Specialized Stroke Rehabilitation

BACKGROUND:

As Ontario's health care system transitions to an integrated care model, Ontario Health Teams (OHTs) will be responsible for providing a full and coordinated continuum of care for all but the most specialized conditions and procedures, which will be delivered by existing specialized providers.

The provision of rehabilitation occurs at different points in the continuum of care and may require a general or a specialized approach depending on the patient population requiring treatment. The University of Toronto's Physical Medicine and Rehabilitation group alongside the GTA Rehab Network identified the following rehabilitation populations that require a specialized approach. These populations include acquired brain injury (ABI), amputee, burn, cardiovascular, complex trauma, oncology, pediatric, pulmonary, spinal cord injury, and stroke. These specialized rehabilitation programs should continue to be provided regionally and/or provincially and be part of system-level planning and capacity building.

The need for specialized expertise and the lower volumes of patients for some populations may preclude the provision of rehabilitation close to home. However, rehabilitation for high volume populations (e.g., older adults with frailty, patients with progressive neurological conditions, musculoskeletal issues, or with injuries from minor trauma) should be provided as part of care that is close to home across all OHTs.

This document provides rehabilitative care best practice guidance for Ontario Health Teams to assist in determining when the expertise of a specially trained interprofessional team with a focused skill set is necessary to provide safe, effective and efficient care. It was developed by the GTA Rehab Network's Specialized Rehab Advisory Group and local rehabilitation expert working groups.

PURPOSE:

The purpose of this document is to provide a guide that:

- delineates what services and resources are required to provide specialized rehabilitation
- differentiates when specialized rehabilitation services are needed to support one of the ten rehabilitation populations (acquired brain injury, amputee, burn, cardiovascular, complex trauma, oncology, pediatric, pulmonary, spinal cord injury and stroke)

GUIDING PRINCIPLES:

There are a few guiding principles of specialized rehabilitation service provision that are common across all ten populations addressed in this document:

- Service is provided by a specially trained interprofessional team with a focused skill set. Rehabilitation professionals include audiologists, dietitians, kinesiologists, occupational therapists, physical medicine and rehabilitation specialists (physiatrists), physiotherapists, psychologists, rehabilitation nurses, respiratory therapists, social workers and speech-language pathologists, as well as other regulated health professionals.[1]

[1] Rehabilitative Care Alliance. (Nov 2020). Patient and System-Level Benefits of Rehabilitative Care A primer to support planning by OHTs and Ontario Health.

Note: The Ontario Ministry of Health provides additional information on other regulated health providers.

- Expertise is demonstrated in programs that see higher volumes of patients. A critical mass of patients must be seen to maintain expertise and clinical efficiency and effectiveness.
    - Critical mass is a threshold for the volume of cases that must be seen by a rehabilitation program to maintain expertise.
- Service provision requires clinical coherence with other programs or services across the continuum of care.
    - Clinical coherence is a relationship between specialized rehabilitation program/service and a complementary service(s) across the continuum that support comprehensive integrated patient care. For example, inpatient ABI rehabilitation has clinical coherence with acute neuro/neurosurgery, outpatient ABI clinics and community care.
- Service provision requires specialized resources including extensive capital and/or operating resources.
- Specialized rehabilitation programs should be funded equitably across the province to ensure there is sufficient capacity to meet evidence-based requirements for rehabilitative care.

HOW TO USE THIS RESOURCE:

The tables that follow provide a description of what specialized rehabilitation provides for the population (Table A) and a description of the patient profile to facilitate determining the optimal rehabilitation sector/location (Table B). This resource will be used for the following rehabilitation populations:

- Acquired brain injury (ABI)
- Amputee
- Burn
- Cardiovascular
- Complex trauma
- Oncology
- Pediatric
- Pulmonary
- Spinal Cord Injury (SCI)
- Stroke

To find specialized rehabilitation programs, see **Rehab Finder**.

KEY ASPECTS OF SPECIALIZED REHABILITATION PROGRAMS FOR PATIENTS FOLLOWING STROKE

Table A

The following section describes the four guiding principles for specialized rehabilitation programs. In order to be considered a specialized rehabilitation program, all aspects of these principles need to be in place and should not be considered in isolation.

