



# Rehabilitative Care Alliance

## Rehabilitative Care Best Practices for Patients with Hip & Knee Replacement

Updated October 2022  
(2019, 2017)

## Table of Contents

<b>Background and Introduction</b> .....	<b>2</b>
Purpose and Intent of Framework .....	2
Development and Update of the Framework .....	3
Considerations .....	5
Equitable & Culturally Appropriate Care.....	5
Conservative Management .....	5
Location of TJR Rehabilitative Care .....	6
Model of TJR Rehabilitative Care .....	7
<i>Figure 1: Referral Decision Tree for Rehabilitative Care</i> .....	8
<b>Considerations for Total Joint Replacement Rehabilitation during and after Pandemic Recovery</b> .....	<b>9</b>
<b>Total Joint Replacement Process Indicators</b> .....	<b>12</b>
Conceptual Framework .....	14
Pre-Operative Care.....	15
Rehabilitation in Acute Care .....	19
Bedded Levels of Rehabilitative Care.....	22
Rehabilitation in Outpatient/Community Clinics .....	27
In-Home Rehabilitative Care .....	34

# Rehabilitative Care Best Practice Framework for Patients with Hip and Knee Replacement

---

## Background and Introduction

### Purpose and Intent of Framework

#### Purpose

Development of the *Rehabilitative Care Best Practice Framework for Patients with Hip and Knee Replacements* was undertaken in 2017 by the Rehabilitative Care Alliance (RCA) to support implementation of the Total Joint Replacement (TJR) Quality Based Procedure (QBP), and the TJR QBP Clinical Handbook, developed by Ontario Health Quality (OHQ – previously Health Quality Ontario).

OHQ has developed Clinical Handbooks for a number of conditions, including total joint replacements, “to serve as a compendium of the evidence-based rationale and clinical consensus driving the development of the policy framework and implementation approach for patients with specific conditions seen in hospitals.”<sup>1</sup> The Total Hip and Knee Replacement handbook includes high level recommendations for post-operative rehabilitative care; however, the extent to which these recommendations can be operationalized across locations of care is limited. The *Rehabilitative Care Best Practice Framework for Patients with Hip and Knee Replacements* meets this need by identifying standardized rehabilitative care best practices, where not already defined in the TJR QBP Clinical Handbook.

In 2018/19, the Ministry of Health implemented "bundled care" for select patient populations with the intent of improving acute/post-acute care coordination and efficiency. To guide provincial implementation of bundled care for patients following simultaneous bilateral hip and knee replacement, the Rehab Care Alliance and Ontario Health Quality worked in collaboration with a provincial subject matter expert group to develop recommendations and update the *Rehabilitative Care Best Practice Framework for Patients with Hip and Knee Replacements* to also include specific consideration of patients with simultaneous bilateral hip and knee replacements.

In 2021/22, as Ontario implemented strategies in keeping with pandemic recovery planning, the RCA recognized that best practice support was needed for new and emerging models of care, given the stricter infection prevention and control measures.

#### Evidence

---

<sup>1</sup> Health Quality Ontario & Ministry of Health and Long-Term Care. (2013). Quality-Based Procedures: Clinical Handbook for Primary Hip and Knee Replacement. Accessed: <http://www.hqontario.ca/Portals/0/Documents/evidence/clinical-handbooks/hip-knee-140227-en.pdf>

Rehabilitative care improves total joint replacement patient outcomes. Following total hip or knee replacement, multidisciplinary rehabilitation improves outcomes at the level of activity and function.<sup>2</sup> Rehabilitation improves strength and gait speed following total hip replacement<sup>3</sup>, and rehabilitative care to restore range of motion is essential to achieving satisfactory function following total knee replacement.<sup>4,5</sup>

### Intent

The Rehabilitative Care Best Practice Framework for Patients with elective Hip and Knee Replacements (the Framework) is intended to:

- Influence best practice across the province;
- Provide a basis for informing and improving quality care for this population; and
- Provide a framework to support an approach to capacity planning that not only considers surgical allocations but also rehabilitative care allocations, and the optimal models/locations of rehabilitative care.

### Development and Update of the Framework

The Framework was originally developed by the TJR QBP Task and Advisory Groups of the RCA. These provincial groups consisted of stakeholders with clinical and system level expertise, including representatives from surgical and acute care services, bedded rehabilitative care programs, community physiotherapy clinics, private rehab clinics, regional home and community care services, and the Ontario Association of Community Care Access Centres.

With the Ministry of Health launching the bundled care funding model in 2018/19 for simultaneous bilateral hip and knee replacements, hospitals participating in the new model began to take a close look at their post-acute pathways, pointing to the need for best practice guidance. A group of subject matter experts was therefore convened by the Rehabilitative Care Alliance and Health Quality Ontario, representing organizations across Ontario who perform high numbers of simultaneous bilateral total joint replacements. The RCA-HQO Bilateral TJR Task Group, including orthopaedic surgeons and rehabilitative care professionals, updated the framework to include best practice recommendations for both unilateral and simultaneous bilateral hip and knee replacement.

---

<sup>2</sup> Khan F, et al. (2008). Multidisciplinary rehabilitation programmes following joint replacement at the hip and knee in chronic arthropathy. *Cochrane Database of Systematic Reviews; Issue 2. Art. No.: CD004957. DOI: 10.1002/14651858.CD004957.pub3.*

<sup>3</sup> Coulter, CL, et al. (2013) Physiotherapist-directed rehabilitation exercises in the outpatient or home setting improve strength, gait speed and cadence after elective total hip replacement: a systematic review. *Journal of Physiotherapy* Volume 59, Issue 4: 219–226

<sup>4</sup> Rowe PJ, et al. (2000). Knee joint kinematics in gait and other functional activities measured using flexible electrogoniometry: how much knee motion is sufficient for normal daily life? *Gait Posture*; 12:143-55.

<sup>5</sup> Mockford BJ, et al. (2008). Does a standard outpatient physiotherapy regime improve the range of knee motion after primary total knee arthroplasty? *J Arthroplasty*; 23:1110-4.

In 2021/22, the RCA TJR Best Practices Task Group further revised the framework based on an updated literature review, input from subject matter, patient & care partner, current data and new models of care.

### **The Framework**

The Framework was developed based on existing TJR care pathways, which identify best practice recommendations specific to different levels/locations of rehabilitative care. The Framework includes best practice recommendations for pre-operative care, in addition to acute care, bedded, outpatient/community clinics and in-home rehabilitation. Given that the post-operative trajectory and rehab outcomes are often dependent upon and informed by preoperative practices, pre-operative care was included in the framework. Key components of this care include pre-operative screening, assessment, education and planning.

For simultaneous bilateral hip and knee replacement, it was noted in 2019 that there was wide variation in where and how rehabilitative care was provided, i.e., inpatient rehabilitation versus outpatient rehabilitation or in-home services. Given that the available clinical evidence was relatively sparse for bilateral joint replacement, rehabilitative care recommendations were developed based on consensus and informed by available administrative data on current practices in Ontario. The Framework was updated based on these recommendations.

