Ontario Stroke Unit Toolkit

Acute

Integrated

Rehabilitation

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Introduction

The Stroke Unit Tool Kit

The aim of this toolkit is to provide health care organizations looking to implement and sustain a stroke unit informed by information and knowledge gained from hospitals with existing units and aligned with the Canadian Stroke Best Practice Recommendations. It is hoped that the toolkit will contribute to the development of new units, or improvements to existing units.

The toolkit provides an overview to help guide implementation.   It offers practical advice, presents pros and cons of a range of options for service delivery, suggests how various institutions may support improvements in service delivery, and identifies key resources to work with.

In the summer/fall of 2015, a survey was conducted across the province with organizations that met the Ontario Stroke Network (OSN) stroke unit definition. A total of 28 organizations with varying sizes of acute (ASU), integrated (ISU) and rehabilitation (RSU) units responded. The purpose of the survey was to gather actual experience of establishing stroke units. The survey results identified strategies which are shared throughout this toolkit.

The toolkit will enable organizations to identify problems or challenges, and develop a strategy using information and other resources assembled for this purpose.

For further questions or to contact existing stroke units, please refer to the Contact List located with this Toolkit on the CorHealth Ontario website.

Section 1: Getting Buy-in

Get the Statistics

Understanding the current environment is key and can be determined by collecting the following statistics in order to engage senior leadership team and secure buy-in:

a. Total stroke admissions/year at your site
b. A breakdown of the stroke subtypes (ischemic, hemorrhagic, TIA)
c. Average LOS on acute and/or rehabilitation for each stroke type
d. Discharge disposition
e. The number of stroke patients in your organization at any one time
f. Location of patients admitted with stroke/TIA

This information will help determine the type, size and location of the stroke unit to be implemented. Section 2 will assist with some of the preparatory work that can help build a case for the stroke unit. The Ontario Stroke Reports compares LHIN performance against a provincial benchmark. It can be helpful to compare the organization performance against the LHIN or Provincial Benchmark to identify the need for change. Using data gathered so far, present to the senior team, physician groups and the LHIN the needs and benefits to implementing a stroke unit.

The provincial survey of 28 established stroke units, were asked how they obtained buy-in to develop their stroke unit. Here are the top responses for the following topics.

1) Top 3 drivers to secure buy-in for implementing their stroke unit:
   a. Stroke Quality-Based Procedures (QBP)
   b. Media attention
   c. Canadian Stroke Best Practice Recommendations (CSBPR)

2) Information to inform current state were:
   a. Length of stay (LOS)
   b. Mortality
   c. Discharge disposition

3) Common themes identified included:
   a. Having stroke unit implementation as a priority of the Regional Stroke Steering Committee Strategic Plan
   b. Engaging key informants and stakeholders such as local stroke champions, senior leadership, management, front line staff, and patient/caregiver representation
   c. Utilizing metrics as drivers with a focus on mortality, complications or readmission rates

Section 2: Preparation and Planning

This section will assist with decisions regarding the type of stroke unit, numbers of beds and location.

1) Build Your Implementation Team

Engage existing stroke champions: senior management, physicians, nurses, allied health, Regional Stroke Network team, patients and families, and other key stakeholders/departments. A physician champion is critical in the planning. In regional stroke centres the physician lead is often a stroke neurologist. In other centres the champion may be a neurologist, internist or hospitalist with an interest in stroke. On a rehabilitation unit the stroke physician champion is often a physiatrist.

TIP: Learn from others

Invite representatives from an organization that has a stroke unit to come and share their learnings to your team.

Choose a hospital that has similar admission numbers to your site; refer to the Contact List for existing stroke units in the province. Invite your champions, as well as those you are looking to get buy-in from. Request the presenting site to demonstrate their positive performance outcomes, as well as patient/family testimony.

A key component of developing a stroke unit is ensuring that there is fulsome representation within the core implementation team. The provincial survey of 28 established stroke units revealed trends in the membership of implementation teams. The provincial survey asked, "Who were the members of the core team in the implementation phase of your stroke unit?" The most common responses to the question included:

Team Member – Ranking Order
Front line staff
Management
Senior leadership (director/VP)
Physician leadership

Survey respondents also identified other essential team members for the core implementation team.

Team Member – Ranking Order
Regional and District Team
Educators/Clinical Nurse Specialists
Internal Systems Providers
Patient Flow/Bed Allocation/Navigator

In addition to the common team members, there were numerous recommendations of other members to be considered, including: Other hospital clinical departments, external partners (e.g. Home and Community Care Support Services), professional practice, patients and families, communications department, and CorHealth Ontario leaders. Patient and caregiver involvement is important and they should be encouraged to participate in the planning, implementation and evaluation stages. Involvement may include committee and working group meetings, focus groups, and satisfaction surveys but should be determined with the patient and caregiver.

In addition to the identified implementation team members, respondents also identified other essential stakeholders that were consulted and/or required for stroke unit implementation.

Stakeholder Consulted
Finance
Health records
Informatics / IT
Communications
Social worker / discharge planning
Professional practice
Interprofessional nursing
Unions
Hospital foundation / volunteers
Other community partners

2) Decide on type of stroke unit

Based on information gathered the next step is to begin looking at the model of stroke unit that best fits the organization. The definitions of the stroke unit models described below were endorsed by the Ontario Stroke Network (OSN) in 2014.

a) Acute Stroke Unit

"A geographical unit with identifiable[1] co-located[2] beds occupied by stroke patients on average 75% of the time[3] and has a dedicated interprofessional team with expertise in stroke care with the following professionals at a minimum nursing, physiotherapy, occupational therapy, speech language pathologist (OSN, 2014)."

b) Integrated Stroke Unit

Both acute and rehabilitation components meet the above ASU definition: "Acute and rehabilitation beds are on a geographical unit with identifiable[1] co-located[2] beds that are occupied by stroke patients 75% of the time[3], and have a dedicated interprofessional team with expertise in stroke care including at a minimum, nursing, PT, OT and SLP (OSN, 2014).

c) Stroke Rehabilitation Unit

Based on the ASU definition: " A geographical unit with identifiable[1] co-located[2] rehabilitation beds that are occupied by stroke patients 75% of the time[3], and has a dedicated interprofessional team with expertise in stroke care including at a minimum, nursing, PT, OT and SLP (OSN, 2014).Of the 28 respondents to the provincial survey, 9 identified having an ISU. The survey asked those sites why they decided on that type of model. The most common answers were as follows:

    i.   To create a seamless flow from acute to rehabilitation
    ii.   Space availability

3) *Decide on a location for your stroke unit*

There are multiple factors that need to be taken into consideration when deciding on a location for the stroke unit.

a) Acute Stroke Unit

The size of the unit (the number of beds allocated to stroke) will determine if it can be a standalone unit or joined with another unit. The size of the unit impacts the ability to independently staff a unit.

b) Integrated Stroke Unit

As with the ASU, you need to decide whether the unit will be a standalone or joined with another unit. Key considerations for an ISU, is that the organization has allocated acute and rehabilitation beds that can be merged with access and proximity to therapy gyms, quiet areas or rooms for SLP or OT treatments.

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[1] *e*.g. 5A -7, 5A-8, 5A-9, 5A-10, 5A-11

[2] co-location is the act of placing multiple entities within a single location

[3] e.g. if the stroke unit is a 4 bed unit, 3 out of those 4 beds must have a stroke patient in them on average 75% of the time.

c) Stroke Rehabilitation Unit

The size of the unit (the number of beds allocated to stroke) will determine if it can be a standalone unit or joined with another unit. The size of the unit impacts the ability to independently staff a unit.

The provincial survey asked all 28 sites that participated "what influenced the physical location of their stroke unit?" The most common answers were as follows:

i.   Preferred close proximity of stroke unit to the therapy gym
ii. Availability of cardiac monitoring
iii. Close to the rehabilitation unit

4) Stroke Unit Bed Formula

Acute Stroke Unit Bed Formula:

To determine the number of beds required, a formula has been developed which considers total volumes, average length of stay (ALOS) and occupancy rate. The occupancy rate utilized by organizations in bed calculation may vary. Occupancy rates frequently referenced when doing bed calculations are 95% or 98% based on the Ontario 2000 average acute occupancy rates of 96% (Ontario Hospital Association, 2000).

To determine the number of beds required, consult your decision support team.

Total stroke volume X ALOS   =   594 X 10 =   17 beds days X % occupancy   365 X 0.95

Stroke Rehabilitation Unit Bed Formula:

To determine the total stroke rehabilitation volumes per year, identify the number of acute stroke patients discharged alive and multiply by the Ontario stroke report card best practice target of 45.4%*. The Stroke Quality-based Procedure Clinical Handbook has identified inpatient rehabilitation LOS targets for each stroke rehabilitation patient group (RPG)*. To determine the average inpatient rehabilitation LOS, average the stroke QBP RPG LOS targets to calculate the average RPG LOS at a set occupancy rate divided by 365 days (Health Quality Ontario and Ministry of Health and Long-Term Care, 2015).

Total stroke (alive) volume X .454 X Average Rehabilitation RPG LOS = 594 X 0.454 X 29.0 = 7975.63 = 23.00
X 365 days X % occupancy   365 X 0.9   346.75   beds

5) Staffing Requirements

An understanding of the staffing requirements for your stroke unit will be critical to secure buy-in from the senior executive team.
Recommended Inpatient Rehabilitation Staff Requirements (Health Quality Ontario and Ministry of Health and Long-Term Care, 2015, https://www.hqontario.ca/Portals/0/Documents/evidence/clinical-handbooks/community-stroke-20151802-en.pdf

Physiotherapy/Occupational Therapy: 1 each per 6 inpatient rehabilitation beds
Speech-language pathology: 1 per 12 inpatient rehabilitation beds

The provincial survey of centres in Ontario whose stroke units closely meet the OSN stroke unit definition demonstrated the following staffing patterns for nursing.