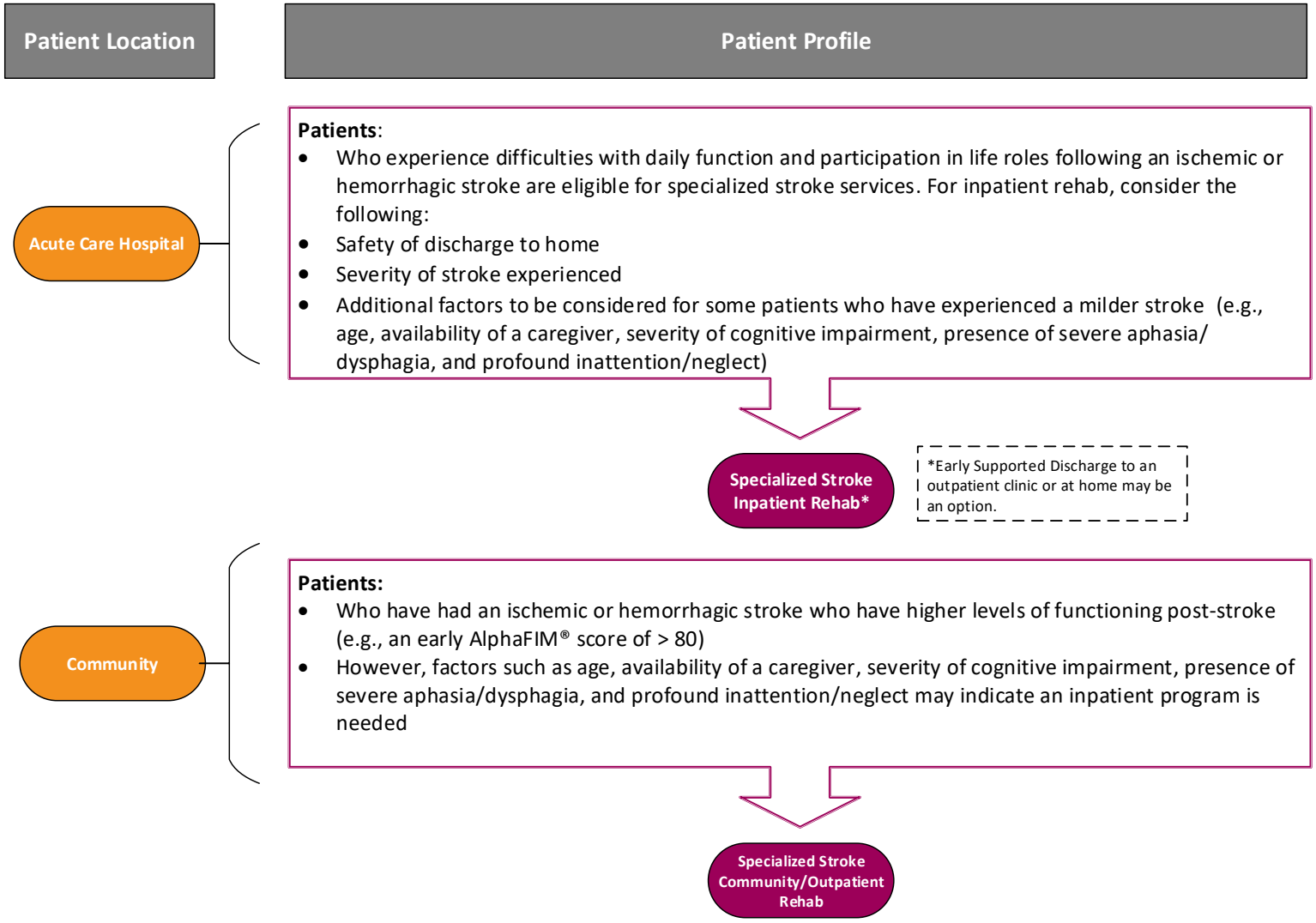
Tables A and B on specialized stroke rehabilitation are based on information by the Toronto Stroke Networks on Integrated Stroke Care.

