tools listed below that are external to Heart & Stroke and the Canadian Stroke Best Practice Recommendations may be useful resources for stroke care. However, their inclusion is not an actual or implied endorsement by the Canadian Stroke Best Practices or Heart & Stroke. The reader is encouraged to review these resources and tools critically and implement them into practice at their discretion.

Healthcare Provider Information

- Canadian Stroke Best Practice Recommendations: Acute Stroke Management Module: https://www.strokebestpractices.ca/recommendations/acute-stroke-management
- Canadian Stroke Best Practice Recommendations: Vascular Cognitive Impairment Module: https://www.strokebestpractices.ca/recommendations/new-vascular-cognitive-impairment
- Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery and Community Participation following Stroke, *Part One: Stroke Rehabilitation Planning for Optimal Care Delivery:* https://www.strokebestpractices.ca/recommendations/stroke-rehabilitation-planning
- Palliative Care Education for All Care Providers: http://pallium.ca/
- Burton and Payne Palliative Care Pathway: http://www.biomedcentral.com/1472-684X/11/22
- Bernacki RE, Block SD. Serious Illness Communications Checklist. *The Virtual Mentor*. 2013;15(12):1045–9. https://www.researchgate.net/publication/259316398_Serious_Illness_Communications_Checklist
- Registered Nurses Association of Ontario (RNAO) Guidelines for End-of-Life Care: https://rnao.ca/bpg/guidelines/endoflife-care-during-last-days-and-hours
- Canadian Virtual Hospice: Decisions: https://www.virtualhospice.ca/en_US/Main+Site+Navigation/Home/Topics/Topics/Decisions.aspx
- Canadian Virtual Hospice: My Grief Learning Modules: https://mygrief.ca/

- Canadian Virtual Hospice: The Learning Hub: https://www.virtualhospice.ca/learninghub
- Canadian Hospice Palliative Care Association. Resources: https://www.chpca.ca/knowledge/resources/

Resources for Individuals with Stroke, Families and Caregivers

- Heart & Stroke: Your Stroke Journey: https://www.heartandstroke.ca/-/media/pdf-files/canada/your-stroke-journey/en-your-stroke-journey-v20.pdf?rev=01a46257b0634561b49b56066a4fb4be
- Heart & Stroke: Acute Stroke Management Infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbpr7_infographic_acutestrokemanagement_en_final.pdf?rev=3477e77c1e4f4069bb0c6a440b541947
- Heart & Stroke: End of Life Care and Palliative Care: https://www.heartandstroke.ca/stroke/recovery-and-support/end-of-life-care-and-palliative-care
- Canadian Hospice Palliative Care Association. Resources: https://www.chpca.ca/knowledge/resources/
- Canadian Virtual Hospice: Decisions: https://www.virtualhospice.ca/en_US/Main+Site+Navigation/Home/Topics/Topics/Decisions.aspx

Summary of the Evidence

Advance care planning (ACP) is a vital process that enables individuals to articulate their values, goals, and preferences for future medical care, particularly if they are no longer able to communicate or make decisions following a medical emergency, such as stroke. Elements to consider in ACP include prognosis of the individual with stroke, treatment options, goals of care, and the identification and documentation of end-of-life wishes. In a recent survey, Johnson et al. [159] surveyed 219 individuals with stroke attending an outpatient stroke clinic, a median of 5 months following a stroke. Patients completed the Planning After Stroke Survival survey, designed to explore the prevalence, experiences, and influencing factors around goals-of-care and ACP conversations. Seventy-three percent of individuals with stroke reported having previously discussed ACP with a physician, while 58% were interested in having additional ACP conversations with their stroke doctor. In a nationally representative study of almost 5,000 community-dwelling older adults, living in the United States, approximately 75% of individuals were reported to have been involved in some form of ACP engagement, defined as having (1) living will or advance directive; (2) durable power of attorney (DPOA); or 3) discussion of preferred medical treatment in the event of serious illness. [160] Green et al. [161] used participant observation and semi-structured interviews to gather information from 14 individuals with stroke, recruited from an acute stroke unit and 2 rehabilitation units and 4 healthcare professionals (HCP), that was related to the communication processes regrading ACP. Four key themes emerged related to why/why not participants engaged in the ACP process: i) lack of perceived urgency by participants, many of whom felt the physician and/or family members would make decisions in accordance with their wishes; ii) a lack of initiation by HCPs to discuss issues around ACP; ii) HCPs expressed hesitation about initiating discussions related to ACP, and uncertainty as the best timing for such discussions. There was also a lack of awareness as to what ACP is, and thought it was outside their scope of practice and iv) confusing ACP with advance directives, designation of care and living wills.

In the PREPARE For Your Care trial, [162] 986 adults aged ≥ 55 years with ≥2 chronic or serious illnesses, were randomized to an online program called PREPARE For Your Care or to read an advance directive (AD) only. The PREPARE intervention included an interactive online values questionnaire that generated a unique action plan and “Summary of My Wishes” document, when all the questions were answered. This summary was printed and given to participants. PREPARE participants were also asked to review the AD, in either English of Spanish for 5 to 15 minutes. Compared with the AD only group, individuals in the PREPARE arm were more likely to engage in ACP documentation (43.0% vs 32.0%, p<0.001) and self-reported engagement was higher at 15 months (98.1% vs. 89.5%). These improvements were observed consistently across both English- and Spanish-speaking participants. In a subgroup analysis of the PREPARE trial, [40] that included 91 participants who had sustained a stroke, those in the PREPARE group had a significantly greater increase in the mean number of completed ACP elements than the AD-only group at 12 months.