### **Best Practice Recommendations**

The TJR QBP Task and Advisory Groups established guiding principles to inform the identification and development of practice recommendations for inclusion in the framework. The groups agreed that the best practice recommendations would:

- Be patient centered
- Address the rehabilitative care needs for the majority of TJR patients and, where possible, identify considerations for TJR patients with more complex needs
- Be evidenced based whenever possible; in the absence of high quality evidence, make recommendations based on expert consensus

In addition to extensive iterative review and endorsement by the TJR QBP Task and Advisory groups, RCA-HQO Bilateral TJR Task Group, TJR Best Practices Task Group and the RCA Patient & Caregiver Advisory Group, the original and updated best practice recommendations included in the framework were validated through consultation by additional external provincial stakeholders. Stakeholders included orthopedic surgeons, clinicians working in rehabilitative programs, and cross-sectoral representatives from regional rehab care committees from across the province.

## Considerations

### Equitable & Culturally Appropriate Care

All people with hip and knee arthritis requiring conservative and/or surgical management should receive equitable and culturally appropriate care. Equity does not require that everyone receive the same rehabilitative care interventions; it requires fairness and justice in the processes of care and patient outcomes. Differential treatment and resource distribution must be provided to achieve comparable outcomes among all people undergoing TJR; redistribution recognizes and addresses barriers to opportunities that could prevent achievement of their rehabilitative care goals.<sup>6</sup> This individualized approach to care enables consideration of the social determinants of health unique to a person.

An anti-racism approach is a systematic method of analysis and a proactive course of action that recognizes the existence of racism, including systemic racism, and actively seeks to identify, reduce and remove the racially inequitable outcomes and power imbalance between groups and the structures that sustain these inequities.<sup>6</sup> Action is needed to respond to embedded historical and current injustices through an anti-oppressive approach, by proactively understanding the role that health and other systems may play in marginalization (in the past and today).<sup>7</sup>

Rehabilitative care should use an inclusive and affirming approach and be conducted in a culturally appropriate, inclusive environment.<sup>8,9</sup> Inclusion recognizes and embraces diversity. Diversity refers to the visible and invisible qualities, experiences and identities that shape a person's individuality, uniqueness and how they are perceived. Dimensions of diversity include race, ethnicity, gender, gender identity, sexual orientation, socioeconomic status, age, physical or mental abilities, religious or spiritual beliefs, and political ideology.<sup>6</sup>

Rehabilitative care should consider the intersecting experiences of marginalization and the needs of the whole person. For example, a Black gay man may face racism inside the LGBTQ2S (Lesbian, Gay, Bisexual, Transgender, Queer and Two-Spirit) community and homophobia in the Black community.<sup>6,8</sup>

### Conservative Management

Although this framework does not provide detailed guidance on conservative management of hip and knee arthritis, it should be noted that an initial clinical assessment for diagnosis to inform the care plan should be

---

<sup>6</sup> Ontario Health. (2021). Ontario Health's Equity, Inclusion, Diversity and Anti-Racism Framework. Accessed:

<https://www.ontariohealth.ca/sites/ontariohealth/files/2020-12/Equity%20Framework.pdf>

<sup>7</sup> Cancer Care Ontario. (2018). Equity in Engagement Framework. Accessed: <https://hqontario.ca/Portals/0/documents/pe/cco-equity-in-engagement-framework.pdf>

<sup>8</sup> RNAO. (2021). Promoting 2SLGBTQI+ Health Equity. Accessed: [https://rnao.ca/sites/rnaoca/files/bpg/2SLGBTQI\\_BPG\\_June\\_2021.pdf](https://rnao.ca/sites/rnaoca/files/bpg/2SLGBTQI_BPG_June_2021.pdf)

<sup>9</sup> Ontario Centres for Learning, Research & Innovation in Long-Term Care. (2020). Embracing Diversity: A Toolkit for Supporting Inclusion in Senior Living. Accessed: [https://clri-ltc.ca/files/2020/03/Retirement-Version\\_EmbracingDiversity-Toolkit\\_20210415.pdf](https://clri-ltc.ca/files/2020/03/Retirement-Version_EmbracingDiversity-Toolkit_20210415.pdf)

initiated in primary care. This care plan should include first-line treatments such as patient education, self-management, therapeutic exercise, physical activity and weight management. Referrals to health care professionals with expertise in arthritis management should also be considered for a comprehensive assessment and management plan, including pharmacological symptom management.<sup>10</sup> Aligned with the international guidelines for the management of hip and knee osteoarthritis, GLA:D™ is one example of an evidence-based conservative management program.<sup>11</sup>

### Location of TJR Rehabilitative Care

To support alignment with provincial directions for rehabilitative care, the RCA's Referral Decision Tree was adapted to serve as a decision-making tool regarding the optimal location of rehabilitative care for patients following primary unilateral or simultaneous bilateral hip and knee replacement.

Recommendations related to the optimal location of TJR rehab for both primary unilateral and simultaneous bilateral TJR should be implemented in consideration of the following recommendations from the TJR QBP Clinical Handbook<sup>1</sup>:

- *The health system should support a move towards community-based rehabilitation following primary total knee or hip replacement and discharge from acute care.*<sup>12</sup>
- *Inpatient rehabilitation should be restricted to patients who meet specific eligibility criteria, and eligibility criteria for inpatient rehabilitation should be standardized*<sup>13</sup>, and
- *The location of rehabilitation within the community should allow for flexibility, depending on the local care context and patients' needs.*<sup>12</sup>

The provision of community-based TJR rehabilitation should also be considered within the context of current MOH policy. Please refer to current MOH policy documents for guidance related to reimbursement and contracting.

For clients/patients receiving in-home rehabilitative care, progress should be monitored, and patients regularly reassessed to determine whether their functional goals can be met in an outpatient/community setting outside of the home.

---

<sup>10</sup> Ontario Health Quality. (2020). Osteoarthritis: Care for Adults with Osteoarthritis of the Knee, Hip or Hand. Accessed: <https://www.hqontario.ca/Portals/0/documents/evidence/quality-standards/gs-osteoarthritis-clinician-guide-en.pdf>

<sup>11</sup> Zywiel MG and McGlasson R. (2020). GLA:DTM Canada Implementation and Outcomes: 2019 Annual Report. Bone and Joint Canada. <https://gladcanada.ca/>

<sup>12</sup> Health Quality Ontario. Physiotherapy rehabilitation after total knee or hip replacement. Ont Health Technol Assess Ser [Internet]. 2005 June; 5(8):1-91. Accessed: [http://www.hqontario.ca/english/providers/program/ohtac/tech/recommend/rec\\_rehabtkr\\_061705.pdf](http://www.hqontario.ca/english/providers/program/ohtac/tech/recommend/rec_rehabtkr_061705.pdf)

<sup>13</sup> Waddell JP, Frank C, editors. (2009). Hip and knee replacement surgery toolkit. Bone and Joint Canada; Available from: [http://www.gov.pe.ca/photos/original/BJ\\_toolkit.pdf](http://www.gov.pe.ca/photos/original/BJ_toolkit.pdf)

### Model of TJR Rehabilitative Care

Wherever rehabilitative care is provided, the best practices identified in the framework should be provided by regulated health professionals, who work with patients to progress them towards self-management of their own health and ongoing rehabilitation.

Recommendations for both 1:1 and individualized group-based rehabilitation are included in the framework. Evidence indicates that both 1:1 and individualized group-based therapy can be beneficial, and that the model of rehabilitative care should be based on best practice, as well as availability, access, and patient need.