Guiding Principles for Specialized Services	REHABILITATION PROGRAM: STROKE REHABILITATION
Requires team expertise and competency	• Stroke care providers must have the knowledge base and expertise to select and provide appropriate interventions, then adapt and progress these interventions in response to the rapidly evolving needs of each stroke patient. • Specialized stroke teams are interprofessional and include at minimum a dietitian, nurse, occupational therapist, physician, physiotherapist, social worker, and speech-language pathologist. • To provide specialized stroke care, all team members must have appropriate and up-to-date credentials/licenses in their fields. Team members are provided with additional training regarding the unique needs of individuals with stroke. • Specialized stroke teams provide care reflective of the Canadian Stroke Best Practice Recommendations and Toronto Stroke Networks' Stroke Standards of Care. • Specialized stroke teams receive ongoing professional development to deliver current evidence-based stroke services.
Provides services to a critical mass	• Providing care to a critical mass (minimum volume) of stroke patients supports development of a specialized skillset for stroke teams and sustainability of specialized stroke services. • The volume of patients seen in specialized stroke programs includes all levels of complexity associated with stroke presentation, resulting in effective and efficient care. • Integrated stroke care requires a coordinated approach across the continuum (e.g., inpatient rehabilitation and community-based/outpatient rehabilitation including in-person, virtual rehabilitation or a hybrid of both) to ensure persons experiencing stroke receive access to expert best practice care. • Specialized stroke teams should be located in a geographically-defined area to support a critical mass of patients.

Guiding Principles for Specialized Services	REHABILITATION PROGRAM: STROKE REHABILITATION
Services require clinical coherence with other programs	• Stroke care is provided across a continuum, starting in hyperacute settings at the onset of stroke and continuing into the community months to years after a stroke. • Since stroke care is provided across a continuum in multiple care settings, coordination with several other specialized and non-specialized services is essential to support a patient's journey of recovery after stroke. • Effective coordination of services is required for positive patient outcomes and equitable, timely access to services for stroke patients.
Services require specialized resources	• Substantial capital and operating resources are required to create and sustain stroke services, including dedicated human resources, space, and equipment to conduct assessments and deliver interventions. These resources are not typically available in non-specialized settings and require specific knowledge and expertise to operate (e.g., endovascular thrombectomy, thrombolysis, videofluoroscopic swallowing studies, fibreoptic endoscopic evaluation of swallowing, augmentative communication, assistive technology, driving assessment and intervention, return to work). • Stroke care interventions are time sensitive and resource dense. Stroke care is progressive and dynamic, requiring specialized, individually tailored resources that extend well beyond the acute episode of care. • Providing care aligned with best practices for stroke rehabilitation intensity requires extensive human resource requirements in the form of specialized stroke teams • Acute rehabilitation services should provide a minimum of 45 minutes of direct therapy per patient per day, at least six days a week, with a recommended therapist to patient ratio of 1:6 for occupational therapy and physiotherapy and 1:12 for speech-language pathology • Inpatient rehabilitation services should provide a minimum of 3 hours of direct task-specific therapy per patient per day by the core therapies for at least six days per week, with a recommended therapist to patient ratio of 1:6 for occupational therapy and physiotherapy and 1:12 for speech-language pathology • Outpatient rehabilitation and in-home services recommended intensity of rehabilitation is 2-3 times/week for 8-12 weeks • Early Supported Discharge services should be provided 5 days per week at the same level of intensity as they would have received in the inpatient setting to meet patient needs.

DETERMINING THE OPTIMAL SPECIALIZED REHABILITATION LOCATION BASED ON PATIENT PROFILE: STROKE

Overview - Stroke Rehabilitation (see Table B for details)



PATIENT PROFILE FOR THOSE REQUIRING SPECIALIZED STROKE REHABILITATION

Table B

The following section describes the patient profile for those who require specialized rehabilitation. It is not meant to reflect comprehensive admission criteria.

To achieve optimal functional outcomes, stroke rehabilitative care requires a coordinated and collaborative interprofessional team approach that should be holistic and person-centred addressing the specific needs of the patient. It is a progressive, dynamic, goal-oriented process aimed at enabling persons whose daily life functioning and participation have been affected by stroke to achieve their optimal physical, cognitive, visual, perceptual, emotional, communicative, and social levels of function. Caregivers and family members of persons who have experienced stroke play a key role as part of the care team and should be provided with ongoing education and support, especially during transitions in care.