Results from a small number of other studies including participants with a mixed medical diagnosis also suggest that interventions aimed at increasing ACP have been successful in significantly increasing the likelihood that end-of-life wishes are known and respected. In a study of 309 individuals with stroke admitted to internal medicine, cardiology, or respiratory medicine, Detering et al. [163] randomized individual with stroke to receive formal advance care planning from a trained facilitator or usual care. The intervention was based on the Respecting Patient Choices model, which involves reflection on goals, values, and beliefs, documentation of future health care wishes, and appointment of a surrogate decision maker. Of those who died, end-of life wishes were significantly more likely to be known and respected for participants in the intervention group compared with those in the control group (86% vs. 30%, $p<0.01$). Following the death of a loved one, family members of those in the intervention group reported significantly less anxiety and depression and more satisfaction with the quality of their relative's death, compared to control group family members. Kirchhoff et al. [164] randomized 313 individual with stroke (and their surrogate decision makers) with congestive heart failure or end-stage renal disease who were expected to experience serious complication or death within 2 years, to receive a patient-centered ACP intervention or usual care. The intervention was composed of a 60 to 90-minute interview with a trained facilitator to discuss disease-specific end-of-life care issues and options and documentation of treatment preferences. 110 patients died within the study period, of which 26% required a surrogate decision maker at the end-of-life. Only a single patient in the intervention group and 3 in the control group received end-of-life care that was contrary to their wishes for reasons other than medical futility. With respect to resuscitation preferences, non-significantly fewer patients in the intervention group received care that was contrary to their wishes (1/62 vs. 6/48). Malhotra et al. [165] included the results of 132 RCTs examining the efficacy of ACP and advanced directive interventions, in both healthy adults and those with chronic diseases. Most interventions focused on communication, with approximately one-third incorporating a decisions aid. There was equivocal evidence that ACP interventions improved patient outcomes such as end-of-life care consistent with preferences (25% of trials [3/12] reported improvement), quality of life (0/14 studies reported improvement), mental health (21% of trials [4/19] reported improvement) and home deaths (25% of trials [1/4] reported improvement), or that it reduced healthcare use/costs (18% of trials [4/22 studies). However, ACP interventions improved other outcomes including quality of patient–physician communication (68% of trials [13/19] reported a benefit), and patient/caregiver congruence in preference (82% of trials; 18/22 reported a benefit).

Sex & Gender Considerations

An online opinion survey of 1,523 randomly selected Canadians in the general population, sponsored by Canadian Researchers at the End-of-Life Network (CARENET), examined knowledge and attitudes towards ACP. [166] Six sociodemographic and economic variables examined, of which sex was one. Models were developed to explore independent predictors of several outcomes including: 1) has heard of ACP, 2) discussed ACP with family/friends, 3) discussed ACP with healthcare provider, 4) has a written ACP plan, 5) has a designated decision maker and 6) an aggregate ACP outcome. While recognition of the term ACP was generally low, there were some significant sex differences in responses. Women were 58% more likely to discuss ACP with their friends. In the aggregate model of ACP knowledge, female sex was also a significant predictor. Other independent predictors were older age and higher income.

Evidence Table and Reference List

Section 9 Palliative and End-of-Life Care

9. Palliative and End-of-Life Care Recommendations 2026

Note: These recommendations apply to all individuals with stroke regardless of stroke type or their stage along the stroke continuum of care and regardless of setting.

Definitions and Descriptions

Palliative care is an approach that aims to reduce suffering and improve the quality of life for individuals who are living with life-limiting illness through the provision of pain and symptom management; psychological, social, emotional, spiritual, and practical support; and support for caregivers during the illness and after the death of the individual they are caring for. Palliative care provides comprehensive care throughout a person's illness trajectory and is not solely limited to end of life care. [44]

In a palliative approach to care, the health care team identifies individuals early on who would benefit from a palliative approach and initiates appropriate discussions and care management. Healthcare providers (e.g., primary care providers, nurses, stroke neurologist, palliative care specialists) are central to facilitate care to all individuals throughout the many transitions. Specialist palliative care teams provide care in an advisory-consultant-educational-coaching role and shared care with primary care clinicians and specialist stroke teams. (Adapted from Staffing a Specialist Palliative Care Service, a Team-Based Approach: Expert Consensus White Paper). [167]

End-of-life care is a part of the palliative approach that involves the management and treatment of dying individuals, and support for their families and informal caregivers.

Goals of care for palliative care: In the event of a treatment decision needing to be made, the medical team may initiate a "goals of care" discussion with the individual and/or their substitute decision-maker. This conversation should establish or clarify the individual's advance care wishes (see Section 8) in the context of their prognosis. Potential topics of discussion may include preferred location of palliation, the cessation of certain medical interventions, and comfort care options and preferences (e.g., excluding some or all components of resuscitation) in the event of immanent death or sudden decline in health status. The intent is to have a written communication plan for the healthcare team to provide individualized palliative care in a timely manner. The individual with stroke's health status can change over time and the written plan should be reviewed in conjunction with such changes in status or changes in the healthcare team. The goals of care plan can be amended or revised at any time by the individual and/or substitute decision-maker, and the fluid nature of these goals should be made clear.