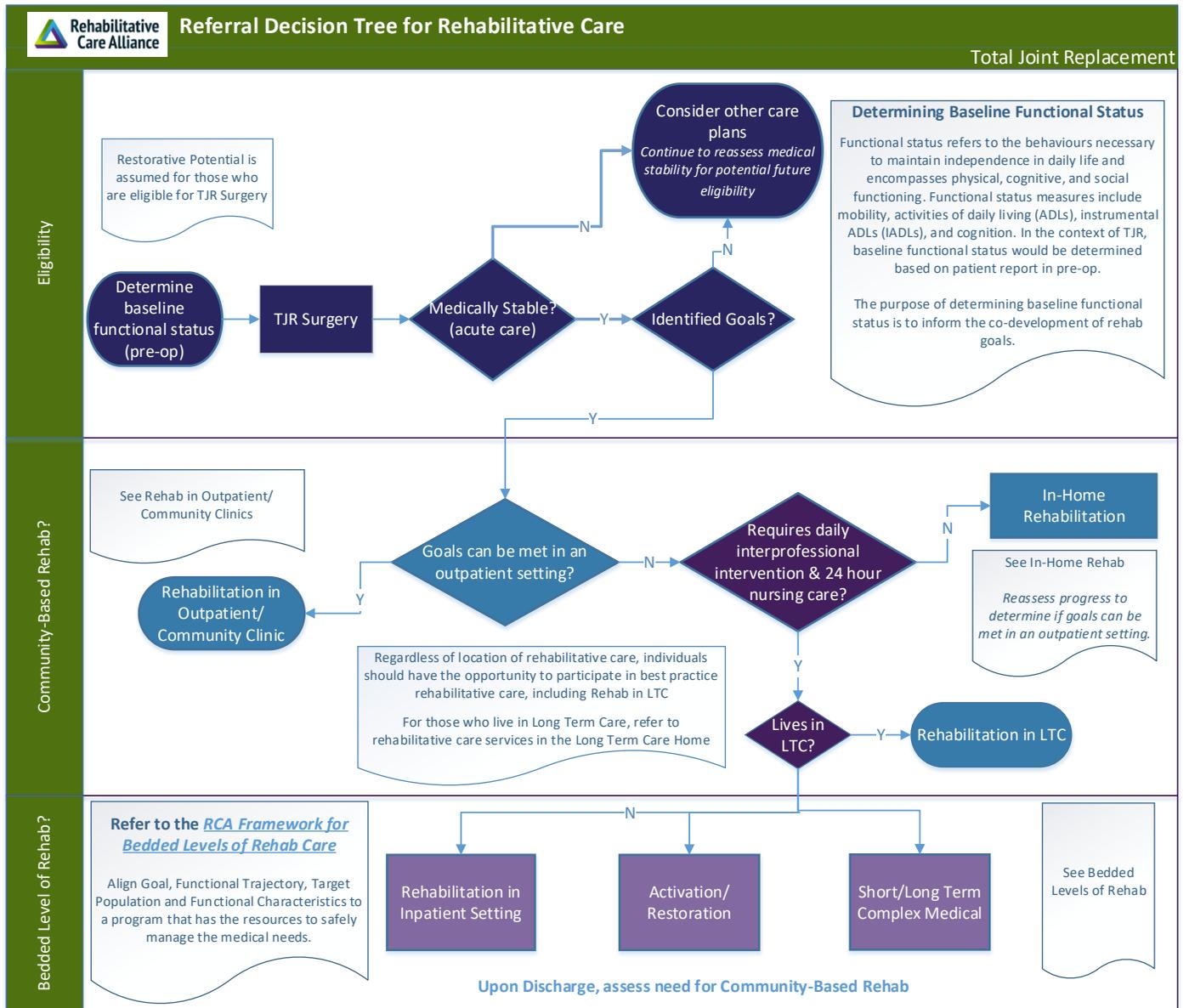
As regions, Ontario Health Teams (OHTs) and Health Service Providers (HSPs) continue to implement best practices and re-engineer clinical processes to improve patient outcomes, innovative TJR models of care will continue to evolve, as is the intention of evidence-informed bundled care for these populations.<sup>1</sup>

Emerging bundled care models, or models of care which include same day surgeries, may necessitate earlier access to rehabilitative care than that which is specified in this framework, and may have implications related to the optimal location of rehabilitative care.

As indicated in the Clinical Handbook, practice changes and innovative models of care should be implemented, *“together with the adoption of evidence-informed practices”*, in an effort to *“improve the overall patient experience and clinical outcomes”*, in addition to reducing costs in order to *“create a sustainable model for health care delivery”*.<sup>1</sup>

<sup>1</sup> Health Quality Ontario & Ministry of Health and Long-Term Care. (2013). Quality-Based Procedures: Clinical Handbook for Primary Hip and Knee Replacement. Accessed: <http://www.hqontario.ca/Portals/0/Documents/evidence/clinical-handbooks/hip-knee-140227-en.pdf>

Figure 1: Referral Decision Tree for Rehabilitative Care



## Considerations for Total Joint Replacement Rehabilitation during and after Pandemic Recovery

Rehabilitative care following total joint replacement (TJR) is essential for successful patient outcomes. As Ontario moved through the pandemic and into recovery, alternate models of rehabilitative care were explored, such as virtual care and remote care monitoring. These models of care are still evolving with changes to the health care system. Guidance specific to current models is therefore potentially premature. An [addendum](#) to this best practice framework was developed in 2020 to provide additional recommendations on the provision of TJR best practice rehabilitative care in the context of COVID-19.

The following are considerations for rehabilitative care following TJR during and after pandemic recovery to ensure that best practice care continues to be provided. Based on literature review, patient and care partner input and the consensus of subject matter experts, these findings are applicable to rehabilitative care following both primary unilateral and simultaneous bilateral hip and knee replacement.

### Group-Based Rehabilitation

Research indicates that outpatient group-based therapy can produce statistically and clinically significant improvements in function following TJR; and for most patients, group-based therapy yields similar outcomes as 1:1 therapy.<sup>14 15</sup> For patients with simultaneous bilateral TJR, smaller group sizes or 1:1 rehabilitative care may need to be considered. Patients in group-based therapy programs report high levels of satisfaction with their treatment, as group-based/congregate therapy allows patients recovering from similar procedures to participate in rehabilitation within a social and supportive environment.<sup>16 17</sup>

In accordance with current infection and prevention protocols, where clinically appropriate and feasible, group-based rehabilitation (in person and/or virtual) following TJR is recommended. Even prior to the pandemic, expert consensus and patient satisfaction reports suggested that small groups were best (with 1 provider per 3-4

---

<sup>14</sup> Coulter CL, et al. (2009). Group physiotherapy provides similar outcomes for participants after joint replacement surgery as 1-to-1 physiotherapy: a sequential cohort study. *Arch Phys Med Rehabil.* 90(10):1727–33.

<sup>15</sup> Ko V, et al. (2013). One-to-one therapy is not superior to group or home-based therapy after total knee arthroplasty: a randomized, superiority trial. *J Bone Joint Surg Am.* 95(21):1942–9.

