Rehabilitation, Recovery and Community Participation following Stroke

Part One: Stroke Rehabilitation Planning for Optimal Care Delivery

7th Edition, 2025

CANADIAN STROKE BEST PRACTICE RECOMMENDATIONS

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Part One:* Stroke Rehabilitation Planning for Optimal Care Delivery, *7th Edition 2025

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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).

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 comorbid 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 comorbid 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 being done separately rather than being integrated across conditions, even related vascular conditions. Even within stroke systems of care, locally and regionally, 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 within the community 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 the extent to which available evidence has included both male and female participants in sufficient proportions to be able to detect outcomes and generalize to a broader population. These findings are presented in the discussion sections of the module and integrated into the actual recommendations where appropriate to do so. 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.

These recommendations have been developed in collaboration with the Canadian Stroke Consortium, CanStroke Recovery Trials Platform, StrokeCog, and the Canadian Neurological Sciences Federation. We work closely 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 Rehabilitation, Recovery and Community Participation following Stroke Module

Stroke is on the rise in Canada with over 108,000 cases presenting to hospitals in 2017/18 in Canada.[2] Stroke is a leading cause of adult disability. In 2022/23, there were 969,095 people 20 years of age and

older estimated to be living with the effects of stroke in Canada.[3] In Canada, one-third of individuals with stroke, usually with transient ischemic attack (TIA) and milder strokes, are discharged back to the community directly from the emergency department. Of those individuals admitted to acute inpatient care, 39% will be discharged to their homes without support services, and an additional 19% will be discharged to their home setting with some support service referrals, 15% will be transferred to an inpatient rehabilitation service, 8% will be transferred to long-term care or complex continuing care (National Ambulatory Care Reporting System [NACRS] and Discharge Abstract Database [DAD] data extracted for contributing sites, Canadian Institute of Health Information [CIHI] portal, 2024). For those who had access to inpatient rehabilitation, the median length of stay was 29 days, 74% were discharged home, with a median Functional Independence Measure [FIM] efficiency of 0.84 FIM points gained per day (NRS data extracted for contributing sites, CIHI portal, 2024).

Ultimately most individuals who experience a stroke will return to the community, living 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 stay and longer waits for community services. Several interdisciplinary team members and services are often required by individuals recovering from stroke. These individuals and their families have reported that coordination and integration of services are often major challenges as they try to navigate community healthcare services. They report at times falling through the cracks and not being able to meet their rehabilitation goals as a result (Community Consultation and Review Panel 2024).

The 7th update of the Canadian Stroke Best Practice Recommendations (CSBPR) *Rehabilitation, Recovery and Community Participation following Stroke* module has been reorganized to better align with the International Classification of Functioning, Disability and Health (ICF) Framework. Further, due to the broad scope of topics covered in this module, this updated 7th edition has been divided into three parts:

- *Part One: Stroke 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, Update 2025.*

This module, Part One: Stroke Rehabilitation Planning for Optimal Care Delivery, reflects the growing and changing body of research evidence available to guide planning, ongoing screening and assessment, management, education, and support of individuals with stroke, their families, and caregivers. This module provides guidance in the delivery of coordinated and seamless systems of care that supports progress achieved during the initial recovery stages and enables people to successfully resume life roles and leisure activities. Successful planning, recovery, transitions and community participation following stroke requires integrated and coordinated person-centred efforts by all members of care teams involved with individuals who have had a stroke, their families and caregivers, and the broader community.

There is an urgent imperative for health systems of care to be vigilant to their recovery needs and ensure services and resources are in place to reduce complications and provide equitable opportunities for all individuals recovering from stroke to achieve optimal health outcomes. Their physical, emotional, psychological, social, spiritual and environmental needs 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 Definitions and Descriptions

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 chronic 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).

Rehabilitation is NOT a setting, rather, it is a process that includes a set of activities that begins soon after the initial event, once the individual with stroke is medically stable to participate and goals for rehabilitation, recovery and participation can be identified.

Rehabilitation occurs across the continuum of stroke care in a variety of formal and informal settings such as acute care or sub-acute care; rehabilitation units, on general or mixed rehabilitation units; in ambulatory or community settings, such as outpatient or day clinics, home-based services (incudes early supported discharge and long-term care services), recreation centres, and outreach teams.

Screening is a process for evaluating the possible presence of a particular problem. Screening is a purposeful action or query for early identification of individuals who may be at risk of developing a specific condition or disorder or problem. Screening may suggest that an issue may exist. Findings from screens can indicate the need for more comprehensive assessment. Screening is usually brief and used to identify possible concerns, not typically to diagnose. Healthcare providers may use preliminary screening measures to support clinical decision making.

Assessment is a process for defining and measuring the nature of a stroke-related health problem, informing a diagnosis, formulating a prognosis, and contributing to developing specific treatment recommendations for addressing the problem or diagnosis. Assessment may also include monitoring response to therapeutic intervention. The purpose of assessment is to gather more specific and detailed information to provide a comprehensive understanding of a potential issue. Assessments will include other information to help provide a broader context of results.

Note: Screening and assessment of individuals following stroke must take into consideration multiple factors. Ideally, both assessment and screening tools should be validated for their specific use and target population to provide the most accurate interpretation of results.

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 said 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/)

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.

Complex Continuing Care (CCC) is a specialized healthcare program for medically complex individuals requiring extended hospital stays and ongoing, intensive medical supervision. It focuses on individuals with multiple interacting chronic conditions who benefit from a coordinated,

interdisciplinary approach to care to achieve optimal mental, physical, cognitive, and social well-being. CCC is characterized by specialized services that cannot be effectively managed in a community setting or under the scope of long-term care, emphasizing active care management and a progressive treatment plan tailored to the individual with stroke's unique needs.

Early Supported Discharge (ESD) is a form of rehabilitation designed to accelerate the transition from hospital to home as soon as medically stable and safe through the provision of rehabilitation therapies delivered by an interprofessional team, in the community. ESD is provided by an interdisciplinary team of rehabilitation professionals and is intended as an alternative to a complete course of inpatient rehabilitation and is most suitable for individuals recovering from mild to moderate stroke.[4, 5]

Home Care is defined as providing medical, nursing, rehabilitation and personal care services to people in a home setting rather than in a medical facility, to enable people to remain safely in their home by continuing their rehabilitation therapy and increasing their independence. Home Care can also include respite services to enable caregivers to maintain employment and attend to personal matters.

Integrated stroke systems consider all aspects of planning and delivering care, such as access, assessment, treatment, clinical evidence, data, outcomes, benchmarking, guidelines, planning, organization of services, funding, and education.

Long-term care is the provision of organized institutional care for people of all ages who need assistance with the activities of daily living (ADL). The goal of long-term care is to ensure that an individual who is not fully capable of self-care and independent living can maintain the best possible quality of life, with the greatest possible degree of independence, autonomy, participation, personal fulfilment and human dignity. The need for long-term care following a stroke is influenced by changing physical, psychological and/or cognitive functional capacities, an individual's abilities and level of independence prior to the stroke, and the availability of family and caregivers.

Restorative Care is a wholistic approach aimed at enhancing the quality of life and promoting the well-being of individuals. It aims to enhance and maintain functional abilities and overall well-being, focusing on maximizing independence and improving functional abilities through supportive interventions that support maintaining and enhancing existing skills. Restorative care also helps individuals engage in daily activities and achieve their personal goals rather than solely targeting the improvement of specific deficits.

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 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 therapies which optimize their survival and recovery.

Stroke System Navigation is a comprehensive, collaborative process that facilitates optimal individual with stroke 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.

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)
- Informational (e.g., providing information about illness and services)
- Appraisal (e.g., providing feedback about their caregiving activities)

Supportive living environments may include a range of settings and support service levels, such as: a private home or residence where healthcare services are provided; group settings such as lodges, transitional care or respite centres where the individual with stroke resides with others with similar care and support needs; assisted living settings where the individual has a private room(s) within a community living setting and access to personal care support, group meals, organized social activities, and transportation.

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.

Virtual Stroke Rehabilitation (Telerehabilitation) refers to the use of information and communication technologies to deliver rehabilitation services from a distance. This can include video or telephone conferencing. Telerehabilitation includes a range of services including evaluation, assessment, monitoring, prevention, intervention, supervision, education, consultation, and coaching.

WHO International Classification of Functioning, Disability and Health [6]

Impairment: Problems in body function or structure such as a significant deviation or loss

Activity limitation: Difficulties an individual may have in executing activities

Participation restrictions: Problems an individual may experience in involvement in life situations

Notable Updates for Rehabilitation, Recovery and Community Participation following Stroke*, Part One: Stroke Rehabilitation Planning For Optimal Care Delivery* Update 2025

1. **Reorganization of the Rehabilitation Module**: The Stroke Rehabilitation, Recovery and Community Participation module has been divided into two parts, and the topics have been restructured to align with the International Classification of Functioning (ICF) framework for improved clarity and flow.
2. **Expanded Inclusion of Healthcare Professionals**: A broader scope of healthcare professionals have been engaged who have expertise to support the ongoing management of medical comorbidities and other medical needs as part of inpatient and community rehabilitation programs.
3. **Virtual Rehabilitation Delivery**: Expanded recommendations for the use of virtual modalities beyond therapy delivery to support rehabilitation functions such as transitions planning and education.
4. **Broader Framing of Sensory Impairments**: Enhanced scope of sensory impairment recommendations, specifically highlighting vision and perceptual difficulties.
5. **Family Participation in Rehabilitation**: Added additional recommendations regarding family meetings and utilizing virtual modalities to enhance family involvement in rehabilitation.
6. **Community Engagement and Participation**: Introduced new and additional recommendations focusing on strategies for community engagement and enhancing participation in community activities as part of returning to life roles.
7. **Alignment of Outpatient and Inpatient Rehabilitation**: Provided additional guidance to ensure outpatient and community-based rehabilitation aligns with the processes and standards of inpatient programs.
8. **Utilization of validated tools**: Further emphasis on the use of validated assessment tools across rehabilitation care.
9. **Early Supported Discharge:** Addition of inclusion criteria when considering Early Supported Discharge.

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.* [7] 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 Rehabilitation, Recovery and Community Participation following Stroke Community Consultation and Review Panels, comprising individuals 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 March 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. [8] 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.[9-11]
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 [7] on the Canadian Stroke Best Practices website. www.strokebestpractices.ca

Assigning Evidence Levels

The Grading of Recommendations, Assessment, Development and Evaluation (GRADE) [12] 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.[9]

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).[12]

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 Rehabilitation, Recovery and Community Participation following Stroke: Part One, Stroke Rehabilitation Planning for Optimal Care Delivery module writing group members can be found in Appendix One.

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The recommendations in this module are also published in the American Journal of Physical Medicine & Rehabilitation (AJPM&R)

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French link:
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(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.

REHABILITATION, RECOVERY AND COMMUNITY PARTICIPATION FOLLOWING STROKE MODULE

Part One: Stroke Rehabilitation Planning for Optimal Care Delivery, 7th edition update, 2025

Section 1 Initial Stroke Rehabilitation Screening and Assessment

1. Initial Stroke Rehabilitation Screening and Assessment Recommendations 2025

Note: these recommendations apply in inpatient and outpatient settings

1.0 All individuals with acute stroke should be assessed to determine the severity of stroke and early rehabilitation needs [Strong recommendation; Moderate quality of evidence].

i. All individuals ***admitted to hospital*** with acute stroke should have an initial assessment, conducted by rehabilitation professionals, as soon as possible after admission [Strong recommendation; High quality of evidence].

   a. The core rehabilitation professional team should include physicians (i.e., physiatrist, neurologist, or other physicians with training in stroke rehabilitation), nurses, physiotherapists, occupational therapists, speech-language pathologists, social workers, and dietitians [Strong recommendation; High quality of evidence]. The individual with stroke, their family and caregivers should also be included as part of the core team [Strong recommendation; Moderate quality of evidence].

   b. Additional team members may include recreation therapists, psychologists, vocational therapists, kinesiologists, rehabilitation therapy assistants, vision specialists, and pharmacists [Strong recommendation; Low quality of evidence].

   c. All professional members of the rehabilitation team should have specialized training in stroke care and recovery [Strong recommendation; High quality of evidence].

   d. All professional team members should be trained in supported conversation to be able to interact with individuals with communication limitations such as aphasia [Strong recommendation; Moderate quality of evidence].

ii. Initial screening and assessment should ideally be commenced within 48 hours of admission by rehabilitation professionals in direct contact with the individual with stroke [Strong recommendation; Moderate quality of evidence].

   a. Initial assessment may include: an evaluation of an individual with stroke's function, safety, physical, psychological and cognitive readiness, and ability to learn and participate in rehabilitation therapies [Strong recommendation; Low quality of evidence].

   b. Transition planning should be considered during the initial rehabilitation assessment [Strong recommendation; Moderate quality of evidence].

iii. Assessment of impairments, functional activity limitations, role participation restrictions and environmental factors should be conducted using standardized, valid assessment tools [Strong recommendation; Moderate quality of evidence].

   a. Assessment tools should be adapted for use with individuals who have communication differences or limitations where required [Strong recommendation; Moderate quality of evidence].

b. Other limitations should also be taken into consideration, such as impaired vision, hearing and communication [Strong recommendation; Low quality of evidence].

iv. For individuals with stroke who do not initially meet criteria for rehabilitation services, reassessment of rehabilitation needs should be considered as indicated by changes in health or functional status [Strong recommendation; Low quality of evidence]. *Refer to Box 1 for additional information.*

v. All individuals with stroke who present with acute stroke or TIA who are ***not admitted to hospital*** should be screened for the need to undergo a comprehensive rehabilitation assessment to determine the scope of deficits from index stroke event and any potential rehabilitation requirements [Strong recommendation; Low quality of evidence].

a. Priority screening areas, including evaluation of safety (cognition, fitness to drive, social support), swallowing, communication, and mobility, should be completed by a clinician with expertise in stroke rehabilitation where feasible *before* the individual with stroke leaves the emergency department or in the primary care setting [Strong recommendation; Low quality of evidence]. *Refer to CSBPR Secondary Prevention of Stroke module.* [13]

b. Additional screening of impairments, including onset of depression, cognitive changes, visual and other perceptual impairment, functional activity limitations, role participation restrictions, social and environmental factors and the presence of modifiable stroke risk factors (such as lifestyle behaviours) should be considered as soon as possible, and at least within two weeks of stroke onset [Strong recommendation; Low quality of evidence].

vi. Once an individual with stroke has undergone assessment, a standardized approach is recommended to determine the appropriate setting for rehabilitation (including inpatient rehabilitation, outpatient and community-based rehabilitation, and home-based rehabilitation.) [Strong recommendation; Low quality of evidence].

a. Standardized criteria for admission to any rehabilitation setting is ideally communicated to all referring centres and services [Strong recommendation; Low quality of evidence]. *Refer to Box 1 for Eligibility and Admission criteria for stroke rehabilitation.*

Box 1: Eligibility Criteria for Stroke Rehabilitation

The following criteria have been developed as part of the Canadian Stroke Best Practice Recommendations to provide guidance and increase consistency for key elements that should be considered in decision-making regarding stroke rehabilitation for individuals with stroke. Criteria for access to rehabilitation services should be agreed upon by all relevant individuals in each region, be clearly stated and communicated to all referral sites to improve the individual with stroke's access and admission to stroke rehabilitation programs in an efficient and transparent manner. This applies to all rehabilitation settings, including inpatient rehabilitation, outpatient and community-based rehabilitation, and home-based rehabilitation. Refer to Section 5 for information on stroke rehabilitation in long-term care settings.

System Characteristics: In order to optimize access and benefits of stroke rehabilitation for individuals with stroke, their families and caregivers, there are several structural and system components that should be established. These may include:

- Efficient and transparent referral process for access to stroke rehabilitation across settings.
- Standards for time from receipt of referral to decision regarding intake to rehabilitation (ideally 24-48 hours).
- Rehabilitation professionals knowledgeable about stroke rehabilitation should be responsible for reviewing intake applications.