Facility Type	Type of Unit	n	RN to Patient Ratio Day Shift	RN to Patient Ratio Night Shift
Regional Stroke Centre (RSC)	ISU	1	1: 4	1:6 patients
RSC	ASU	6	1: 4 to 5 patients	1: 5 to 6 patients (1 RSC: 1:6 to7)
District Stroke Centre (DSC)	ISU	4	1: 5 to 6 patients	1: 6 to 7 patients
DSC	ASU	5	1: 4 to 5 patients	1: 5 to 6 patients (1 DSC: 1:8)
Community Hospital	ASU	2	1: 4 to 5 patients	1:5 to 1:7
Community Hospital	ISU	2	1: 4 to 5 patients	For rehabilitation portion of ISU: 1:8 to 10

6) Budget Considerations (See **Appendix A** for sample Budget Plans)

When developing a budget for the stroke unit, it is imperative to work closely with the finance department. It is important to consider initial start-up costs of the unit and the annual operating costs. Below are some examples of set up costs and areas to be incorporated into an annual operating budget.

Start-up costs:
- Equipment purchases (e.g. BP machines, weight scales, wheelchairs, commodes, lifts, ECG machines, telemetry packs, monitors, oximetry machines, equipment for gym)
- Stroke education and training for the interprofessional team
- Unit renovation costs
- Creation of additional interprofessional positions to accommodate staff-to-patient ratios

Annual Operating Costs:
- Human resource costs:
- Staffing ratios, nursing skill mix
- Allied health relief costs
- New and ongoing staff stroke orientation and training
- Pharmacy
- Medical-surgical supplies/supplies and expenses
- AlphaFIM® certification
- Additional workshops/courses and conference registration

Section 3: Key Components of the Implementation

The implementation team will be key to the success of the implementation of the stroke unit. The following outlines key components to stroke unit implementation the team will need to consider in planning.

1) Assessment of Current State

How does stroke care currently occur?
What areas of stroke best practices are done well and where are the gaps?

a) Use the QBP template

Review the QBP Clinical Handbook for Stroke, as well as the acute and rehabilitation Canadian Stroke Best Practice Recommendations (CSBPR) to assist the interprofessional team in identifying gaps in knowledge and best practice stroke care.

b) Process mapping

If the organization has access to the expertise of process improvement consultants/quality specialists, they can assist the team in process mapping. This will help the group come to a common understanding of the current process (current state process map). Later they can engage the team in a future state process mapping (future state process map).

TIP: Quality Improvement Tools

For more information on quality improvement tools, check out the Health Quality Ontario website:

http://www.hqontario.ca/Quality- Improvement/Tools-and-Resources

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2) Stroke Care Pathway

The planning committee will need to discuss how to implement care pathways, order sets and protocols to guide standardization of best practice stroke care within your organization.

In rehabilitation, care pathways are not common as each stroke patient should have an individualized stroke rehabilitation plan. The CSBPR, Section 2.2.i, states:

"The interprofessional rehabilitation team should assess patients within 48 hours of admission and together with the patient and family develop and document a comprehensive individualized rehabilitation plan which reflects the severity of the stroke and the needs and goals of the patient [Evidence Level C]."

3) Education/Training

What training currently takes place for stroke care? Is stroke education accounted for in the orientation of new staff to the stroke unit? What are the plans for ongoing stroke education? Assessing the current state will also help to identify knowledge gaps (See Orientation in **Section 4** of the toolkit for more information).

4) Day-to-Day Operations

a) Admission to an Acute Stroke Unit

How will stroke patients be identified for admission to your stroke unit? Developing admission criteria, i.e., types of stroke patients who will be admitted to the stroke unit (hemorrhagic and/or ischemic). (See **Appendix B** for sample of Stroke Unit Admission Criteria).

Consider the organization's bed management policy.
- Does it support timely admission to the stroke unit beds?
- Are the stroke unit beds protected and exclusive for stroke?

What is the surge plan if there are more stroke admissions than beds available on the stroke unit?
- Are there sufficient beds to manage patients requiring isolation?
- How will patients requiring telemetry or Step-Down Unit level care be managed? What will be the process to prioritize admission to the unit, for patients coming from other units or organizations? (See **Appendix C** for sample of Flow Algorithm).

b) Admission to a Rehabilitation Stroke Unit

- What is the process for referral and application to stroke rehabilitation?
  - Does this process allow timely admission to rehabilitation?
  - What is the feedback mechanism to acute care (e.g. if the patient is refused from rehabilitation)?
- The Resource Matching and Referral (RM&R) form is the provincial standard application form for all rehabilitation and complex continuing care.
  - Who is responsible for reviewing the application?
  - Will the stroke rehabilitation program allow patients to be admitted 7 days per week, as per the QBP Clinical Handbook for Stroke recommendation (module 4.1.2)?

The CSBP Rehabilitation module outlines general eligibility and admission criteria for stroke rehabilitation. Has the organization considered these in its stroke rehabilitation unit admission criteria?

Will the stroke rehabilitation unit staff have the required education and confidence to receive stroke patients who are medically stable but medically complex (e.g. patients with an NG tube or IV medications)?

c) Team Communication

- How will the team receive and share information it needs in order to care for the stroke patient e.g., discuss results of screening and assessment tools, patient and/caregiver issues, discharge planning.
- What communication processes currently exist? What is working well?
- What time of day should the team meet? How frequently?

d) Process for rounds (daily bullet rounds; weekly or biweekly rounds)

The implementation team will need to discuss establishing a process for rounding in order to ensure the interprofessional team, patients and families have the necessary information needed to care for stroke patients. The target LOS for ischemic stroke patients in acute stroke units is 5 days and for hemorrhagic strokes 7 days, as per QBP recommendations. This necessitates that team members are efficient with sharing of information in order to provide comprehensive stroke care and facilitate patient transitions to the next phase of stroke care.

The CSBPR: Acute Stroke Unit Care module recommends "daily/bi-weekly patient care rounds with interdisciplinary stroke team to conduct case reviews, discuss patient management issues, family concerns or needs, and discharge planning (discharge or transition to the next step in care, timing, and transition requirements)."

In Stroke Rehabilitation Unit Care it is also recommended that "stroke unit teams conduct at least one formal interdisciplinary meeting per week to identify ongoing or new rehabilitation problems, set goals, monitor progress, and plan discharge for patients on the unit [Evidence Level B]. Individualized rehabilitation plans should be regularly updated based on review of patient status [Evidence Level C]" (Teasell, Salbach et al., 2019).

In addition to determining the type of rounds: the implementation team will also need to discuss:

- Who will be present?
- What information will be communicated?
- What time of day (or day of the week) will rounds take place?
- What is the length of time allotted for the rounds?

Consider developing a "cheat-sheet" to keep rounds focused especially if the type of rounds is a new process, as it helps team members to stay on track with the agenda. (See **Appendix D** for sample of Rounds Template).

e) Transition Planning:

- Discharge planning commences when the patient arrives on the unit.
- What will be the process for discharge planning? Alpha FIM should be implemented and utilized.
- Is there a triage process/tool for referrals to community/inpatient rehabilitation?
- Are there stroke education resources for discharge teaching?

Inpatient stroke rehabilitation patient group (RPG) LOS targets have been set. In order to determine the RPG into which the patient is classified, the FIM assessment must be completed. (Health Quality Ontario and Ministry of Health and Long-Term Care, 2015, http://www.hqontario.ca/Portals/0/Documents/evidence/clinical-handbooks/community- stroke-20151802-en.pdf)

- What is the unit's plan to complete the FIM assessment on or by day 3 after admission (target day 3, admission is day 1)?
- Who will determine the RPG and set the discharge date according to RPG LOS targets?
- How and when will the discharge date be communicated to the patient?

5) *Patient Trajectory*

A key component to ensuring timely access to the stroke unit is to consider possible patient transitions to and from the unit. It is important to be familiar with the best practice transition recommendations for acute and rehabilitation stroke units.
Transitions Module: https://www.strokebestpractices.ca/recommendations/managing-stroke-transitions-of-care

a) Acute Stroke Unit
Patients admitted to hospital with an acute stroke or TIA should be treated on an inpatient stroke unit (Evidence Level A) as soon as possible; ideally within 24 hours of hospital arrival (Evidence Level C) (CSBPR, 2018).
Patients admitted to the acute stroke unit may experience very different journeys. Some of the common transitions include:

- Patients receiving tPA/endovascular thrombectomy: Where will the patient be cared for in the first 24 hours after receiving tPA in the Emergency Department (Intensive Care Unit/Step-Down Unit/Acute Stroke Unit)? What is the process to move patients to the acute or integrated stroke unit after the first 24 hours?
- Patients repatriated post tPA/procedure to the referring centre
- Patients not receiving tPA
- Inpatients who have a stroke as a secondary complication on another unit
- Patients transferred from another facility

The planning committee will need to determine discharge locations for patients to ensure timely patient flow across the system.
Questions for consideration:

- How will the SU team support timely discharge home with services and community-based stroke rehabilitation services?
- What are the general inclusion criteria for stroke rehabilitation?
- What is the process for discharging patients who require long term care services or complex continuing care services?
- Clear streamlined processes will ensure timely flow across the continuum and ensure timely access to acute stroke services.

If the acute stroke unit organization refers patients to a standalone stroke rehabilitation unit for rehabilitation, the planning committee will need to be familiar with the general inclusion criteria. It will be critical that the committee has a clear understanding and endorsement of the definition for medical stability. See Eligibility and Admission Criteria for Stroke Rehabilitation in the CSBPR (look for Box One: Eligibility and Admission Criteria).

b) Stroke Rehabilitation Unit or Integrated Stroke Unit

All patients who require inpatient rehabilitation following stroke should be treated by a specialist rehabilitation team in a geographically defined unit (Evidence Level A) (Health Quality Ontario and Ministry of Health and Long-Term Care, 2015, http://www.hqontario.ca/Portals/0/Documents/evidence/clinical-handbooks/community-stroke-20151802-en.pdf).

    i.   Integrated Stroke Unit
- If post-acute rehabilitation will be provided on the integrated stroke unit, the planning committee will need to discuss and determine processes for eligibility and for transferring care between acute and rehabilitation physicians.

    ii.   Standalone Rehabilitation facilities
- How will the acute stroke team work with the rehabilitation stroke team to create a "pulling" of patients into stroke rehabilitation, in order to achieve acute LOS targets of 5 days for ischemic stroke and 7 days for hemorrhagic stroke patients?

    iii.   Other considerations
- Do both the acute stroke team and rehabilitation stroke team consider themselves as one team or an extended team?
- Do both teams have opportunities to review patient cases together?
- Do both teams have an opportunity to meet to discuss where improvements in the transition process from acute to rehabilitation can be made?
- Is the process for referral to rehabilitation efficient and timely?
- Is there agreement between both teams on a common rehabilitation referral/ triage tool?
- What are the general inclusion criteria for stroke rehabilitation for the facility?
- Can information technology (IT) create/provide electronic tools to support communication between teams, patients and families?
- Do the acute and rehabilitation teams need to meet to come to a common understanding of medical stability for transfer?