<sup>16</sup> Khan F, et al. (2008). Multidisciplinary rehabilitation programmes following joint replacement at the hip and knee in chronic arthropathy. *Cochrane Database of Systematic Reviews.* 2(CD004957)

<sup>17</sup> Hurley MV and Walsh N. (2009). Effectiveness and clinical applicability of integrated rehabilitation programs for knee osteoarthritis. *Current Opinion in Rheumatology.* 21:171–176

patient ratio) and should be considered during and after pandemic recovery.<sup>18 19</sup> However, one on one therapy is also effective where group-based therapy is less feasible due to lower patient volumes.

### Same-Day Discharge

In recent years, advances in surgical techniques such as minimally invasive surgical approaches have resulted in a significant increase in the annual rates of same-day discharge following total hip and knee replacement.<sup>20</sup> Patients are typically younger with fewer co-morbid conditions. Protocols, developed to ensure patient safety, include screening of candidates pre-operatively for mobility, social support and cognitive appropriateness. Protocols for same-day discharge focus on the common theme of safety for discharge, including physiotherapy assessment for safe mobility and prophylactic therapies for pain and nausea. Immediate post-discharge supports may include post-operative home visits and/or virtual supports such as telephone call follow up or remote monitoring via web-based platforms such as apps.<sup>21</sup> All patients who undergo TJR, regardless of length of hospital stay, participate in the same community-based rehabilitation programs. Patient satisfaction is generally rated as high and the procedures are cost-effective.<sup>22</sup>

Consideration of equitable care for those who are too medically and/or psychosocially complex to meet the strict eligibility criteria for same-day discharge will be important throughout and after this period of pandemic recovery.

### Virtual Care

Virtual care is defined as “any interaction between patients and/or members of their circle of care, occurring remotely, using any forms of communication or information technology with the aim of facilitating or maximizing the quality and effectiveness of patient care.”<sup>23</sup> Virtual care may be considered as a potential strategy to provide TJR rehabilitative care and evidence shows that it is as effective as face-to-face intervention

---

<sup>18</sup> Westby, M, et al. (2014). Expert consensus on best practices for post-acute rehabilitation after total hip and knee arthroplasty; a Canada and United States delphi study. *Arthritis Care & Research*. 66(3).

<sup>19</sup> Kimona Issa, MD, et al. (2013). MD. Evaluation of Patient Satisfaction With Physical Therapy Following Primary THA. *Orthopedics*. 36(5):e538-e542

<sup>20</sup> Debbi, E. et al. (2022). Same-Day Discharge Total Hip and Knee Arthroplasty: Trends, Complications, and Readmission Rates. *The Journal of Arthroplasty*. 37(3): 444-448.

<sup>21</sup> Vibav, M. et al. (2021). Post-Operative Remote Monitoring for Same-Day Discharge Elective Orthopedic Surgery: A Pilot Study. *Sensors*. 21(7): 5754. DOI:10.3390/s21175754

<sup>22</sup> Bodrogi, A. et al. (2020). Management of patients undergoing same-day discharge primary total hip and knee arthroplasty. *CMAJ*. 192(2)E34-E39. DOI: <https://doi.org/10.1503/cmaj.190182>

<sup>23</sup> Ontario Health. (2020) Recommendations for Regional Health Care Delivery during the COVID-19 Pandemic: Outpatient Care, Primary Care, and Home and Community Care.

for patients who have been assessed as able to benefit.<sup>24 25 26 27</sup> However, virtual care is not appropriate for all rehabilitative care needs and should therefore be utilized at the recommendation of the regulated rehabilitative care professional in consultation with the patient and care partner, and based on the needs, preferences and abilities of the patient.

Virtual care can be utilized for various aspects of patient care, including the patient interview, physical assessment and diagnosis, treatment, maintenance activities, consultation, education and training. Virtual care is more than video or phone visits. It includes digital supports for self-care, online education and self-management tools, provider-to-provider and provider-to patient supports via messaging, email, text, apps, etc. and remote sensor monitoring. Hybrid rehabilitative care models which include both in-person and virtual care may also be considered (e.g., virtual assessment with in-person follow up, if required).<sup>28 29 30 31 32</sup>

The following factors should be considered when considering virtual care delivery of rehabilitation interventions<sup>33 34 35 36</sup>:

- Care partner involvement and availability
- Access to technology and internet and other practical limitations (e.g., communication abilities).
- Potential safety issues. Engage and train care partners to provide assistance for the safety of tasks during intervention and/or technical support.
- Impact of language barriers, hearing and/or visual impairment on their patient's ability to participate.
- Cognitive ability and how it may impact their patient's safety, the ability to complete a self-directed program and to follow the carry-over advice that is provided.

---

<sup>24</sup> Eichler, S., et al. (2019). The effectiveness of telerehabilitation as a supplement to rehabilitation in patients after total knee or hip replacement: randomized controlled trial. *JMIR Rehabilitation & Assistive Technologies*, 6 (2), 1-12  
<http://rehab.jmir.org/2019/2/e14236/>

<sup>25</sup> Shukla, H., et al. (2017) Role of telerehabilitation in patients following total knee arthroplasty: evidence from a systematic literature review and meta-analysis. *Journal of telemedicine and Telecare*, 23 (2), 339-346. doi: <https://doi.org/10.1177/1357633x16628996>

<sup>26</sup> Jian, S., et al. (2018). The comparison of Telerehabilitation and face-to-face rehabilitation after total knee arthroplasty: a systematic review and meta-analysis. *Journal of Telemedicine and Telecare*, 24(4), 257-262. DOI: 10.1177/1357633X16686748

<sup>27</sup> Piqueras, M., et al. (2013). Effectiveness of an interactive virtual telerehabilitation system in patients after total knee arthroplasty: a randomized controlled trial. *Journal of Rehabilitation Medicine*, 45, 392-396. doi: 10.2340/16501977-1119

<sup>28</sup> Ontario Health. (2020) Recommendations for Regional Health Care Delivery during the COVID-19 Pandemic: Outpatient Care, Primary Care, and Home and Community Care.

<sup>29</sup> Wolfstadt, J. et al. (2019) Improving patient outcomes following total joint arthroplasty: is there an app for that? *BMJ Qual Saf.* 28: 775-777. doi:10.1136/bmjqs-2019-009571

<sup>30</sup> Prvu Bettger, J. et al. (2020) Effects of Virtual Exercise Rehabilitation In –Home Therapy Compared with Traditional Care after Total Knee Arthroplasty. *The Journal of Bone and Joint Surgery.* 102:101-9. <http://dx.doi.org/10.2106/JBJS.19.00695>

<sup>31</sup> Hoogland, J et al. (2019) Feasibility and Patient Experience of a Home-Based Rehabilitation Program Driven by a Tablet App and Mobility Monitoring for Patients After a Total Hip Arthroplasty. *JMIR Mhealth Uhealth.* 7(1): e10342.

<sup>32</sup> Anton et al. (2016) Validation of a Kinect-based tele-rehabilitation system with total hip replacement patients. *Journal of Telemedicine and Telecare.* 22(3): 192-197.

<sup>33</sup> Irish Society of Chartered Physiotherapists. (2020) Guide for treating older people post COVID-19 in hospital, post-acute care and the community.

<sup>34</sup> Ontario Health. (2020) Pan-LHIN Guidelines for Virtual Home Care.