- Family members and caregivers should be included as part of the rehabilitation process, including decisions regarding type and location of rehabilitation where appropriate.
- Availability and accessibility of the appropriate type and level of rehabilitation services and resources across geographic regions.
- Availability of early supported discharge (ESD) programs and criteria for the individual with stroke who is an appropriate candidate.

General Inclusion Criteria for Stroke Rehabilitation

- All individuals with acute or recent stroke:
  - Who require inpatient or outpatient interdisciplinary rehabilitation to achieve functional goals to improve independence;
  - Who would benefit from interdisciplinary rehabilitation assessment and treatment from staff with stroke expertise (*refer to Recommendation 1.0.i for list of team members*);

    And,
  - Whose stroke etiology and mechanisms have been clarified and appropriate prevention interventions started (exceptions noted below under 'medically stable').
- Goals for rehabilitation can be established and are specific, measurable, attainable, realistic and timely.
- The individual with stroke is **medically stable, meaning that**:
  - A confirmed diagnosis of stroke has been identified, although the mechanism or etiology may not be initially clear, such as in cryptogenic stroke; these situations should not cause delays in access to rehabilitation;
  - All medical issues and/or comorbidities (e.g. excessive shortness of breath, blood pressure stability, cardiac issues and congestive heart failure) are being managed and are not precluding active participation in the rehabilitation program;
  - All key medical investigations have been completed ***and*** *planned* follow up appointments are scheduled by time of discharge from acute care.
- The individual with stroke demonstrates the ability to participate, which includes:
  - Tolerance and endurance to participate in the program demands/schedule;
  - Ability to follow at minimum one-step commands, with communication support if required;
  - Sufficient attention, and short-term memory to progress through rehabilitation process.
- The individual with stroke has consented to treatment in the program and demonstrates a willingness and motivation to participate in the rehabilitation program.

General Exclusion Criteria for Stroke Rehabilitation

- Medically unstable.
- Severe cognitive impairment that prevents the individual with stroke from learning and actively participating in therapy.
- Behaviour that is inappropriate and putting self or others at risk, such as physical and verbal aggression.
- Not willing to participate in program.

Determining if an Individual With Stroke is a Suitable Candidate for Outpatient (Hospital or Home-Based) Rehabilitation:

- The individual with stroke meets the criteria for rehabilitation candidacy, medical stability, and rehabilitation readiness as defined above.
- The individual with stroke's current medical, personal care, and rehabilitation needs can be met in the community.
- The individual with stroke can attend therapy alone or if assistance is required a caregiver is available to attend therapy sessions.

Rationale

Early rehabilitation assessment is vital to evaluate specific functional impairments resulting from stroke, such as mobility, speech, cognitive, or swallowing difficulties. By identifying these deficits early, clinicians can create a personalized rehabilitation plan that targets individual needs. Early assessment also helps to inform decision making regarding the level of rehabilitation services that will likely we required following discharge from an acute care service and can also aid in the process of discharge planning from acute care, regardless of the eventual discharge destination. For individuals with stroke who do not initially meet the criteria for inpatient rehabilitation, both ongoing reassessments are appropriate referrals to other services are important to ensure post-stroke rehabilitation needs and goals are optimized.

Individuals with stroke stressed that access to rehabilitation screening and assessment should be provided to all individuals who experience a stroke. The first few days or weeks in the hospital after experiencing a stroke can be confusing and overwhelming, and individuals with stroke valued the opportunity to ask questions to healthcare providers during initial assessments, as well as when healthcare providers communicated with the family early on following stroke, with appropriate consent.

Individuals with stroke, their families and caregivers face challenges in advocating for themselves as well as retaining information during the initial period following stroke, especially when speech and sensory function is affected by the stroke. They valued receiving information in multiple formats – written and verbal - as well as information being repeated.

System Implications

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

1. An adequate complement of interdisciplinary healthcare providers with training and experience in stroke and stroke rehabilitation.
2. A process for timely referral to specialized stroke inpatient services in all centres (e.g., electronic referral system and standardized assessment tools).
3. Availability and accessibility of the appropriate type and level of rehabilitation services and resources across geographic regions, including inpatient rehabilitation, outpatient and community-based rehabilitation, and home-based rehabilitation (including in supportive living).
4. Availability of early supported discharge (ESD) programs and criteria for the individual with stroke who is an appropriate candidate.
5. A clear efficient referral process for individuals with stroke to access rehabilitation professionals and programs after acute management, and if not acutely admitted, from community settings such as primary care.
6. Standards for time from receipt of referral to decision regarding intake to rehabilitation (suggest 24-48 hours).
7. Rehabilitation professionals knowledgeable about stroke should be responsible for reviewing intake applications.

8. Processes in place to ensure family members and caregivers are included as part of the rehabilitation process, including decisions regarding type and location of rehabilitation where appropriate and with the individual with stroke's consent.
9. An interdisciplinary team that is resourced to provide prescribed levels of rehabilitation therapy.
10. A defined geographic area or unit where individuals with stroke are assured access to an experienced team.
11. Standardized, validated, and expert consensus-based screening assessment tools and training.
12. Access to a follow-up clinic for secondary stroke prevention to ensure assessment of mild stroke-related difficulties and referral to rehabilitation services and programs when deficits and issues are identified that are amenable to rehabilitation.
13. Mechanisms to reevaluate individuals who do not initially meet criteria for rehabilitation to ensure that they have access to rehabilitation as appropriate, if the individual with stroke meets defined rehabilitation criteria.
14. Mechanisms to periodically re-evaluate those individuals who are admitted to long-term care, complex continuing care, or other settings to ensure that they have access to rehabilitation as appropriate, if the individual with stroke meets defined rehabilitation criteria.
15. Coordination and development of strong partnerships in the community, and adequate resources to ensure access to comprehensive stroke rehabilitation. This is especially important in more rural and remote geographic locations where virtual care technologies should be optimized.

Performance Measures

System indicators:

1. Proportion of individuals with stroke who are admitted to inpatient rehabilitation following an acute stroke event.
2. Proportion of individuals with stroke living in remote communities with access to rehabilitation assessments and therapies to support stroke recovery, both in-person and virtually.
3. Proportion of individuals with mild, moderate and severe stroke admitted to inpatient or community stroke rehabilitation, by age and sex.
4. Distribution of discharge disposition locations following inpatient rehabilitation.
5. 30-day acute ischemic stroke mortality during acute care and or inpatient rehabilitation hospital stay (Aligns to Accreditation Canada).

Process indicators:

6. Proportion of individuals with stroke with a rehabilitation assessment within 48 hours of hospital admission for acute stroke by at least one stroke rehabilitation specialist, as appropriate to patient needs (aligns to Accreditation Canada).
7. Median time from hospital admission for stroke to initial rehabilitation assessment for each of the rehabilitation disciplines (Target is within 48 hours of hospital admission).
8. Proportion of individuals with mild, moderate and severe stroke discharged to the community who receive a referral for outpatient rehabilitation prior to leaving acute and/or inpatient rehabilitation setting (either facility-based or community- based programs).
9. Median length of time between referral for outpatient rehabilitation to first appointment with the rehabilitation services (Target is within 30 days).
10. Proportion of individuals with severe stroke reassessed for rehabilitation following initial assessment within one month, 3 months and six months of index stroke event.

Patient-oriented indicators:

11. Self-reported quality of life at 6 months and one year following stroke (using a validated QoL tool) (ICHOM).
12. Occurrence of new stroke within 90 days of discharge from stroke admission (ICHOM).

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 Rehabilitation Planning for Optimal Care Delivery Module: Box 1: Eligibility and Admission Criteria for Stroke Rehabilitation
- Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery and Community Participation following Stroke, *Part Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery; and, Part Three: Optimizing Activity and Community Participation following Stroke, Update 2025.*
- Stroke Engine: FIM® Instrument: https://strokengine.ca/en/assessments/functional-independence-measure-fim/
- UDS: AlphaFIM® Instrument: https://www.udsmr.org/
- Stroke Engine: Modified Rankin Scale: https://strokengine.ca/en/assessments/modified-rankin-scale-mrs/
- EBRSR: Evidence-Based Review of Stroke Rehabilitation: Managing the Stroke Rehabilitation Triage Process:http://www.ebrsr.com/evidence-review/4-managing-stroke-rehabilitation-triage-process
- Aphasia Institute: https://www.aphasia.ca/
- 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: 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: Rehabilitation and Recovery Infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/rehabilitation-nov2019/csbp-infographic-rehabilitation.pdf?rev=a2cff1fb27424c84bbd44b568d58d1b4
- 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
- Stroke Engine: https://strokengine.ca/en/

Summary of the Evidence

Comprehensive assessment of an individual with stroke's cognitive and functional status conducted within the first few days following a stroke is essential to guide the development of individualized care plans. These assessments should be conducted using a standardized approach with validated tools. Areas of evaluation should include a person's ability to perform basic self-care activities (such as dressing, grooming, personal hygiene, feeding, functional mobility and communication) and instrumental activities of daily living (including meal preparation, home management, communication activities, financial management, shopping and community living skills).

Admission to an interprofessional program should be limited to individuals with stroke who have more than one type of disability and who require the services of two or more rehabilitation disciplines. Individuals with stroke with a single disability can usually benefit from outpatient or community-based services, and generally do not require an interprofessional program. Hakkennes et al. [14] surveyed 14 clinicians responsible for assessing the suitability of individuals with stroke for inpatient rehabilitation. A questionnaire was administered to assess factors that were used to assess an individual with stroke's suitability for rehabilitation. Potentially relevant items included 15 patient-related factors (e.g. age, pre-morbid mobility) and 2 organization factors (bed availability and funding source). Using data from 8,783 Veterans admitted to a Veterans Affairs Medical Center with a primary diagnosis of stroke, Stineman et al.[15] reported that 11.2% of veterans were selected for comprehensive-level rehabilitation. Individuals with stroke at the lowest grades of physical independence and the middle cognitive stages had significantly higher odds of admission to a comprehensive rehabilitation unit. Other independent factors associated with higher odds of admission for comprehensive rehabilitation included patients who were age <70 years, married, living at home pre-stroke and the presence of a comprehensive rehabilitation unit at admitting hospital. In the CERISE study,[16] consultants were surveyed to identify medical and nonmedical factors that influenced the decision to admit an individual with stroke for stroke rehabilitation. The presence of pre-morbid cognitive disability, depression and severe behavioral problems were identified as factors reduced the likelihood of admission.

Sex & Gender Considerations

Although no literature exists on the topic, an effective initial assessment should consider the sex- and gender-related differences to tailor rehabilitation interventions appropriately, ensuring that both physical and psychological aspects of recovery are addressed in an individualized manner.

Evidence Table and Reference List

Section 2 Stroke Rehabilitation Unit

2. Stroke Rehabilitation Unit Recommendations 2025

Note: Applicable for all stroke rehabilitation settings (acute care hospital, inpatient rehabilitation, outpatient clinic, community-based services and programs, including long-term and complex continuing care settings).

2.1 Stroke Rehabilitation Team

i. Stroke rehabilitation should be delivered by an interdisciplinary team of health professionals, with expertise and training in providing post-stroke care, regardless of where services are provided, to ensure consistency, promote optimal recovery, and reduce the risk of complications [Strong recommendation; Moderate quality of evidence].

ii. The interdisciplinary rehabilitation team should assess individuals with stroke within 48 hours of admission and together with the individual and their family develop and document a comprehensive individualized rehabilitation plan which reflects the severity of the stroke, the needs and goals of the individual, the best available research evidence, and clinical judgment [Strong recommendation; Low quality of evidence].

iii. Stroke unit teams should conduct at least one formal interdisciplinary meeting per week to identify ongoing or new rehabilitation problems, set goals, monitor progress, and plan discharge for individuals with stroke on the unit [Strong recommendation; Moderate quality of evidence].

iv. Individualized rehabilitation plans should be regularly updated based on review of health status and stroke recovery progress [Strong recommendation; Low quality of evidence].

v. Clinicians should use standardized, valid assessment tools when appropriate to support treatment and care planning [Strong recommendation; Low quality of evidence].

vi. Verbal and written information should be tailored to the individual's cognitive, sensory, and communication abilities [Strong recommendation; Moderate quality of evidence]. *Refer to Knowledge Translation and Implementation Resource sections and Stroke Engine for additional information on Stroke Rehabilitation Screening and Assessment Tools.*

2.2 Stroke Rehabilitation Unit

i. All individuals who require inpatient rehabilitation following stroke should be treated on a specialized stroke rehabilitation unit [Strong recommendation; High quality of evidence], characterized by the following elements:

   a. Rehabilitation care is formally coordinated and organized [Strong recommendation; High quality of evidence].

   b. The rehabilitation unit is geographically defined [Strong recommendation; High quality of evidence].

   c. The rehabilitation unit is staffed by an interdisciplinary rehabilitation team with expertise/core training in stroke rehabilitation consisting of physicians (i.e., physiatrist, neurologist, or other physicians with training in stroke rehabilitation), nurses, physiotherapists, occupational therapists, speech-language pathologists, social workers, and dietitians [Strong recommendation; High quality of evidence]. The individual with stroke, their family and caregivers should also be included as part of the core team [Strong recommendation; Moderate quality of evidence].

   d. Additional members of the interdisciplinary team may include pharmacists, stroke navigators, neuropsychologists, psychologists, palliative care specialists, recreation therapists, vocational therapists, kinesiologists, rehabilitation therapy assistants, spiritual care providers, vision specialists, sexual health specialists, music or art

therapists, peer supporters, stroke recovery group liaisons, and other consulting services based on individual needs [Strong recommendation; Low quality of evidence].

e. Individuals who have experienced a stroke, their families and caregivers should have early and active involvement in the rehabilitation process [Strong recommendation; Moderate quality of evidence].

f. Transition and discharge planning should be initiated on admission to the unit [Strong Recommendation; Low quality of evidence]. *Refer to Section 7 for additional information on care planning.*

g. Education for individuals with stroke, their families and caregivers, is an integral part of stroke rehabilitation care that should be included throughout rehabilitation interactions [Strong recommendation; High quality of evidence]. *Refer to the CSBPR Stroke Systems of Care module, Section 5 for additional information on education following stroke.*

h. All team members should be trained and capable of interacting with individuals with communication limitations such as aphasia, by using supported conversation techniques [Strong recommendation; Moderate quality of evidence]. *Refer to Part Two, Section 7 Language and Communication for additional information.*

ii. Individuals who have experienced a moderate or severe stroke, who are ready for rehabilitation and have goals amenable to rehabilitation, should be given an opportunity to participate in inpatient stroke rehabilitation [Strong recommendation; High quality of evidence].

iii. Where admission to a dedicated stroke rehabilitation unit is not possible, inpatient rehabilitation provided on a general rehabilitation unit should be considered as an alternative (i.e., where interdisciplinary care is provided to individuals with stroke disabled by a range of disorders including stroke) [Strong recommendation; Low quality of evidence].

a. Individuals with stroke treated on general rehabilitation units should receive equivalent rehabilitation intensity and principles as individuals treated on dedicated stroke rehabilitation units, as described in section 3 [Strong recommendation; Moderate quality of evidence].

Section 2.2 Clinical Considerations

1. Considering the high prevalence of comorbidities and complex medical needs in individuals with stroke, team members should incorporate the use of healthcare professionals who can manage the medical needs of individuals undergoing stroke rehabilitation.

Rationale

There is a large and rigorous body of evidence to indicate that individuals who have sustained a stroke with residual impairment and disability will experience a better outcome if admitted to a specialized stroke rehabilitation unit or facility, as soon as they are “rehab ready”. Data from the latest update of the Stroke Unit Trialists [17] indicate that at 12 months, an extra two people are estimated to survive for every 100 receiving stroke unit care, an extra 6 will be living at home, and an extra 6 will be independent in daily activities. Key elements of a stroke rehabilitation unit include a geographically defined space or beds, which is staffed by an interdisciplinary team, whose practice is dominated by individuals recovering from stroke.

Individuals with stroke spoke to the importance of access to a specialized stroke rehabilitation unit with a dedicated stroke rehabilitation team with expertise and training in providing stroke care. If admission to a dedicated stroke rehabilitation unit is not possible, they felt strongly that individuals with stroke should still have access to stroke rehabilitation and recovery that is equivalent to the care received on a specialized stroke rehabilitation unit. They also spoke to the importance of an interdisciplinary team, and communication and collaboration between healthcare team members to ensure their care was

coordinated and seamless. They highlighted the importance of clear information and education, including information on the role of each healthcare team member and who to go to for questions, and the importance of information privacy and sensitivity.