Medical Assistance in Dying (MAiD): Medical assistance in dying (MAiD) is a process that allows an eligible individual to receive assistance from a medical practitioner to intentionally and safely end their lives. Canadian federal law defines very specific criteria for MAiD eligibility. Each province and territory have established procedures and protocols for assessment for MAiD. Some individuals who have experienced a stroke may be eligible for MAiD under specific, legally defined criteria. Clinicians providing post-stroke care should understand their expectations and obligations regarding MAiD and be able to provide effective referrals when appropriate. [168]

i. A palliative approach should be considered when there has been a catastrophic stroke or a stroke in the context of significant pre-existing comorbidity, to optimize care for the individuals, and their family members and informal caregivers [Strong recommendation; Low quality of evidence].

ii. The interdisciplinary stroke team should have discussions with the individual and decision-makers regarding the individual's goals of care that includes consideration of the diagnosis, prognosis, values, wishes, and whether care should focus on comfort or on prolonging life [Strong recommendation; Low quality of evidence].

  a. There should be regular communication with the individual, family, and informal caregivers to ensure their goals and needs are being met [Strong recommendation; Low quality of evidence].
  b. Palliative and end-of-life discussions should be ongoing and reflect any changes in diagnosis or prognosis [Strong recommendation; Low quality of evidence].
  c. Topics to be discussed with individuals, families, and informal caregivers may include the appropriateness of life-sustaining measures, including mechanical ventilation, enteral/intravenous feeding, and intravenous fluids, and the purpose of all medications, including those for symptom management [Strong recommendation; Low quality of evidence].

iii. Palliative care discussions should be documented and reassessed regularly with the healthcare team and substitute decision-maker [Strong recommendation; Low quality of evidence].

iv. Individuals with stroke, families, informal caregivers, and the healthcare team should have access to palliative care specialists, particularly for consultation about individuals with difficult-to-control symptoms, complex or conflicted end-of-life decision-making, or complex psycho-social family issues [Strong recommendation; Low quality of evidence].

v. Decisions to initiate, withdraw, or forgo life-prolonging treatments after stroke, including artificial nutrition and hydration, should be made in discussion with the individual, family, and caregivers as appropriate, taking into account the best interests of the person, and including whenever possible their prior expressed wishes, either in an advanced care plan or through discussions [Strong recommendation; Low quality of evidence].

vi. Each member of the healthcare team should understand their roles and responsibilities as defined by their respective provincial or territorial college or professional organization regarding discussions about medical assistance in dying (MAiD) [Strong recommendation; Low quality of evidence].

vii. Organ and tissue donation should be discussed with families and informal caregivers as appropriate [Strong recommendation; Low quality of evidence].

viii. Supportive counselling, funeral support, and bereavement resources should be provided to families and informal caregivers after the individual's death [Strong recommendation; Low quality of evidence].

Section 9 Clinical Considerations

1. The interdisciplinary stroke team should have the appropriate communication skills and knowledge to respectfully address the physical, spiritual, cultural, psychological, ethical and social needs of the individual with stroke, their family and informal caregivers who are involved in the individual's end-of-life care.
2. Referral and liaison with community-based hospice or palliative care should be coordinated based on individuals' needs and goals of care.
3. For individuals with stroke at the end of life, the following areas may be considered where appropriate (note, other areas may be relevant as well for each individual):
   a. Need for formal palliative care consultation
   b. Cessation of routine vital sign checks, blood work, and diagnostic tests
   c. Oral care
   d. Eye care
   e. Pain management
   f. Delirium

   g. Respiratory distress and upper airway secretions
   h. Nausea and vomiting, incontinence and constipation
   i. Nutrition and hydration
   j. Skin and wound care
   k. Seizures
   l. Anxiety and depression.
   m. Interdisciplinary support for individuals, families, and caregivers during dying process
   n. Preferred location of palliative care (e.g., home, hospice, another supportive living environment)
   o. Preferred person to be notified of individual's death
   p. Referral and liaison to MAiD team based on individual's needs and goals of care

4. Consider the use of validated decision aids to support shared decision making and documentation.

Rationale

Palliative care is essential following stroke due to the complex and often life-altering consequences that can arise. Palliative care addresses these multidimensional needs by focusing on symptom management, emotional support, and alignment of care with patient and family goals. It is particularly important for those with severe strokes, or a poor prognosis, helping to ensure comfort, dignity, and informed decision-making at the end of life. Integrating palliative care early can also facilitate discussions around goals of care and advance directives, especially when individual with stroke lose decision-making capacity.

Individuals with lived experience of stroke recognized that palliative and end-of-life discussion can be very challenging. Palliative care is often misunderstood as being only about end-of-life, but individuals emphasize that it can also be about finding positivity and support. They suggested it would be helpful if one individual from the healthcare team could be designated to ensure appropriate conversations are held with the appropriate parties about palliative and end-of-life care needs. They share that palliative care is not often discussed, but believe it should be, and state that sometimes individuals need "permission" to know it's okay to bring up the topic with family, friends, and loved ones, or with a healthcare provider, and having someone initiate the conversation in a supportive environment can be helpful. Peer support is seen as a helpful space for these discussions, offering a non-judgmental environment where individuals can reflect and share experiences.

They expressed that palliative and end-of-life care wishes should be brought up and discussed before they are required, to help give the individual some control and let them express what they want and need for this time in their life. They also note that each individual may take a different approach to palliative care discussions, based on their own personal context, values, preferences, culture and beliefs.