Section 4: Key Elements of the Stroke Unit

This section of the toolkit highlights key elements that are critical to the stroke unit's ongoing success. An example of one of these key elements is processes of care, which can include policies, pre- printed orders and care pathways. The CSBPR places strong emphasis on development and sustainability of stroke expertise. To reflect these recommendations, this section of the toolkit also discusses validated assessment tools, staffing, orientation and recommendations for ongoing professional education for all disciplines involved in caring for patients on stroke units.

1) *Processes of Care*

Processes of care are key to facilitate uptake of stroke best practices and the operation of a stroke unit. These processes are an important mechanism to enable rapid transfer of a patient to a specialized stroke unit as soon as possible after arrival in an acute hospital or rehabilitation setting. Processes of care include policies, order sets, and clinical or care pathways.

Along with this resource, connecting with an organization on the contact list is recommended for examples of processes of care.

2) *Validated Tools*

Appropriate assessment with validated tools of patients with stroke admitted to a stroke unit is essential. "Comprehensive assessment of patients with stroke is necessary for the appropriate clinical management and evaluation of outcomes, for quality management and research," (Duncan et al, 2005). In this article the Agency for Health Care Policy and Research (AHCPR), "recommends the use of well-validated, standardized instruments in evaluating stroke patients. These instruments help to ensure reliable documentation of the patient's neurological conditions, level of disability, functional independence, family support, quality of life, and progress over time."

The CSBPR (www.strokebestpractices.ca) state, "Clinicians use standardized, valid assessment tools to evaluate the patient's stroke related impairments and functional status." The CSBPR have developed a resource to help guide the use of appropriate standardized and validated assessment tools in stroke care.

Canadian Stroke Best Practice Recommendations Validated Assessment Tools

*Category	Validated Tool	Description
Tools to Assess Functional Capacity and Activities of Daily Living	Functional Independence Measure (FIM)	Assessment tool for physical and cognitive disability and is intended to measure burden of care.
	AlphaFIM®	Shortened version of the Functional Independence Measure
	Modified Ranking Scale (mRS)	Assessment tool for rating global outcomes
	Barthel Index of Activities of Daily Living (BI)	Assessment tool for evaluating independence in self-care activities
	Frenchay Activities Index (FAI)	Assessment tool for instrumental activities of daily living
	6-Minute Walk Test (6MWT)	Assessment tool for walking capacity and endurance
Tools to Assess Stroke Severity	Canadian Neurological Scale (CNS)	Assessment tool for neurological impairment
	National Institute of Health Stroke Scale (NIHSS)	Assessment tool for neurological status following a stroke
	Orptington Prognostic Scale (OPS)	Assessment tool for stroke severity and has been found to be beneficial in identifying a patient's suitability for rehabilitation.
Tools to Assess Motor Function	Fugl-Meyer Assessment of Motor Recovery after Stroke (FMA)	Assessment tool for motor functioning following a stroke
	Rivermead Motor Assessment (RMA)	Assessment tool for motor performance
	Stroke Rehabilitation Assessment of Movement (STREAM)	Assessment tool for motor functioning following a stroke
Tools to Assess Mobility	Berg Balance Scale (BBS)	Assessment tool for balance in older adults
	Chedoke-McMaster Stroke Assessment Scale (CMSA)	Screening and assessment tool for physical impairment and disability
	Clinical Outcome Variables (COVS)	Assessment tool for functional mobility
	Functional Ambulation Categories (FAC)	Assessment tool for rating ambulation status

*Category	Validated Tool	Description
	Rivermead Mobility Index (RMI)	Assessment tool for functional mobility
	Timed "Up and Go" Test (TUG)	Screening tool for basic mobility and balance
Tools to Assess the Upper Extremity	Action Research Arm Test (ARAT)	Assessment tool for upper extremity function and dexterity
	Box and Block Test (BBT)	Assessment tool for unilateral gross manual dexterity
	Chedoke Arm and Hand Activity Inventory (CAHAI)	Assessment tool for arm and hand function
	Nine Hold Peg Test (NHPT)	Assessment tool for fine manual dexterity
	Wolf Motor Function Test (WMFT)	Assessment tool for upper extremity motor ability
Tools to Assess Mood and Cognition	Beck Depression Inventory (BDI)	Screening tool for depression and, if present, provides cut points for severity
	Geriatric Depression Scale (GDS)	Screening tool for depression and, if present, provides cut points for severity
	Hospital Anxiety and Depression Scale (HADS)	Screening tool for anxiety and depression and, if present, provides cut points for severity
	General Health Questionnaire (GHQ)	Screening tool for psychiatric disorders
	Mini-Mental State Examination (MMSE)	Screening tool for cognitive impairment
	Montreal Cognitive Assessment (MoCA)	Screening tool for cognitive impairment
	Clock Drawing Test (CDT)	Screening tool for cognitive impairment
Tools to Assess Visual Perception and Neglect	Behavioral Inattention Test (BIT)	Screening and assessment tool for visual neglect
	Line Bisection Test (LBT)	Screening tool for unilateral spatial neglect
	Motor-free Visual Perception Test (MVPT)	Assessment tool for visual perception
Tools to Assess Specific Impairments	Modified Ashworth Scale (MAS)	Assessment tool for spasticity
	Frenchay Aphasia Screening Test	Screening tool for aphasia

Adapted from "Stroke Rehabilitation Screening and Assessment Tools" in Canadian Best Practice Recommendations for Stroke Care 2013, and Updates 2015 and 2019.

For more information regarding standardized and validated assessment tools to be used on a stroke unit, please refer to the following resources:

- Assessment tools used in stroke care can be found at www.strokengine.ca.
- Tools to screen and assess swallowing can be found at: https://heartstrokeprod.azureedge.net/-/media/1-stroke-best-practices/rehabilitation-nov2019/csbpr-rehabiliation-table3-suggested-swallow-screening-and-assessment-tools13nov19.ashx?rev=a75669797c844289a5682c6ea61d81d1

3) Orientation

To implement and promote stroke expertise for staff on a stroke unit, it is necessary to establish a program of ongoing interprofessional education involved in caring for patients on stroke units. It is recommended to establish a *Stroke Unit Orientation* for new staff. The model and delivery of orientation is dependent on the resources available at each site, as well as the structure of the stroke unit (i.e. educator or champion designated unit versus the availability of Regional Stroke Network staff).

TIP: Stroke Orientation
Stroke Unit Orientation Topics should include:
- Pathophysiology and Neuroanatomy of Stroke, and Stroke Syndromes
- Acute Stroke Management
- Diagnostics and Assessments
- CNS / NIHSS Scales
- Swallowing, Feeding and Oral Care
- Mobility, Positioning and Transfers
- Cognition, Perception and Behaviour
- Stroke and Depression
- Secondary Stroke Prevention

Additional Topics to be included, as appropriate:
- Stroke Prevention
- Prehospital Care and Emergency Management
- Pre-printed orders
- Care/Clinical Pathways
- Intimacy Post Stroke
- AlphaFIM®
- Bladder & Bowel Continence

Ensuring stroke best practices are incorporated into new staff orientation is essential and a variety of methods can be used:

- Combination of in-class, self-study and on- online resources is recommended.
- Shadowing and partnering with a senior staff on the stroke unit.

The format of the orientation is at the discretion of the stroke unit, however a full day of education or unit orientation is recommended. Stroke unit orientation is typically provided on an 'as needed' basis, however providing monthly, quarterly or annually orientation is also suggested to support ongoing learning.

The orientation should be provided to all members of the interprofessional team according to the stroke unit staffing model which may include nurses, allied health providers and Personal Support Workers (PSW)/Patient Care Assistants (PCA's).

Ongoing education should be provided by the stroke unit Clinical Educator and/or designated interprofessional champions.

Sample Resources
- Acute Unit Orientation (Stroke Network of Southwestern Ontario https://www.swostroke.ca/46/Acute_Stroke_Unit_Orientation/
- Stroke Rehabilitation Unit Orientation (Stroke Network of Southwestern Ontario https://www.swostroke.ca/47/Stroke_Rehabiliation_Unit_Orientation/
- Stroke Engine: https://strokengine.ca/en/
- Hemispheres- on line stroke competency series: http://www.apexinnovations.com

4) Stroke Expertise

"Stroke expertise is critical in achieving good outcomes and the more experience treating stroke patients, the better; with the goal of staff spending 80-100% of their time caring for stroke patients" (Matthew Meyer, personal communication, 2015).

The CSBPR state the interprofessional stroke unit team should have stroke expertise. This section describes the CorHealth Ontario's Core Competency framework to ensure stroke expertise. There is also an emphasis on continuing education, due to the emergence of new evidence that results in changes to best practices in stroke care. The Ministry of Health and Long Term Care, QBP for Stroke Care recommended the core stroke unit team should consist of health care professionals with stroke expertise in medicine, nursing, occupational therapy, physiotherapy, speech language pathology, social work, and clinical nutrition. To support development of stroke expertise, health care professionals on the core stroke unit team should be individuals who spend the ***vast majority of their time treating stroke patients and regularly complete education about stroke care*** (Health Quality Ontario and Ministry of Health and Long-Term Care, 2015).

Staff should be trained, in a timely manner. Each stroke unit should establish processes to facilitate development of stroke expertise in alignment with the CorHealth Ontario's core competencies. The Ontario Regional Education Group (OREG) and CorHealth Ontario have developed a set of stroke care competencies, minimum core set of knowledge and skills that any professional providing stroke care should already possess or are working towards acquiring.
Examples of effective resources include attending conferences, workshops, refresher sessions and shadowing senior staff and champions.