System Implications

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

1. Timely access to specialized inpatient stroke rehabilitation services.
2. An adequate number of geographically defined stroke rehabilitation units with a critical mass of trained staff with expertise in stroke rehabilitation interdisciplinary team care during the rehabilitation period following stroke.
3. Resources to enable the individual with stroke access to appropriate type and intensity of rehabilitation professionals throughout their stay (including weekends when required).
4. Referral process in place to connect individual with stroke, family and caregivers to appropriate support services such as the local Indigenous Health Office, if available.
5. To prevent complications and the recurrence of stroke, protocols and strategies should be developed and communicated to all staff.
6. System and process changes to enable therapists to ensure effective therapist-to-individual with stroke ratios in rehabilitation settings, with the goal of therapists spending approximately 80% of their time providing direct care to individuals with stroke.
7. Processes in place to monitor, review and update rehabilitation goals and initiation of discharge planning, ensuring flexibility and adaptability.
8. The interdisciplinary rehabilitation team and health systems leaders and planners should follow evidence-based best practices as defined by current consensus-based clinical practice guidelines.

Performance Measures

System indicators:

1. [Access] Proportion of individuals with acute stroke transferred from acute inpatient unit to rehabilitation inpatient unit (aligns to Accreditation Canada).
2. Proportion of individuals within a stroke region who access an inpatient stroke rehabilitation unit as part of their episode of care for a stroke event.
3. Median length of time from stroke rehabilitation referral to and admission to stroke inpatient rehabilitation.
4. Proportion of individuals with stroke who are discharged from acute care without rehabilitation referrals in place.
5. Number or proportion of individuals with stroke admitted to a stroke unit — either a combined acute care and rehabilitation unit or a rehabilitation stroke unit in an inpatient rehabilitation facility — at any time during their hospital stay (acute and/or rehabilitation).

Process indicators:

6. Number of individuals with stroke assessed by each of the following disciplines during inpatient rehabilitation: physiatrist, physiotherapist, occupational therapist, speech–language pathologist, dietitian, psychologist and social worker.

7. Proportion of individuals with stroke requiring readmission to an acute care hospital for stroke-related causes during inpatient rehabilitation.
8. Proportion of total time spent on a stroke rehabilitation unit during inpatient stay for stroke rehabilitation.
9. Frequency and duration of each therapy received from rehabilitation professionals while in an inpatient rehabilitation setting following stroke.
10. Median total number of days spent in inpatient rehabilitation, by stroke type.
11. Median active and total length of stay on an inpatient stroke rehabilitation unit (aligns with Accreditation Canada).
12. Final discharge disposition for individuals with stroke following inpatient rehabilitation:
    a. proportion discharged to their original place of residence prior to stroke (including those residing in LTC prior to stroke);
    b. proportion discharged to a long-term care facility or nursing home;
    c. proportion requiring readmission to an acute care hospital for stroke-related and non-stroke related causes;
    d. proportion of individuals with stroke discharged back to the community who were residing in a community setting prior to their stroke (excluding those residing in LTC prior to stroke).

Patient-oriented indicators:

13. Change in functional status measured with a standardized measurement tool, from time of admission to an inpatient rehabilitation unit for individuals with stroke to the time of discharge.
14. Self-reported quality of life at 6 months and one year following stroke (using a validated QoL tool) (ICHOM).
15. Report of new stroke within 90 days of discharge from stroke admission (ICHOM).

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 Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery; and, Part Three: Optimizing Activity and Community Participation following Stroke, Update 2025*
- Stroke Engine: FIM® Instrument: https://strokengine.ca/en/assessments/functional-independence-measure-fim/
- UDS: AlphaFIM® Instrument: https://www.udsmr.org/
- Stroke Engine: Modified Rankin Scale. https://strokengine.ca/en/assessments/modified-rankin-scale-mrs/

- EBRSR: Evidence-Based Review of Stroke Rehabilitation: Managing the Stroke Rehabilitation Triage Process: http://www.ebrsr.com/evidence-review/4-managing-stroke-rehabilitation-triage-process
- Australian Aphasia Rehabilitation Pathway: http://www.aphasiapathway.com.au/?name=About-the-statements
- Aphasia Institute: https://www.aphasia.ca/
- Stroke Engine: https://strokengine.ca/en/
- iWalkAssess: http://www.iwalkassess.com/
- International Journal of Stroke: Standardized measurement of balance and mobility post-stroke: Consensus-based core recommendations from the third Stroke Recovery and Rehabilitation Roundtable.[18]

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: Rehabilitation and Recovery Infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/rehabilitation-nov2019/csbp-infographic-rehabilitation.pdf?rev=a2cff1fb27424c84bbd44b568d58d1b4
- 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
- Aphasia Institute: https://www.aphasia.ca/
- Stroke Engine: https://strokengine.ca/en/

Summary of the Evidence

It is now well-established that individuals with stroke who receive stroke unit care are more likely to survive, return home, and regain independence compared to individuals who receive less organized forms of care. Stroke unit care is characterized by an experienced interprofessional stroke team, including physicians, nurses, physiotherapists, occupational therapists, and speech therapists, among others, dedicated to the management of individuals with stroke, often located within a geographically defined space. Other features of stroke units include staff members who have an interest in stroke, routine team meetings, continuing education/training, and involvement of caregivers in the rehabilitation process.

In an updated 2020 Cochrane Review, the Stroke Unit Trialists' Collaboration[17] identified 29 randomized and quasi-randomized trials (n=5,902) comparing stroke unit care with alternative, less organized care (general medical wards, mixed rehabilitation ward and a mobile stroke team). In this update, a single trial with 49 participants was added since the last update in 2013. The inclusion of a network meta-analysis (NMA) is also featured in this update. Twenty-three trials incorporated rehabilitation lasting several weeks, if required; 17 of these units admitted participants acutely, and 8 after a delay of one or two weeks. Overall, compared with alternative services, stroke units were associated with significant reductions, ranging from 23% to 25%, in the odds of a poor outcome (mRS 3-6 at the end of follow-up or the need for institutional care), death, death or institutional care, and death or disability, all of which were supported by moderate quality of evidence. At 12 months, an extra two people are estimated to survive for every 100 receiving stroke unit care, an extra 6 will be living at home, and an extra 6 will be independent in daily activities. The benefit of stroke unit care was independent of sex, age stroke type and severity. In the NMA, compared with a general ward, the odds of a poor outcome were reduced significantly with a stroke unit (Odds Ratio [OR]=0.74, 95% CI 0.62-0.89), and mixed rehab ward (OR=0.70, 95% CI 0.52-0.95), but not compared with a mobile stroke team (OR=0.88, 95% CI 0.58-1.34). For the outcome of death at the end of scheduled follow-up, only a stroke ward was associated with a significant reduction (OR=0.62, 95% CI 0.47-0.82) compared with a general ward. Given that this review has been updated several times since 1997 with largely similar conclusions and there are few new trials being published, the focus of future research may shift to the examination of specific components of care or care process whereby stroke unit care is superior to other models.

To determine if the benefits of stroke unit care demonstrated in clinical trials can be replicated in routine clinical practice, Seenan et al.[19] conducted a systematic review of 25 observational studies (n=42,236) comparing stroke unit care to non-stroke unit care. In most cases, studies compared acute stroke units with conventional care. Stroke unit care was associated with a reduction in the risk of death (OR=0.79, 95% CI 0.73 to 0.86, p<0.001) and of death or poor outcome (OR=0.87, 95% CI=0.80 to 0.95; p=0.002) within one-year of stroke. Similar findings were reported for the outcome of death at one year in a secondary analysis limited to multi-centered trials (OR=0.82, 95% CI 0.77 to 0.87, p<0.001).

Sex & Gender Considerations

In the Stroke Unit Trialists' Collaboration (SUTC) 2020 Cochrane review,[17] the benefits of receiving care on a stroke rehabilitation unit were found to be independent of sex, age stroke type and severity.

Evidence Table and Reference List

Section 3 Delivery of Inpatient Stroke Rehabilitation

3. Delivery of Inpatient Stroke Rehabilitation, Recommendations 2025

i. All individuals with stroke should receive rehabilitation therapies as early as possible once they are medically stable and able to participate in active rehabilitation [Strong recommendation; High quality of evidence]. *Refer to Section One, Box 1: Eligibility and Criteria for Stroke Rehabilitation for additional information.*

ii. Very early high-intensity mobilization of individuals with stroke within the first 24 hours is not recommended [Strong recommendation; High quality of evidence].

   a. Mobilization of individuals with stroke should begin when the person is medically stable and ideally between 24 and 48 hours post stroke, but caution is advised, and clinical judgment should be used [Strong recommendation; Moderate quality of evidence].

iii. Individuals with stroke should receive rehabilitation therapies of appropriate intensity and duration, individually designed to meet their needs for optimal recovery and tolerance levels [Strong recommendation; High quality of evidence].

iv. **Individualized rehabilitation plans** should include a person-centred approach, shared decision-making, culturally appropriate and agreed-upon goals and preferences of the individual with stroke, family, caregivers and the healthcare team [Strong recommendation; Moderate quality of evidence].

v. Once deemed to be medically and neurologically stable, individuals with stroke should receive a recommended three hours per day of direct task-specific therapy, five days a week [Strong recommendation; Moderate quality of evidence], delivered by the appropriate interdisciplinary stroke team members [Strong recommendation; Low quality of evidence].

vi. Therapy should include repetitive and intense use of tasks that challenge the individual with stroke to acquire the necessary skills needed to perform functional tasks and activities [Strong recommendation; High quality of evidence].

vii. The team should promote the practice and transfer of skills gained in therapy into the individual with stroke's daily routine in preparation for continuation after discharge [Strong Recommendation; Moderate quality of evidence].

Rationale

To obtain maximum benefit from inpatient stroke rehabilitation, several essential elements are required. These elements include adequate intensity of therapy, task-oriented training, excellent team coordination and early discharge planning. Early mobilization and intensive rehabilitation following a stroke are both important elements for promoting optimal recovery and reducing long-term disability. Initiating movement and physical activity as soon as medically safe helps to prevent complications, while intensive rehabilitation improves the likelihood of independence in mobility, and self-care. Other essential elements of rehabilitation include a highly coordinated, interdisciplinary specialized team, which meets regularly to discuss rehabilitation goals and progress, and begins transition planning early in the process.

Individuals with stroke, their families and caregivers really appreciate being regularly informed about their care, including the assessment tools, timelines and decision-making regarding specialist referrals, and the need for support and guidance as they navigate the healthcare system following release from hospital, including psychosocial support. This includes establishing rapport and developing trust. They highly valued person-centred care and appreciated when communication and discussions on rehabilitation plans and goals including family members and caregivers, when consent is provided. The importance of flexibility and reassessment and updating the rehabilitation plan throughout the rehabilitation journey is a critical element to reflect changes in needs and goals, and this has to be balanced with the burden of repetitive assessments on an individual. Delivery of rehabilitation therapy should take a wholistic approach that also includes “invisible” stroke impairments such as cognitive

changes, fatigue, mental health status, pain, visual and perceptual changes, as these will contribute to optimized recovery. The current constraints of the system on frequency and duration of rehabilitation services also impact outcomes and dedicated staff members, such as stroke navigators, was considered valuable by individuals with stroke and family members and perceived to aid the recovery process. They also valued a regular rehabilitation schedule with time for appropriate rest. Delivery of rehabilitation therapy also includes individuals with stroke being provided exercises they could continue on the weekend should rehabilitation sessions be unavailable, and the benefit of access to specialized rehabilitation equipment to support exercises and recovery.

System Implications

Working together to achieve optimal functional outcomes after stroke requires the health system and organizations to ensure:

1. Timely access to specialized, interdisciplinary stroke rehabilitation services, regardless of geographic location of the individuals' home community and the individual with stroke's financial means.
2. A critical mass of trained healthcare providers functioning as a coordinated team during the rehabilitation period following stroke.
3. Adequate healthcare provider resources to provide the recommended intensity of individualized therapies for individuals with stroke.
4. Establishment of protocols and partnerships between inpatient rehabilitation and community care providers to ensure seamless transitions and continuity of care between hospital and community. Particular considerations should be made for individuals residing in more rural or remote locations.
5. Communication strategies in place to facilitate the sharing of all information concerning the individual with stroke, including assessments, rehabilitation goals and results between healthcare providers and settings.
6. Access to all stroke rehabilitation services for individuals who have any cognitive, sensory, or communication limitations with appropriate adaptations needed as required.
7. Optimization of strategies to prevent the recurrence of stroke through health promotion and education.
8. Stroke rehabilitation support initiatives for caregivers to increase family and caregiver understanding of rehabilitation plans, their roles in supporting the individual with stroke, and improve adherence.
9. Processes for individuals with stroke and caregivers to re-access the rehabilitation system as required. Financial barriers should not limit access to rehabilitation services.
10. All rehabilitation hospital services have mechanisms established to contribute to the CIHI National Rehabilitation Reporting System.
11. Stroke rehabilitation support initiatives for caregivers to increase individual with stroke/caregiver understanding of rehabilitation plans and improve adherence.

Performance Measures

System indicators:

1. Median length of time from stroke admission to an acute care hospital to assessment of rehabilitation potential by a rehabilitation healthcare professional.
2. Median length of time from stroke onset to stroke rehabilitation referral.

Process indicators:

3. Proportion of individuals with stroke requiring readmission to an acute care hospital for stroke-related causes during inpatient rehabilitation.

4. Median length of time spent on a stroke rehabilitation unit during inpatient rehabilitation.
5. Median number of hours of direct therapy for each type of service received while in inpatient rehabilitation.
6. Number of individuals with stroke screened for cognitive impairment using valid screening tool during inpatient rehabilitation.
7. Number of individuals with stroke screened for depression using valid screening tool during inpatient rehabilitation.
8. Median number of days spent in active rehabilitation (i.e., length of stay less days unable to participate due to service interruptions, such as illness or short-term readmission to acute care).
9. Median number of days spent waiting for transfer to an inpatient rehabilitation setting (i.e. from the time a patient is ready for rehabilitation to the time of admission to inpatient rehabilitation).
10. Median number of days spent in alternate level of care or inpatient rehabilitation while waiting for return to home or placement in a residential or long-term care setting.

Patient-oriented indicators:

11. Change (improvement) in functional status scores using a standardized assessment tool from admission to an inpatient rehabilitation program to discharge (e.g., FIM® Instrument, AlphaFIM®, Modified Rankin Scale).
12. Time from stroke onset to mobilization: e.g., sitting, standing upright, and walking with or without assistance.
13. Time from stroke onset to independence in feeding, dressing, grooming, toileting and bathing and other self-care.
14. Final discharge disposition for individuals with stroke following inpatient rehabilitation: proportion discharged to their original place of residence, proportion discharged to a long-term care facility or nursing home, proportion discharged to supportive housing or assisted living.

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 Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery; and, Part Three: Optimizing Activity and Community Participation following Stroke, Update 2025.*
- Stroke Engine: FIM® Instrument: https://strokengine.ca/en/assessments/functional-independence-measure-fim/
- UDS: AlphaFIM® Instrument: https://www.udsmr.org/
- Stroke Engine: Modified Rankin Scale: https://strokengine.ca/en/assessments/modified-rankin-scale-mrs/
- EBRSR: Evidence-Based Review of Stroke Rehabilitation: Managing the Stroke Rehabilitation Triage Process: http://www.ebrsr.com/evidence-review/4-managing-stroke-rehabilitation-triage-process

- 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: 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: Rehabilitation and Recovery Infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/rehabilitation-nov2019/csbp-infographic-rehabilitation.pdf?rev=a2cff1fb27424c84bbd44b568d58d1b4
- 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
- Aphasia Institute: https://www.aphasia.ca/
- Stroke Engine: https://strokengine.ca/en/

Summary of the Evidence

Early mobilization

Early mobilization post stroke is intended to reduce the risk of medical complications including deep vein thrombosis, pressure sores, painful shoulders, and respiratory infections. While the potential benefits of early mobilization were examined in several smaller randomized controlled trials (RCTs),[20-22] the largest and most definitive trial was A Very Early Rehabilitation Trial for Stroke (AVERT) trial. Bernhardt et al. [23] randomized 2,104 adults (1:1) to receive early mobilization, a task-specific intervention focused on sitting, standing, and walking activity, initiated within 24 hours of stroke onset, or to usual care for 14 days, or until hospital discharge. The median time to first mobilization was significantly earlier in the early mobilization group (18.5 vs. 22.4 hrs, p<0.0001). Patients in the early mobilization group received significantly more out of bed sessions (median of 6.5 vs. 3, p<0.0001) and received more daily therapy (31 vs. 10 min, p<0.0001). However, significantly fewer patients in the early mobilization group had a favourable outcome (modified Rankin score [mRS] 0-2), the primary outcome, at 3 months (46% vs.

