

## Specialized Amputee 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.<sup>1</sup>

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<sup>1</sup> 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 AN AMPUTATION INJURY

Table A

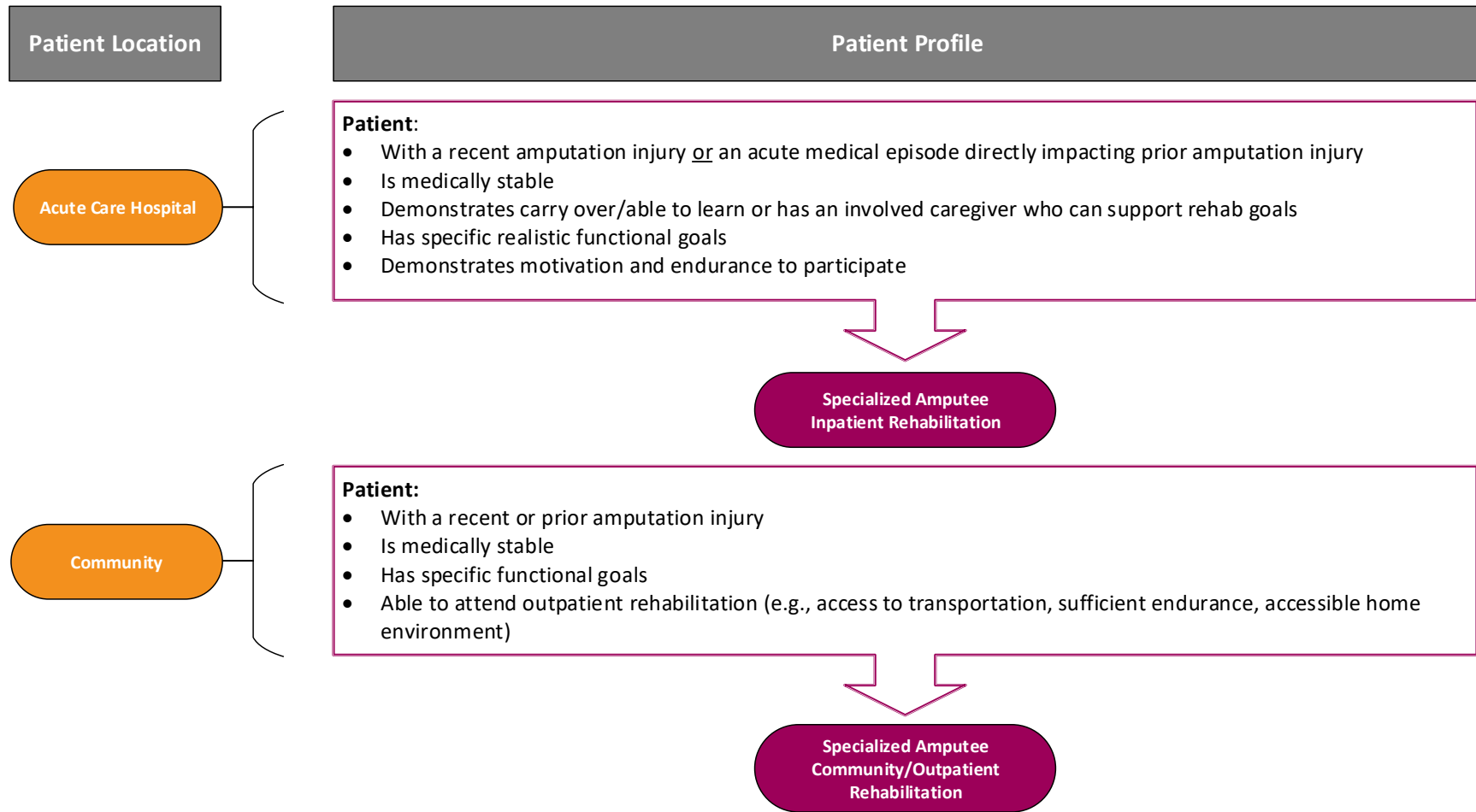
The following section describes four guiding principles for specialized rehabilitation programs. In order to be considered a specialized rehabilitation program, all aspects of these principles need to be in place and should not be considered in isolation.