The core team/champions/clinical leads may be considered as resources to provide opportunities to enhance staff expertise on the unit. It is recommended to develop a process for stroke unit staff to participate in regional, provincial, national, and international educational opportunities in the care and management of stroke patients; encourage networking with interprofessional stroke teams in other facilities, regions and nationally. This will facilitate knowledge sharing, problem solving, collaboration, and increase the consistency of stroke care delivery across sites and nationally.
Connecting with your Regional Stroke Education Coordinator regarding the availability of online and local resources is recommended.   Resource information is also available at https://www.corhealthontario.ca/resources-for-healthcare-planners-&-providers/stroke-general/professional-education-inventory

Section 5: Evaluation

The ability to measure and monitor performance, process, as well as patient and system outcomes in stroke care is critical to improving the delivery of healthcare. There are a number of existing sources of data and recommended indicators for measuring stroke unit care which are commonly used in Ontario:

1. Stroke Quality-Based Procedures: Clinical Handbook for Stroke (2015) and accompanying Baseline Indicators
2. Ontario Stroke Reports - released annually

This section of the toolkit uses the above resources and also incorporates responses from the provincial survey, administered to Ontario's stroke units in 2015. A case study is used to introduce common stroke unit evaluation indicators and is followed by a summary table of indicators recommended for stroke unit care. The appendices provide comprehensive information about the indicators recommended (**Appendix E**), examples of evaluation dashboards (**Appendix F**) and supplemental reading for more information on stroke indicators (**Appendix G).**

Stroke Unit Evaluation Case Study

	Stroke Unit Indicators

DAY 1: Camille is a 58 year old woman who experienced stroke symptoms on June 12th, 2022 at 15:15. She arrived at the Regional Stroke Center by ambulance at 16:00. A CT scan ruled out a hemorrhagic stroke and her CTA indicated she was not a candidate for EVT. She received IV tPA at 16:30. Camille was closely monitored in the Level 2 Critical Care Unit. Camille remained NPO until a validated swallowing screen was completed and found to be normal.

DAY 2: After 24 hours from stroke onset, Camille's repeat CT revealed damage in her right middle cerebral artery territory. On June 13th, she was transferred to the hospital's 6-bed acute stroke unit, a geographically co-located unit with identifiable beds, occupied by stroke patients She was cared for by the acute stroke unit's dedicated interprofessional team (IPT). On the stroke unit she continued to be monitored. An oral care protocol and falls reduction plan were put in place to prevent complications

DAY 3: On June 14th, Camille was assessed by the interprofessional rehabilitation professionals of the acute stroke unit team, experts in stroke care who spend the majority of their time working with stroke patients. Together with the rest of the stroke unit team, they formulated a management plan with her and her family. The AlphaFIM® assessment was completed. She scored 50, placing her in the moderate stroke category, suggesting the post-acute discharge destination should be an inpatient stroke rehabilitation unit. The referral process to inpatient stroke rehabilitation was initiated. Camille and her family received ongoing stroke education on the stroke unit to support smooth transition to rehabilitation and eventually back home.

> *Note: Quality-Based Procedures (QBP) recommended length of stay is **5** days for **ischemic stroke** and **7** days for **intracerebral hemorrhage***

Days 4-5: Over the next two days, the interprofessional acute care team cared for Camille while she recovered and began to regain motor function. Before transfer to inpatient rehabilitation, the social worker with the stroke unit team administered a depression screen which was negative. The occupational therapist conducted a cognitive screen which suggested mild cognitive impairment.

Day 6: DAY 6: Camille was discharged from the acute stroke unit and transferred to the stroke rehabilitation unit on June 17th.

DAY 7-32: Camille was assessed within 24-48 hours by the interprofessional rehabilitation team with stroke expertise. Her FIM (Functional Independence Measure) assessment resulted in a score of 62. Soon after admission, an individualized rehabilitation plan was created and Camille received an average of 145 minutes of direct, face-to-face therapy from the core therapists, 6 days per week. By the end of her stay, she had made gains in her function which was demonstrated by improvements in her FIM score to 86.

> **FIM Efficiency Calculation** Discharge (86) – Admission (62) FIM Length of Stay (25 days)

Based on her Rehabilitation Patient Group (RPG) assignment of 1130, the QBP recommended LOS was 25.2 days. At discharge, the FIM Efficiency was calculated at 0.96

DAY 32: On July 13th, after 25 days on the inpatient rehabilitation unit, Camille was discharged home with the support of her husband. A referral for outpatient stroke rehabilitation was made to follow up on residual deficits from her stroke.

SIX MONTHS LATER: Camille remains in her community, and is enjoying participating in a stroke survivor support group and community stroke exercise class at her local fitness centre.

Stroke Unit Indicators

- ◄ *Dysphagia Screening*
- ◄ *Stroke Unit Admission*
- ◄ *Complication Rate*
- ➤ *Interprofessional Team Assessment*
- ➤ *AlphaFim® Completed Day 3*
- ➤ *Patient & Caregiver Education*
- ➤ *Depression Screening*
- ➤ *Cognitive Screening*
- ➤ *Acute-Care LOS*
- ➤ *Acute Discharge Destination*
- ➤ *Rehabilitation Intensity*
- ➤ *Inpatient Rehabilitation LOS by RPG*
- ➤ *FIM Efficiency*
- ➤ *Rehabilitation Discharge Destination*
- ➤ *Readmission Rates*

Recommendations for Stroke Unit Quality Indicators	Stroke Unit Type		
	ASU	ISU	RSU
*Proportion of patients treated in a designated Stroke Unit anytime during their inpatient stay	x	x	x
Indicators Specific to the <u>Acute</u> Phase of Stroke Care			
*Proportion of patients with **Dysphagia Screening** in an acute care setting	x	x	
Proportion of patients who have **AlphaFIM®** completed by day 3 after admission (target day 3, admission day is day 1)	x	x	
Proportion of patients discharged from hospital with **Antithrombotic Therapy**	x	x	
*Proportion of inpatients that experience **at least one Complication**	x	x	
Indicators Specific to the <u>Rehabilitation</u> Phase of Stroke Care			
Proportion of patients admitted to Inpatient Rehabilitation **with severe stroke** from acute care setting		x	x
*Mean total **Rehabilitation Intensity** minutes per day per stroke patient in a rehabilitation setting		x	x
* Median **FIM Efficiency** for all stroke (RCG 1)		x	x
Indicators for Stroke Unit Care (Acute, Integrated, and Rehabilitation)			
Proportion of patients with documentation of **Patient and Caregiver Education**	x	x	x
Proportion of patients with documentation of **Depression Screening**	x	x	x
Proportion of patients with documentation of **Vascular Cognitive Impairment Screening (VCI)**	x	x	x
Patient/Family/Experience & Staff Satisfaction	x	x	x
Indicators Related to LOS and Discharge Disposition			
*Median **LOS** in an acute care hospital setting (Total, Acute, and ALC LOS)	x	x	
Median **time from stroke onset** to admission to Inpatient Rehabilitation	x	x	x
*Proportion of patients **Admitted to Inpatient Rehabilitation** from acute care setting	x	x	
Proportion of patients discharged to each **Discharge Disposition (**specific to the setting)	x	x	x
*Median **LOS** in an inpatient rehabilitation setting **by Rehabilitation Patient Group (RPG)**		x	x
System-Level Indicators			
In-hospital **Mortality** Rate (30-day all cause)	x	x	
Readmission Rate (30 & 90-Day all cause)	x	x	
* Denotes indicators commonly used by stroke units (acute, integrated, or rehabilitation) in Ontario, as reported in the **Provincial**			

1) Data Sources

a) Canadian Institute for Health Information (CIHI)

i. Discharge Abstract Database (DAD)

Discharge Abstract Database captures administrative, clinical and demographic information on in hospital discharges (including deaths, sign-outs and transfers). Data is received directly from acute care facilities or from their respective health/regional authority or ministry/department of health. Facilities in all provinces and territories except Quebec are required to report. (CIHI, 2022, retrieved from https://www.cihi.ca/en/acute-care)

ii. National Rehabilitation Reporting System (NRS)

The National Rehabilitation Reporting System (NRS) collects data from participating adult inpatient rehabilitation facilities and programs across Canada. The minimum data set contains clinical data on functional status based on the 18-item FIM® instrument and additional cognitive elements. Facilities collect client data on admission and discharge from the inpatient rehabilitation program. They send the data directly to CIHI on a quarterly basis so it can be included in online comparative reports. (CIHI, 2022, retrieved from https://www.cihi.ca/en/rehabilitation#_nrs)

iii. Special Projects

At times, "special projects" are implemented in the DAD and NRS, where extra data fields are added to supplement the data already being collected. Stroke has a number of special projects, and applicable stroke unit ones are explained briefly below:

- **Project 340** – Since 2008/09 data about stroke and TIA care have been collected under this special project (stroke symptom onset date and time, CT scan/MRI scan within 24 hours of hospital arrival, stroke unit admission, administration of tPA, prescription of anti-thrombotics at discharge).
- **Project 640** – Captures additional data on the type of care provided to stroke patients (dysphagia screening, telestroke consultation, date of stroke unit admission, date of stroke unit discharge, triage date and time).
- **Project 740** – On April 1, 2014 the data fields in Project 740 became mandatory to complete for all acute stroke admissions in Ontario. Project 740 captures information about the AlphaFIM® assessment: whether it was completed, date completed, motor rating, cognitive rating

CIHI Stroke Case Definitions		
Main Category	**Diagnostic Code**	**Comments**
TIA	G45.0, G45.1, G45.2, G45.3, G45.8, G45.9	
Ischemic Stroke	I63 (excludes I63.7), I64, H34.0, H34.1	
Intracerebral Hemorrhagic Stroke	I61 (excludes I61.7)	
Subarachnoid Hemorrhagic Stroke	I60	I60 codes **excluded** in QBP and in some Accreditation Canada Stroke Distinction elements
Thrombosis of Intracranial System	G08, O22.5-, O87.3-, I67.6	

iv.   Chart Audit

In order to augment the data collected under the Canadian Institute for Health Information (CIHI) Special Projects and to aid with quality improvement initiatives, manual chart audits can be conducted at your hospital.   Chart audits can be completed in a timely manner (avoiding the time lag common with data reported to CIHI) and allow the stroke unit to focus on the specific information related to the quality improvement topic or initiative at hand.

2) *Quality-Based Procedures: Stroke*

The Quality-Based Procedures: [Clinical Handbook for Stroke](#) sets out key recommended practices for stroke unit care in acute care and in rehabilitation.