50%; adjusted odds ratio [OR]=0.73, 95% CI 0.59-0.90, p=0.004). There were no significant differences between groups for any of the secondary outcomes (shift in distribution of mRS scores, time to achieve assisted-free walking over 50 metres, proportion of patients able to walk unassisted at 3 months, death or serious adverse events), nor were any interactions identified based on pre-specified subgroups for the primary outcome (age, stroke type, stroke severity, administration of tissue plasminogen activator, or geographical region of recruitment).

Further analysis of AVERT data,[24] controlling for age and stroke severity, suggested that shorter, more frequent mobilization early after acute stroke was associated with improved odds of favorable outcome at 3 months, while increased amount (minutes per day) of mobilization reduced the odds of a good outcome. Additional analysis from AVERT indicated that very early mobilization (VEM) was associated with an increased risk of early mortality. [25] After adjustment for age and stroke severity, the odds of 14-day mortality were significantly higher in the early mobilization group (adj OR=1.76, 95% CI 1.06–2.92). In a recent systematic review Rethnam et al.[26] included the results from AVERT and 5 other trials. Significantly fewer patients in the VEM group had a favourable outcome (mRS 0-2) at 3 months (48% vs. 52%; adj OR=0.75, 95% CI 0.62–0.92), with no increased risk of death (7% vs. 7%, adj OR=1.46, 95% CI 0.92–2.31). In contrast to these findings, a 2018 Cochrane review, [27] which included the results from 9 RCTs of 2,958 patients who had sustained an acute stroke, reported no significant difference between groups (early mobilization, starting a median of 18.5 hours after admission vs. usual care, with mobilization initiated a median of 33 hours after admission) in the odds of the primary outcome (death, dependency or institutionalization at 3 months), with 51% of patients in the early mobilization group achieving the primary outcome vs. 49% in the usual care group (OR= 1.08, 95% CI 0.92 to 1.26). Li et al. [28] also reported that at 3 months, there was no significant difference between groups in the proportion of patients with an mRS score of 0-2 (relative risk [RR]=0.80; 95% CI 0.58-1.02), in a systematic review that included the results from 6 RCTs. Early mobilization was associated with higher Barthel Index scores at 3 months (standardized mean difference [SMD]=0.66, 95% CI 0.0-1.31) and a significantly reduced length of stay [LOS] (weighted mean difference [WMD]=-1.97, 95% CI -2.63 to -1.32).

Intensity

Greater amounts of rehabilitation therapies have been associated with significantly greater improvements in activities of daily living (ADL). In early systematic, Kwakkel et al. [29] including the results from 9 RCTs, reported that greater amounts of physical therapy (PT) and/or occupation therapy (OT) were associated with significantly higher ADL scores (Hedges' *g*=0.28, 95% CI 0.16-0.41), and better neuromuscular outcomes (Hedges' *g* =0.37, 95% CI 0.13-0.62). In one of the trials included in this review rehabilitation therapy was compared with no treatment, likely leading to an overestimation of the benefit. Lohse et al. [30] included 30 RCTs in a systematic review & meta-regression and reported that in studies where participants received more therapy, functional outcome was improved beyond control groups that received less (Hedges' *g*=0.35; 95% CI 0.26–0.45). Mean scheduled therapy time was significantly longer in treatment groups compared with control groups (57.4 vs. 24.1 hours, Δ=33.3 hours). Schneider et al.[31] included the results of 14 studies of 954 participants, most of whom were recovering from stroke. Outcomes of trials comparing additional dose of rehabilitation interventions vs. standard amount of the same rehabilitation interventions, aimed at improving upper or lower activity, or both, were pooled. Additional rehabilitation was associated with significantly greater improvements in standardized measures of upper and lower extremity activity (SMD=0.39, 95% CI 0.07-0.71, p=0.02), with a larger increase in additional therapy (≥100%) having a greater effect (SMD=0.59, 95% CI 0.23-0.94, p=0.001). Results from receiver-operator characteristic curve analysis indicated that an increase of ≥240% of standard dose of therapy would be required to ensure true benefit to result in an improvement in activity.

In a recent 2021 Cochrane review, Clark et al.[32] examined the effect of more time spent in the same type of rehabilitation on activity measures post stroke, including the results of 21 RCTs (n=1,412). Most of the participants had received therapy within 6 months of stroke onset. Different amounts of the same type of OT and/or PT provided daily, were compared. The difference in total time between control and intervention groups ranged widely from 186 to 6,160 minutes with a median difference was 840 minutes, depending on the number of weeks or months therapy was provided. At the end of the active intervention period, more time spent in rehabilitation therapies was not associated with significant improvement in ADL performance compared with less time (SMD=0.13, 95% CI -0.02 to 0.28; 19 trials, GRADE: very

low), nor with activity measures of the upper (SMD=0.09, 95% CI -0.11 to 0.29, 18 trials, GRADE: very low) or lower limb (SMD=0.25, 95% CI -0.03 to 0.53; 5 trials, GRADE: low). However, in subgroup analysis of studies with a larger difference in total amount of therapy between treatment arm, there was a significant benefit of more therapy in ADL performance (SMD=0.40, 95% CI 0.14 to 0.66).

Task-Specific Training

Task-specific training involves the repeated practice of functional tasks, which combines the elements of intensity of practice and functional relevance. The tasks should be challenging and progressively adapted and should involve active participation. French et al.[33] included the results from 11 RCTs that included an upper limb rehabilitation component. Repetitive task-specific training was associated with a small treatment effect on arm and hand function, assessed post intervention. (SMD=0.25, 95% CI 0.01 to 0.49, and SMD=0.25, 95% CI 0.00 to 0.51, respectively). The benefits appeared to persist up to 6 months follow-up. Patients treated from 16 days to 6 months post stroke derived the greatest value.

Sex & Gender Considerations

There is no research focused specifically on sex and gender differences on the topic of early mobilization; however, in the patient-level meta-analysis mentioned earlier,[26] sex was not found to be an effect size modifier in subgroup analyses of the primary outcome (favourable outcome at 3 months).

With respect to intensity of rehabilitation therapies, a recent publication by MacDonald et al.[34] used administrative data sets including 12,770 patients to examine the differences between the sexes with respect to the amount of therapy received during inpatient rehabilitation. The average length of hospital stay (LOS) was approximately 30 days, with no significant differences between the sexes. The mean admission FIM score was significantly higher for men (72.77 vs. 69.91, $p<0.0001$). The mean daily provision of therapy was significantly higher for men (75.86 min/day vs. 73.33 min/day). In adjusted analysis, the difference remained after age stratification, with men aged <60 years and 60-79 years receiving more therapy per day by 3.34 and 1.37 minutes/day, respectively. The difference between men and women aged ≥80 years was not significant (1.15 min/day). Mean rehabilitation intensity, the primary outcome, defined as minutes/ per day of direct therapy provided to a patient/ rehabilitation LOS, was also significantly higher for men (29.76 vs. 29.69, $p<0.0001$). While these differences are statistically significant, their impact on rehabilitation outcome is unclear; however, in an earlier, and related publication MacDonald et al.[35] reported there were no significant differences between the sexes in the discharge FIM scores. Mean length of hospital stay was 2% shorter for women and women were more likely to be discharged home (adjusted odds ratio [OR]= 1.14, 95% CI 1.05 to 1.24).

Evidence Table and Reference List

Section 4 Outpatient and Community Based Rehabilitation, and Early Supported Discharge

4. Outpatient and Community Based Rehabilitation, and Early Supported Discharge Recommendations 2025

Note: *These recommendations apply to all individuals with stroke who are assessed by healthcare professionals following a stroke event, treated by primary care, or at a stroke prevention clinic, emergency department, urgent care centre, inpatient acute care or inpatient rehabilitation setting, and discharged back to the community.*

4.1 Outpatient & In-Home Rehabilitation

i. Individuals with stroke who have ongoing rehabilitation goals should continue to have access to specialized stroke services after leaving hospital [Strong recommendation; High quality of evidence].

   a. This should include healthcare facility-based outpatient services and/or in-home rehabilitation services, and virtual stroke rehabilitation [Strong recommendation; High quality of evidence].

ii. Outpatient and/or in-home rehabilitation services should be provided by interdisciplinary team members with appropriate training and expertise [Strong recommendation; High quality of evidence], based on the individual needs and in consultation with the individual with stroke, their family and caregivers [Strong recommendation; Moderate quality of evidence].

   a. Services should ideally begin within 48 hours of discharge from an acute hospital (emergency department or inpatient) or within 72 hours of discharge from inpatient rehabilitation [Strong recommendation; Low quality of evidence].

iii. Outpatient and/or in-home rehabilitation service delivery should be delivered in a setting that best meets the needs of the individual, and consider functional rehabilitation needs, participation-related goals, availability of family/social support, individual and family preferences where appropriate [Strong recommendation; Low quality of evidence].

iv. Outpatient and/or in-home rehabilitation services should include the same elements as coordinated inpatient rehabilitation services [Strong recommendation; Moderate quality of evidence]. This includes:

   a. Involvement of individuals with stroke, their family and caregivers in recovery planning, rehabilitation management, goal setting, and transition planning [Strong recommendation; Moderate quality of evidence].

   b. An interdisciplinary stroke rehabilitation team [Strong recommendation; High quality of evidence].

   c. A case coordination approach including regular team communication to discuss assessment of new clients, review client management, goals, and plans for discharge or transition [Strong recommendation; Moderate quality of evidence].

   d. Therapy provided for 60 minutes per session per required discipline [Strong recommendation; Moderate quality of evidence], for 2 to 5 days per week, [Strong Recommendation; Moderate quality of evidence].

   e. Interdisciplinary care planning and communication is essential to ensure continuity of care, individual with stroke safety, and to reduce risk of complications and adverse events during stroke care particularly at transition points [Strong recommendation; Moderate quality of evidence].

v. At any point in their recovery, individuals with stroke who have experienced a change in functional status and who would benefit from additional rehabilitation services should be

offered a further period of rehabilitation in the setting best suited to their needs if they meet the requirements outlined in *Box 1: Eligibility Criteria for Stroke Rehabilitation* [Strong recommendation; Moderate quality of evidence].

Section 4.1 Clinical Consideration:

1. The duration of outpatient and/or in-home rehabilitation services should be based on the rehabilitation needs and goals of the individual with stroke, and progress towards those over time.

4.2 Early Supported Discharge (ESD)

i. For individuals with mild or moderate stroke, early supported discharge should be considered where appropriate and services are available to provide the recommended intensity of therapy [Strong recommendation; High quality of evidence]. *Refer to Box 4 for criteria for ESD.*

ii. Early supported discharge services should be provided by a well-resourced, coordinated, interdisciplinary specialized team [Strong recommendation; High quality of evidence].

iii. Early supported discharge services should be provided within 48 hours of discharge from an acute hospital or within 72 hours of discharge from inpatient rehabilitation [Strong recommendation; Moderate quality of evidence].

iv. Services should be provided five days per week at the same level of intensity as they would have received in the inpatient setting to meet individual with stroke needs [Strong recommendation; Moderate quality of evidence]. *Refer to Section 3 ii, Delivery of Inpatient Stroke Rehabilitation, for additional information.*

   a. Where possible, ESD should be provided by the same team that provided inpatient rehabilitation to ensure a smooth transition [Strong recommendation; Moderate quality of evidence].

   b. Where different therapists are providing ESD services, communication with the hospital-based rehabilitation team is important during the transition. Processes to facilitate clear and timely communication should be implemented and appropriate meetings scheduled to ensure continuity of care [Strong recommendation; Low quality of evidence].

Box 4 General Inclusion Criteria for Early Supported Discharge

This list provides considerations to aid decision making when assessing individuals who may be suitable for early supported discharge (ESD). Criteria for access to rehabilitation services should be agreed upon by all relevant stakeholders in each region, be clearly stated and communicated to all referral sites to improve access for individuals with stroke.

a. Mild to moderate disability;

b. Medically stable with ability to tolerate and participate in active rehabilitation from the point of discharge;

c. Clearly articulated rehabilitation functional goals, requiring ongoing intensive therapy by one or more disciplines;

d. Motivation and willingness to participate in ESD;

e. Availability of appropriate nursing care and support services at home;

f. Able to be discharged home safely, and manage self-care and activities of daily living, including availability and ability of family and caregivers to support ESD;

g. Able to access resources and equipment to support ESD therapy.

Rationale

Early supported discharge (ESD) following a stroke is an effective model of care that facilitates an individual's transition from hospital to home as soon as they are medically stable, while still receiving intensive rehabilitation and support. This approach involves an interdisciplinary team, working together to provide tailored care and rehabilitation in the home environment. ESD has been shown to promote faster recovery, improve satisfaction, and reduce hospital readmissions, as well as being less costly. Individuals with stroke often experience less stress and a greater sense of independence when in their own home, while alleviating pressure on hospital resources by freeing up beds for others. Importantly, the home environment provides unique opportunities to address real-life challenges and re-establish daily routines, enhancing the functional recovery process and overall quality of life for stroke survivors.

Many individuals with stroke who have completed a course of inpatient rehabilitation will still require ongoing therapy provided in the community to achieve their desired goals once discharged from hospital. Community-based rehabilitation may be provided as hospital-based clinics and programs (e.g., day hospital), community clinics or programs, or through privately owned and operated rehabilitation facilities. In smaller communities where access to outpatient and/or community rehabilitation services are limited, in-home therapy and virtual care digital technology can also be utilized.

Individuals with stroke emphasized that community stroke rehabilitation services, including psychological and mental health services, should be available for all those who have ongoing rehabilitation goals. They identify the difficulties with access to services and resources once they are back in the community, and the challenge of re-accessing rehabilitation services in the community should they be required, including lack of information on how to re-access services and who to contact. Furthermore, individuals with stroke emphasized the importance of education relating to available community supports and resources that is tailored to their needs and goals, as well as access to peer support groups. Individuals with stroke also expressed how they would have appreciated more follow-up after returning to the community, and regular follow-ups thereafter.

System Implications

There is a marked lack of available outpatient and community-based rehabilitation resources. Therefore, the health system should aim to provide the following:

1. Referral pathways to access stroke rehabilitation services from both inpatient and community settings.
2. Timely access to stroke rehabilitation services in the community following discharge.
3. Organized and accessible stroke care in communities, including for those with communication, perceptual or sensory limitations.
4. Mechanisms in place to support Early Support Discharge.
5. Increased numbers of skilled healthcare providers who have experience practicing in outpatient and community rehabilitation.
6. Optimization of strategies to prevent the recurrence of stroke, including regular screening for stroke risk factors and use of standardized screening tools.
7. Stroke rehabilitation support for caregivers to increase the individual with stroke, family and caregiver understanding of rehabilitation plans, skills to support rehabilitation, and improve adherence.
8. Long-term rehabilitation services widely available, and without financial barriers, in long-term care and complex continuing care facilities, and in outpatient and community programs, including in-home visits.
9. Increased use of virtual rehabilitation technologies to broaden access to outpatient rehabilitation services.

10. Mechanisms for prospective data collection for evaluation and monitoring. All programs should have these in place or be developing them.