System Implications

Following stroke, systems should be in place to optimize successful transitions and return to life roles, health management, activities and social participation. These may include:

1. Communication and referral pathway established between the hospital and community based palliative organizations to ensure individual with stroke is connected appropriately and in a timely manner.

2. Formalized palliative care processes and standards need to be established, including a team experienced in providing end-of-life care for individual with stroke, with the ability to monitor of quality of palliative care delivery.
3. Established referral process to specialist palliative care services, either within the same organization or through telehealth technology in rural and remote locations.
4. These services should be able to address the needs of individual with stroke and families, including physical, spiritual, cultural, psychological, and social needs.
5. Communication and skills training for physicians, nurses, and allied health professionals that addresses supporting individual with stroke and their families through poor prognoses, and dealing with potential conflicts over patient wishes and decisions (e.g., consultation with ethics experts).
6. Protocols for advance care planning and palliative care to elicit patient and family goals for care preferences, and for ensuring care preferences are documented and communicated to decision-makers and healthcare team members.
7. Palliative care protocols that are integrated into ongoing care delivery.
8. Information on palliative care and linkages to local stroke support organizations and their services for staff to share with individual with stroke and families.

Performance Measures

System Indicators:

1. Proportion of hospitals or LTC facilities with clinical protocols for identifying and managing palliative needs in individual with stroke.
2. Proportion of hospitals or LTC facilities with access to interdisciplinary palliative teams (e.g., physicians, nurses, spiritual care, social workers, therapists).

Process Indicators:

1. Proportion of individuals with stroke who had a referral to specialist palliative care services during inpatient care.
2. Proportion of individuals with stroke who are dying following a stroke whose symptoms are routinely being assessed and monitored, and care plans adjusted as status changes.
3. Percentage of individuals with stroke with documented goals-of-care or ACP discussions within 7 days of admission or following deterioration.
4. Proportion of dying individuals with stroke who were who are cared for under a palliative care approach.
5. Percentage of individual with stroke receiving palliative care who have regular assessment and documentation of pain, dyspnea, agitation, and other symptoms using a standardized tool.
6. Median number of days from palliative care referral to death among individual with stroke.

Patient-oriented outcome and experience indicators:

1. Proportion of individuals with stroke who die in the location specified in their palliative care plan.
2. Family and caregiver ratings on the palliative care experience following the death in hospital of a individuals with stroke.

3. Family-reported experience with communication, support, and symptom management through post-death surveys.

Implementation Resources and Knowledge Transfer Tools

Resources and tools listed below that are external to Heart & Stroke and the Canadian Stroke Best Practice Recommendations may be useful resources for stroke care. However, their inclusion is not an actual or implied endorsement by the Canadian Stroke Best Practices or Heart & Stroke. The reader is encouraged to review these resources and tools critically and implement them into practice at their discretion.

Healthcare Provider Information

- Canadian Stroke Best Practice Recommendations: Acute Stroke Management Module: https://www.strokebestpractices.ca/recommendations/acute-stroke-management
- Canadian Stroke Best Practice Recommendations: Vascular Cognitive Impairment Module: https://www.strokebestpractices.ca/recommendations/new-vascular-cognitive-impairment
- Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery and Community Participation following Stroke, *Part One: Stroke Rehabilitation Planning for Optimal Care Delivery:* https://www.strokebestpractices.ca/recommendations/stroke-rehabilitation-planning
- Palliative Care Education for All Care Providers: http://pallium.ca/
- Burton and Payne Palliative Care Pathway: http://www.biomedcentral.com/1472-684X/11/22
- Bernacki RE, Block SD. Serious Illness Communications Checklist. *The Virtual Mentor*. 2013;15(12):1045–9. https://www.researchgate.net/publication/259316398_Serious_Illness_Communications_Checklist
- Registered Nurses Association of Ontario (RNAO) Guidelines for End-of-Life Care: https://rnao.ca/bpg/guidelines/endoflife-care-during-last-days-and-hours
- Canadian Virtual Hospice: Decisions: https://www.virtualhospice.ca/en_US/Main+Site+Navigation/Home/Topics/Topics/Decisions.aspx
- Canadian Virtual Hospice: My Grief Learning Modules: https://mygrief.ca/
- Canadian Virtual Hospice: The Learning Hub: https://www.virtualhospice.ca/learninghub
- Canadian Hospice Palliative Care Association. Resources: https://www.chpca.ca/knowledge/resources/

Resources for Individuals with Stroke, Families and Caregivers

- Heart & Stroke: Your Stroke Journey: https://www.heartandstroke.ca/-/media/pdf-files/canada/your-stroke-journey/en-your-stroke-journey-v20.pdf?rev=01a46257b0634561b49b56066a4fb4be
- Heart & Stroke: Post-Stroke Checklist: https://www.heartandstroke.ca/-/media/1-stroke-best-practices/resources/patient-resources/002-17_csbp_post_stroke_checklist_85x11_en_v1
- Heart & Stroke: Acute Stroke Management Infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/resources/patient-resources/csbpr7_infographic_acutestrokemanagement_en_final.pdf?rev=3477e77c1e4f4069bb0c6a440b541947
- Heart & Stroke: End of Life Care and Palliative Care: https://www.heartandstroke.ca/stroke/recovery-and-support/end-of-life-care-and-palliative-care

