

Specialized Cardiovascular 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 CARDIOVASCULAR REHABILITATION PROGRAMS

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.

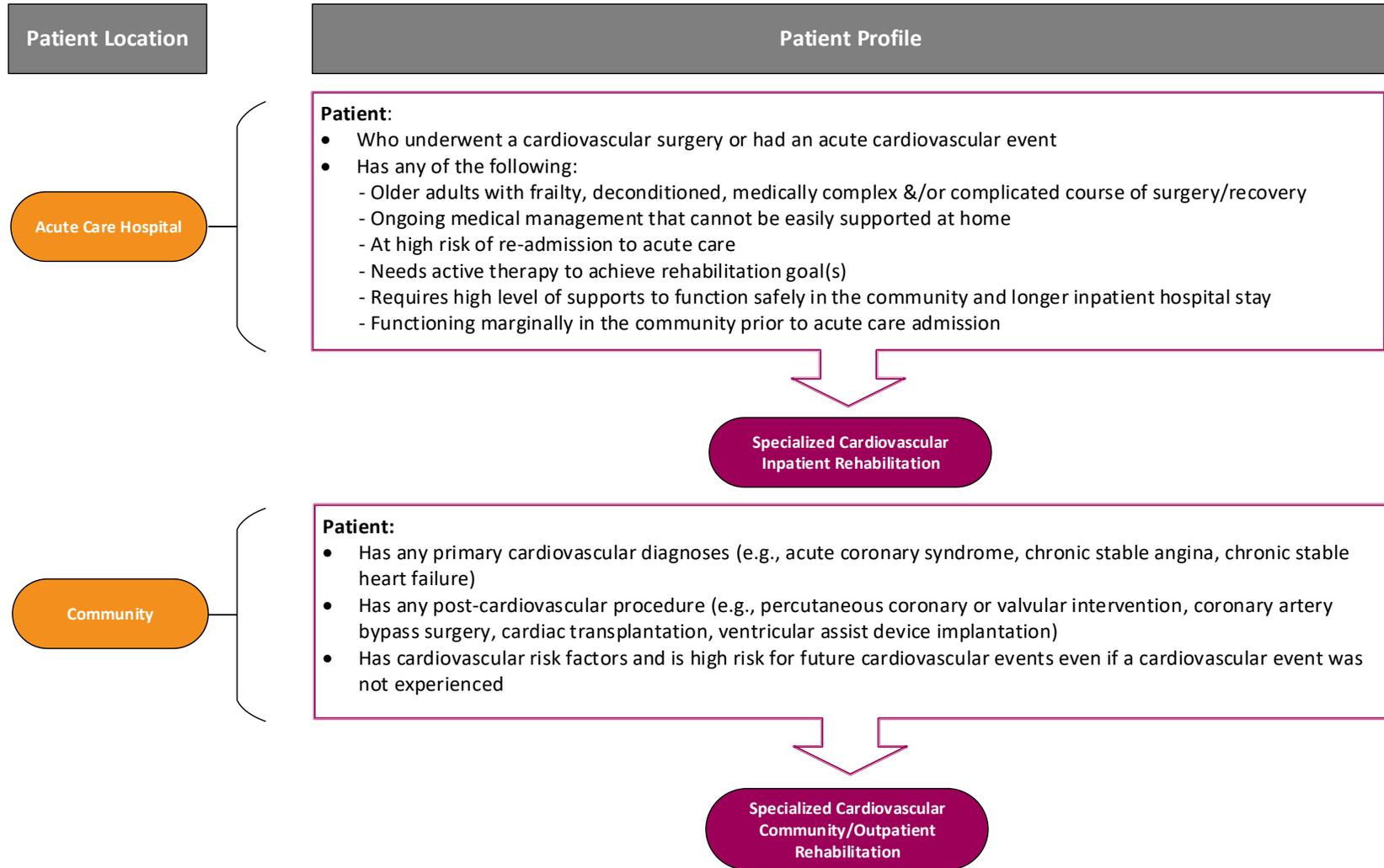
Guiding Principles for Specialized Services	REHABILITATION PROGRAM: CARDIOVASCULAR REHABILITATION
<p>Requires team expertise and competency</p>	<ul style="list-style-type: none"> • Depending on the program and setting, different health professionals are involved as part of the interprofessional team. The type of regulated health care professionals required will depend on the complexity of patients served, the services offered and the size of the program.² Although the composition of the team may differ, the delivery of the core components of cardiovascular rehabilitation (i.e., health behaviour change and education; cardiovascular risk factor management [including exercise, nutrition, mental health and smoking status assessment and related interventions]; and cardioprotective therapies) requires expertise from a range of different health professionals working within their scope of practice while adhering to their college regulations.² • The interprofessional team members: <ul style="list-style-type: none"> – May include, but are not limited to the following: physicians, nurses, physiotherapists, occupational therapists, speech-language pathologists, social workers, pharmacists, dietitians, kinesiologists, psychologists, cardiac technologists. – Must be knowledgeable in cardiovascular conditions and profession-specific treatment for these conditions (example: appropriate type/level of exercise or activities, discipline-specific treatment strategies [i.e., nutrition, mental health], counselling skills, cognitive behavior therapy, etc.). – Must maintain their skills and competencies, including keeping up to date with evidence-based research. – Have basic cardiac life support training – Have expertise in secondary prevention strategies and connections with community services for ongoing secondary prevention (example: exercise facilities, diabetes clinics, primary care providers)