Performance Measures

System indicators:

1. Proportion of individuals with stroke who receive outpatient or community-based therapy following discharge from an acute stroke admission.
2. Proportion of persons receiving outpatient/community-based rehabilitation assessment, follow-up and treatment in all districts/sections/communities served by the stroke rehabilitation service/program. (This would include telehealth, clinic, in-home).
3. Frequency and duration of services provided by rehabilitation professionals in the community.
4. Use of health services related to stroke care provided in the community for stroke rehabilitation, including timing and frequency and duration of services.

Process indicators:

5. Proportion of individuals with stroke discharged to the community who receive a referral for ongoing rehabilitation before discharge from hospital (acute and/or inpatient rehabilitation).
6. Median length of time between referral for outpatient rehabilitation to first appointment for assessment and therapy.
7. Number of individuals with stroke assessed by physiotherapy, occupational therapy, speech–language pathologists and social workers as needed in outpatient and community settings.

Patient-oriented indicators:

8. Magnitude of change in functional status scores from admission to stroke rehabilitation to discharge, using a standardized measurement tool, for individuals with stroke engaged in outpatient and community rehabilitation programs.
9. Measure of burden of care for family and caregivers of individuals with stroke living in the community and change in burden scores at 3 months, 6 months and one year following discharge from hospital for an acute 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 Stroke Rehabilitation Planning for Optimal Care Delivery Module: Box 4 General Inclusion Criteria for Early Supported Discharge
- Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery and Community Participation following Stroke, *Part Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery; and, Part Three: Optimizing Activity and Community Participation following Stroke, Update 2025.*
- Stroke Engine: FIM® Instrument: https://strokengine.ca/en/assessments/functional-independence-measure-fim/
- UDS: AlphaFIM® Instrument: https://www.udsmr.org/

- Stroke Engine: Chedoke-McMaster Stroke Assessment Scale: https://strokengine.ca/en/assessments/chedoke-mcmaster-stroke-assessment/
- EBRSR: Evidence-Based Review of Stroke Rehabilitation: Managing the Stroke Rehabilitation Triage Process: http://www.ebrsr.com/evidence-review/4-managing-stroke-rehabilitation-triage-process
- Stroke Engine: Reintegration to Normal Living Index: https://strokengine.ca/en/assessments/reintegration-to-normal-living-index-rnli/
- Stroke Engine: Leisure section of the Assessment if Life Habits (LIFE-H): https://strokengine.ca/en/assessments/assessment-of-life-habits-life-h/
- Stroke Engine: Stroke Impact Scale: https://strokengine.ca/en/assessments/stroke-impact-scale-sis/
- Stroke Engine: https://strokengine.ca/en/
- KITE UHN: Canadian Stroke Community-based Exercise Recommendations Update 2020: A Resource for Community-based Exercise Providers: https://kite-uhn.com/can-stroke-community-based-exercise-recommendations
- Ontario Health: CorHealth Ontario: Navigation During Community Stroke Rehabilitation Guidance Document: https://www.corhealthontario.ca/Navigation_During_Community_Stroke_Rehabilitation_Guidance_Document_-_May_2024.pdf

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: Rehabilitation and Recovery Infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/rehabilitation-nov2019/csbp-infographic-rehabilitation.pdf?rev=a2cff1fb27424c84bbd44b568d58d1b4
- 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
- Aphasia Institute: https://www.aphasia.ca/
- CanStroke Recovery Trials: Tools and Resources: https://canadianstroke.ca/tools/
- Stroke Engine: https://strokengine.ca/en/
- KITE UHN: Guide "Choosing a Community Exercise Program After Stroke: https://kite-uhn.com/can-stroke-community-based-exercise-recommendations

Summary of the Evidence

Outpatient Rehabilitation

Outpatient therapy is often required following discharge from acute and/or rehabilitation inpatient services to help individuals with stroke continue to make gains towards their rehabilitation goals. Continuing therapy may take several forms, depending on resource availability and individual considerations and include such models as hospital-based "day" hospital programs, community-based programs, or home-based rehabilitation. There is strong evidence that any form of continuing rehabilitation therapy is superior to no additional therapy. The Outpatient Service Trialists, published in 2003,[36] which has not been updated, identified 14 RCTs that included individuals with stroke who were living at home prior to their stroke and whose stroke had occurred within the previous year. In 12 of these trials, participants were recruited from a hospital setting, while in the remaining two trials, participants were recruited from home. Individuals with stroke were randomized to receive specialized outpatient therapy-based interventions or usual care (often no additional treatment). Service interventions examined included those that were home-based (n=2), day hospital or outpatient clinics (n=12). In these trials, provision of services included physiotherapy, occupational therapy services or interprofessional staff, aimed primarily at improving performance in activities of daily living (ADL). Therapy duration in these trials ranged from 5 weeks to 6 months. At the end of scheduled follow-up (mean of 3-12 months), outpatient therapy was associated with reduced odds of a poor outcome, defined as deterioration in ability to perform ADLs, dependency or institutionalization (OR=0.72 95% CI 0.57–0.92; p=0.009) and with small, but significantly greater improvements in ADL, extended ADL and mood scores compared with usual care (standardized mean difference [SMD]=0.14, 95% CI 0.02–0.025; p=0.02, SMD=0.17, 95% CI 0.04–0.30; p=0.01 and SMD=0.11, 95% CI -0.04–0.26; p=0.02, respectively). The authors estimated that for every 100 persons with stroke in the community receiving therapy-based rehabilitation services, 7 (95% CI 2–11) patients would avoid a poor outcome, assuming 37.5% would have had a poor outcome with no treatment. A more recent systematic review authored by Chi et al. [37] included the results from 49 RCTs comparing home-based rehabilitation therapies (occupational and physical therapy) provided with the aim of improving physical function vs. usual care, no care or active control, with a focus on ADL training. Home-based rehabilitation was associated with a moderate improvement in function (Hedges' *g*=0.58; 95% CI, 0.45-0.70). Younger age, male sex, and first-ever acute stroke episode were variables associated with greater improvements.

In terms of establishing the relative superiority of outpatient-based rehabilitation programs compared with continued inpatient services, the differences between service models appears minimal. In a systematic review, Hillier & Inglis-Jassiem[38] included the results of 11 RCTs of patients who were discharged from inpatient rehabilitation to home following a stroke and who had been living in the community prior to the event. Home-based therapy was associated with a 1-point mean difference in Barthel Index [BI] gain at 6–8 weeks following the intervention and a 4-point difference at 3–6 months, compared with hospital-based rehabilitation. By 6 months following treatment, there were no longer significant differences between groups. Overall, there were no significant differences in outcomes reported in 4 of the included trials, with some benefits noted in favour of home-based therapy reported in 7 trials (lower cost, less carer strain, lower readmission). No trials reported any benefits in favour of hospital-based rehabilitation. Lincoln et al.[39] reported no significant differences between groups randomized to receive hospital-based care (outpatient or day hospital) compared with community stroke teams (CST), staffed with multidisciplinary therapists in measures of ADLs, extended ADLs or

Euro-QoL scores with the exception of the emotional support item, favouring the community stroke team group. Carer strain and satisfaction scores were higher in the CST group.

Early Supported Discharge

Early supported discharge (ESD) is a form of rehabilitation designed to accelerate the transition from hospital to home through the provision of rehabilitation therapies delivered by an interprofessional team, in the community, as soon as possible following discharge. It is intended as a lower-cost alternative to a complete course of inpatient rehabilitation and is best suited for patients recovering from mild to moderate stroke. Key components of effective ESD programs include in-hospital and discharge planning, a case manager or 'key worker' based in the stroke unit who represents the essential link between the stroke unity and the outpatient care, guaranteeing continuity of care and enabling the smooth transition from the hospital to the home. Individuals with stroke who participated in ESD programs have been shown to achieve similar outcomes compared with those who received a course of inpatient rehabilitation. The effectiveness of ESD programs following acute stroke has been evaluated most comprehensively by the Early Supported Discharge Trialists.[4] In the most updated version of the review, the results from 17 RCTs were included. The majority of the trials evaluated ESD using a multidisciplinary team which, coordinated discharge from hospital, and provided rehabilitation and care at home. ESD services were associated with a reduction in the odds of death or dependency at end of scheduled follow-up after a median duration of follow-up of 6 months (OR=0.80, 95% CI 0.67 to 0.95). The associated number needed to treat (NNT) per 100 patients was 5. The benefits were greatest among patients with mild-moderate disability. ESD services were also associated with slightly greater improvement in extended ADL performance (SMD= 0.17, 95% CI 0.04-0.30), greater satisfaction and a significantly shorter hospital LOS (mean difference [MD]=-5.5, 95% CI -2.9 to -8.2 days). A more recent systematic review,[40] included the results from 20 RCTs, all published after 1997, in which patients were randomized to receive either conventional care or any care service intervention that included rehabilitation or support provided by professional medical personnel with the aim of accelerating and supporting home discharge. ESD programs were not associated with a significant reduction in hospital LOS (SMD=-0.13, 95% CI −0.31 to 0.04 days), improvement in ADLs (SMD=0.79, 95% CI -0.04-1.18), or a reduction in caregiver strain. The authors suggested that the reason for the conflicting results with the Cochrane review [4] may have been due to their tighter inclusion criteria, which excluded patient-led, family-led, and telerehabilitation interventions, and to ceiling effects of the ADL measures used.

Langhorne et al.[41] included data from 11 RCTs in a patient level meta-analysis, which examined the effects of patient characteristics and differing levels of ESD service provision (more coordinated v. less organized) on the outcome of death and dependency. The levels of service provision evaluated were: (1) early supported discharge team with coordination and delivery, whereby an interprofessional team coordinated discharge from hospital and post discharge care and provided rehabilitation therapies in the home; (2) early supported discharge team coordination, whereby discharge and immediate post-discharge plans were coordinated by an interprofessional care team, but rehabilitation therapies were provided by community-based agencies; and (3) no early supported discharge team coordination, whereby therapies were provided by uncoordinated community services or by healthcare volunteers. There was a reduction in the odds of a poor outcome for patients with a moderate initial stroke severity (BI 10-20), (OR= 0.73; 95% CI 0.57-0.93), but not among patients with severe disability (BI< 9) and also among patients who received care from a coordinated multidisciplinary ESD team (OR=0.70; 95% CI 0.56- 0.88) compared to those without an ESD team. Based on the results of this study, it appears that a select group of patients, with mild to moderately disabling stroke, receiving more coordinated ESD could achieve better outcomes.

Home Exercise Programs

The effectiveness of home-based exercise programs for mobility improvement was the subject of a Cochrane review.[42] The results from four RCTs (n=166) examining home-based therapy program targeted at the upper limb were included. The effectiveness of therapy was compared with usual care

in three studies.[43, 44] The primary outcomes were performance on ADL and functional movement of the upper limb. The results were not significant for both outcomes (MD = 2.85 95% CI -1.43–7.14 and MD = 2.25 95% CI -0.24–4.73, respectively). No significant treatment effect was observed for secondary outcome measures as well (performance on extended ADL and upper limb motor impairment). The authors concluded that there was insufficient evidence to draw conclusions regarding the effectiveness of home-based therapy programs compared to usual care. A more recent systematic review [45] came to a similar conclusion. The results from 15 RCTs were included comparing self-administered home-based, structured upper limb practice vs. nonstructured home-based practice or no intervention. Neither structured nor non-structured practice were associated with significant improvement in performance on ADL.

Sex & Gender Considerations

No studies examining potential sex or gender differences in the delivery, or associated outcomes of outpatient rehabilitation or early supported discharge programs, were retrieved.

Evidence Table and Reference List

Section 5 Stroke Rehabilitation in Long-term Care and Complex Continuing Care

5. Stroke Rehabilitation in Long-term Care and Complex Continuing Care, Recommendations 2025

Note: These recommendations apply specifically to individuals with stroke living in long-term care or chronic 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 chronic, continuing or long-term care. Also refer to recommendations included in other modules such as Secondary Prevention of Stroke and Stroke Systems of Care for additional information on management of individuals with stroke living in long-term care settings.

5.1 Assessment and Care Planning

i. All individuals who transition to a long-term or complex continuing care setting following a stroke should have an initial medical and functional assessment as soon as possible after admission [Strong recommendation; High quality of evidence]. *Refer to Rehabilitation, Recovery and Community Participation following Stroke Part Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery, Part Three: Optimizing Activity and Community Participation following Stroke and other sections of this module for information on assessments.*

   a. A discharge summary along with the care plan should accompany the individual to a long-term or complex continuing care setting [Strong recommendation; High quality of evidence] *Refer to Box 7 regarding information to include in the discharge summary.*

   b. The initial assessment of functional, physical, emotional, cognitive, communication and perceptual status should align with existing assessment processes where possible [Strong recommendation; Moderate quality of evidence].

ii. Assessment results should be used to modify individualized care plans to meet the rehabilitation needs and goals of individuals who are admitted to long-term or complex continuing care following a stroke and optimize quality of life [Strong recommendation; Moderate quality of evidence].

iii. Individualized care plans should be updated to reflect changes in reassessments, functional status, goals of the individual with stroke, and care requirements and address issues of safety [Strong recommendation; Moderate quality of evidence].

iv. Individuals with stroke living in long-term or complex continuing care setting should be referred to appropriate healthcare professionals for further consultation when changes in functional status are identified during the initial assessment or subsequent existing assessment processes where possible [Strong recommendation; Moderate quality of evidence].

v. Individuals with stroke living in long-term care, complex continuing care and similar settings should receive care from individuals who are knowledgeable in stroke care, maintenance and recovery goals, and therapies aligned to stroke best practice recommendations [Strong recommendation; Moderate quality of evidence].

   a. Individuals providing care in these settings should be provided with updated education in these areas on a regular basis [Strong recommendation; Moderate quality of evidence].

5.2 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 and speech-language therapy) following admission [Strong recommendation; Moderate quality of evidence].

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 and restorative care [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 would benefit from new or additional rehabilitation services should be offered a trial of higher intensity inpatient or outpatient rehabilitation [Strong recommendation; Moderate quality of evidence].

iv. Individuals with stroke living in long-term or complex continuing care should have access to restorative care interventions that foster self-care, social engagement and emotional well-being [Strong recommendation; Moderate quality of evidence].

5.3 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 advocate for access to rehabilitation and restorative care as appropriate [Strong recommendation; Low quality of evidence].

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

   c. 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 Stroke Systems of Care module for additional information on advance care planning and palliative care.*

Rationale

Healthcare surveillance data indicates that persons with stroke are among the largest population receiving long-term care, and their number is steadily increasing worldwide. The post-discharge period is consistently reported to be a stressful and challenging time for individuals with stroke and their families as they adjust to new roles, altered functional and cognitive abilities, and changes in living setting for people admitted to long-term care following an acute stroke. The transition from hospital to long-term or complex continuing care (LTC/CCC) for individuals with stroke can be a difficult step for those who cannot return to their previous living arrangements in the community as a result of significant impairments or complex medical needs. 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 individuals with stroke. This will enable those with stroke to maintain quality of life and dignity and have rehabilitation and recovery goals and plans that focus on restorative care, maintenance of function, support to mitigate and address for health declines, sensitivity to family needs, and provide care by staff knowledgeable in stroke to maximize outcome goals.

Individuals with stroke felt strongly that those living in Long-term Care (LTC) or complex continuing care (CCC) should have the same access to stroke rehabilitation services as others. They emphasized that care plans in LTC/CCC should reflect and address stroke rehabilitative needs and goals. It can be difficult for those living in LTC/CCC to advocate for access to rehabilitation services, and 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.

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 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 rehabilitation services during transition to LTC/CCC settings; and while in LTC/CCC settings to support 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. Availability of active rehabilitation services for individuals with stroke living in long-term care settings.

Process indicators:

2. Proportion of individuals with stroke who are discharged from acute care directly to a long-term care setting following an acute stroke.
3. Proportion of readmissions to acute care for stroke-related causes following discharge to long-term care, stratified by type of stroke.
4. Median wait time from referral to admission to nursing home, complex continuing care or long-term care facility.

Patient-oriented indicators:

5. Proportion of individuals with stroke who were living independently in a community setting prior to stroke who are admitted to long-term care following stroke.
6. Changes in functional status from time of admission compared at 3 months, 6 months and one year following admission to long-term care.
7. 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.
8. 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).