- Canadian Hospice Palliative Care Association. Resources: https://www.chpca.ca/knowledge/resources/
- Canadian Virtual Hospice: Decisions: https://www.virtualhospice.ca/en_US/Main+Site+Navigation/Home/Topics/Topics/Decisions.aspx

Summary of the Evidence

Palliative care is an important component of stroke care given that a high proportion (12%) of patients will die within 30 days of stroke onset. [169] The palliative care needs of 191 acute individuals with stroke were evaluated using the Sheffield Profile for Assessment and Referral to Care (SPARC), a screening tool developed to be used in advanced illness, regardless of diagnosis. SPARC included domains related to physical, psychological, religious and spiritual, independence and activity, family and social issues. [170] Patient dependence, defined as a Barthel Index score of <15 and increasing age were found to be independent predictors of palliative care need. Holloway et al. [171] compared the reasons for palliative consults for patients following stroke to other conditions including cancer, congestive heart failure, chronic obstructive pulmonary disease, and dementia. Of the total stroke admissions during the 3-year study period, 101 (6.5%) were referred for a palliative care consult. Patients with stroke had the lowest (worst) mean Palliative Performance Scale scores compared with all other conditions. Compared with patients with other conditions, individuals with stroke who received a palliative care consult were more often referred for end-of-life issues and more likely to die in hospital. Patients who had suffered a stroke were more likely to be unconscious during the assessment and more frequently lacked the capacity to make or participate in their own medical care decisions. When compared by stroke subtype, patients who had suffered an ischemic stroke were the least likely to be referred for palliative care (3.2%) while those with a subarachnoid hemorrhage were referred most often (15.0%). The relatives of patients who had died from a stroke were interviewed approximately 6 weeks later and questioned about their perceptions of the quality of dying they received in the hospital. [172] While the participants were generally satisfied with the quality of care received, there were a few areas of concern that were related to feeding, inability to say goodbye to loved ones, and not retaining a sense of dignity. Eriksson et al. [173] used data from 1,626 patients included in a national quality register for end-of-life care who had died of stroke in a hospital or nursing home, and compared care during the last week of life with 1,626 patients in the same register who died of cancer, matched for place of death, age and sex. The odds of experiencing dyspnea, anxiety and severe pain were significantly lower for individual with stroke; however, family members were less likely to be offered bereavement follow-up. Patients were also less likely to be informed about the transition to end-of-life care.

Palliative care pathways have been developed to ensure that in the last days of their lives patients receive the most appropriate care possible. However, there is an absence of high-quality evidence to suggest that they are effective. In a Cochrane Review, Chan et al. [174] sought studies that examined the use of an end-of-life care pathway compared with usual care for the dying. A single cluster RCT was identified (n=16 hospital wards), comparing an Italian version of the Liverpool Care Pathway (LCP-I), a continuous quality improvement programme of end-of-life care vs. usual care. In this trial, 232 family members of 308 patients who died from cancer were interviewed. Outcomes were assessed during face-to-face interviews of family members 2–4 months after the patient's death. Only 34% of the participants were cared for in accordance with the care pathway as planned. The odds of adequate pain control and control of nausea or vomiting were not significantly higher in the LCP-I group. In terms of specific interventions designed to address many common palliative care issues including dysarthria, anxiety, depression, urinary and fecal incontinence, vomiting, delirium and pressure ulcers, Cowey et al. [175] concluded there was insufficient evidence to guide their use, following a review of 77 primary studies including individuals with stroke requiring palliative care.

Several studies have examined the characteristics of patients who are transferred to palliative care units. San Luis et al. [176] included data retrieved from chart review of 236 patients admitted to hospital with a confirmed diagnosis of stroke, of whom 97 patients were transitioned to palliative care. These patients were more likely to be older, have atrial fibrillation, have more severe dysphagia on the first swallowing evaluation, have suffered a left MCA stroke, had higher initial stroke severity, received intravenous alteplase, and were admitted on a weekday. Gott et al. [177] reported that the diagnosis of stroke was a strong predictor of transfer to palliative care among a mixed diagnosis group of 514 patients with palliative care needs (OR=8.0, 95% CI 2.5-25.9, p=0.001).

Decisions to withhold or withdraw life-prolonging treatments after stroke affect a substantial proportion of patients who have experienced a severe stroke. Alonso et al. [178] reviewed the charts of 117 patients with ischemic or hemorrhagic, who died during hospitalization, in order to identify those with do-not-resuscitate-orders (DNRO), and therapy goal modifications with transition to symptom control. Factors that contributed to the decision to limit life-sustaining therapies were sought. A DNRO was made in 101 (86.3%) patients, usually within 48 hours of admission. Forty patients were transferred to palliative care after a mean of 5 days. Thirty-eight patients were not able to communicate at the time of decision making. Following transfer, monitoring of vital parameters (95%) and diagnostic procedures (90%) were discontinued. Antibiotic therapy (86%), nutrition (98%) and oral medication (88%) were never ordered or withdrawn. Low-dose heparin was withdrawn in 23% cases. All patients were maintained on intravenous fluids until death. Disturbance of consciousness at presentation, dysphagia on day 1 and large supratentorial strokes were independent predictors of decisions to withdrawing/ withholding further treatment. Patients died an average of 2.6 days following therapy restrictions.