² Cardiac Care Network (2014). Standards for the provision of cardiovascular rehabilitation in Ontario. Prepared by Cardiac Care Network of Ontario. Available from https://www.corhealthontario.ca/resources-for-healthcare-planners-&-providers/rehabilitation/CCN_Cardiovascular_Rehab_Standards_2014.pdf

Guiding Principles for Specialized Services	REHABILITATION PROGRAM: CARDIOVASCULAR REHABILITATION
	<ul style="list-style-type: none"> – The program has an established standardized referral process to a Diabetes Education Program, or has a professional in the team with a Certified Diabetes Educator designation (CDE®).
Provides services to a critical mass	<ul style="list-style-type: none"> • To be considered experts, rehabilitation clinicians should carry a caseload of patients requiring cardiovascular rehabilitation on a regular basis to develop/maintain clinical skills to address patients’ needs. • The volume of patients seen in specialized inpatient and/or outpatient rehabilitation programs should be inclusive of a range of cardiovascular-related levels of complexity and needs to be sufficient to maintain expertise in the cardiovascular rehabilitation population, resulting in effective and efficient care. • Specialized cardiovascular rehabilitation has the capacity to offer specialized services across multiple sectors/locations of care (e.g., inpatient rehabilitation and outpatient/ community-based rehabilitation including in-person, virtual rehabilitation or a hybrid of both in-person and virtual).
Services require clinical coherence with other programs	<ul style="list-style-type: none"> • Coordinated care with cardiovascular care specialists/clinics (including cardiologists, cardiovascular surgeons) and home care services • Diagnostic services including stress tests, electrocardiogram (ECG) tests, etc. • Mental health services including psychosocial/psychiatry support • Patient/family and/or peer support services
Services require specialized resources	<ul style="list-style-type: none"> • Equipment to measure cardiovascular status (e.g., blood pressure equipment, oxygen saturation, ECG tracing, glucose meter) • Weight scale such as chair, bed or standing scale to monitor volume status • Integrated health information system and technology to provide virtual care, timely access to laboratory test results • Outpatient cardiovascular rehabilitation exercise testing availability or partnership to obtain exercise testing

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

Overview – Cardiovascular Rehabilitation (see Table B for details)



PATIENT PROFILE FOR THOSE REQUIRING SPECIALIZED CARDIOVASCULAR 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, cardiovascular 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: CARDIOVASCULAR REHABILITATION
<p>Inpatient Rehabilitation</p>	<p>Patient profile:</p> <ul style="list-style-type: none"> • Typically, patients are transferred from acute care centre following cardiovascular surgery (e.g., coronary bypass or valve replacement) <u>or</u> after an acute cardiovascular event (e.g., myocardial infarction or heart failure).^{3 4 5 6} • In addition, any of the following description or condition contributes to a patient requiring inpatient rehabilitative care: <ul style="list-style-type: none"> – Patients are usually older adults with frailty, deconditioned, medically complex, with cognitive impairment and/or had a complicated course of surgery/recovery, malnourished or at risk of malnutrition (e.g., prolonged ventilation, pulmonary complication, repeat surgery, renal failure and dialysis, stroke, delirium)⁷ – Needs ongoing medical management that cannot be easily supported at home (e.g., fluid management, anticoagulation stabilization, wound healing) – Patient is at high risk of re-admission to hospital

³ Koukoui, F., Desmoulin, F., Lairy, G., Bleinc, D., Boursiquot, L., Galinier, M., Smih, F. & Rouet, P. (2015). Benefits of cardiac rehabilitation in heart failure patients according to etiology: INCARD French study. *Medicine*, 94 (7), 1-9. DOI: 10.1097/MD.0000000000000544.