<sup>35</sup> St. Joseph's Group, Thunder Bay. Tele-Rehab: Practical tips for using telemedicine to conduct remote rehabilitation consultations.

<sup>36</sup> Davies, L., et al. (2021). An international core capability framework for physiotherapists to deliver quality care via videoconferencing: a Delphi study. *Journal of Physiotherapy*, 67, (4), 291-297.

- Privacy and confidentiality issues. Patients may be at home with many other people or in a virtual group therapy session, which can impact confidentiality. Additional sessions may be required for sensitive issues, e.g., phone call or private in-person visits. Patients may need to sign consent forms and/or paperwork. Additional time for mailing may be needed.
- Need for flexible hours to accommodate the needs of patients and their care partners.
- Allow for extra time to build rapport and trust and for potential technical issues.

The onset of the COVID-19 pandemic has resulted in a rise in the use of virtual rehabilitation. Given the implementation of virtual rehabilitation, the RCA has developed [Evaluation Considerations for Virtual Rehab](#). This document provides guidance around outcome indicators that can be considered to evaluate the efficacy and quality of virtual rehabilitation for service delivery.

## Total Joint Replacement Process Indicators

To inform identification of indicators to support performance monitoring, the Total Joint Replacement Best Practices Task Group conducted a review of possible indicators. The following four process indicators were identified as key components of care, throughout the pathway, that will optimize rehabilitative care outcomes following TJR:

- 1) Processes are in place for pre-operative education, treatment (as applicable) and plan for post-operative rehabilitative care
  - a. % of hospitals that perform TJR surgery that have standardized processes in place to provide pre-operative:
    - i. Education
    - ii. Treatment, as applicable
    - iii. Plan for post-operative rehabilitative care
- 2) Outcome measures are utilized
  - a. % of hospitals that perform TJR surgery that utilize clinical outcome measures
  - b. % of hospitals that perform TJR surgery that have a centralized method for reporting and analysis of clinical outcome measures
- 3) In partnership with clients, a post-operative rehabilitative care plan is prepared and in place prior to discharge
  - a. % of hospitals that perform TJR surgery that have standardized processes in place to:
    - i. plan for post-operative rehabilitative care
    - ii. engage clients and care partners as part of this discharge planning process

- 4) Patients receive timely access to rehabilitative care post-acute care discharge
  - a. % of patients who receive rehabilitative care in outpatient/community clinic following TKR within 7 days of discharge from Acute Care
  - b. % of patients who receive rehabilitative care in outpatient/community clinic following THR within 4 weeks post discharge from Acute Care
  - c. % of patients who receive In-Home rehabilitative care following TKR within 7 days of discharge from Acute Care
  - d. % of patients who receive In-Home rehabilitative care following THR within 7 days of discharge from Acute Care

	<b>Rehabilitative Care Best Practices for Patients with Hip and Knee Replacements</b> Conceptual Framework				
Processes of Care	<i>Pre-Operative Care</i>	<i>Rehabilitation in Acute Care</i>	<i>Bedded Levels of Rehabilitative Care</i>	<i>Rehabilitation in Outpatient/Community Clinics</i>	<i>In-home Rehabilitative Care</i>
<i>Patient &amp; Care Partner Engagement</i>					
<i>Screening</i>					
<i>Assessment</i>					
<i>Treatment/Interventions</i> <ul style="list-style-type: none"> <li>• Individual (1:1) and Individualized Group-based Interventions</li> <li>• <i>Functional Training (e.g. ADLs &amp; Mobility)</i></li> </ul>					
<i>Pain</i>					
<i>Transition Care Planning</i>					
<i>Clinical Outcome Measures</i>					

**These best practice recommendations are applicable to both primary unilateral and simultaneous bilateral TJR populations except where specified.**

Processes of Care	Pre-Operative Care
<b>Patient &amp; Care Partner Engagement</b>	<ul style="list-style-type: none"> <li>• Patients and care partners must be included in the circle of care communication and care planning.</li> <li>• Designated care partners who provide care to maintain the patient’s mental and physical health and who advocate on the person’s behalf must be considered essential to rehabilitation and transition care planning and should be allowed to remain with the patient and participate as part of the circle of care.</li> <li>• An approach of trust, respect and accommodation should be recognized as essential to the provision of equitable and culturally appropriate rehabilitative care. Rehabilitative care providers must learn about the health beliefs, practices and values of the cultural groups they serve and develop culturally responsive knowledge, skills and attitudes.<sup>1</sup></li> <li>• Patients and families benefit from education on how to participate in a successful recovery. As patients have different learning styles, it is recommended that this education be provided through a number of media (e.g., videos and information booklets) and that it includes the opportunity for patients and families to ask questions and to access materials according to their needs.<sup>2</sup></li> <li>• A patient information package is provided to standardize and consolidate information, to facilitate communication for the patient and health care providers, and to foster a sense of patient participation in outcomes achieved.<sup>3</sup></li> <li>• Providing quality health information (accurate, accessible, and actionable) enables patients to better manage their health and wellbeing, and make fully informed decisions about their treatment and care.<sup>2</sup></li> <li>• Patient education materials should be developed using plain language as a key strategy for improving health literacy and be compliant with the Accessibility for Ontarians with Disabilities Act (AODA)<sup>4</sup> requirements for accessibility.</li> <li>• All patients need to be made aware of their responsibility to participate in their recovery. This includes participation in rehabilitation and exercise in the hospital and after discharge.<sup>2</sup></li> <li>• Information given needs to be paced to avoid overload during the pre-operative and in-patient stages. Use of technology such as an app on their mobile phone, tablet etc. could support patients to revisit information at their own convenience and time of need.<sup>5</sup></li> <li>• Discuss with patients all aspects of their rehabilitative care, content may include:<sup>2,3,6</sup> <ul style="list-style-type: none"> <li>○ Expected length of stay</li> <li>○ Precautions and joint protection post-operatively, energy conservation and pain management techniques</li> <li>○ Information on assistive devices to support independence with ADLs, and home set-up<sup>7</sup> <ul style="list-style-type: none"> <li>▪ These may include: Raised toilet seat, bath seat/chair/bench, grab bars, non-slip surfaces, raised cushion, reachers, elastic shoe-laces, long handled scrub brush, long handled shoe horn, installation of handrails<sup>2</sup></li> </ul> </li> <li>○ Discussing the importance of procuring the equipment emphasized, preparing the home, and arranging for help with meal planning/preparation</li> <li>○ Exercise, functional activities, ADLs (Toileting, dressing, bathing, car transfers, homemaking, bed transfers, stairs)<sup>2</sup></li> <li>○ Increased functional endurance and return to work/sports<sup>2</sup></li> <li>○ When to seek medical attention</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• Contact information for patients in the event that they have any follow-up questions.<sup>2</sup></li> <li>• Encourage patient’s family/support persons to attend information sessions and become familiar with educational materials and role in recovery (driving, transportation plan including rides, public transit and potential for disabled parking permits, ADL’s and accessing additional resources).<sup>7</sup></li> <li>• Many patients who present as candidates for hip or knee replacement surgery present with lifestyle factors that influence outcomes such as obesity, lack of exercise and smoking. These may be addressed through education focused on health promotion, disease prevention and lifestyle changes<sup>2</sup>; consider making referral to appropriate, available community resources.</li> </ul>
<b>Screening</b>	<ul style="list-style-type: none"> <li>• Screen pre-operatively to predict patients’ post-operative discharge needs and inform proactive discharge planning.</li> <li>• List of common elements<sup>8,9</sup>:             <ol style="list-style-type: none"> <li>1. Age</li> <li>2. Gender</li> <li>3. Mobility/Functional Status</li> <li>4. Community Supports</li> <li>5. Assistance at Home/Home Environment</li> <li>6. Type &amp; Number of Active Medical Issues/Comorbidities</li> <li>7. Patient Safety</li> <li>8. Baseline Cognition &amp; Insight</li> <li>9. Body Mass Index (BMI)</li> <li>10. Tobacco Use</li> </ol> </li> <li>• Screen to identify:<sup>3,10</sup> <ol style="list-style-type: none"> <li>1. Potential post-op and/or discharge issues</li> <li>2. If the patient would benefit from a preoperative in-home provider visit by a Physiotherapist (PT) or Occupational Therapist (PT) to assess the home environment.</li> </ol> </li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>• Rehabilitative care providers must ensure a safe, inclusive space to provide rehabilitative care with consideration for the patient’s intersecting identities, health beliefs, practices and values.<sup>1,11</sup></li> <li>• Rehabilitative care providers must use culturally appropriate language and a person-centred, history-taking approach, such as asking open-ended questions and ensuring privacy and confidentiality during interactions with all patients and care partners.<sup>1,11</sup></li> <li>• Baseline functional status should be determined based on patient and care partner report. Functional status refers to the behaviours necessary to maintain independence in daily life and encompasses physical, cognitive, and social functioning. Functional status measures include mobility, activities of daily living (ADLs), instrumental ADLs (IADLs), and cognition.<sup>12</sup> The purpose of determining baseline functional status is to inform the co-development of rehab goals.</li> <li>• A patient’s functional tolerance at the time of initial consult will assist in defining their level of disability and urgency rating.<sup>2</sup></li> <li>• Functional ability may be measured through self-administered questionnaires and/or through functional testing using valid outcome measures. Examples of these measures are provided in the “Clinical Outcomes” section.<sup>2</sup></li> </ul>