Sex & Gender Considerations

Women are less likely to receive critical life-prolonging care than men. In a retrospective study including 137,358 adult patients hospitalized for acute stroke in Ontario from 2003-2017, Joundi et al. [179] reported that, among women, each successive year after 2003 was associated with a 20% reduction in the odds of receiving ICU care, compared with men. The odds of receiving mechanical ventilation, a percutaneous feeding tube, and tracheostomy were all significantly lower for women, regardless of stroke type (ischemic vs. intracerebral hemorrhage). Women are also more likely to opt for comfort care measures than men.[180]

Singh et al. [181] included 395,411 individuals with stroke included in the National Inpatient Sample from 2010-2012. Demographics, comorbidities, procedures, and outcomes between patients with and without a palliative care encounter (PCE) were compared. Patient characteristics that were independently associated with the use of PCE were older age, hemorrhagic stroke, white race and female sex.

Evidence Table and Reference List

APPENDIX ONE: STROKE SYSTEMS OF CARE SCIENTIFIC WRITING GROUP AND AUTHORS, 7th Edition, 2026

Name	Professional role	Location	Declared conflicts of interest
Co-Chairs			
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Sacha Arsenault, OT, MA *Co-Chair*	Health System Leader OT, MA Provincial Director, Stroke Services BC	BC	Consulting fees from Accreditation Canada, payment for accreditation surveys Support travel from UNEARTH CVD Heart Brain Connection (University Health Network, Toronto), travel expenses to attend team meeting
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Gord Gubitz, MD *Advisor*	Stroke Neurologist Professor of Medicine, Division of Neurology, Dalhousie University; Stroke Program Director, Halifax Infirmary	Halifax, NS	Member of CAMAP Board of Directors Received/will be receiving a grant or honorarium from CAMAP; Chair of national MAiD educational curriculum Support for adding meeting and/or travel from CAMAP, national/international educational symposia Currently participating or have participated within past two years in a clinical trial - ESCAPE-MeVO, OCEANIC, Site sub-investigator
M Patrice Lindsay *Senior Editor,* *CO-Corresponding author*	RN, PhD, FWSO Researcher, Senior Author/Lead, Principal, MarcLind Health Systems and Engagement Consulting	Toronto, ON	Consulting fees from Canadian Neurological Sciences Federation, payment to Self Payment of consulting fees for writing the present manuscript, payment to self

			Leadership or fiduciary role with Canadian Institutes for Health Research Advisory Board, and BHI Executive committee, volunteer no payments received
Membership			
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	Associate Professor, NOSM University		Committee Member; CorHealth Ontario, Co-Chair, Stroke Unit Advisory Committee, no payments
Lily Zhou, MD, MSc	Neurologist, Vancouver General Hospital Assistant Professor, University of British Columbia, Department of Medicine	Vancouver, BC	Grants or contracts from Vancouver Costal Health Research Institute, salary Support Leadership or fiduciary role with Canadian Stroke Consortium, no payment
Katie White B.Sc.PT, MSc.	Director, Health Systems, Heart and Stroke Foundation of Canada	Port Moody, BC	None to declare
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Anita Mountain MD, FRCPC	Medical Lead, Acquired Brain Injury Program, Queen Elizabeth II Health Sciences Centre Assistant Professor Division of Physical Medicine & Rehabilitation, Department of Medicine, Dalhousie University	Halifax, NS	All support for the present manuscript, Heart and Stroke Foundation of Canada, no payments Grants or contracts from any entity - Qualified site investigator for research supported by Brain Canada, Heart and Stroke Foundation of Canada, Canadian Partnership for Stroke Recovery/CIHR/Governors of the University of Calgary. No payments to self. Support for research coordinator and research activities related to research grants from primary organization Leadership or fiduciary role as Rehabilitation co-chair for Canadian Stroke Best Practice Recommendations Advisory Committee, no payments.

APPENDIX TWO: STROKE SYSTEMS OF CARE EXTERNAL REVIEWERS 2026

Name	Professional role	Location	Declared conflicts of interest
Renee D. Cashin, BN, MN, RN	Director of Stroke and Vascular, Provincial Cardiovascular and Stroke Program, NLHS	St. John's, NL	Received a grant or honorarium from Optimizing Research Project – Dr. Noreen Kamal, was provided a one-time fund to the Research and Innovation Team to help support collecting data for hyperacute stroke to submit to a national database
Luciana Catenese, MD	Medical Lead Hyperacute Stroke and Stroke Unit, Hamilton General Hospital Associate Professor of Medicine, Division of Neurology McMaster University	Hamilton, ON	Received/will be receiving a grant from Servier Currently participating in a clinical trial with the ACT-GLOBAL platform and have participated in ACT, TEMPO-2, TIMELESS, ENRICH-AF,OPTIMISE - Site Principal Investigator
Andrew S Dawson, FRCPC	Physical Medicine and Rehabilitation Medical Director, Rehabilitation, Fraser Health Authority	North Vancouver, BC	Holds investments in a pharmaceutical organization, medical device company, communications first, or not-for-provit organization with Eli Lilly – Retail Investor Currently participating or have participated within the past two years in a clinical

			trial - Camaros Trial, Investigator
Michael E. Kelly, MD, PHD, FRCSC	Provincial Department Head of Surgery Fred H. Wigmore Professor of Surgery	Saskatoon, SK	Holds investments in a pharmaceutical organization, medical device company, communications first, or not-for-provit organization with Custom Health, Endostream, Radical Catheter Inc,Basecamp Vascular - shareholder Consultant with Medtronic Inc, Cerenovus Inc., Penumbra Inc. Currently participating or have participating within the past two years in a clinical trial with University of Manitoba, site PI
Andrea King, BA, BScRec, MA, CTRS	Nova Scotia Health	Halifax, NS	None to declare
Lisa Korec, RN, BN, MA CAM	Director Neurosciences Saskatchewan Health Authority	Saskatoon, SK	None to declare
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Kelly Sharp, BScOT, MRSc	Regional Planning Lead for Stroke and Rehab	Vancouver, BC	None to declare