Ten quality indicators recommended by the Stroke QBP Clinical Expert Advisory Group were selected to evaluate the intended and unintended impact of QBP implementation. An additional measure (risk-adjusted all-cause 30-day readmission rate) was recommended by the MoHLTC.

a. Proportion of ischemic stroke patients arriving at an ED within 3.5 hours of symptom onset who received acute thrombolytic therapy (tPA)
b. Proportion of patients who received brain imaging (CT scan or MRI) within 24 hours of arrival at an ED
c. Proportion of patients treated on a designated inpatient stroke unit
d. Distribution of severity among inpatient rehabilitation patients
e. Discharge destinations following acute inpatient admission
f. Acute and alternative level of care (ALC) lengths of stay
g. Proportion of patients admitted to inpatient rehabilitation within 7 days of acute care admission
h. Risk-adjusted 90-day all-cause unplanned visit rate to ED
i. Risk-adjusted 30-day all-cause mortality rate
j. Risk-adjusted 30-day all-cause readmission rate (Note this is a MoHLTC recommended measure, not a quality indicator)
k. Risk-adjusted 90-day all-cause readmission Rate (MoHLTC, 2015)

3) *Ontario Stroke Evaluation Report*

Ontario Stroke Reports

The annual [Ontario Stroke Evaluation Report](#) documents progress made in the provision of best practice stroke care through a number of core performance indicators. The report includes recommendations to continue improving stroke care across Ontario. Current and past reports are available online. Contact your Regional

Stroke Centre's Regional Director or District Stroke Centre Coordinator for your local area reports.

4) *The Importance of Sharing Data with Your Team*

Regular review of stroke unit data and sharing of results with staff, patients, families, and other stakeholders is an important part of improving quality of care. Open and ongoing communication between management and front-line interprofessional staff and teams regarding performance is vital and can be achieved by sharing data, educating on the meaning of data, and seeking input for decision-making and changing processes. The format for displaying the data can be in the form of a table or graphical display uploaded into a dashboard or infographic for easier viewing.   The process of sharing performance results varies between organizations and a variety of communication methods have been used such as:

- sharing results with opportunity for discussion at staff /team meetings or huddles/at committee and/or group meetings such as Quality Rounds, Stroke Sustainability Committee
- posting results on a bulletin board on the stroke unit
- using electronic communication such as email

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Glossary

ALC: Alternate Level of Care

ASU: Acute Stroke Unit

CIHI: Canadian Institute for Health Information

CorHealth: CorHealth Ontario at (Ontario Health)

CT: computed tomography

CTA: computed tomography angiography

DAD: Discharge Abstract Database

ISU: Integrated Stroke Unit

LOS: Length of Stay

MoCA: Montreal Cognitive Assessment

NPO: nil per os

OSN: Ontario Stroke Network

QBP: Quality-Base Procedures

RCG: Rehabilitation Client Group

RPDB: Registered Persons Database

RSU: Rehabilitation Stroke Unit

Appendix A: Sample Budget Plan 1 for a 28 Bed Stroke Rehabilitation Unit

Adapted from Hamilton Health Sciences Stroke Rehabilitation Unit Annual Budget

Budget Item			Total Budget
Revenue			
• Preferred Accommodation, External Recoveries			**$263, 380**
Total Revenue			**$263, 380**
Expenses			
• **Compensation and Wages:** Includes salary, overtime costs, 3.6% Sick Rate, Vacation for FT Staff based on years of service, STAT holidays, Education, Training and Orientation costs, Relief Hours for Allied Health Staff and other benefits			**$3,087,701**
Job Category	**Total Budget Hours**	**FTE Equivalents**	
Business Clerk	2,270	1.16	
Social Worker	3,519	1.80	
Therapeutic Recreationist	1,369	0.70	
Registered Dietitian	704	0.36	
Speech Language Pathologist	3,324	1.70	
Psychometrist	1,173	0.60	
Pharmacist	1,564	0.80	
Psychologist	978	0.50	
Communication Disorders Assistant	1,173	0.60	
Dietetic Assistant	1,600	0.82	
Occupational Therapist	5,321	2.72	
Physiotherapist	5,664	2.90	
Registered Nurse	21,139	10.81	
Registered Practical Nurse	33,274	17.02	
Pharmacy Technician	977	0.50	
OT/PT Assistant	4,692	2.40	
Respiratory Therapist	1,173	0.60	
• **Drugs:** Non Medicated IV's, Supplies – Medical Gases			**$5,070**
• **Medical/Surgical Supplies:** Instruments, Sutures, General Medical/Surgical Supplies, Catheters, Needles, Syringes, Gloves, Rubber Goods			**$51,056**
• **Other Supplies and Expenses:** Printing/Stationery/Office, Supplies: Printed Forms, General Office Supplies, Housekeeping Supplies (Paper & Disposable Supplies, Waste Disposable Containers, Cleaning Agents), Patient Wearing Apparel, Staff Wearing Apparel, Bed/Supplies: Disposable Linen, Dietary Supplies, Clinical Lab: Reagents/Chemicals, Glassware, Plastic, Specimen Collection Supplies, Electrodiagnostic Supplies, Respiratory Therapy Supplies, General Department Supplies, Delivery and Courier, Course Registration/Fees and Materials, Travel Expenses – Staff, Travel Expenses – Patient, Language & Hearing Translation Fees, Catering, Equipment Maintenance, Rental/Lease of Equipment, Minor Equipment			**$55,599**
• **Interdepartmental Expenses:** Internal Laundry Processing, Interdepartmental Services, Printing			**$59,807**
Total Expenses			**$3,259,233**

Sample Budget Plan 2
Adapted from Hamilton Health Sciences Stroke Rehabilitation Unit Annual Budget

Item	Total One Time Costs	Annual Operating Costs
Equipment		
2 wheel rollator walkers		
Lap trays		
Patient Bedside Chairs		
Shower Chairs		
Shower Commode Chairs, Bariatric commode.		
Wheelchairs, bariatric Wheelchair, Tilt Wheelchair		
Additional Beds, Alarm beds		
Telemetry		
Ceiling Lifts		
Isolation cart		
Mobile Vital Signs Tower		
Visitor chairs		
Staffing		
Additional positions to accommodate staff to patient ratios.		
Other Human Resource Requirement		
Added Housekeeping personnel for any extra beds that were created.		
Specialized positions: Stroke navigator, NP		
Training		
APEX Hemisphere Seats, web based online learning series		
Ongoing Education costs e.g. augmenting Stroke Unit Orientation		
One Time Education 4 hour education or series of 1 hour lunch and learns (need to cover cost of lunch)		
Other		
Purchase of DRUG: tPA (Stock in ED and/or ASU. Imaging, Lab Costs, added cost related to nutrition costs associated with extra patient beds.		
Communications		
Development of newsletters or cost needed to build internal intranet site regarding the Stroke Unit		

Appendix B: Acute Stroke Unit Admission Criteria Sample Templates

Sample 1: Adapted from Hamilton Health Sciences (2011 Acute Stroke Unit Admission Criteria

Patients will be admitted to the acute stroke unit if they meet the following criteria:

- Patients presenting to the emergency department or at one of the organization's referring sites with primary diagnosis of TIA, ischemic or hemorrhagic stroke.
- Patients with questionable primary diagnosis of stroke who present to the emergency department or are on another inpatient unit may be admitted to the acute stroke unit after consultation by the stroke unit physician.
- Patients who are admitted to hospital with another diagnosis but develop new onset stroke symptoms may be transferred to the acute stroke unit when stroke is the patient's primary medical problem and after consultation with the stroke unit physician.
- Patients who initially require admission to the ICU or Step-Down Unit, will be transferred to the stroke unit when medically stable.

Sample 2: Integrated Stroke Unit (ISU) Eligibility Criteria (Lakeridge Health, 2022)

Criteria	Integrated Stroke Unit
Admission Criteria	**Acute Stroke Admission** The patient/client must have a new onset of: • Acute ischemic stroke with related stroke order set • Acute hemorrhagic stroke with related stroke order set • Transient Ischemic Attack (TIA) with high risk symptoms **Stroke Rehabilitation Admission** The patient/client: • Is medically stable [3, ***] • Has a diagnosis of moderate (Alpha FIM 40 -80) to severe (Alpha FIM <40) stroke and has expectation of functional independence improvement OR mild stroke (Alpha FIM > 80 if discharge home is unsafe or contraindicated[4] • Has identified goals that are specific, measurable, realistic and timely[1] • Demonstrates stamina to participate in the program demands/schedule[3] • Has the ability to follow at minimum one-step commands, with communication support, if required[3] • Has sufficient attention, and short term memory to progress through rehabilitation process [3] • Consents to treatment in the program and demonstrates a willingness and motivation to participate in the rehabilitation program[3] • Has goals/care needs that cannot otherwise be met in the community [1] (e.g. home with homecare services, LTC, ARC) • Requires daily interventions, frequent/daily re-assessment by regulated health professionals to update and progress treatment plan, and a coordinated/in-house interprofessional team of regulated health professionals[1] • Will return to their previous living environment or other appropriate community environment following participation in rehabilitation[1]

Criteria	Integrated Stroke Unit
Tolerance	• Able to tolerate being up out of bed for at least 1 hour a day • Able to participate in at least three 30 minute therapy sessions 5 days per week, as appropriate[1,3]
Expected Length of Stay	• LOS is determined based on the benchmarks for each RPG AND on a case by case basis (0 – 48.9 days)[4] • No longer requires ongoing nursing care and on-site access to physician[1] • Identified rehab goals have been met and additional progress can be achieved independently or with the assistance of a caregiver at home or through community-based rehabilitation[1]
Exclusion Criteria	• Non-stroke diagnosis[3] • Palliative stroke patients • Medically unstable[3] • Severe cognitive impairment preventing patient from learning and participating in therapy[3] • Behaviour is inappropriate and putting self or others at risk, such as physical and verbal aggression[3] • Not willing to participate in the program[3]
Special Needs	Can accommodate most special needs with advanced planning on a patient by patient basis