⁴ Yost, G., Coyle, L., Milkevitch, K., Adair, R., Tatoes, A. & Bhat, G. (2017). Efficacy of inpatient rehabilitation after left ventricular assist device implantation. *Physical Medicine & Rehabilitation*, 9, 40-45. <https://doi.org/10.1016/j.pmrj.2016.05.013>

⁵ Kim, C. et al. (2019). Clinical practice guideline for cardiac rehabilitation for Korea. *Annals of Rehabilitation Medicine*, 43(3), 355-443. <https://doi.org/10.5535/arm.2019.43.3.355>

⁶ La Rovere, M. T. & Traversi, E. (2019). Role and efficacy of cardiac rehabilitation in patients with heart failure. *Monaldi Archives for Chest Disease*, 89(1027) 69-72. <https://doi.org/10.4081/monaldi.2019.1027>

⁷ GTA Rehab Network. (2010). Cardiac rehab definition framework. Available from <http://www.gtarehabnetwork.ca/uploads/File/tools/rehab-definitions-conceptual-framework-cardiac.pdf>

LOCATION OF REHABILITATION	PATIENT PROFILE: CARDIOVASCULAR REHABILITATION
	<ul style="list-style-type: none"> - Needs active therapy to achieve rehabilitation goals(s) including mobility retraining, stairs retraining, basic activities of daily living, retraining for progression of independence, reconditioning and education prior to community discharge including assistive device and/or home modification recommendation for safety - Patient requires a longer inpatient hospital stay due to high level of supports needed to function safely and independently at home/community (e.g., lives alone). However, further acute care stay is not needed as patient is medically stable. - Patient was functioning marginally in the community prior to cardiovascular surgery or acute cardiovascular event.
<p>Outpatient/Community-Based Rehabilitation Specialized cardiovascular rehabilitation can be provided in-person, virtually or as a hybrid of both.⁸</p>	<p>Patient profile:</p> <ul style="list-style-type: none"> • Indications for cardiovascular rehabilitation for individuals with established cardiovascular disease shall include: <ol style="list-style-type: none"> 1) Any primary cardiovascular diagnoses (e.g., acute coronary syndrome, chronic stable angina, chronic stable heart failure)^{9 10 11 12 13 14 15 16}

⁸ See Appendix A for key considerations for virtual rehabilitation

⁹ Cardiac Care Network (2014). *Standards for the provision of cardiovascular rehabilitation in Ontario*. Prepared by Cardiac Care Network of Ontario. Available from https://www.corhealthontario.ca/resources-for-healthcare-planners-&-providers/rehabilitation/CCN_Cardiovascular_Rehab_Standards_2014.pdf

¹⁰ Dalal, H., Doherty, P. (2015). Cardiac rehabilitation. *British Medical Journal*, 351, 1-8. <https://doi.org/10.1136/bmj.h5000>

¹¹ Richards, S., Anderson, L., Jenkinson, C., Whalley, B., Rees, K., Davies, P., Bennett, P., Liu, Z., West, R., Thompson, D. & Taylor, R. (2017). Psychological interventions for coronary heart disease. *Cochrane Database of Systematic Reviews, Issue 4*. Art. No.: CD002902. <https://doi.org/10.1002/14651858.CD002902.pub4>

¹² Long, L., Mordi, I., Bridges, C., Sagar, V., Davies, E., Coats, A., Dalal, H., Rees, K., Singh, S & Taylor, R. (2019). Exercise-based cardiac rehabilitation for adults with heart failure (review). *Cochrane database of systematic reviews, Issue 1*. Art. No.: CD003331. <https://doi.org/10.1002/14651858.CD003331.pub5>

¹³ Dibben, G., Dalal, H., Taylor, R., Doherty, P, Tang, L. & Hillsdon, M. (2017). Cardiac rehabilitation and physical activity: systematic review and meta-analysis. *Heart*, 104(17), 1394-1402. <http://dx.doi.org/10.1136/heartjnl-2017-312832>

¹⁴ Anderson, L., Sharp, G., Norton, R., Dalal, H., Dean, S., Jolly, Kl, Cowie, A., Zawada, A. & Taylor, R. (2017). Home-based versus centre-based cardiac rehabilitation. *Cochrane Database of Systematic Reviews, Issue 6*. Art. No.:CD007130. <https://doi.org/10.1002/14651858.CD007130.pub4>

¹⁵ Rush, K., Hatt, L., Janke, R., Burton, L., Ferrier, M., Tetrault, M. (2018). The efficacy of telehealth delivered educational approaches for patients with chronic disease: A systematic review. *Patient Education and Counseling* 101(8), 1310-1321. <https://doi.org/10.1016/j.pec.2018.02.006>