	<ul style="list-style-type: none"> <li>• Complete assessment to confirm the discharge destination of the patient post-surgery (i.e., home care, outpatient rehab, bedded rehab).<sup>6</sup> <ul style="list-style-type: none"> <li>○ (e.g., Discharge Triage Considerations for Patients Following Elective Hip/Knee Replacement)</li> <li>○ Alignment with eligibility criteria for in-home care.</li> <li>○ Consider the use of a discharge planning and risk assessment tool. For example: The Risk Assessment and Prediction Tool (RAPT)<sup>13</sup></li> </ul> </li> <li>• Complete Physiotherapy or Occupational Therapy Assessment for equipment needs post-surgery.<sup>7</sup></li> <li>• Review and document goal setting and expectations.<sup>10</sup></li> <li>• Evaluate cognitive status as indicated.<sup>10</sup></li> <li>• Complete a home environment questionnaire.<sup>10</sup></li> <li>• Complete the hospital specific pre-operative outcome measure to establish the benchmark for patient progress and achievement of functional outcomes.<sup>10</sup></li> <li>• A variety of contextual factors including a patient's coping skills, self-efficacy, anxiety, and social support are associated with perceived well-being and satisfaction after TJR surgery and therefore should be identified and addressed in the pre-operative period.<sup>14</sup></li> </ul>
<b>Treatment/Interventions</b> <ul style="list-style-type: none"> <li>• Individual (1:1) and Individualized Group-based Interventions</li> <li>• Functional Training (e.g., ADLs &amp; Mobility)</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration of standardized exercises specific to THR and TKR with a home program of exercises to be continued either at a gym facility or home.<sup>3,9</sup></li> <li>• Current evidence does not support preoperative physiotherapy as essential; however, patients should stay as active as possible within limits of their pain. Therefore, consider referral to a pre-operative strengthening/ROM exercise program appropriate for joint replacement (E.g., NEMEX-TJR, GLA:D™, community exercise programs)<sup>10,15-17</sup></li> <li>• NEMEX-TJR stands for NEuroMuscular Exercise for total joint replacement. It is based on principle of neuromuscular training with the "aim of improving sensorimotor control and achieving compensatory functional stability"<sup>16</sup></li> <li>• GLA:D™ consists of two patient education sessions and 12 neuromuscular exercise therapy sessions. All sessions are group-based and supervised by a GLA:D certified clinician with expertise in osteoarthritis and exercise therapy.<sup>17</sup></li> <li>• Following surgery, patients will require one or more walking aids to assist with ambulation. These may include a walker, crutches or a cane. Acquisition of these items should be arranged prior to surgery.<sup>3</sup></li> <li>• Fitting of the walking aid(s) by a health professional helps to ensure the correct dimensions for the patient, and to ensure the patient demonstrates safe use as appropriate.<sup>2</sup> Document the details of information provided to the client regarding assistive devices, needed equipment, and home modifications.</li> </ul>
<b>Pain</b>	<ul style="list-style-type: none"> <li>• Review Pain management techniques, (i.e., medications, ice) and importance of joint protection.<sup>7,10,13,14</sup></li> <li>• Use multimodal pain management education to maximize effect and outcomes.<sup>7,18</sup></li> <li>• Provide resources to patients, including patient and/or family on pain management and what to expect</li> <li>• Each person's pain experience will be unique. Patient, physician and team should work together to ensure that pain is manageable.</li> </ul>
<b>Transition Care Planning</b>	<ul style="list-style-type: none"> <li>• Transition plans must be developed and agreed upon in partnership with the patient, their care partner/s and the health care team involved at each point of transition. A communication liaison must be designated as part of the circle of care.</li> <li>• Patients can be linked to other health optimization programs within the community through formal groups and informal networks (e.g., the Canadian Orthopaedic Foundation's Your Bone and Joint Health, The Arthritis Society, Weight Watchers®, smoking cessation programs, etc.).<sup>2</sup></li> <li>• Post-operative rehabilitation needs have been identified and a referral to rehabilitation has been initiated.<sup>3,6</sup></li> </ul>