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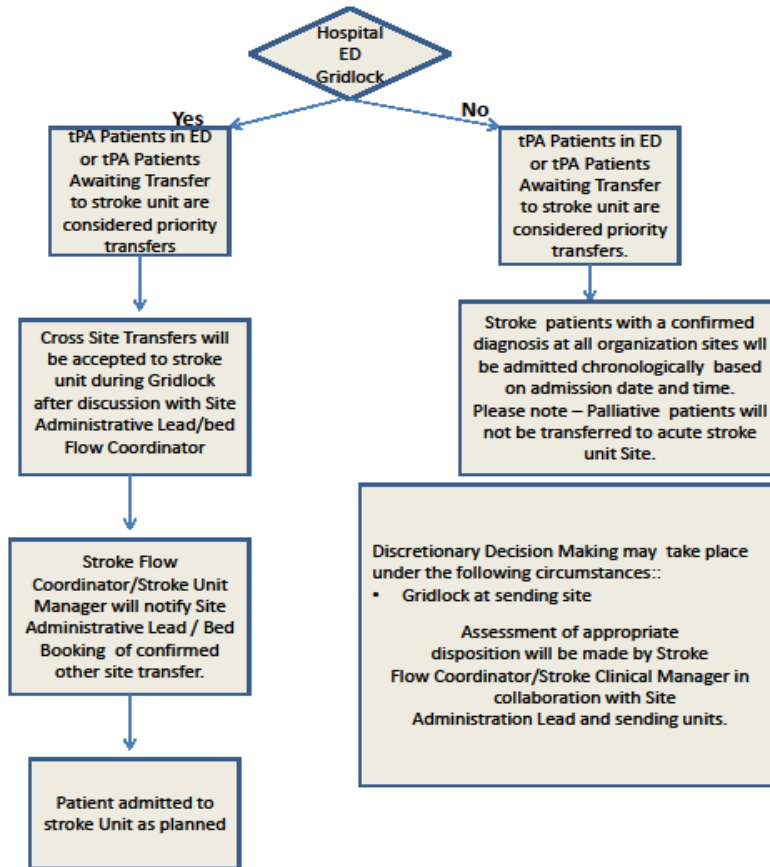http://www.health.gov.on.ca/en/pro/programs/ecfa/docs/qbp_stroke.pdf

*** Medically Stable - ISU:
The patient is medically stable:
- o 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;
- o All medical issues and/or co-morbidities (e.g. excessive shortness of breath, and congestive heart failure) are being managed and are not precluding active participation in the rehabilitation program
- o All key medical investigations have been completed *or* scheduled follow-up appointments made by time of discharge from acute care.

Appendix C: Flow Algorithm

Stroke Patient Flow Guidelines

```
                        Hospital
                          ED
                        Gridlock

        Yes                              No
┌─────────────────────┐      ┌─────────────────────┐
│  tPA Patients in ED │      │  tPA Patients in ED │
│   or tPA Patients   │      │   or tPA Patients   │
│  Awaiting Transfer  │      │  Awaiting Transfer  │
│  to stroke unit are │      │  to stroke unit are │
│  considered priority│      │  considered priority│
│      transfers      │      │      transfers.     │
└─────────────────────┘      └─────────────────────┘

┌─────────────────────┐      ┌─────────────────────┐
│ Cross Site Transfers│      │ Stroke patients with│
│   will be accepted  │      │   a confirmed       │
│   to stroke unit    │      │ diagnosis at all    │
│   during Gridlock   │      │ organization sites  │
│  after discussion   │      │ wll be admitted     │
│  with Site          │      │ chronologically     │
│  Administrative     │      │ based on admission  │
│  Lead/bed Flow      │      │ date and time.      │
│  Coordinator        │      │ Please note –       │
└─────────────────────┘      │ Palliative patients │
                             │ will not be         │
                             │ transferred to      │
                             │ acute stroke unit   │
                             │ Site.               │
                             └─────────────────────┘

┌─────────────────────┐      ┌─────────────────────┐
│  Stroke Flow        │      │ Discretionary       │
│  Coordinator/Stroke │      │ Decision Making may │
│  Unit Manager will  │      │ take place under    │
│  notify Site        │      │ the following       │
│  Administrative     │      │ circumstances::     │
│  Lead / Bed Booking │      │ • Gridlock at       │
│  of confirmed other │      │    sending site     │
│  site transfer.     │      │                     │
└─────────────────────┘      │  Assessment of      │
                             │  appropriate        │
                             │  disposition will   │
┌─────────────────────┐      │  be made by Stroke  │
│ Patient admitted to │      │  Flow Coordinator/  │
│ stroke Unit as      │      │  Stroke Clinical    │
│ planned             │      │  Manager in         │
└─────────────────────┘      │  collaboration with │
                             │  Site Administration│
                             │  Lead and sending   │
                             │  units.             │
                             └─────────────────────┘
```

Adapted from Hamilton Health Sciences Centre (2013)
Acute Stroke Flow Algorithm

Appendix D: Rounds Template

Interdisciplinary rounds planning – team worksheet

There are several different models for interdisciplinary rounds. Consider the following:

1. What patients will be seen each round?
□ All patients on unit
□ Patients with urgent care issues and newly admitted patients
□ Patients with urgent care issues and patients nearing discharge
□ Other: _____

2. Who will attend?

□ Patients	□ Allied Health (social work	□ Other (i.e.: spiritual care,
□ Families	PT, OT, SLP, discharge	navigator, educator,
□ Physician	planner, dietitian,	_____)
□ Residents	_____)	
□ Nurse		

3. Who will lead the discussion about each attribute? What Quality and Safety checks are relevant to our patients?

4. Do we need a team lead? If so, who is the most appropriate person for this role?

5. What time will we host rounds?
        □ AM _____
        □ PM _____

6. How will rounds discussions be documented?

7. How will patients and families be informed about rounds? Who will inform patients and families?

8. How will we accommodate families who can't physically be present for rounds? (e.g., families from northern or rural areas)

9. How will we identify and address patient's and family's individual needs for rounds? (e.g., translators, cultural and spiritual needs, etc.)
Obtained from:
https://www.colleaga.org/sites/default/files/attachments/Interdisciplinary-Rounding-Module-Sept-2015-Print.pdf

Appendix E: Recommended Stroke Unit Quality Indicators

Utilize the table below with Decision Support, Health Records, and/or clinical teams involved in data collection to create reports which will allow monitoring for stroke unit improvements.

It is important to note that among reporting bodies (e.g. CIHI, OSN, MOHLTC/HQO, Accreditation Canada), there are differences and often ongoing refinement to indicator definitions, sample populations, as well as targets and benchmarks. It is important to be aware of these factors prior to comparing stroke unit performance to established benchmarks and targets. As an example, the stroke cohort in the QBP Clinical Handbook for Stroke excludes strokes occurring as post admission complications (in-hospital strokes) as well as subarachnoid hemorrhages, but these stroke sub-types may be included in other data sets.

An asterisk (*) denotes the indicator is very commonly used by stroke units (acute, integrated, or rehabilitation) in Ontario, according to the results of the **Provincial Stroke Unit Survey (2015).**

Appendix E: Stroke Unit Quality Indicators

LEGEND: A=Acute R=Rehabilitation I=Integrated (Acute+ Rehabilitation)

Stroke Unit Indicators	Data Definition/Calculation	Data Source	Indicator Source & Benchmark, Target or Threshold	Comments & Considerations
*Proportion of patients **treated in a designated Stroke Unit** anytime during their inpatient stay **A/R/I**	Numerator: Number of stroke/TIA patients who spent time on a Stroke Unit Denominator: Total number of stroke/TIA patients admitted to hospital • Calculate n, %	CIHI DAD- Project 340 **(A/I)** Chart Audit **(R)**	**Ontario Stroke Report**– Proportion of stroke/TIA patients treated on a Stroke Unit at any time during their inpatient stay **Benchmark: 75.0%** **CSBPRs** 2021 (H&S) Quality of Stroke Care in Canada: Key Quality Indicators & Stroke Case Definitions **(Target > 75% (excluding TIA & SAH)** based on Canadian Stroke Audit **QBP** Module 3, Admission to Acute Module 4, Admission to Inpatient Rehabilitation Facility Baseline Results, Appendix A, Indicator Technical Information	Comments Define the type of Stroke Unit model being measured CIHI Project 340: Documentation that patient was admitted directly to Stroke Unit or was transferred to Stroke Unit after admission regardless of duration of stay on a Stroke Unit QBP Definition of a Stroke Unit: A geographical unit with identifiable co- located beds that are occupied by stroke patients 75% of the time and have a dedicated interprofessional team with expertise in stroke care including, at minimum, nursing, physiotherapy, occupational therapy and speech-language pathology Considerations Calculate by stroke subtype

Stroke Unit Indicators	Data Definition/Calculation	Data Source	Indicator Source & Benchmark, Target or Threshold	Comments & Considerations
Indicators Specific to the <u>Acute</u> Phase of Stroke Care				
*Proportion of patients with **Dysphagia Screening** in an acute care setting **A/I**	<u>Numerator:</u> Number of stroke patients with documented dysphagia screen in the ED or inpatient acute care setting <u>Denominator:</u> Total number of stroke patients including the ED and inpatient acute care • Calculate n, % **Exclusion Criteria** Denominator: • Patients with TIA	CIHI DAD CIHI NACRS Project 640	**CSBPRs** 2021 (H&S) Quality of Stroke Care in Canada: Key Quality Indicators & Stroke Case Definitions **(Target > 80%)** based on Canadian Stroke Audit **QBP** <u>Module 1,</u> Early Assessment **Ontario Stroke Report Card** Indicator 9 - Proportion of acute stroke (excluding TIA) patients with a documented initial dysphagia screening performed during admission within 72 hours to acute care **Benchmark: 87.5% (2012/13)**	<u>Considerations</u> Timing of dysphagia screen: Calculate mean, median time from patient arrival to dysphagia screen-**threshold: within 24 hours.**
Proportion of patients who have **AlphaFIM®** completed on or before day 3 from acute stroke admission **A/I**	<u>Numerator:</u> Total number of inpatient stroke admissions with AlphaFIM® assessment completed on or before day 3 of admission documented <u>Denominator:</u> Total number of stroke patients • Calculate n, % **Exclusion Criteria** <u>Denominator:</u> • Patients with TIA	CIHI DAD-Project 740	**QBP** <u>Module 3,</u> Admission to Acute Care <u>Module 6,</u> Pre-discharge/ Discharge Planning **Target: AlphaFIM® completed on or before day 3 of admission**	<u>Comments</u> CIHI 740 AlphaFIM® score – Projected FIM 13 Raw Motor Rating and Projected FIM 5 Raw Cognitive Rating were documented