9. Onset of new pressure injury, falls or other complications related to stroke following discharge to long-term or complex continuing care within first year.

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 Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery; and, Part Three: Optimizing Activity and Community Participation following Stroke, Update 2025.*
- 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: Rehabilitation and Recovery Infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/rehabilitation-nov2019/csbp-infographic-rehabilitation.pdf?rev=a2cff1fb27424c84bbd44b568d58d1b4
- 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
- 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 event, 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.[46-50] The numbers of patients admitted to a long-term care facility, both immediately upon discharge from hospitals, and up to 10 years post stroke have been examined. Pooling the results from 18 studies, Burton et al.[47] reported a median of 17% of patients were transferred directly to a LTC facility following discharge from an acute care hospital with a diagnosis of stroke. Between 10% and 11% of patients admitted to an acute care hospital were residing at an LTC facility at one, three- and 6-months following stroke.[51] Brodaty et al.[49] 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.[52] 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 patients were institutionalized at 4 years.

Individuals with stroke discharged to long term care 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.[53, 54]

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.[55] 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 [56] 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 stroke survivors residing in care homes. The OCTH trial [57] 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

In long-term care settings, sex and gender differences can potentially influence the course of recovery and the quality-of-care individuals with stroke receive, although research in this area is limited. Women, especially older women, tend to experience more severe and prolonged disabilities after stroke compared with men, and have increased frailty and comorbidities such as osteoporosis or other cardiovascular diseases. Women may also receive less aggressive rehabilitation in long-term care, as

care plans often emphasize maintaining functional independence rather than aggressive recovery. Men often face more severe physical impairments early on and may struggle with stigma related to seeking emotional or psychological support, resulting in underreporting of depression or anxiety, conditions that can hinder rehabilitation progress. Men living in LTC settings may also experience lower quality-of-life compared with women.[58]
Evidence Table and Reference List

Section 6 Virtual Stroke Rehabilitation

6. Virtual Stroke Rehabilitation, Recommendations 2025

Notes:

In-person stroke rehabilitation should be prioritized when possible, and virtual stroke rehabilitation should be considered a viable option when appropriate for an individual situation, the goals of therapy, and current health and functional status.

These recommendations are based on the premise that stroke rehabilitation can be provided through virtual technology at any stage along the care continuum, *alone or in combination with in-person formats (i.e. hybrid)* and for a range of intended goals. Virtual stroke rehabilitation has been shown to safely and effectively increase access to rehabilitation therapies and care providers, community reintegration, home monitoring, as well as support mental health and activities of daily living. Virtual healthcare delivery has been shown to enable timely and cost-efficient access to best-available stroke rehabilitation regardless of where the person with stroke is located. *For the purposes of these recommendations, virtual stroke rehabilitation will include both fully virtual and hybrid formats*.

6.1 Access and Eligibility for Virtual Stroke Rehabilitation

6.1.1 Access to Stroke Rehabilitation through Virtual Care Modalities

i. Virtual stroke rehabilitation should be considered as a reasonable alternative for eligible individuals with stroke when an in-person therapy session is not feasible or available, or as an adjunct when the goals of the session can be achieved virtually [Strong recommendation; Moderate quality of evidence].

ii. Virtual care modalities should be integrated into stroke rehabilitation planning and service delivery across the continuum (i.e., from acute care to stroke prevention, stroke rehabilitation, 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].

iii. All rehabilitation disciplines should consider the use of virtual care technology for assessment of individuals with stroke and for delivery of clinical therapies (e.g., exercise monitoring and intensity adjustments, speech and language therapies for aphasia) where appropriate [Strong recommendation; Low quality of evidence].

iv. Home-based monitoring for outpatient stroke rehabilitation through web-based applications may be considered as an alternative or adjunct to in-person rehabilitation therapy sessions when frequent monitoring is necessary and access to in-person services is limited [Strong recommendation; Moderate quality of evidence]. *Refer to CSBPR Stroke Systems of Care module for additional information.*

Section 6.1.1 Clinical Considerations

1. Clinicians should consider the current health status of the individual with stroke (e.g., cognitive, communication, physical, and sensory abilities), behavioural factors, and available resources, to determine the safety and appropriateness of virtual stroke rehabilitation. *Refer to Heart & Stroke Virtual Care Decision Framework for additional information.*
2. Clinicians should consider individual preferences when an individual with stroke is eligible for both virtual and in-person stroke rehabilitation, and the clinician is able to offer either one or a combination of both options.
3. Clinicians should develop a safety or adverse events plan with the individual with stroke prior to starting virtual stroke rehabilitation. This includes having the individual's phone number, address, and emergency contact information, and asking them to have a family member or

caregiver nearby and/or a phone at hand. *Refer to CSBPR Virtual Stroke Care Toolkit for additional information.*

4. The benefits of virtual modalities may extend beyond therapy activities and could support other rehabilitation functions such as transitional planning, education and skills training, and peer support.

6.1.2 Eligibility for Virtual Rehabilitation

i. All individuals with acute stroke admitted to hospital should be assessed to determine the severity of their stroke, their early rehabilitation needs, and the most appropriate mechanism to deliver timely and effective stroke rehabilitation, whether in-person, virtual, or a hybrid (a combination of in-person and virtual modalities) model [Strong recommendation; Moderate quality of evidence]. *Refer to Section 1 for additional information.*

ii. All individuals with acute stroke who are not admitted to hospital should be screened in-person or using virtual healthcare modalities for the need to undergo a comprehensive rehabilitation assessment to determine the scope of deficits from the index stroke event and any potential rehabilitation requirements [Strong recommendation; Low quality of evidence].

iii. Clearly defined criteria and protocols should be available to help referring sites determine when and how individuals with stroke can access virtually delivered services, including stroke rehabilitation, secondary stroke prevention, and ambulatory services [Strong recommendation; Low quality of evidence]. *Refer to Heart & Stroke Virtual Care Decision Framework for additional information.*

6.2 Assessment and Service Delivery for Virtual Stroke Rehabilitation

6.2.1 Assessment

i. Where available, tools selected for assessment of impairments, activity limitations, participation restrictions, and environmental factors relevant to stroke rehabilitation should have evidence of validity for the method of virtual administration and be administered by trained personnel [Strong recommendation; Low quality of evidence].

   a. Assessment tools selected for use via videoconferencing should have evidence of validity for this administration method [Conditional recommendation; Low quality of evidence]

   b. Assessment tools selected for use via telephone should have evidence of validity for this administration method [Conditional recommendation; Moderate quality of evidence].

ii. Screening for pre-stroke mental health and cognitive status and for changes in mood or cognition following stroke should be included as a routine component of virtual stroke rehabilitation [Strong recommendation; Moderate quality of evidence].

iii. For individuals with stroke who have cognitive, sensory or communication impairments (such as aphasia or vision loss), assessment tools should be adapted for use through virtual modalities, as required [Strong recommendation; Low quality of evidence].

Section 6.2.1 Clinical Considerations

1. There is limited published evidence on the safety, feasibility, reliability, and validity of approaches to administering standardized assessment tools post-stroke using virtual rehabilitation platforms or technologies. Safety precautions should be taken during virtual performance-based health assessments. *Refer to Heart & Stroke Virtual Care Decision Framework for additional information.*

   a. Healthcare professionals should receive training on the administration of virtual

performance-based assessment tools to optimize validity and safety.

b. Assessment considerations may include ensuring the individual with stroke has sufficient capacity to follow instructions, access to handholds to maintain balance, and a support person present to assist.

c. Healthcare professionals should provide instructions to individuals with stroke and their families and caregivers on how to prepare the home environment to ensure safe participation in assessment and therapy activities.

2. When assessment tools cannot be fully administered virtually, a hybrid model that combines in-person and virtual assessment should be considered.

   a. Where possible, timed assessment tools should be administered using a consistent method, either virtual or in-person. It is not advisable to directly compare timed data from assessment tools administered in-person and virtually, for the same individual, due to lag times.

3. Self-reported measures of rehabilitation outcomes, which are typically evaluated using performance-based assessment tools, may be feasible and useful to integrate when in-person assessment is not available.

4. Motivation and mood may influence engagement of the individual with stroke during virtual and in-person stroke rehabilitation sessions.

6.2.2 Service Delivery

i. Outpatient stroke rehabilitation services, whether delivered using virtual modalities alone or a hybrid model, should offer the same elements as coordinated, in-person rehabilitation services [Strong recommendation; Moderate quality of evidence]. *Refer to Section 4 for details.*

Refer to Stroke Systems of Care module for additional information on Virtual Care Principles.

Rationale

Virtual stroke rehabilitation refers to the use of information and communication technologies to deliver rehabilitation services from a distance, often using video or telephone conferencing. Virtual stroke rehabilitation supports equitable and timely access to optimal stroke services across geographic boundaries and improves communication and networking and enables better access to stroke expertise, regardless of the location of the individual with stroke or the treating hospital, facility or healthcare provider. The most familiar application of virtual stroke rehabilitation is the provision of therapies provided by physiotherapists, occupational therapists and speech-language therapists or their assistants that mimic in-person interactions and are provided synchronously (real time) over weeks or months, as required. Virtual stroke rehabilitation can also be used for other purposes including assessment, counselling and support, and education. One of the key advantages of virtual stroke rehabilitation is that it provides opportunities for individuals who live in isolated or rural communities across Canada to access specialized rehabilitation services reducing or eliminating transportation challenges that are commonly encountered by individuals who have had a stroke and their caregivers.

Individuals with stroke have emphasized that virtual stroke rehabilitation enables increased and more equitable access to care and resources, especially when access to in-person services may not be available or feasible. The decisions surrounding the use of virtual stroke rehabilitation 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 rehabilitation 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. These recommendations emphasize the need for education about virtual care and training on the use of technology for both individuals with stroke, family and caregivers as well as healthcare providers delivering their care.

There is value in having a support person with individuals when participating in virtual stroke rehabilitation to help with technology, remember information, support and enhance safety, aid movements, and provide encouragement. While having a support person may not be possible for everyone, healthcare professionals are encouraged to consider the impact this may have on those participating in a virtual visit.

It is recognized that, for a variety of reasons, virtual care may not be appropriate for some individuals or certain session goals. There is a need for joint decision-making between the individual with stroke and their healthcare team to determine the most appropriate way forward, whether that be virtual, in-person, or a hybrid model, which also considers issues of safety and privacy, and use of secure systems for teleconferencing and information storing.

System Implications

To ensure that as many of these virtual stroke rehabilitation 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 rehabilitation. 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 rehabilitation, 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 rehabilitation 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 rehabilitation technologies.
3. Virtual stroke rehabilitation 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 healthcare 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 rehabilitation 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 rehabilitation 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 rehabilitation 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 rehabilitation 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 rehabilitation care and services and document the consent and any discussion.

Performance Measures

System indicators:

Virtual stroke rehabilitation is an emerging field. It is critically important that mechanisms be established to collect consistent high-quality data to inform planning and improvement and provide evidence for quality and sustainability. Virtual care should be considered as one modality in the delivery of stroke care.

Jurisdictions may consider using one or more of the following indicators to monitor virtual care services:

Health system and clinical indicators (please refer to Quality of Stroke Care in Canada Key Quality Indicators and Stroke Case Definitions for more details)

1. Proportion of individuals with stroke who receive access to stroke rehabilitation through virtual healthcare modalities for assessment and/or management.
2. Number of scheduled rehabilitation appointments for individuals with stroke accessing rehabilitation services through virtual healthcare modalities, with values reported separately for each service accessed (e.g., physiotherapy, speech therapy).
3. Cost effectiveness of virtual stroke rehabilitation compared to in-person stroke rehabilitation.
4. Rural and remote settings increased access to stroke rehabilitation services through virtual modalities.

Process indicators:

5. Median time from referral for virtual stroke rehabilitation to first virtual stroke rehabilitation encounter.
6. Median time from stroke onset to rehabilitation referral for:
    a. Inpatient stroke rehabilitation
    b. Ambulatory stroke rehabilitation
    c. Virtual stroke rehabilitation
7. 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.

8. Median duration of scheduled virtual stroke rehabilitation encounters, with values reported separately for each service (e.g., physiotherapy, speech therapy).
9. Proportion of virtual stroke rehabilitation encounters requiring urgent transfer of individual with stroke to an in-person healthcare visit.
10. Proportion of virtual stroke rehabilitation encounters disrupted by technical difficulties by the healthcare provider.
11. Proportion of virtual stroke rehabilitation appointments provided using synchronous two-way video conferencing compared to by telephone only.

Patient-oriented indicators:

12. Patient-reported experience with virtual stroke rehabilitation related to attributes such as feasibility, satisfaction, quality, sound, visual clarity, reliability of technology, and ease of use.
13. Patient-reported experience of their safety during virtual stroke rehabilitation encounters, including prevention of risks associated with virtual stroke rehabilitation.
14. Proportion of virtual stroke rehabilitation encounters that included family members and/or caregivers who were in a different location from the individual with stroke.
15. Changes in functional status from start of virtual stroke rehabilitation compared at 3 months, 6 months and one year post start.

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 Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery; and, Part Three: Optimizing Activity and Community Participation following Stroke, Update 2025.*
- 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
- 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: 2020 CPR & EEC Guidelines: https://cpr.heartandstroke.ca/s/article/Guidelines?language=en_US
- Stroke Engine: https://strokengine.ca/en/
- Aphasia Institute: ParticiPics: https://www.aphasia.ca/participics/
- UHN TR-Telerehab Toolkit: https://kite-uhn.com/tools/tr-telerehab-toolkit
- Academy of Neurologic Physical Therapy: Neuro Telehealth: https://www.neuropt.org/practice-resources/best-practice-initiatives-and-resources/neuro-telehealth
- The TeleRehab SPOT: https://telerehab-spot.com/

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: Are You at Risk for Heart Disease or Stroke?: https://www.heartandstroke.ca/-/media/pdf-files/iavc/health-information-catalogue/en-are-you-at-risk
- 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
- Aphasia Institute: ParticiPics: https://www.aphasia.ca/participics/
- CanStroke Recovery Trials: Tools and Resources: https://canadianstroke.ca/tools/
- Stroke Engine: https://strokengine.ca/en/

Summary of the Evidence

Virtual stroke rehabilitation, also known as telerehabilitation, refers to the use of information and communication technologies to deliver rehabilitation services from a distance, often using video or telephone conferencing. The most familiar application of stroke telerehabilitation is the provision of therapies that mimic face-to-face interactions, which are provided synchronously over weeks or months, as required. Remote interventions, monitoring, evaluation and education can also be provided in asynchronous forms, using a variety of technologies. One of the key advantages of telerehabilitation is that it provides the opportunity for individuals who live in isolated or rural communities access to specialized rehabilitation services, which would otherwise be unavailable to them. Furthermore, telerehabilitation reduces or eliminates transportation problems that are commonly encountered by stroke survivors and their caregivers.

The results from a rapidly expanding volume of literature suggests that virtual stroke rehabilitation can be both feasible and effective compared with in-persons 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.[59-64] In the 2020 Cochrane review,[60] virtual care was also used successfully to treat persons with speech and language impairments and low mood post stroke. Knepley et al.[65] 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.[66] In the Augmented Community Telerehabilitation Intervention (ACTIV) trial, [67] 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. [68] 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. [69] 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.[70] 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 individuals with stroke 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.[71, 72]

Sex & Gender considerations

Research in this area is sparse. Older women may have less experience with technology or feel less comfortable using digital platforms for rehabilitation, which can hinder their participation in virtual programs. Men may potentially be less likely to seek out virtual rehabilitation support, leading to underutilization of digital resources. Additionally, men may experience challenges with technology due to lower levels of digital literacy and may be less likely to ask for help when they encounter difficulties. Virtual rehabilitation may not address gender-specific needs such as emotional or psychological support, often more prevalent in women, who may experience higher levels of post-stroke depression and anxiety. Virtual platforms that don't incorporate an interactive element, thereby decreasing social interaction, may negatively affect women to a greater extent, since they generally place a high value on community and relational support.