	<ul style="list-style-type: none"> <li>• Mechanisms should be in place to communicate the date of the outpatient rehab appointment to the patient and inpatient acute care team; appointment to be confirmed by the inpatient team prior to the patient’s discharge from acute care.<sup>6</sup></li> <li>• Transportation options for out-patient rehab are discussed and provided to the patient including locally subsidized programs, if available.<sup>6</sup></li> <li>• For patients who are expected to receive their rehabilitation services in home due to risk or complexity issues, the interdisciplinary assessment results and care plan (as below) should be shared with the in-home provider, according to patient need/urgency.</li> <li>• Equipment, home management, home environment plans are discussed and patient’s individual plan for care is initiated and discussed as needed.<sup>3</sup></li> <li>• Send a referral to an in-home provider for preoperative home assessment for patients identified as being at risk by the screening process.<sup>10</sup></li> </ul>
<b>Clinical Outcome Measures</b>	<p>Based on the needs of the patients in the pre-operative care setting, Range of Motion (ROM), Strength, and Gait Speed should be measured, along with at least one patient reported measure and performance outcome measure:</p> <ul style="list-style-type: none"> <li>• Patient Reported Outcome Measures Examples<sup>2,3,7,10,19</sup> <ul style="list-style-type: none"> <li>○ EQ-5D-5L</li> <li>○ Oxford Hip &amp; Knee Score (For simultaneous bilateral TJR, complete separate measure for each joint)<sup>20</sup></li> <li>○ Western Ontario and McMaster Universities Osteoarthritis Index WOMAC</li> <li>○ Lower Extremity Functional Scale (LEFS)</li> <li>○ Pain Visual Analogue Scale (VAS)/Numeric Pain Rating Scale (NPRS)</li> <li>○ Hip Disability and Osteoarthritis Outcome Score (HOOS)/ Knee Injury and Osteoarthritis Outcome Score (KOOS)</li> <li>○ Patient Specific Functional Scale (PSFS)</li> </ul> </li> <li>• Performance Outcome Measure Examples:<sup>2,3,7,10,19</sup> <ul style="list-style-type: none"> <li>○ 30 Second Chair Stand Test (30CST)</li> <li>○ Gait Speed (e.g., 2 Minute Walk Test, 40 Metre Walk Test)</li> <li>○ Timed Up and Go (TUG)</li> <li>○ Stair Climb Test</li> <li>○ Functional Reach</li> </ul> </li> </ul>

Processes of Care	Rehabilitation in Acute Care
<b>Patient &amp; Care Partner Engagement</b>	<ul style="list-style-type: none"> <li>• Patients and care partners must be included in the circle of care communication and care planning</li> <li>• Designated care partners who provide care to maintain the patient’s mental and physical health and who advocate on the person’s behalf must be considered essential to rehabilitation and transition care planning and should be allowed to remain with the patient and participate as part of the circle of care</li> <li>• An approach of trust, respect and accommodation should be recognized as essential to the provision of equitable and culturally appropriate rehabilitative care. Rehabilitative care providers must learn about the health beliefs, practices and values of the cultural groups they serve and develop culturally responsive knowledge, skills and attitudes.<sup>1,11</sup></li> <li>• Patients and care partners benefit from education on how to participate in a successful recovery. As patients have different learning styles, it is recommended that this education be provided through a number of media and that it includes the opportunity for patients and families to ask questions and to access materials according to their needs.<sup>2</sup></li> <li>• A patient information package is provided to standardize and consolidate information, to facilitate communication for the patient and health care providers, and to foster a sense of patient participation in outcomes achieved.<sup>3</sup></li> <li>• Providing quality health information (accurate, accessible, and actionable) enables patients to better manage their health and wellbeing, and make fully informed decisions about their treatment and care.<sup>2</sup></li> <li>• Patient education materials should be developed using plain language as a key strategy for improving health literacy and be compliant with the Accessibility for Ontarians with Disabilities Act (AODA)<sup>4</sup> requirements for accessibility.</li> <li>• All patients need to be made aware of their responsibility to participate in their recovery. This includes participation in rehabilitation and exercise in the hospital and after discharge.<sup>2</sup></li> <li>• Information given needs to be paced to avoid overload during the pre-operative and in-patient stages. Use of technology such as an app on their mobile phone, tablet etc. could support patients to revisit information at their own convenience and time of need.<sup>5</sup></li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>• Rehabilitative care providers must ensure a safe, inclusive space to provide rehabilitative care with consideration for the patient’s intersecting identities, health beliefs, practices and values.<sup>1,11</sup></li> <li>• Rehabilitative care providers must use culturally appropriate language and a person-centred, history-taking approach, such as asking open-ended questions and ensuring privacy and confidentiality during interactions with all patients and care partners.<sup>1,11</sup></li> <li>• An appropriately trained health care provider (e.g., nurse, physiotherapist) should be responsible for the initial assessment prior to the first mobilization attempt.<sup>15</sup> Shift schedules for physiotherapists may need to be adjusted to facilitate this initial assessment, in particular for those with same-day discharge.</li> <li>• Initial evaluation and instructional session should occur within the first hours after surgery. Mobilization will be based on lower limb motor function and the patient’s ability to stand.</li> <li>• There should be no range of motion restrictions unless specified by the operating surgeon.</li> </ul>
<b>Treatment/Interventions</b>	<ul style="list-style-type: none"> <li>• Patients should perform exercises to help with their circulatory and respiratory system, including             <ul style="list-style-type: none"> <li>○ Foot and ankle pumping (10x/hr)</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>• <b>Individual (1:1) and Individualized Group-based Interventions</b></li> <li>• <b>Functional Training (e.g., ADLs &amp; Mobility)</b></li> </ul>	<ul style="list-style-type: none"> <li>○ Deep Breathing Exercises (10x/hr)<sup>15</sup></li> <li>• Post-op Day (POD) 0, patients encouraged to mobilize out of bed<sup>9,15</sup> <ul style="list-style-type: none"> <li>○ Transfer bed to chair</li> <li>○ Sit to stand</li> <li>○ Bathroom transfers</li> <li>○ Ambulation</li> <li>○ For Same Day Discharge, trial stairs</li> </ul> </li> <li>• Range of Motion (ROM) exercises, including passive, active assisted and active ROM should be taught<sup>9</sup></li> <li>• For TKR, swelling of the knee is common if activity is increased too abruptly. Patients should be allowed sufficient time to rest and elevate their leg x4-5 days<sup>15</sup></li> <li>• From POD 1, patient should be encouraged to mobilize as tolerated, including walking and stair climbing with a gait aid (walker, crutches or cane)<sup>15</sup></li> </ul>
<p style="text-align: center;"><b>Pain</b></p>	<ul style="list-style-type: none"> <li>• Assess pain using a standardized pain assessment instrument, e.g., The Numeric Pain Rating Scale (NPRS), VAS.<sup>7</sup></li> <li>• Use multimodal pain management and multimodal pain management education to maximize effect and outcomes.<sup>7,18</sup></li> <li>• Cryotherapy may be useful for pain relief and it can be used in combination with compression devices<sup>15</sup></li> <li>• Review pain management techniques, (i.e., medications, ice) and importance of joint protection.<sup>2,3,7</sup></li> <li>• Consider strategic use of PRN (as needed) pain medications (i.e., 30-45 minutes prior to assessment/treatment) to maximize participation and improve rehabilitative benefit<sup>21</sup></li> <li>• Each person’s pain experience will be unique. Patient, physician and team should work together to ensure that pain is manageable.</li> </ul>
<p style="text-align: center;"><b>Transition Care Planning</b></p>	<ul style="list-style-type: none"> <li>• Transition plans must be developed and agreed upon in partnership with the patient, their care partner/s and the health care team involved at each point of transition. A communication liaison must be designated as part of the circle of care.</li> <li>• Review therapy goals, treatment expectations and discharge criteria with patient.<sup>3</sup></li> <li>• If the patient is discharged to any provider other than the hospital where the surgery was performed, a Discharge Report must be completed, and provided to the receiving care provider.<sup>3</sup> A discharge report should include information such as relevant post-op information (PT and/or MD note) and discharge date; treatment, activity and weight-bearing restrictions; a discharge medication list; and date of follow-up appointment.<sup>22</sup></li> <li>• Criteria for discharge home:       <ul style="list-style-type: none"> <li>○ Ambulates and transfers safely with mobility devices</li> <li>○ Able to do stairs if needed</li> <li>○ Home exercise/education program has been provided to patient and/or caregiver</li> <li>○ Rehabilitation plan is in place (Outpatient/Community Clinic/In-Home)</li> </ul> </li> <li>• If criteria for discharge are not met, consider inpatient rehabilitation.</li> <li>• Referral to outpatient or community service as needed. Confirm appointments and referrals prior to discharge.<sup>7</sup></li> <li>• Schedule face-to-face and real time discharge conversations (“warm handoffs”) with the patient and care partner.</li> </ul>