Stroke Unit Indicators	Data Definition/Calculation	Data Source	Indicator Source & Benchmark, Target or Threshold	Comments & Considerations
Proportion of patients discharged from hospital with **Antithrombotic Therapy** **A/I**	Numerator: Number of ischemic stroke/TIA patients who are discharged from hospital on antithrombotic medication(s)(including patients with contraindications) Denominator: Total number of ischemic/TIA stroke patients discharged alive • Calculate n, % **Exclusion Criteria** Denominator: Patients who died in hospital, Patients with hemorrhagic stroke	CIHI DAD CIHI NACRS Project 340	**QBP** Module 3, Admission to Acute Care Module 5, Secondary Prevention	Comments Includes all classes of antithrombotics: antiplatelets or anticoagulants
*Proportion of inpatients that experience **at least one Complication** **A/I**	Numerator: Number of stroke/TIA patients that experience at least one confirmed complication while in hospital Denominator: Total number of stroke/TIA patients admitted to hospital • Calculate n, %	CIHI DAD	**CSBPRs** 2021 (H&S) Quality of Stroke Care in Canada: Key Quality Indicators & Stroke Case Definitions **Performance Measurement Manual** (Canadian Stroke Strategy, 2008) Acute-4.2, i, p. 24	Comments Complications to consider include: pneumonia, urinary tract infection, venous thrombo- embolism, skin pressure ulcers, GI bleed, & secondary intracerebral bleed CIHI-Type II post admit co-morbidity Calculate by each complication type Calculate by stroke subtype, age, & gender Complications must be new - not a continuation of a pre- existing co-morbidity or condition Considerations Calculate by each complication type Calculate by stroke subtype, age, & gender

Stroke Unit Indicators	Data Definition/Calculation	Data Source	Indicator Source & Benchmark, Target or Threshold	Comments & Considerations
Indicators Specific to the <u>Rehabilitation</u> Phase of Stroke Care				
Proportion of patients admitted to Inpatient Rehabilitation **with severe stroke (RPG 1100 or 1110)** from acute care setting **R/I**	<u>Numerator:</u> Number of stroke patients with severe disability (RPG 1100 or 1110) in inpatient rehabilitation <u>Denominator:</u> Total number of stroke (RCG-1) patients admitted to inpatient rehabilitation	CIHI NRS	**QBP** <u>Module 4,</u> Admission to Inpatient Rehabilitation <u>Facility Baseline Results,</u> Appendix A, Indicator Technical Information <u>Ontario Stroke Report Card</u> Indicator 18-Proportion of patients admitted to inpatient rehabilitation with severe stroke **Benchmark: 58.7% (2014/15)**	<u>Comments</u> For QBP, results are expressed as the proportion of severe stroke admissions in which the patient was admitted to inpatient rehabilitation within 7 days of acute hospital admission. The denominator is the number of admissions in which the patient was admitted to inpatient rehabilitation within 30 days of acute hospital discharge.
*Mean total Rehabilitation Intensity minutes per day per stroke patient in a rehabilitation setting **R/I**	<u>Numerator:</u> Total minutes of therapy provided by PT, OT, SLP, PTA, OTA, and CDA <u>Denominator:</u> Active length of stay See OSN calculation: • [Calculation Method](#) • Calculate in minutes per day	CIHI NRS	**QBP** <u>Module 4,</u> Admission to Inpatient Rehabilitation **Target: At least 3 hours of direct task- specific therapy per day by the interprofessional stroke team at least 6 days per week** **Ontario Stroke Report** Mean number of minutes per day of direct therapy that inpatient stroke rehabilitation patients received	<u>Comments</u> Rehabilitation Intensity is the amount of time the patient spends in individual, goal-directed rehabilitation therapy, focused on physical, functional, cognitive, perceptual and social goals to maximize the patient's recovery, over a seven day/week period. It is time that a patient is engaged in active face-to-face treatment, which is monitored or guided by a therapist

Stroke Unit Indicators	Data Definition/Calculation	Data Source	Indicator Source & Benchmark, Target or Threshold	Comments & Considerations
* Median **FIM Efficiency** for all stroke (RCG-1) **R/I**	Numerator: SUM (FIM Discharge - FIM admission) for all stroke patients (RCG-1) Denominator: Length of Stay of stroke patients admitted to inpatient rehabilitation Then calculate median FIM efficiency by RCG-1 based on each case. Inclusion Criteria Numerator: All stroke patients admitted to inpatient rehabilitation who have both an admission and discharge FIM score completed Exclusion Criteria Denominator: Patients readmitted to acute care or transferred to another facility before completion of inpatient rehabilitation	CIHI NRS	**CSBPRs 2021** (H&S) Quality of Stroke Care in Canada: Key Quality Indicators & Stroke Case Definitions (Target: 25th percentile = 20 point change in FIM score **Ontario Stroke Report Card** Indicator 16- Median FIM® efficiency for moderate stroke in inpatient rehabilitation **Benchmark: 1.5 (2014/15)**	
Indicators for Stroke Unit Care (Acute, Integrated, and Rehabilitation)				
Proportion of patients with documentation of **Patient and Caregiver Education** **A/R/I**	Numerator: Number of stroke/TIA patients who have documentation in their record of the occurrence of patient/caregiver education Denominator: Total number of stroke/TIA patients admitted to hospital Calculate n, %	Chart Audit	**QBP** Module 3, Admission to Acute Care Module 4, Admission to Rehabilitation	

Stroke Unit Indicators	Data Definition/Calculation	Data Source	Indicator Source & Benchmark, Target or Threshold	Comments & Considerations
Proportion of patients with documentation of **Depression Screening** **A/R/I**	Numerator: Number of stroke/TIA patients with documentation to indicate screening for depression using valid tool Denominator: Total number of stroke/TIA patients admitted to hospital • Calculate n, % **Exclusion criteria** Denominator: Patients who died in hospital	Chart Audit	**CSBPRs** 2021 (H&S) Quality of Stroke Care in Canada: Key Quality Indicators & Stroke Case Definitions **(Rehab)** **QBP** Module 3, Admission to Acute Care	Comments Note the standard tool that was used (e.g., PHQ9)
Proportion of patients with documentation of **Vascular Cognitive Impairment Screening (VCI)** **A/R/I**	Numerator: Number of stroke/TIA patients with documentation to indicate screening for cognitive impairment using valid tool Denominator: Total number of stroke/TIA patients admitted to hospital • Calculate n, % **Exclusion criteria** Denominator: Patients who died in hospital	Chart Audit	**CSBPRs** 2021 (H&S) Quality of Stroke Care in Canada: Key Quality Indicators & Stroke Case Definitions **(Rehab)** **QBP** Module 3, Admission to Acute Care	Comments Note the standard tool that was used (e.g., MoCA)
Patient/Family Experience **Staff Satisfaction** **A/R/I**	Patient/Family experience in stroke unit care. Staff satisfaction with implementation of stroke unit and stroke unit care elements.	Patient / Family satisfaction-experience-based survey (NRCC- Picker); telephone follow-up Staff Satisfaction-Survey; focus group interviews	• Patient/Family experience at or after discharge • Staff satisfaction during and after stroke unit implementation	Considerations Qualitative evaluation elements about experience/ satisfaction with delivery of care, education and training, system and practice-level changes

Stroke Unit Indicators	Data Definition/Calculation	Data Source	Indicator Source & Benchmark, Target or Threshold	Comments & Considerations
Indicators Related to Length of Stay and Discharge Disposition				
*Median **Length of Stay** in an acute care hospital setting (Total, Acute, and ALC LOS) **A/I**	Numerator: Number of acute hospital days for stroke/TIA patients admitted and discharged from time of admission (inpatient acute) until hospital discharge (time patient left hospital) Denominator: Total number of stroke/TIA patients Then calculate median LOS based on each case. Calculate in days for Total, Acute and ALC Exclusion Criteria Numerator: • Days in acute setting classified as inpatient rehabilitation patient signed out (AMA) Denominator: Records where patient signed out (AMA)	CIHI DAD Project 640- if calculating Stroke Unit portion of LOS	**CSBPRs** 2021 (H&S) Quality of Stroke Care in Canada: Key Quality Indicators & Stroke Case Definitions **Target in Acute ≤ 8 days** **QBP** Module 3, Admission to Acute **Target 3 days for TIA, 5 days for Ischemic Stroke, & 7 days for Intracerebral Hemorrhagic Stroke** Facility Baseline Results, Appendix A, Indicator Technical Information **Ontario Stroke Report Card** Indicator 10- Proportion of ALC days to total LOS in acute care **Benchmark:** **8.2% (2014/15)**	Comments • Calculate LOS by stroke subtype Considerations • Calculate 90th percentile for total, acute, and ALC (QBP) • Calculate proportion of ALC days to total LOS in acute as % (where patients had at least 1 ALC day) • Calculate total LOS separated by location (e.g., ED arrival to physically left ED, Stroke Unit (at least 80% of time spent in a Stroke Unit), ALC)
Median **time from stroke onset to admission to Inpatient Rehabilitation** **A/R/I**	Numerator: Number of days for stroke patients from time of stroke symptom onset until admission date to inpatient rehabilitation Denominator: Total number of stroke patients admitted to inpatient rehabilitation Then calculate median days based on each case. • Calculate in days **Exclusion Criteria** Denominator: Patients with TIA	CIHI DAD CIHI NRS	• **CSBPRs** 2021 (H&S) Quality of Stroke Care in Canada: Key Quality Indicators & Stroke Case Definitions **QBP** **Target: Admission to Inpatient Rehabilitation within 7 days of Acute Care Admission** **Facility Baseline Results,** Appendix A, Indicator Technical Information **Ontario Stroke Report** Median number of days between stroke (excluding TIA) onset and admission to stroke inpatient rehabilitation	Considerations Calculate separately by median length of time from stroke onset to stroke rehabilitation referral, and stroke rehabilitation referral to admission to stroke inpatient rehabilitation