LOCATION OF REHABILITATION	PATIENT PROFILE: STROKE REHABILITATION

Inpatient Rehabilitation	Patients who experience difficulties with daily function and participation in life roles following an ischemic or hemorrhagic stroke are eligible for specialized stroke services. Stroke rehabilitation begins soon after a stroke has occurred, with early assessment by rehabilitation professionals in acute care.
	
	Specialized teams on stroke units provide care aligned with best practice and evidence. Research on specialized stroke unit care shows that receiving care on a stroke unit is associated with reduced risk of death and disability compared to receiving stroke care in less coordinated settings.[2]
	
	Patient profile:
	• Stroke patients must be medically stable and have identifiable goals for rehabilitation, recovery, and participation.
	• Typically, rehabilitation is recommended for any person experiencing stroke with resulting functional difficulties.
	• When deciding whether a patient should be referred to a community-based or inpatient rehabilitation setting, several factors should be considered. For inpatient rehabilitation, these include:
	  ○ If someone cannot be safely discharged home, they should be considered for inpatient rehabilitation
	  ○ The severity of stroke experienced.

[2] Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. Cochrane Database Syst Rev 2013, pp. Cd000197

LOCATION OF REHABILITATION	PATIENT PROFILE: STROKE REHABILITATION
	▪ Patients with a moderate to severe stroke (i.e., an early AlphaFIM® score of 40 to 80)[3] or severe stroke (i.e., an early AlphaFIM® score < 40) require inpatient rehabilitation.[4] ▪ Patients with an early AlphaFIM® score of > 80 would typically go to outpatient rehabilitation. However, depending on age, availability of a caregiver, severity of cognitive impairment, presence of severe aphasia/dysphagia, and profound inattention/neglect, patients may need inpatient rehabilitation. ○ Intensity of rehabilitation and therapy services provided ▪ Inpatient rehabilitation services should provide a minimum of 3 hours of direct task-specific therapy per patient per day by the core therapies for at least six days per week, with a recommended therapist to patient ratio of 1:6 for occupational therapy and physiotherapy and 1:12 for speech-language pathology • Stroke rehabilitation aims to optimize function post-stroke, prevent secondary disabilities or medical conditions, support independence, and help stroke survivors attain a high quality of life. • Together, members of a specialized stroke team support care in the following areas: ○ cognition ○ perception ○ communication ○ mobility ○ psychosocial ○ participation ○ risk factor management ○ occupation • Specialized stroke rehabilitation also supports transitions of care, e.g., home assessments, modifications or equipment to support transitions, and caregiver training and education to support transitions.

[3] AlphaFIM® and FIM® are trademarks of Uniform Data System for Medical Rehabilitation (UDSMR), a division of UB Foundation Activities, Inc. All Rights Reserved.

[4] Health Quality Ontario and Ministry of Health and Long-Term Care. (2016). Quality-Based Procedures: Clinical Handbook for Stroke (Acute and Post-acute), (December 2016). Toronto: Health Quality Ontario. Retrieved from: http://www.health.gov.on.ca/en/pro/programs/ecfa/docs/qbp_stroke.pdf

LOCATION OF REHABILITATION	PATIENT PROFILE: STROKE REHABILITATION

	Other Considerations:
	• If a patient requires inpatient rehab, consider if **Early Supported Discharge (ESD)** to an outpatient clinic or at home is an option.
	  ○ Early supported discharge services are provided 5 days per week and offered in an ambulatory setting or in-home). ESD is designed to reduce length of hospital stay and still *provide the same intensity as inpatient rehabilitation*, and as such is an acceptable form of rehabilitation and should be offered to a select group of patients when available and provided by a well-resourced, coordinated specialized team. Criteria for ESD candidacy include:
	  ▪ Mild to moderate disability
	  ▪ Ability to participate in rehabilitation from the point of discharge
	  ▪ Medically stable, availability of appropriate nursing care, necessary resources and support services (e.g., family, caregivers, and home care services)
	.