Guiding Principles for Specialized Services	REHABILITATION PROGRAM: AMPUTEE REHABILITATION
<p><b>Requires team expertise and competency</b></p>	<ul style="list-style-type: none"> <li>• All members of the interprofessional team demonstrate ongoing competencies and application of evidence-based practices to deliver care that minimizes the impact of impairments, reduces activity limitations and maximizes participation. This includes capability to:               <ul style="list-style-type: none"> <li>– Provide pre-amputation counselling</li> <li>– Determine prosthetic candidacy</li> <li>– Provide prosthetic care for suitable patients at all levels of limb loss - including ability to prescribe and fabricate all prosthetic types: conventional/body-powered/hybrid/myoelectric and cosmetic, and experience with component technologies such as microprocessor knees and ankles</li> <li>– Offer prosthetic and non-prosthetic training, education and recommendations (inpatient and outpatient)</li> <li>– Provide orthotic care to protect the remaining limb (e.g., custom foot orthotics, offloading braces, ankle foot orthoses [AFOs] for foot drop, Charcot Restraint Orthotic Walker [CROW] walkers for Charcot arthropathy).</li> </ul> </li> <li>• Offer ongoing interprofessional care and follow-up from Physical Rehabilitation and Medicine, Physiotherapy, Occupational Therapy, Social Work, Prosthetics, Clinical Nutrition and Nursing/Wound care.</li> </ul>
<p><b>Provides services to a critical mass</b></p>	<ul style="list-style-type: none"> <li>• To be considered experts, rehabilitation clinicians should carry a caseload of patients requiring amputee rehabilitation on a regular basis to develop/maintain clinical skills to address patients' needs.</li> <li>• The volume of patients seen in specialized inpatient and/or outpatient rehabilitation programs should be inclusive of all amputee-related levels of complexity and needs to be sufficient to maintain expertise in the amputee rehabilitation population, resulting in effective and efficient care.</li> </ul>

Guiding Principles for Specialized Services	REHABILITATION PROGRAM: AMPUTEE REHABILITATION
	<ul style="list-style-type: none"> <li>• Specialized amputee rehabilitation has the capacity to offer specialized services across multiple sectors/locations of care (e.g., inpatient rehabilitation and community-based/outpatient rehabilitation including in-person, virtual rehabilitation or a hybrid of both).</li> </ul>
<p><b>Services require clinical coherence with other programs</b></p>	<ul style="list-style-type: none"> <li>• Relationships with Vascular, Plastic and Orthopaedic Surgery Programs</li> <li>• Psychosocial support provided by Psychiatry, Psychology, Social Work and/or Occupational Therapy</li> <li>• Housing support and counselling provided by Social Work/Care Coordinators</li> <li>• Funding advice and counselling for prosthetics and equipment (e.g., team members with Assistive Devices Program [ADP] authorization status for prosthetics and mobility devices)</li> <li>• Organizational partnerships with Dialysis Centres to provide rehabilitation and prosthetic opportunities to dialysis patients</li> </ul>
<p><b>Services require specialized resources</b></p>	<ul style="list-style-type: none"> <li>• Prosthetics/Orthotics Facility affiliated or integrated with the program</li> <li>• Available peer support</li> <li>• Education for the family on challenges regarding use of prosthetic and adherence</li> <li>• Long term community follow-up and secondary prevention care for dysvascular limb loss patients (Chiropractic, diabetic education).</li> <li>• Objective amputee outcomes are documented and followed</li> </ul>

DETERMINING THE OPTIMAL SPECIALIZED REHABILITATION LOCATION BASED ON PATIENT PROFILE: AMPUTATION INJURY

Overview - Amputation Injury Rehabilitation (see Table B for details)



**PATIENT PROFILE FOR THOSE REQUIRING SPECIALIZED AMPUTEE 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, amputee rehabilitation requires a coordinated and collaborative interprofessional team approach that should be holistic and person-centred addressing the specific needs of the patient. Patients and families are viewed as partners in service delivery and the interprofessional team works in collaboration with them to deliver care.