Stroke Unit Indicators	Data Definition/Calculation	Data Source	Indicator Source & Benchmark, Target or Threshold	Comments & Considerations
*Proportion of patients **Admitted to Inpatient Rehabilitation** from acute care setting **A/I**	Numerator: Number of stroke patients admitted to inpatient rehabilitation following discharge from acute care setting Denominator: Total number of stroke patients discharged alive Calculate n, %	CIHI DAD CIHI NRS	**QBP** Rehabilitation- Module 4, Admission to Inpatient Rehabilitation Facility Baseline Results, Appendix A, Indicator Technical Information **Ontario Stroke Report (target > 30%)**	Comments Not all stroke patients go directly to inpatient rehabilitation; all patients who appear in inpatient rehabilitation within 30 days should be included. In general, patients who qualify for inpatient *rehabilitation are those with an early AlphaFIM® score of 40 to 80* (QBP) Considerations Calculate by AlphaFIM® Score
Proportion of patients discharged to each **Discharge Disposition** specific to the setting **A/R/I**	Numerator: Number of stroke/TIA patients discharged to each discharge disposition Denominator: Total number of stroke/TIA patients discharged alive Calculate by n, % Exclusion Criteria: Denominator Patients who die in hospital	CIHI DAD CIHI NRS	**QBP** Rehabilitation- Module 4, Admission to Inpatient Rehabilitation Facility Baseline Results, Appendix A, Indicator Technical Information **Ontario Stroke Report Card** Indicator 12 - Proportion of stroke (excluding TIA) patients discharged from acute care who received a referral for outpatient rehabilitation **Benchmark: 12.8% (2012/13)** Indicator 19- Proportion of stroke/TIA patients discharged from acute care to LTC/CCC (excluding patients originating from LTC/CCC) **Benchmark: 2.5% (2014/15)**	Considerations Calculate by AlphaFIM® score In general, patients who qualify for inpatient rehabilitation are those with an early AlphaFIM® score of 40 to 80 (QBP) Patients with a AlphaFIM® score of greater than 80, would typically go to outpatient rehabilitation (QBP)

Stroke Unit Indicators	Data Definition/Calculation	Data Source	Indicator Source & Benchmark, Target or Threshold	Comments & Considerations
*Median **Length of Stay** in an inpatient rehabilitation setting **by Rehabilitation Patient Group (RPG)** **R/I**	Numerator: Total number days for all stroke patients per RPG admitted to inpatient rehabilitation setting and discharged from time of patient arrival at inpatient rehabilitation setting until hospital discharge (time patient physically left rehabilitation hospital setting) Denominator: Total number of stroke patients per RPG discharged from inpatient rehabilitation setting • Calculate in days **Inclusion Criteria:** Numerator: • Active Rehabilitation LOS days and ALC days (at least 1 ALC day) **Exclusion Criteria:** Numerator: Inpatient days categorized as acute care	CIHI NRS	**QBP** Module 4, Admission to Inpatient Rehabilitation **OSN Stroke Reference Group Benchmarks are: RPG 1100 = 48.9 day LOS** **RPG 1110 = 41.8 day LOS** **RPG 1120 = 35.8 day LOS** **RPG 1130 = 25.2 day LOS** **RPG 1140 = 14.7 day LOS** **RPG 1150 = 7.7 day LOS** **RPG 1160 = 0 day LOS** **Ontario Stroke Report Card** Indicator 15- Proportion of inpatient stroke rehabilitation patients achieving RPG active LOS target **Benchmark:** **80.8% (2014/15)**	Considerations Calculate proportion of ALC days to total LOS in rehabilitation Calculate LOS by stroke subtype Calculate total LOS separating active LOS, service interruptions (e.g., return to acute for short period of times), and ALC days
System-Level Indicators				
In-hospital **Mortality Rate** (30-day all-cause) **A/I**	Numerator: Number of stroke/TIA patients who died within 30 days of admission Denominator: Total number of stroke/TIA patients admitted to hospital Calculate n, % **Exclusion Criteria** Numerator: Stroke patients who died in hospital more than 30 days after hospital admission	CIHI DAD CIHI NACRS	**QBP** Facility Baseline Results, Appendix A, Indicator Technical Information • Risk-adjusted all- cause mortality per 100 patients admitted to acute care facility (DAD and RPDB as data sources) **Ontario Stroke Report** Risk adjusted stroke/TIA mortality rate at 30 days (per 100 patients)	Comments Mortality rates in the Ontario Stroke Report Card and QBP reports are risk-adjusted & include patients who die not only in hospital but elsewhere within 30 days of acute admission Considerations Calculate 7-day mortality Calculate by stroke subtype Calculate by location (e.g., ED, Stroke Unit)

Stroke Unit Indicators	Data Definition/Calculation	Data Source	Indicator Source & Benchmark, Target or Threshold	Comments & Considerations
Readmission Rate (30 & 90-day all-cause) **A/I**	Numerator: Total number of readmissions to ED (unplanned visits to ED) or inpatient care due to any cause within 30 &/or 90 days of discharge Denominator: Total number of stroke/TIA patients discharged alive from inpatient acute care • Calculate n, % **Exclusion Criteria** Denominator: • Elective admissions or transfers Patients who die in hospital	CIHI DAD CIHI NACRS	**QBP** Facility Baseline Results, Appendix A, Indicator Technical Information Risk-adjusted, non-elective 30- day all-cause Risk-adjusted, non-elective 90- day all-cause **Ontario Stroke Report** Age and sex adjusted readmission rate at 30 days for patients with stroke/TIA for all diagnoses (per 100 patients)	Comments QBP refers to all- cause readmission rate and includes 30 and 90-day readmission rates & 90-day all-cause unplanned visits to ED Readmission rates in the QBP and Ontario Stroke Report Card are risk-adjusted Considerations Calculate if part of stay was in Stroke Unit Calculate by stroke sub- type
Additional Indicators for Consideration				
Interprofessional Communication **A/R/I**	How often do team members meet for case review? What type of communication is used between patient transitions?	Observation Survey	*Target: At least one to two interprofessional meetings per week* **CSBPRs** 2021 (H&S) Acute. See Optimal Acute Inpatient Stroke Care **Literature:** • Elf, Putilova, Ohrn & von Koch (2009) • Perry (2005) • Thijs, Peeters, Dewindt, Hemelsoet, De KlippelLaloux et al. (2009) • West, Langhorne, Bernhardt (2013)	Considerations Qualitative & Quantitative Evaluation Elements: • Regular interactions, Interactive forums, joint discharge planning, electronic record in place, stroke pathway in place, case management

Stroke Unit Indicators	Data Definition/Calculation	Data Source	Indicator Source & Benchmark, Target or Threshold	Comments & Considerations
Use of Best Practice Protocols and Patient Clinical Pathways A/R/I	Number of Stroke/TIA best practice protocols & pathways in use.	Electronic Record Systems Chart Audit	**Literature:** • Putilova, Ohrn & von Koch (2009) • Thijs, Peeters, Dewindt, Hemelsoet, De Klippel, Laloux et al. (2009). • West, Langhorne, Bernhardt (2013)	<u>Considerations</u> Quantitative Evaluation of number of protocols, pathways, order sets in place
Quality Improvement Plans/Projects A/R/I	Number of QI plans in development or implemented related to improving stroke/TIA patient and system outcomes.	Semi-Structured Interview	**Literature:** Perry (2005)	<u>Considerations</u> Qualitative Evaluation Elements: • CQI programs in place, CQI methods adapted, feedback loops , QA

Appendix F – Sample Dashboards

Dashboards are a commonly used tool to gauge performance and progress towards goals that can be designed to monitor specific indicators. Dashboards are often a one-page snapshot of the indicators that were selected to be monitored on a regular basis. Current data is displayed allowing stakeholders to visualize where they are with respect to current performance and to observe and react to trends over time.

Hamilton Health Sciences (HHS) provided examples of the stroke unit dashboard in use at their organization. These pictures are for illustrative purposes only.

HHS Dashboard Example 1

HHS Dashboard Example 2

		YTD Actual	YTD Target	Actual Jul-Sep/15	Actual Apr-Jun/15	Actual Jul-Sep/14	12 month trend
Stroke/TIA 30 day In- hospital Mortality Rates	✅	8.4 %	22.0 %	8.4 %		8.3 %	
Proportion of all Ischemic Stroke Pts who receive acute thrombolytic therapy (tPA)	✅	25.8 %	7.0 %	25.8 %		18.9 %	
MEDIAN time from patient arrival in the ER to administration of acute thrombolytic agent	✅	39.0	60.0	39.0		42.0	
Proportion of Patients receiving tPA within one hour	✅	81.7 %	50.0 %	81.7 %		85.5 %	
Proportion of stroke patients treated on a stroke unit ACUTE - Ischemic Stroke, TIA and ICH	✅	86.2 %	75.0 %	86.2 %		79.2 %	
ACUTE Length of Stay (MEDIAN)	✅	5	14	5		6	
Percent of readmits to acute care for stroke related causes	✅	0.9 %	12.0 %	0.9 %		1.0 %	
Proportion of acute patients discharged to inpatient rehabilitation - Total	✅	32.2 %	15.0 %	32.2 %		40.7 %	
Proportion of Ischemic Stroke/TIA pts prescribed antithrombotic therapy on ACUTE discharge	✅	92.2 %	90.0 %	92.2 %		99.7 %	
Percent of pts with initial dysphagia screening during admission to ACUTE inpt care	✅	88.9 %	85.0 %	88.9 %		78.0 %	
Percent of pts with initial dysphagia screening during admission - REHABILITATION	✅	99.3 %	85.0 %	99.3 %		97.5 %	
Proportion of all stroke patients treated on a stroke unit - REHABILITATION	✅	100.0 %	80.0 %	100.0 %		100.0 %	
Rehabilitation Length of Stay (MEDIAN)	✅	23	14	23		26	
Percent of Ischemic Stroke/TIA patients prescribed antithrombotic therapy on REHAB discharge	✅	94.6 %	90.0 %	94.6 %		100.0 %	

Appendix G - Supplemental Indicators and Evaluation Information

Canadian Stroke Best Practice Recommendations

www.strokebestpractices.ca

A sub-section called *Performance Measures* is included on the webpage for each section of the Canadian Stroke Best Practice Recommendations. These measures relate specifically to the section's topic and are more all-inclusive than the indicators listed in this document.

Accreditation Canada, Stroke Distinction https://accreditation.ca/stroke-distinction/

Stroke Distinction is a "highly specialized quality improvement program" (Accreditation Canada, 2021). This program recommends use of a number of quality indicators.
"The program's rigorous and highly specialized standards are based on the Canadian Best Practice Recommendations for Stroke Care." (Accreditation Canada, 2016)