	Vancouver Coastal Health		
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Donelda Sooley, MHSc, MSc, S-LP(c)	Regional Director, Central East Stroke Network, Royal Victoria Regional Health Centre	Barrie, ON	None to declare Received payment from an organization from Royal Victoria Regional Health Centre – employee, receive a salary
Sandy Steinwender, OT Reg. (BC), MSc, PhD (c)	PHSA SSBC Provincial Lead Clinical Initiatives and Innovation	Vancouver, BC	None to declare
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APPENDIX THREE: CSBPR STROKE EDUCATION FRAMEWORK

Stroke Education Framework for Individuals with Stroke, Family & Caregivers

This document provides a guide for all healthcare providers and educators across the continuum of care who interact with individuals with stroke, their family and caregivers. The goal of this framework is to provide a systematic and comprehensive outline of core topics (Table One) that are important to address along the continuum of stroke care. In this context, patient education involves interventions that facilitate learning (facts plus interpretation and integration of information in such a manner as to bring about attitude or behavior changes).[a]

These topics should be considered within each stage and setting of care and across all transitions. Public education and increasing awareness of stroke signs is an imperative. Once a stroke event occurs, it is important to ensure individuals, and their families are provided with education on ongoing basis and regularly reinforced by all team members throughout rehabilitation and recovery which may help to build up self-management capacity, understanding and ability to actively participate in their care and recovery and optimize outcomes.

Regardless of form, educational activities should adhere to some core principles for delivering education following stroke:

- Be person-centred and respect values, needs, preferences. Individuals with stroke, their family and caregivers should be active participants in educational activities.
- Be provided in a learning environment that is inclusive, culturally sensitive, trauma-informed, and free from bias or discrimination
- Be formal or informal, oral and written, and ideally a combination of multiple methods.
- Be presented in many forms, such as individual or group learning, in person or virtual, synchronous or asynchronous.
- Be individualized, adapted to the individual's abilities, readiness to learn, health status, health literacy, comprehension levels, and offered in a variety of languages.
- Minimize jargon and consider target reading level (i.e., grade 6), and complexity of educational materials provided.
- Use visual aids and apply teach-back methods.
- Be routinely documented in the health record, including time of education interaction, topics covered and level of understanding.
- Be goal-oriented, active, and practical to engage the learner (i.e., involving a tailored conversation) – this approach will likely be more effective than passive information (i.e., providing multiple information pamphlets without reviewing them in an interactive way).

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[a] Hafsteinsdóttir TB, Vergunst M, Lindeman E, Schuurmans M. Educational needs of patients with a stroke and their caregivers: a systematic review of the literature. *Patient Educ Couns*. 2011 Oct;85(1):14-25.

- Repetition is important. Reinforce and build on content previously shared, check for comprehension, and allow time for questions to be asked and answered.
    - The timing and duration of education post stroke is important. Aim for 15-20 minute sessions and morning sessions to minimize cognitive fatigue. Consider frequency, reinforcement, comprehension, and tolerance.
    - Family and caregivers may have different information needs. Involve family and caregivers in education sessions when appropriate and consider including information about coping strategies and community supports and resources.
    - Ideally have designated staff identified to provide targeted education, while recognizing all team members have a responsibility to provide and reinforce education for those they care for.
    - Provide training for healthcare team members in teaching methods that incorporate adult learning theory, and motivational interviewing.
    - Organizations should evaluate their processes for providing stroke education and their approach to monitoring quality and effectiveness.
    - Not all topics will be applicable to each individual with stroke; however, components of stroke education should be considered – including self-identified content areas and provider identified information needs.
    - Education content should be consistent across the continuum of care. Attempts should be made to minimize conflicting information.
    - Continually modify education materials and plan regular updates to ensure current, accurate and relevant.
    - Provide access to ongoing educational resources at all care transitions.

Table One: Core Educational Content across the Stroke Continuum

STROKE AWARENESS AND ACTION	ACUTE STROKE CARE	STROKE PREVENTION	STROKE REHABILITATION AND RECOVERY	COMMUNITY PARTICIPATION
Ongoing review and reinforcement of all information previously provided that is relevant to the individual with stroke and their unique situation				