Community-Based/ Outpatient Rehabilitation Specialized stroke rehabilitation can be provided in-person, virtually or as hybrid of both.[5]	Any patients experiencing difficulties with daily function and participation in life roles following an ischemic or hemorrhagic stroke are eligible for specialized stroke services. Stroke rehabilitation begins soon after a stroke has occurred, with early assessment by rehabilitation professionals in acute care. **Patient profile:** • Individuals with higher levels of functioning post-stroke (e.g., an early AlphaFIM® score of > 80)[6] would typically be considered for community-based rehabilitation. However, there are other factors that may indicate an inpatient program is needed (e.g., age, availability of a caregiver, severity of cognitive impairment, presence of severe aphasia/dysphagia, and profound inattention/neglect[7]). • Outpatient rehabilitation and in-home services recommended intensity of rehabilitation is 2-3 times/week for 8-12 weeks

[5] See Appendix A for key considerations for virtual rehabilitation.

[6] AlphaFIM® and FIM® are trademarks of Uniform Data System for Medical Rehabilitation (UDSMR), a division of UB Foundation Activities, Inc. All Rights Reserved.

[7] Health Quality Ontario and Ministry of Health and Long-Term Care. (2016). Quality-Based Procedures: Clinical Handbook for Stroke (Acute and Post-acute), (December 2016). Toronto: Health Quality Ontario. Retrieved from: http://www.health.gov.on.ca/en/pro/programs/ecfa/docs/qbp_stroke.pdf

LOCATION OF REHABILITATION	PATIENT PROFILE: STROKE REHABILITATION

	• Stroke rehabilitation aims to optimize function post-stroke, prevent secondary disabilities or medical conditions, support independence, and help stroke survivors attain a high quality of life.
	• Together, members of a specialized stroke team support care in the following areas:
	  ○ cognition
	  ○ perception
	  ○ communication
	  ○ mobility
	  ○ psychosocial
	  ○ participation
	  ○ risk factor management
	  ○ occupation
	• Specialized stroke rehabilitation also supports transitions of care, e.g., home assessments, modifications or equipment to support transitions, and caregiver training and education to support transitions.
	
	Other Considerations:
	• Stroke secondary prevention services are also provided at designated centres by specialized teams.

APPENDIX A: KEY CONSIDERATIONS ON VIRTUAL REHABILITATION

There are several benefits of providing virtual rehabilitation for patients and clinicians. These include: reducing travel time for patients and increasing the ability to reach patients in more remote communities.[1] There are also challenges with providing virtual rehabilitation. These may include the lack of equipment and/or comfort with using technology, the absence of contextual factors that are more available during in-person sessions, limitations around safety (e.g., hands on assistance with exercises), and limitations in the ability to conduct some assessments and interventions. [1, 2, 3] The following are key considerations for conducting virtual rehabilitation:

- Select patients carefully. Not every patient or every patient's goals are suitable and the decision to use a virtual format should be considered on a case-by-case basis using professional clinical judgment.[4]
- Confirm that the patient has the required technology and the needed support/assistance for virtual rehabilitation and that the patient's setting is in a safe, secure and confidential environment. [5]
- Follow professional regulatory college guidelines about obtaining consent; the collection, use and retention of personal health information; safety considerations and emergency planning, and having the proper skills and training to provide virtual rehabilitation.[2, 4, 5]
- Use the most effective and secure virtual platform to provide high quality and confidential virtual rehabilitation (e.g., use high speed internet, a confidential setting, and a platform that is compliant with the Personal Information Protection and Electronics Document Act (PIPEDA)).[5]
- Have support processes in place to provide technical support and address technical issues for both the patient and provider and to address language, communication or other accessibility issues.[4]
- Consider use of virtual, in-person or a mix of the two formats (e.g., hybrid model) depending on the patient's resources, needs, and goals.
- Use indicators to evaluate the impact, effectiveness, quality and safety of virtual rehabilitation.[4]

References:

[1] Bland, K., Bigaran, A., Campbell, K., Trevaskis, M., & Zopf, E. (2020). Exercising in isolation? The role of telehealth in exercise oncology during the COVID-19 pandemic and beyond. *Physical Therapy, 100* (10), 1713-1716. https://doi.org/10.1093/ptj/pzaa141