Evidence Table and Reference List

Section 7 Interdisciplinary Stroke Rehabilitation Care Planning, Transitions and Communication

7. Interdisciplinary Stroke Rehabilitation Care Planning, Transitions and Communication, Recommendations 2025

Note: Individualized care planning in stroke rehabilitation refers to a tailored approach that focuses on the unique needs, preferences, and goals of each individual with stroke recovering from a stroke. This process involves a comprehensive assessment of the individual with stroke's medical history, physical abilities, emotional well-being, cultural needs, environmental and social circumstances. Through collaboration among healthcare professionals, individuals with stroke, and their families, individualized care planning aims to develop a personalized rehabilitation program that addresses specific deficits, facilitates recovery, and enhances overall quality of life. The plan is regularly reviewed and adjusted based on the individual with stroke's progress and evolving needs, ensuring that care remains relevant and effective throughout the rehabilitation experience.

7.0 Interprofessional care planning and effective communication among all team members and individuals with stroke are essential and should be part of all stroke rehabilitation care planning and delivery 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].

7.1 Individualized Care Plan

i. The individual with stroke, their family and caregivers should be actively engaged in development of a care plan, and regular updates as recovery progresses [Strong recommendation; Moderate quality of evidence].

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

iii. Family members and caregivers should have the opportunity to meet with the rehabilitation team to discuss rehabilitation activities, progress, concerns and transition planning [Strong recommendation; Moderate level of evidence]; virtual modalities to support participation may be considered [Strong recommendation; Low quality of evidence].

iv. A family meeting/conference to discuss the care plan, rehabilitation treatments, and other relevant information should be considered to support person and family-centred rehabilitation and transitions of care [Strong recommendation; Low quality of evidence].

Section 7.1 Clinical Consideration

1. The 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 person progresses through the continuum of care.

7.2 Transition Planning

i. Transition planning should begin as soon as possible as a well-organized collaboration between health professionals, the individual with stroke, their family, and caregivers [Strong recommendation; Low quality of evidence].

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

iii. The following should be considered throughout transition planning:

a. A goal-oriented transition plan (e.g., discharge date) should be developed and revised with the individual with stroke, family, and caregivers [Strong recommendation; Moderate quality of evidence].

b. Identification of and addressing possible transition issues for the individual with stroke and their family, including those factors that may delay discharge (such as home environment concerns, unique responsibilities, social supports including caregiver engagement, transportation issues, and equipment needs) [Strong recommendation; Moderate quality of evidence]. Ideally these should be addressed early in transition planning [Strong recommendation; Low quality of evidence].

c. Referrals and/or appointments should be initiated 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. Assessment of caregiver ability to meet the specific needs of the individual with stroke [Strong recommendation; Low quality of evidence]. *Refer to Section 8 and Section 9 for additional information.*

e. Utilization of virtual care 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 Toolkit for additional information.*

iv. Specific transition planning activities that should be completed as appropriate include:

a. A home assessment to identify home modifications and any equipment required for accessibility and safety [Strong recommendation; Moderate quality of evidence].

b. Caregiver skills training to meet the current and changing needs of the individual with stroke [Strong recommendation; Moderate quality of evidence]. *Refer to Section 8 and Section 9 for additional information.*

c. Planned and goal-oriented day, weekend and/or overnight visits to the identified discharge location [Strong recommendation; Moderate quality of evidence], in order to help identify potential barriers, assess readiness for discharge, and inform therapy and discharge planning activities.

d. Written and verbal discharge instructions, with demonstrations of skills as needed, are provided to the individual with stroke and their family and tailored to their needs and characteristics (language, comprehension, culture) [Strong recommendation; Moderate quality of evidence]. *Refer to Clinical Consideration 1 for additional information.*

e. Verbal and written information should be tailored to the individual's cognitive, sensory, and communication abilities and to the health literacy of the individual with stroke, their family and caregivers. [Strong recommendation; Moderate quality of evidence].

f. A post-discharge follow-up plan should be initiated pre-discharge by a designated team member to ensure continuity of care [Strong recommendation; Moderate quality of evidence].

g. Individuals with stroke should have access to designated transition support team members as needed post-discharge, such as a case manager or stroke navigator [Strong recommendation; Moderate quality of evidence].

Section 7.2 Clinical Considerations:

1. When providing discharge instructions, healthcare team members should address the following:
    a. Any risks and safety considerations relevant to the individual's recovery;
    b. Clear individualized action and tailored resources to support the recovery process;
    c. Medications at discharge, including instructions for use, any adjustments, renewals and 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 post-discharge questions or concerns.

7.3 Health Professional Communication

i. Processes should be in place to ensure timely and effective transfer of relevant information at all points of access and transition in the healthcare system, to ensure seamless transitions and continuity of care [Strong recommendation; Moderate quality of evidence].

ii. 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 next stage of care [Strong recommendation; Moderate quality of evidence].

iii. The transfer of information should be:

    a. Comprehensive and timely, occur before 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. 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]. *Note, not all individuals with stroke may have a primary care provider, and if not, this should also be addressed. Refer to Box 7 for core content to be considered for inclusion in discharge summaries.*

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

    d. In multiple formats including the use of virtual modalities when appropriate [Strong recommendation; Moderate quality of evidence]. *Refer to Section 6. Virtual Stroke Rehabilitation, and the CSBPR Virtual Stroke Care Toolkit for additional information.*

Box 7 Checklist of Core Transition Summary Information

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

- ☐ Stroke diagnosis, stroke etiology, and date of stroke
- ☐ Stroke risk factors
- ☐ Past medical history
- ☐ Medications on discharge
- ☐ Summary of hospital course including secondary complications, comorbid 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 and instrumental activities of daily living (iADLs) including any supervision or assistance required
- ☐ Secondary prevention strategies (and referrals to clinics)
- ☐ Mental health 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, 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 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

Stroke care can be complex and requires ongoing monitoring and management. Clear communication in a timely manner is essential to ensure continuity of care, safety, and to reduce risk of complications and adverse events resulting from the confusion and ambiguity that can arise during transition points. Currently electronic health records are not always accessible across settings for healthcare providers to follow the individual with stroke's progression, creating risks for inconsistent and fragmented 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.

Effective discharge planning is essential for smooth transitions through the continuum of stroke care. Delayed or incomplete planning leads to prolonged hospital stays and an increased risk of adverse events following discharge. Individuals with stroke, family members and healthcare providers should all be involved in discharge planning to ensure effective and safe transitions, including the timing of discharge planning. Ensuring that the discharge planning occurs throughout the stages of care, rather than directly prior to discharge, can improve the experience of the individual with stroke, their family and caregivers. This helps to make sure that all services and resources are established ahead of time.

Individuals with stroke stressed the importance of home visits in discharge planning, and healthcare providers understanding of the supports available at home and in the community and the goals for recovery. They have reported difficulties accessing resources post discharge, and possible denial of services based on established access criteria; accessible transportation; and financial support. These challenges were further complicated when the individual did not have a primary care practitioner, which should be addressed and taken into consideration during the discharge planning process.

Individuals with stroke discussed the frustration and challenges that can occur if a delay between hospital discharge and beginning of outpatient/home rehabilitation is experienced. They highly appreciated receiving a written discharge document that provides information on continued rehabilitation goals, a home exercise program, as well as a list of available supports in the community that is reviewed and discussed.

System Implications

Transitions of care 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 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. Strong relationships and formal agreements among healthcare providers within regions to increase the efficient and timely transition of individuals with stroke.
6. Access to self-management and caregiver training and support services as required ensuring a smooth transition.
7. 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.
8. Adequately resourced community health and support services for individuals with stroke.
9. Providing the right care and services in the right settings at the right times following stroke.
10. Capacity for social workers and other case management or healthcare personnel with dedicated responsibilities for discharge planning.
11. Staff who are aware of person's right to privacy and who comply with privacy legislation and preferences when releasing a person with stroke's information.
12. 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. Proportion of healthcare organizations with electronic health records that allow individuals with stroke to access their records and information.

Process indicators:

2. Median number of alternate level of care days inpatient stroke rehabilitation settings.
3. Median length of stay of individuals with stroke in inpatient stroke rehabilitation.
4. 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.

Patient-oriented indicators:

5. Readmission rate for individuals with stroke discharged from stroke rehabilitation for all reasons, within 90 days, 6 months and one year.
6. Proportion of individuals with stroke who are given a copy of their completed discharge plan at the time of discharge from inpatient rehabilitation.
7. Proportion of individuals with stroke who return to the hospital post-discharge from inpatient rehabilitation for non-medical reasons (i.e., failure to cope, failure to thrive).
8. Quality of life of people 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).
9. Changes in functional status from discharge home from inpatient or community-based stroke rehabilitation compared at 3 months, 6 months and one year post start of rehabilitation.

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 Rehabilitation Planning for Optimal Care Delivery Module: Box 7: Checklist of Core Transition Summary Information
- Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery and Community Participation following Stroke, *Part Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery; and, Part Three: Optimizing Activity and Community Participation following Stroke, Update 2025.*
- 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
- 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
- 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/
- UBC Health Practice Education Portal: A National Interprofessional Competency Framework: https://practiceedportal.health.ubc.ca/a-national-interprofessional-competency-framework/#:~:text=The%20National%20Interprofessional%20Competency%20Framework%2

C%20created%20by%20the,important%20cornerstones%20when%20building%20and%20facilitating%20interprofessional%20curricula.

- 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/
- KITE UHN: Canadian Stroke Community-based Exercise Recommendations Update 2020: A Resource for Community-based Exercise Providers: https://kite-uhn.com/can-stroke-community-based-exercise-recommendations

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: Rehabilitation and Recovery Infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/rehabilitation-nov2019/csbp-infographic-rehabilitation.pdf?rev=a2cff1fb27424c84bbd44b568d58d1b4
- 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/

- KITE UHN: Guide "Choosing a Community Exercise Program After Stroke: https://kite-uhn.com/can-stroke-community-based-exercise-recommendations

Summary of the Evidence

Discharge Planning

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, individual with stroke, and family/caregivers, a post-discharge follow-up plan, and communication with team members at the next phase of care. In a recent Cochrane review, Gonçalves-Bradley et al.[73] identified 33 RCTs including individuals admitted to any type of hospital (acute, rehabilitation or community) with any medical or surgical condition. 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 readmission rates (relative risk [RR]=0.89, 95% CI 0.81 to 0.97) were both found to be significantly reduced for elderly individuals with a medical condition who received discharge planning, compared to care as usual. No significant between group differences were reported in terms of discharge destination or mortality. In the only RCT identified in the Cochrane review [73] that included patients recovering from stroke, Sulch et al. [74] 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 mean length of stay (days) (50±19 vs. 45±23). However, those randomized to receive conventional care experienced significantly greater improvement on the Barthel Index from 4 to 12 weeks (median change = 6 vs. 2, $p<0.01$) and reported significantly higher scores on the EuroQol at 6 months (72 vs. 63, $p<0.01$).

Stroke Navigators

Navigating through the post-stroke continuum has been highlighted as a frequent source of dissatisfaction, for individuals with stroke and informal caregivers, particularly during the transition from hospital to community. Several studies have been conducted to evaluate the benefit of individuals who coordinate access to appropriate services for individuals recovering from stroke, who go by many names including stroke navigator, case manager, care coordinator, or system navigator). Manderson et al.[75] conducted a systematic review including 15 publications, representing 9 RCTs examining system navigation models for older adults living with multiple chronic diseases making transitions across healthcare settings. The services provided included care planning, coordination of care, phone support, home visits, liaison with medical and community services, and individual with stroke and caregiver education. In most of the studies, economic, psychosocial and functional benefits were associated with system navigation. While the services of a registered occupational therapist, who functioned as a community stroke navigator, resulted in significant improvements in the mean daily functioning subscale of the Reintegration to Normal Living Index (RNLI) among 51 patients at the end of four months, (54.1 to 59.3, $p=0.02$), there were no significant improvements in other outcomes (2-minute walk test, depression outcomes), or any caregiver outcomes.[76]

Interprofessional Communication

Transitions between and within health care settings pose a safety and quality of care concern for individuals recovering from stroke. A consensus policy statement by the American College of Physicians in 2009 highlighted concerns of safety at transition points, particularly between inpatient and outpatient care.[77] A stroke survivor is vulnerable to many of these transition points as they progress through the acute, subacute 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 safety and quality of care. A systematic review, [78] sought to assess the impact of co-ordinated multidisciplinary 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.[79] 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%). PCPs received notification of discharge in only 23% of cases. In a controlled study of 3,248 hospitals, Mitchell [80] explored the association between physician/nurse communication with the individual with stroke regarding discharge instructions and readmission. An average of 84% of patients reported receiving discharge instructions. Hospitals that had smaller bed numbers, were non-profit and located in non-urban areas were more likely to provide discharge instructions. Individuals with stroke 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. [81] 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 individual with stroke 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. [82] 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 individuals from hospital. The final checklist included 3 types of discharge documents: the discharge summary, 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 individual 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 individual care; however, the topic has not been well researched within interdisciplinary healthcare teams. In a qualitative study of operating room personnel conducted in Ontario,[83] 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 8 Supporting Individuals with Stroke, Their Family and Caregivers During Stroke Rehabilitation

8. Supporting Individuals with Stroke, their Family and Caregivers During Stroke Rehabilitation Recommendations 2025

8.0 Individuals with stroke, their family and caregivers should be supported through all transitions of care with individualized psychosocial supports, education, skills training and information about accessing community-based services and resources [Strong Recommendation; High quality of evidence].

Refer to Stroke Systems of Care module for additional information on Supporting Individuals with Stroke, Family and Caregivers.

8.1 Screening, Assessment and Management in Stroke Rehabilitation and Recovery

i. Individuals with stroke, their family and caregivers should be **screened** for levels of coping, depressive symptoms, and other physical and psychological issues throughout the rehabilitation experience, using validated tools [Strong Recommendation; High quality of evidence].

ii. Individuals with stroke, family and caregivers should undergo assessments to facilitate the development of a rehabilitation and recovery plan.

   a. The type and depth of assessments should be tailored to the individual's needs, readiness, issues identified during screening and stages of transition [Strong recommendation; Low quality of evidence].

iii. Assessments should address the following areas where appropriate as they relate to a family member or caregiver's ability to support the individual with stroke throughout their rehabilitation experiences and transitions back to community:

   a. 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].

   b. Caregiver willingness, capacity for skills acquisition, ability to support ADLs, and experience for providing rehabilitation and recovery support to the individual with stroke [Strong recommendation; Low quality of evidence].

   c. 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].

   d. Resource issues such as financial situation, housing, transportation, insurance, healthcare benefits, medication and rehabilitation equipment cost coverage [Strong recommendation; Moderate quality of evidence].

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

iv. When issues are identified through screening and assessments, referrals to appropriate experts and services to address rehabilitation and recovery issues and optimize outcomes should be made for individuals with stroke, families and caregivers [Strong recommendation; Moderate quality of evidence].

v. Individuals with stroke, families, and caregivers should be provided with information about peer support groups or services in their community, including caregiver support groups or services, descriptions of the services and benefits they offer, and be encouraged to consider participation [Strong recommendation; Moderate quality of evidence].

Box 8 Supporting Successful Transitions of Care 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 as they transition to different settings and phases of care. This checklist is applicable to all care settings and should enable the healthcare 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 be based on shared decision-making and tailored to the individual's cognitive, sensory, and communication abilities. It may include:

- ☐ 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 and recommendations should be included in collaborative action plans and include goals and follow-up care.
- ☐ Access to a designated contact person in the hospital and community for continuity of care and questions.
- ☐ Access to and advice from health and social service organizations appropriate to needs and stage of transition and recovery.
- ☐ Links to and information about local community agencies such as stroke groups, peer visiting programs, meal provider agencies, and other services and agencies.
- ☐ Information and guidance on advance care planning, palliative care, and end-of-life care as appropriate.
- ☐ Where possible, access to peer supports who have had a stroke and experienced transitions following the acute phase.
- ☐ All communication should be 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.

Rationale

Stroke is a life-altering event, which impacts the lives of family members and informal caregivers, who may be expected to assume roles, tasks and responsibilities beyond their current capabilities. 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 individuals with stroke (as high as 60 percent has been reported). Families may also struggle with adjusting to new caregiving responsibilities, navigating healthcare systems, and understanding the long-term needs of the stroke survivor. Providing education, and access to support groups can help alleviate these burdens, while also fostering better communication between caregivers, healthcare professionals, the individual with stroke, their family and caregivers.