• Reinforce Signs of Stroke, including FAST (Face, Arms, Speech, Time)
• Importance of calling 911 if any stroke signs and symptoms appear again after initial stroke
• Never drive self or someone with stroke to hospital on your own
• Risk factors for stroke
  • High Blood Pressure
  • Atrial Fibrillation
  • Obesity
  • High Sodium Diet
  • Diabetes
  • High Cholesterol
  • Lack of Exercise
  • Smoking
  • Sleep Apnea
  • Family History
  • Environmental
  • Social Isolation
  • Unique risk factors for women
• Risk of stroke for all age groups from newborns to children, young adults and older adults
	• Define what a stroke is, types of stroke, and cause of stroke for individual if known
	• Diagnostic tests
	  • CT scan
	  • MRI
	  • Carotid imaging
	  • ECG for AFib detection
	• Other tests and interventions
	• Consent and decision-making regarding treatment
	• Acute management plan
	• Acute intravenous thrombolysis
	• Endovascular interventions
	• Involvement of neurosurgery if applicable and why
	• Admission process and what to expect after admission
	• Potential impairments and limitations – what areas may be involved, potential outcomes and impact
	• Focus on self-management and involvement of family and informal caregivers in daily activities
	• Medications: purpose, schedule, interactions, adherence
		• Effects of stroke in months following index event – risk for depression, cognitive changes, sleep apnea, post-stroke fatigue; and provide strategies and self-management skills so individual with stroke, families and caregivers can manage in community and home settings
		• Medication management
		• Atrial fibrillation risks and management as appropriate
		• Adherence to medication and other therapies and treatments
		• Access to community resources and stroke support groups
		• Re-access to healthcare system
		• Advance care planning and personal health directives
			• Educate individuals with stroke about goal setting so they can actively participate in goal setting and care planning across settings
			• Information regarding specific individualized rehabilitation needs
			• Rehabilitation settings (inpatient and outpatient) and goals of care
			• Roles of each of the rehabilitation team members involved in care
			• Individualized rehabilitation plan to address current impairments and limitations
			• The types or rehabilitation exercises and activities that could and should be done between scheduled sessions with therapists
			• Patient, family caregiver safety while participating in rehabilitation – such as how to prevent complications or minimize falls.
			• Self-management skills for mobility and activities of daily living
				• Importance of information transfer and provision of written core information about previous stroke related episodes of care to share with stroke experts and recovery team members in next phase of care, including primary and community care
				• Appropriate expectations for recovery of impairments and limitations, time frames and likely transition points appropriate to the individual
				• Addressing functional issues – ongoing rehabilitation and physical activity recommendations, personalized plan of care and goal setting
				• Self-management skills for mobility, symptom management, medication adherence and activities of daily living, strategies to prevent complications and recurrent stroke, safe transfers and bathing techniques
				• Ongoing management of sleep health and energy conservation strategies to address post-stroke fatigue
				• Need for follow-up with primary health care providers for

STROKE AWARENESS AND ACTION	ACUTE STROKE CARE	STROKE PREVENTION	STROKE REHABILITATION AND RECOVERY	COMMUNITY PARTICIPATION

	• Risk of complications, and activities to promote safety and prevent complications
	• Family and caregiver safety and role in recovery
	• Initiate transition planning
	• Discuss potential pathway for care and likely next setting of care
	• Potential for home modifications prior to discharge
	• For individual with stroke discharged directly from the ED:
	  • Need for follow-up with primary care and stroke specialists (refer to prevention education)
	  • Risk of recurrence and review of stroke signs and symptoms
	• Accessing resources and stroke support following discharge
	• Accessing resources and stroke support following discharge from acute care
	• Expectations for recovery following discharge, addressing issues including depression, post-stroke fatigue, rehabilitation needs and access, and issues for social reintegration
	• Re-access to healthcare system
	• Advance care planning and personal health directives
			• Importance of good sleep health and management of post-stroke fatigue
			• Strategies to address communication issues such as aphasia, and ways family and others can be involved in learning supportive communication techniques
			• Nutrition and management of dysphagia, and safe swallowing strategies to reduce aspiration risk
			• Management of bowel and bladder issues
			• Discharge planning, type of care needed after discharge, and required modifications to living setting prior to discharge from inpatient rehabilitation
			• Information on potential mental health challenges such as mood, depression, anxiety, behaviour changes, and ways to recognize these and seek help
			• Information on potential cognitive challenges following stroke, and ways to recognize these and seek help
			• Access to therapists and programs for ongoing rehabilitation in out-patient and community settings
			• Access to community resources and stroke support groups
				ongoing monitoring and management
				• Ongoing monitoring and strategies to address psychosocial and cognitive issues, i.e., problem-solving techniques, decision-aides, stress management, fear, mood changes and depression, family support, referrals to community resources
				• System navigation and reconnecting to healthcare teams when needed
				• Food preparation and modifications to address dysphagia
				• Types of services available in the community and how to access them – e.g., mobility assistance, meal delivery, communication support, respite care, transportation
				• Linkage to support groups and peer support resources
				• Social and leisure activity review and importance of resuming social interactions
				• Information regarding resuming vocational, educational and driving activities
				• Information regarding relationships and sexuality post-stroke

STROKE AWARENESS AND ACTION	ACUTE STROKE CARE	STROKE PREVENTION	STROKE REHABILITATION AND RECOVERY	COMMUNITY PARTICIPATION
	• Palliative and end-of-life care when applicable		• Explore return to leisure and social activities • Re-access to healthcare system following rehabilitation • Advance care planning and personal health directives • Return to work and driving	• Information and strategies for parenting and resuming caregiver roles following stroke • Advance care planning and personal health directives • Strategies to address caregiver burnout • Access to women-specific recovery resources

Notes:

- Each module within the Canadian Stroke Best Practice Recommendations will have additional information regarding specific educational content relevant to that topic area.

Additional CSBPR Educational Resources:

- CSBPR Post-Stroke Checklist
- CSBPR Self-Management Checklist
- Infographics for Individuals with Stroke (refer to individual modules)
- www.strokebestpractcies.ca/resources
- www.heartandstroke.ca/stroke
- www.heartandstroke.ca/women

APPENDIX FOUR: REFERENCES

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