[2] McGuff, R., Cotie, L., Harris, J., Baer, C., Brisco, K., Chipperfield, D., Moran, B., Pike, R., Ross, M., Yeung, C., Blacquiere, D., Mountain, A., Gierman, N., Lindsay, P. (Eds.), on behalf of Heart and Stroke Foundation of Canada in collaboration with the Canadian Association of Cardiovascular Prevention and Rehabilitation. (2021). *Virtual Cardiovascular Prevention and Rehabilitation Implementation Toolkit*. Heart and Stroke Foundation of Canada. Available from https://www.heartandstroke.ca/-/media/1-stroke-best-practices/vcr-toolkit-final-2021.ashx?rev=e2d73b476e6e4ef1abc09624992566d0

[3] Turolla, A., Rossettini, G., Viceconti, A., Palese, A., & Geri, T. (2020). Musculoskeletal physical therapy during the COVID-19 pandemic: Is telerehabilitation the answer? *Physical Therapy, 100* (8), 1260-1264. https://doi.org/10.1093/ptj/pzaa093

[4] Rakover, J., Laderman, M., & Anderson, A. (2020). Telemedicine: Centre Quality and Safety. *Healthcare Executive, 35*(5), 48-49.

[5] O'Neil, J. (n.d.) Tele-Rehabilitation in times of COVID-19. Canadian Physiotherapy Association. https://physiotherapy.ca/times-covid-19

APPENDIX B: STAKEHOLDER ENGAGEMENT

UNIVERSITY OF TORONTO, TEMERTY FACULTY OF MEDICINE, DIVISION OF PHYSICAL MEDICINE & REHABILITATION [a]		
PM&R Specialist	**Job Title and Affiliation**	**Specialized Rehab Population**
Dr. Mark Bayley	Medical Director and Physiatrist-in-Chief, University Health Network/Toronto Rehab and Altum Health Professor, University of Toronto [a] Vice-Chair, Coordinating Council, GTA Rehab Network Adjunct Scientist, Institute of Clinical and Evaluative Sciences, Sunnybrook Health Sciences Centre	All Populations
Dr. Larry Robinson	Program Chief, Rehabilitation Services, Sunnybrook Health Sciences Centre Director and Professor, Division of Physical Medicine and Rehabilitation, University of Toronto [a] Senior Scientist, Evaluative Clinical Sciences, St. John's Rehab Research Program, Sunnybrook Research Institute	All Populations
Dr. Farooq Ismail	Physician (Physical Medicine and Rehabilitation Specialist), West Park Healthcare Centre Assistant Professor, University of Toronto [a]	Stroke Rehab
Dr. Shannon Leigh MacDonald	Physician (Physical Medicine and Rehabilitation Specialist), Sinai Health/Hennick Bridgepoint Hospital Co-chair, Integrated Stroke Flow Committee, Toronto Stroke Networks, Lecturer, University of Toronto [a]	Stroke Rehab
Dr. Tri Nguyen	Physician (Physical Medicine and Rehabilitation Specialist), Unity Health/Providence Healthcare	Stroke Rehab
Dr. Satyendra Sharma	Physician (Physical Medicine and Rehabilitation Specialist), University Health Network/Toronto Western Hospital Baycrest Health Sciences, Sinai Health System/Hennick Bridgepoint Hospital, Sunnybrook Health Sciences Centre Director, Spasticity Clinic, Sunnybrook Health Sciences Centre Assistant Professor, University of Toronto [a]	Stroke Rehab

SPECIALIZED REHAB ADVISORY GROUP	
Organization	**Member**
Holland Bloorview Kids Rehabilitation Hospital	Joanne Maxwell
Sinai Health System/Hennick Bridgepoint Hospital	Wendy Cameron
Sunnybrook Health Sciences Centre/St John's Rehab	Dr. Larry Robinson (Co-Chair) Siobhan Donaghy
Unity Health Toronto/Providence Healthcare	Anna Marie Sneath
University Health Network/Toronto Rehab	Dr. Mark Bayley (Co-Chair) Joanne Kwong
West Park Healthcare Centre	Angela Dowd
GTA Rehab Network	Charissa Levy Sue Balogh Sanja Milicic Iafrate Sharon Ocampo-Chan

Specialized Stroke Rehabilitation: Tables A and B are based on information by the Toronto Stroke Networks on Integrated Stroke Care.