These recommendations support the following goals: to emphasize the need for a wholistic approach to care; to help individuals with stroke, families and caregivers to navigate the healthcare system, particularly following the initial acute stage of stroke care; to define the various components of support; to focus on individuals with stroke and their families, highlighting the person with stroke and family-centred care approach; and to address needs beyond the physical impact of stroke. Increased screening, assessment and surveillance of individual with stroke, family and caregiver needs and coping will provide a wholistic person- and family-centred approach to stroke care and optimally lead to better outcomes and adaptation.

Individuals with stroke have emphasized that stroke rehabilitation and recovery is a continuum, in which resource and support needs change overtime. They stressed the importance of psychosocial support for individuals with stroke, their family and caregivers across the continuum of care. They also highlighted that additional support may be required for those who do not have support systems at home. Support for caregivers is also highlighted as an important component along with peer support. Receiving information on community-based services, resources and supports should be tailored to the needs of the individual and help build capacity for self-advocacy when required, and follow-ups with healthcare teams following discharge.

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. Opportunities for education and training for individuals with stroke, families and caregivers to provide peer support when requested.
7. 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. Availability of community-based support programs and services for individuals with stroke and their family.
2. Availability of community-based respite programs and services.
3. Proportion of individuals with stroke with a follow-up visit by a primary care provider in the first year following a hospital admission for stroke (acute and/or rehabilitation).

Process indicators:

4. The number and proportion of individuals with stroke diagnosed with post-stroke depression, measured at each transition point as a proportion of all individuals with stroke.

Patient-oriented indicators:

5. 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.
6. 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 acute and or rehabilitation hospital stay.

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 Rehabilitation Planning for Optimal Care Delivery Module: Box 8 Supporting Successful Transitions of Care Checklist
- Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery and Community Participation following Stroke, *Part Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery; and, Part Three: Optimizing Activity and Community Participation following Stroke, Update 2025.*
- 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 stroke survivors 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: Person and Family-Centred Care Best Practice Guideline: http://rnao.ca/bpg/guidelines/person-and-family-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: Rehabilitation and Recovery Infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/rehabilitation-nov2019/csbp-infographic-rehabilitation.pdf?rev=a2cff1fb27424c84bbd44b568d58d1b4
- 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, individuals with stroke, families and informal caregivers are typically faced with multiple life changes and challenges as the individual with stroke transitions between the stages of recovery. Gallacher et al. [84] reviewed 69 qualitative studies examining the concept of burden following stroke, highlighting the impact it may have on the effectiveness of interventions and individual with stroke 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 of the health and vocational status of caregivers. Caregivers reported spending significantly longer periods of time providing caring for stroke survivors, relative to pre-stroke levels. [85] Depression and anxiety may also be increased. Loh et al. [86] estimated the prevalence of depressive symptoms and anxiety among stroke caregivers to be 40.2% and 21.4%, respectively. Hayes et al. [87] 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 (odds ratio [OR]=1.62, 95% CI 1.14-2.31, p=0.008) and depression (OR=1.10, 95% CI 1.04-1.17, p=0.001). Ko et al. [88] 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. [89] reported that 6 months following stroke, 35.2% of

spouses, of a sample of 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 individuals with stroke and their informal caregivers have been explored in several qualitative studies using in-person or telephone interviews. Similar themes emerged across studies. Cameron et al. [90] 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. Individuals with stroke discussed the need to feel safe in the home environment while caregivers discussed their need to feel supported. Assessing the individual with stroke for readiness was a key theme discuss by HCPs. Individuals with stroke noted gaining insight into what life would be like, and caregiver evaluated their abilities to care for stroke survivor. Individuals with stroke and caregivers discussed the range of emotions they experienced and how their experienced changes before and after the weekend pass. In a similar study, [91] including 24 informal caregivers to stroke survivors and 14 HCP, the themes that emerged from both the caregivers and the HCP concerned the type and intensity of support needed, who provides support and the method of providing support and the primary focus of care, which varied across the care continuum (i.e., as survivor transitioned from inpatient rehabilitation through community care).

Creasy et al.[92] 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. [93] 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 stroke survivors (aged 18 to 55 years) during their recovery.[94] 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 individuals with stroke, family and caregiver were examined in a systematic review, which included the results from 18 studies of caregivers of individuals recovering from stroke or individual with stroke/caregiver dyads.[95] 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 individuals with stroke and family members in the intervention group experienced significantly greater improvements in measures of depression, anxiety and quality of life. In studies that included individuals with stroke/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 [96] that included 16 trials composed of stroke survivor/caregiver dyads discharged home from rehabilitation hospitals. Intervention in these trials included a written guide for stroke survivors, 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

Sex and gender differences significantly shape how family members provide support for individuals with stroke post stroke, often reflecting traditional caregiving roles and societal expectations. Women, particularly daughters or spouses, are more likely to assume caregiving responsibilities, with many stepping into this role due to social norms that associate women with caregiving duties. This can lead

to women experiencing higher levels of physical and emotional strain, as they balance caregiving with other responsibilities such as work and managing family life. In contrast, men are less likely to take on caregiving roles, and when they do, they may face challenges in navigating the emotional and physical aspects of care, as societal expectations often discourage them from expressing vulnerability or seeking help. As a result, men may struggle with recognizing the emotional and psychological needs of the stroke survivor, or they may underreport their own stress or exhaustion. These gendered patterns can influence the quality of care and the well-being of both the stroke survivor and the caregiver. Tailored support that acknowledges these gender differences—such as providing additional emotional resources for women caregivers or encouraging men to engage more actively in caregiving tasks—can help alleviate the strain on family members and improve the overall care environment.
Evidence Table and Reference List

Section 9 Education for Individuals with Stroke, Their Family and Caregivers During Stroke Rehabilitation

9. Education for Individuals with Stroke, Their Family and Caregivers During Stroke Rehabilitation, Recommendations 2025

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

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

iii. Individuals with stroke, their family and caregivers should undergo an assessment to determine readiness for education, health literacy, psychosocial support, ability to integrate rehabilitation and recovery knowledge and training, and to access appropriate health information and social services [Strong recommendation; Moderate quality of evidence].

iv. Opportunities to learn and master self-management skills should be provided during the rehabilitation and recovery process to support the development of self efficacy and self management [Strong recommendation; Moderate quality of evidence]. *Refer to Box 9 for additional information regarding self-management topics for individuals with stroke, their family and caregivers.*

v. With consent, family members and caregivers may be invited and encouraged to attend rehabilitation therapy sessions and given the opportunity to learn rehabilitation and recovery skills to support safety and self-management [Strong recommendation; Low quality of evidence].

vi. Rehabilitation teams should offer updated, validated and reliable information and resources to individuals with stroke, their family and caregivers, facilitating easier self-management and navigation of community-based health and social systems following discharge [Strong recommendation; Moderate quality of evidence].

Refer to Stroke Systems of Care module for additional information on Education for Individuals with Stroke, Families and Caregivers.

Box 9 Education and Self-Management Checklist

Education topics to address:

- ☐ Secondary stroke prevention
- ☐ Medication management
- ☐ Risk factor management (including adherence to pharmacotherapy and health related lifestyle behaviours)
- ☐ Role and importance of exercise, information on selection of community-based exercise programs
- ☐ Symptom and stress management techniques
- ☐ Fatigue, sleep management, and energy conservation strategies
- ☐ Nutrition, healthy eating strategies
- ☐ Coping with physical changes
- ☐ Coping with emotions such as fear, anxiety, anger, apathy and depression
- ☐ Coping with cognitive and memory changes
- ☐ Coping with sensory, perceptual and communication deficits or limitations
- ☐ Safety and fall prevention
- ☐ Health-related problem-solving and decision making
- ☐ Relationships, intimacy and sexuality
- ☐ Community participation and resuming valued activities
- ☐ Recreation, 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 educational activities, work, and volunteering
- ☐ Financial resources and social services
- ☐ Advance care planning, end-of-life and palliative care options
- ☐ Respite care options
- ☐ Social and peer support

Skills Training and Self-Management Topics:

- ☐ Self-management education to encourage independence, increase confidence and 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)
- ☐ Energy conservation techniques to manage fatigue
- ☐ Participation in independent exercise to improve and maintain fitness
- ☐ Accessing community services and resources
- ☐ Ongoing health system navigation
- ☐ Awareness of the importance of self-care and caregiver burnout

Rationale

Education is an ongoing and vital part of the rehabilitation and recovery process for individuals with stroke, family members and caregivers. Individuals with stroke generally retain less than 25% of the information that is provided during their inpatient stay, partly due to the impacts of stroke, exhaustion and at times denial. Therefore, information needs to be reinforced often and consistently across care transitions. Active education interventions that are inclusive help to equip both individuals with stroke, family and caregivers with the tools to manage the rehabilitation and recovery process. Providing

relevant and appropriate information for each phase of the stroke recovery process, recognizing the individual's changing needs, contributes to increased quality of care and may lead to improved outcomes. Education interventions that are interactive and adapted to the cognitive and communication challenges, are generally more effective for learning retention. Skills training for family and caregivers is also an important component, which helps to empower individuals and their families to take an active role in the recovery process, improving quality of life, including supporting mental health, and contributing to better long-term outcomes.

Individuals with stroke highly value and appreciate education and information following stroke. There is benefit in receiving a package containing all information in one place that can be reviewed when needed, and they encourage that this should be routinely provided to all individuals following stroke. Examples of information that panel members specifically noted as useful includes a summary of health information, information on stroke and the impairments that can occur, contact numbers, available resources, risk factors, medication side effects, multimorbidity, and information to address financial challenges and funding opportunities as appropriate. At discharge, information (both written and orally) on expected next steps, information on community rehabilitation, and information on community supports and resources is highly valued by individuals with lived experience.

The way information is provided is also important to consider, and individuals with stroke appreciate when healthcare providers are sensitive and honest during communications, information is tailored to their needs and goals and supports their understanding and expectations of all aspects of the rehabilitation and recovery journey. Importantly, information should be accessible for those with communication, cognitive, sensory or perceptual challenges, and provided in the preferred language of the individual with stroke, their family and caregivers when able.

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. 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.
6. Access to educational resources that are culturally safe, relevant and appropriate, and where possible available in the individual's preferred language.
7. Access to self-management support services through virtual healthcare technologies, especially in rural areas and where there are local resource gaps.
8. 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 educational materials, resources and programs for individuals and their family following stroke.

Process indicators:

2. Proportion of individuals with stroke with documentation of education provided at each stage throughout the stroke management and recovery process.
3. Total number of encounters focused on education for each individual with stroke, and the time spent on education during a healthcare encounter for stroke.
4. Proportion of individuals with stroke discharged with a copy of their discharge plan and educational materials.

Patient-oriented indicators:

5. Proportion of individuals with stroke who report being involved in education and training related to their ongoing management and recovery from stroke.
6. Change in self-management behaviour at 6 weeks, 3 months and 6 months following stroke, using validated measurement tools.
7. Change in individuals with stroke and family knowledge of stroke-related content before and after teaching session.
8. 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).
9. Proportion of individuals 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 Rehabilitation Planning for Optimal Care Delivery Module: Box 9 Education and Self-Management Checklist
- Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery and Community Participation following Stroke, *Part Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery; and, Part Three: Optimizing Activity and Community Participation following Stroke, Update 2025.*
- 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

- Accreditation Canada: Accreditation Canada Stroke Distinction Program: https://accreditation.ca/stroke-distinction/
- NCBI: "Timing It Right": a conceptual framework for addressing the support needs of family caregivers to stroke survivors 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: Rehabilitation and Recovery Infographic: https://www.strokebestpractices.ca/-/media/1-stroke-best-practices/rehabilitation-nov2019/csbp-infographic-rehabilitation.pdf?rev=a2cff1fb27424c84bbd44b568d58d1b4
- 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/
- Stroke Engine: https://strokengine.ca/en/
- KITE UHN: Guide “Choosing a Community Exercise Program After Stroke: https://kite-uhn.com/can-stroke-community-based-exercise-recommendations

Summary of the Evidence

Self-Management Programs

Self-management programs empower individuals with stroke and their families 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,[97] included the results from 14 RCTs of

individuals 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 (standardized mean difference [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.[98, 99] Lennon et al. [100] conducted a systematic review of studies (including randomized and non-randomized controlled trials) that assessed "self-management" interventions for individuals 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.

Education for Individuals with Stroke, Family and Caregivers

The benefit of family and caregiver involvement was assessed in a 2021Cochrane review,[101] 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 individuals 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.[102] randomized 138 individuals 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. Individuals 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.[103] 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.[104] 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. Individuals with stroke experienced

reductions in anxiety and depression at 12 months (p<0.001) and increased quality of life at 3 and 12 months (p<0.05). No differences between mortality, institutionalization or functional ability were reported between intervention and control groups. Using a similar intervention, Forster et al. [105] 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.[104]), 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.

Sex & Gender Considerations

Sex and gender differences can significantly influence the educational approach and the effectiveness of rehabilitation programs. For example, women tend to have strokes later in life and may face unique challenges such as higher frequency of disability and post-stroke depression. As a result, educational content should be tailored to address these gender-specific concerns, incorporating information on hormonal influences, caregiving responsibilities, and emotional well-being. Additionally, gender norms and expectations may affect how individuals access care and engage with rehabilitation activities, with women often assuming a greater amount of the caregiving duties, and men potentially being less likely to seek help for emotional or psychological issues. Tailoring education to these differences can improve the patient's understanding of their condition, empower them to actively participate in their recovery, and promote better long-term outcomes.

Evidence Table and Reference List

APPENDIX ONE: REHABILITATION, RECOVERY AND COMMUNITY PARTICIPATION FOLLOWING STROKE SCIENTIFIC WRITING GROUP AND AUTHORS 2025

PART ONE: STROKE REHABILITATION PLANNING FOR OPTIMAL CARE DELIVERY

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			(Vision Loss Rehabilitation Canada) or to self. Leadership or fiduciary role in other board, society, committee or advocacy group, with the Academy for Certification of Vision Rehabilitation Specialists (ACVREP) committee on certification standards for occupational therapists - unpaid
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PART TWO: DELIVERY OF STROKE REHABILITATION TO OPTIMIZE FUNCTIONAL RECOVERY

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			Stroke Best Practice Guidelines; Canadian Stroke Consortium – unpaid advisory/executive board
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VIRTUAL STROKE REHABILITATION EXPERT WRITING SUBGROUP

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APPENDIX TWO: STROKE REHABILITATION PLANNING FOR OPTIMAL CARE DELIVERY EXTERNAL REVIEWERS 2025

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Erin McHattie R.Kin, BSc.Kin	Stroke Distinction Lead, Accreditation Canada	Ottawa, ON	None to declare
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Hardeep Singh MScOT, PhD	Assistant Professor, University of Toronto	Toronto, ON	Have/had an affiliation or relationship (financial or otherwise) with a for-profit or not-for-profit organization with Brain injury association of Peel and halton (biaph) and Heart and Stroke Foundation of Canada All support for the work reported in the manuscript - March of dimes, heart and stroke, biaph. Holds the March of Dimes early career professorship at the University of Toronto. Holds a grant in aid and new investigator award (deferred) from Heart & Stroke Received/will be receiving a grant or an honorarium from March of Dimes, current position at UofT is funded by March of Dimes Received in kind support for recruitment assistance for research studies from March of Dimes Currently participating, or have participated within the past two years, in a clinical trial with Sinai health as a coinvestigator on the DASH trial
Ricardo Viana MD, FRCPC	Medical Director, Stroke Rehabilitation, Parkwood Institute, St. Joseph's Healthcare Associate Professor, Western University, Schulich School of Medicine & Dentistry, Department of Physical Medicine & Rehabilitation	London, ON	Currently participating or have participated within the past two years as a Trial Physician of the Direction Trial comparing the efficacy of Dysport and Botox. Identify patients who may meet criteria, provide study injections and outcome measure assessments. I am not aware of the results, nor do I have a preference for any of the agents.

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