LOCATION OF REHABILITATION	PATIENT PROFILE: AMPUTEE REHABILITATION
<b>Inpatient Rehabilitation</b>	<p><b>Patient profile:</b></p> <ul style="list-style-type: none"> <li>• Person with a recent amputation injury <u>or</u> a person experiencing an acute medical episode that is directly impacting prior amputation injury</li> <li>• Medically stable for transfer to a rehabilitation program</li> <li>• Carry over/able to learn, or has an involved caregiver who can support rehabilitation goals</li> <li>• Has specific realistic functional goals (non-prosthetic, prosthetic and/or decreasing burden of care)</li> <li>• Demonstrates sufficient motivation and endurance to participate in the rehabilitation program</li> </ul> <p><b>Other Considerations:</b></p> <ul style="list-style-type: none"> <li>• Goal of rehabilitation is to maximize the patient’s functional potential to make them as independent as possible, non-prosthetically or prosthetically. Non-prosthetic and prosthetic therapy may be completed in one admission. Alternatively, the patient may be discharged from a non-prosthetic program to heal or condition further and then re-admitted for prosthetic training.</li> <li>• Consultation may be provided by the amputee specialized rehabilitation team to general rehabilitation team for patients with prior amputations who are experiencing general medical/other issues.</li> <li>• Consultation may be provided by the amputee specialized rehabilitation team to other specialized rehabilitation teams (e.g., burns, complex trauma, stroke) as required for comprehensive care.</li> </ul>
<b>Community-Based/ Outpatient Rehabilitation</b>	<p><b>Patient profile:</b></p> <ul style="list-style-type: none"> <li>• Person with a recent <u>or</u> prior amputation injury</li> <li>• Medically stable for community-based rehabilitation</li> <li>• Has specific functional goals (non-prosthetic, prosthetic and/or decreasing burden of care)</li> </ul>

LOCATION OF REHABILITATION	PATIENT PROFILE: AMPUTEE REHABILITATION
Specialized amputee rehabilitation can be provided in-person, virtually or as a hybrid of both <sup>2</sup>	<ul style="list-style-type: none"> <li>• Able to attend the outpatient program (e.g., has access to transportation, has sufficient endurance to participate, accessible home environment)</li> </ul>

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<sup>2</sup> See Appendix A for key considerations for virtual rehabilitation.

## 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.<sup>1</sup> 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.<sup>1, 2, 3</sup> 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.<sup>4</sup>
- 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.<sup>5</sup>
- 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.<sup>2, 4, 5</sup>
- 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 \(PIPEDA\)](#)).<sup>5</sup>
- 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.<sup>4</sup>
- 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.<sup>4</sup>

### References:

<sup>1</sup> 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>

<sup>2</sup> McGuff, R., Cotie, L., Harris, J., Baer, C., Brisco, K., Chipperfield, D., Moran, B., Pike, R., Ross, M., Yeung, C., Blacquiére, 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>

<sup>3</sup> Turolla, A., Rossetini, 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>

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

<sup>5</sup> 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 <sup>a</sup>		
PM&R Specialist	Job Title and Affiliation	Specialized Rehab Population
Dr. Mark Bayley	Medical Director and Psychiatrist-in-Chief, University Health Network/Toronto Rehab and Altum Health Professor, University of Toronto <sup>a</sup> 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 <sup>a</sup> Senior Scientist, Evaluative Clinical Sciences, St. John’s Rehab Research Program, Sunnybrook Research Institute	All Populations
Dr. David Berbrayer	Medical Director, Physical Medicine and Rehabilitation Clinics, Sunnybrook Health Sciences Centre Academic Physician (Physical Medicine and Rehabilitation Specialist), Holland Bloorview Kids Rehabilitation Hospital Associate Professor, University of Toronto <sup>a</sup> Chairman, Section of PM&R of the Ontario Medical Association Vice Chair, Continuing Professional Development Committee of the Canadian Association of Physical Medicine and Rehabilitation	Amputee Rehab
Dr. Steven Dilkas	Physician (Physical Medicine and Rehabilitation Specialist), Amputee Rehabilitation Program, West Park Healthcare Centre Assistant Professor, University of Toronto <sup>a</sup>	Amputee Rehab
Dr. Amanda Lee Mayo	Physician (Physical Medicine and Rehabilitation Specialist), Amputee and Cardiac Rehabilitation Programs, Sunnybrook Health Sciences Centre/St. John’s Rehab Assistant Professor, University of Toronto <sup>a</sup>	Amputee Rehab Cardiovascular Rehab

<b>SPECIALIZED REHAB ADVISORY GROUP</b>	
<b>Organization</b>	<b>Member</b>
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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 lafrate Sharon Ocampo-Chan

<b>SPECIALIZED REHAB WORKING GROUP – AMPUTEE REHAB</b>	
<b>Organization</b>	<b>Member</b>
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Unity Health Toronto/ Providence Healthcare	Rony Toma Sarane Poon
West Park Healthcare Centre	Stefania Lehkyj Julia Sterling
GTA Rehab Network	Charissa Levy Sanja Milicic lafrate Sharon Ocampo-Chan