¹⁶ Halldorsdottir, H., Thoroddsen, A. & Ingadottir, B. (2019). Impact of technology-based patient education on modifiable cardiovascular risk factors of people with coronary heart disease: A systematic review. *Patient Education and Counseling*. <https://doi.org/10.1016/j.pec.2020.05.027>

LOCATION OF REHABILITATION	PATIENT PROFILE: CARDIOVASCULAR REHABILITATION
	<p>2) Post-procedure such as: percutaneous coronary or valvular intervention, coronary artery bypass surgery, cardiac transplantation, ventricular assist device implantation^{17 18 19}</p> <ul style="list-style-type: none"> Individuals who have not experienced a cardiovascular event but have cardiovascular risk factors (e.g., hypertension, diabetes, hyperlipidemia) and are high risk for future cardiovascular events should also be referred to cardiovascular rehabilitation.²⁰ <p>Other Considerations:</p> <ul style="list-style-type: none"> Outpatient/community-based rehabilitation is provided by interprofessional cardiovascular team members under an ambulatory care program either onsite, through telephone or online videoconferencing, or in community settings (e.g., community centres). It can also be combined as a hybrid model with patients attending sessions partially onsite in an ambulatory care facility, and partially virtual (e.g., telephone or online videoconferencing). In addition to attending rehabilitation sessions, patients are also expected to independently carry out their rehabilitation program at home. The ability of outpatient cardiovascular programs to admit patients with certain specialty cardiovascular diagnoses (e.g., cardiac transplantation) is dependent on the expertise of the cardiovascular rehabilitation team (i.e., for treatment). Virtual Cardiovascular Prevention and Rehabilitation Implementation Toolkit²¹ – The Heart and Stroke Foundation in collaboration with the Canadian Association of Cardiovascular Prevention and Rehabilitation (CACPR) supported the development of this toolkit. The toolkit aims to support the delivery of cardiovascular rehabilitation and secondary prevention via virtual

¹⁷ Dalal, H., Doherty, P. (2015). Cardiac rehabilitation. *British Medical Journal*, 351, 1-8. <https://doi.org/10.1136/bmj.h5000>

¹⁸ Richards, S., Anderson, L., Jenkinson, C., Whalley, B., Rees, K., Davies, P., Bennett, P., Liu, Z., West, R., Thompson, D. & Taylor, R. (2017). Psychological interventions for coronary heart disease. *Cochrane Database of Systematic Reviews*, Issue 4. Art. No.: CD002902. <https://doi.org/10.1002/14651858.CD002902.pub4>

¹⁹ Long, L., Mordi, I., Bridges, C., Sagar, V., Davies, E., Coats, A., Dalal, H., Rees, K., Singh, S & Taylor, R. (2019). Exercise-based cardiac rehabilitation for adults with heart failure (review). *Cochrane database of systematic reviews*. Issue 1. Art. No.: CD003331. <https://doi.org/10.1002/14651858.CD003331.pub5>

²⁰ Cardiac Care Network (2014). *Standards for the provision of cardiovascular rehabilitation in Ontario*. Prepared by Cardiac Care Network of Ontario. Available from https://www.corhealthontario.ca/resources-for-healthcare-planners-&-providers/rehabilitation/CCN_Cardiovascular_Rehab_Standards_2014.pdf

²¹ 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>

LOCATION OF REHABILITATION	PATIENT PROFILE: CARDIOVASCULAR REHABILITATION
	modalities by providing guidance and practical tips for health care professionals as they integrate teleconferencing, videoconferencing, secure messaging, or audio digital tools into their practice.

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., 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>

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 Psychiatrist-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. 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 ^a	Amputee Rehab Cardiovascular Rehab
Dr. Paul Oh	Medical Director, GoodLife Fitness Chair & Senior Scientist, Cardiovascular Prevention and Rehabilitation Program, University Health Network/Toronto Rehab and Peter Munk Cardiac Centre Associate Professor, Clinical Pharmacology and Toxicology Division, Faculty of Medicine, University of Toronto	Cardiovascular Rehab
Dr. Sivakumar Gulasingam	Physician (Physical Medicine and Rehabilitation Specialist), University Health Network/Toronto Rehab Assistant Professor, University of Toronto ^a	Cardiovascular Rehab Spinal Cord Injury Rehab

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Unity Health Toronto/ Providence Healthcare	Anna Marie Sneath
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GTA Rehab Network	Charissa Levy Sue Balogh Sanja Milicic Iaftrate Sharon Ocampo-Chan

SPECIALIZED REHAB WORKING GROUP – CARDIOVASCULAR REHAB	
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Thunderbay Regional Health Sciences Centre	Kyle Baysarowich
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