	<ul style="list-style-type: none"> <li>• Provide the written individualized discharge plan to the patient and care partner at the time of discharge from hospital. Provide written individualized care and discharge plans to patient’s primary care team, specialists and other providers.</li> <li>• Provide list of scheduled follow-up rehabilitation appointments and review with the patient and care partner at time of discharge.</li> <li>• Confirm patient and care partner’s understanding of the information discussed, and document in the patient’s chart.</li> </ul>
<b>Clinical Outcome Measures</b>	<p>Based on the needs of the patients in the pre-operative care setting, Range of Motion (ROM) and Strength should be measured, along with at least one patient reported measure and performance outcome measure<sup>9</sup>:</p> <ul style="list-style-type: none"> <li>• Patient Reported Outcome Measures Examples<sup>2,3,7,10,19</sup>:       <ul style="list-style-type: none"> <li>○ EQ-5D-5L</li> <li>○ Oxford Hip &amp; Knee Score (For simultaneous bilateral TJR, complete separate measure for each joint)<sup>20</sup></li> <li>○ Western Ontario and McMaster Universities Osteoarthritis Index WOMAC</li> <li>○ Lower Extremity Functional Scale (LEFS)</li> <li>○ Pain Visual Analogue Scale (VAS)/Numeric Pain Rating Scale (NPRS)</li> <li>○ Hip Disability and Osteoarthritis Outcome Score (HOOS)/ Knee Injury and Osteoarthritis Outcome Score (KOOS)</li> <li>○ Patient Specific Functional Scale (PSFS)</li> </ul> </li> <li>• Performance Outcome Measure Examples<sup>2,3,7,10,19</sup>:       <ul style="list-style-type: none"> <li>○ 30 Second Chair Stand Test (30CST)</li> <li>○ Gait Speed (e.g., 2 Minute Walk Test, 40 Metre Walk Test)</li> <li>○ Timed Up and Go (TUG)</li> <li>○ Stair Climb Test</li> <li>○ Functional Reach</li> </ul> </li> </ul>

Processes of Care	Bedded Levels of Rehabilitative Care
<b>Considerations</b>	<ul style="list-style-type: none"> <li>• Inpatient rehabilitation should not be the first choice for the typical patient with a primary unilateral or simultaneous bilateral elective total hip or knee replacement.<sup>23</sup></li> <li>• The target of the Orthopaedic Quality Scorecard indicates that no more than 10% of primary unilateral hip/knee replacement patients will require inpatient rehabilitation.<sup>24</sup></li> <li>• Post-acute rehabilitative care arrangements to be confirmed preoperatively.</li> <li>• If admission to inpatient rehabilitation is necessary, community-based rehabilitative care service is to be agreed upon prior to discharge.</li> <li>• Guided by the RCA Referral Decision Tree for Rehabilitative Care, the determining factors for discharge to inpatient rehabilitative care should be evaluated based on a patient's post-operative inpatient assessment and focus on physical and functional post-operative limitations. The following concerns may trigger consideration of discharge to inpatient rehabilitation:             <ul style="list-style-type: none"> <li>○ Unable to transfer in/out of bed</li> <li>○ Unable to ambulate with a gait aid sufficiently for household mobility</li> <li>○ If applicable, unable to ascend/descend stairs with 1-assist (for entry/exit of home)</li> </ul> </li> <li>• A patient's inpatient rehabilitative care length of stay should be based on addressing the above specific functional limitations and meeting the patient's functional goals, with a transition plan to return home and continue rehabilitation in a community-based rehabilitative care setting, as soon as they are able.</li> </ul>
<b>Patient and Care Partner Engagement</b>	<ul style="list-style-type: none"> <li>• Patients and care partners must be included in the circle of care communication and care planning</li> <li>• Designated care partners who provide care to maintain the patient's mental and physical health and who advocate on the person's behalf must be considered essential to rehabilitation and transition care planning and should be allowed access to inpatient health care organizations</li> <li>• An approach of trust, respect and accommodation should be recognized as essential to the provision of equitable and culturally appropriate rehabilitative care. Rehabilitative care providers must learn about the health beliefs, practices and values of the cultural groups they serve and develop culturally responsive knowledge, skills and attitudes.<sup>1</sup></li> <li>• Patient education is best accomplished using a combination of methods. When education materials are provided in addition to verbal communication, patient education is more effective.<sup>25</sup></li> <li>• Providing quality health information (accurate, accessible, and actionable) enables patients to better manage their health and wellbeing, and make fully informed decisions about their treatment and care.<sup>25</sup></li> <li>• Patient education materials should be developed using plain language as a key strategy for improving health literacy and be compliant with the Accessibility for Ontarians with Disabilities Act (AODA) requirements for accessibility.<sup>4</sup></li> <li>• Information given needs to be paced to avoid overload during the pre-operative and in-patient stages. Use of technology such as an app on their mobile phone, tablet etc. could support patients to revisit information at their own convenience and time of need.<sup>5</sup></li> </ul>

	<ul style="list-style-type: none"> <li>• A mechanism should be in place to assess the patient’s learning needs.<sup>3</sup></li> <li>• Multi-modal education should be provided to patients that can be tailored to their individual preferences and experiences.<sup>25</sup></li> <li>• Education on all of the following topics should be available and reviewed with patient/family as appropriate<sup>3</sup>:             <ul style="list-style-type: none"> <li>○ Pain and swelling management (including post-hospital care)<sup>19</sup></li> <li>○ Mobility</li> <li>○ Fall prevention</li> <li>○ Precautions/safe use of opioids</li> <li>○ Expected Progress</li> <li>○ Caregiving training</li> <li>○ Safe activity resumption, including return to sports<sup>26–28</sup></li> <li>○ Resume driving<sup>14</sup></li> <li>○ Include principles of healthy lifestyles and active living in the rehabilitation program.<sup>3</sup></li> <li>○ Include the provision of resources or referrals to external programs and sources of help (e.g., Arthritis Society)</li> <li>○ Review TJR precautions with patient and family/caregiver.<sup>7</sup></li> </ul> </li> <li>• Future tools that are offered using technology such as Apps for smart phones might be helpful for some patients.</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>• Rehabilitative care providers must ensure a safe, inclusive space to provide rehabilitative care with consideration for the patient’s intersecting identities, health beliefs, practices and values.<sup>1,11</sup></li> <li>• Rehabilitative care providers must use culturally appropriate language and a person-centred, history-taking approach, such as asking open-ended questions and ensuring privacy and confidentiality during interactions with all patients and care partners.<sup>1,11</sup></li> <li>• Assessment and development of an individualized therapy plan (1:1 or group setting).<sup>3</sup></li> <li>• Outcome Measures should include performance measures, self-report measures, and clinical measures.<sup>7</sup></li> </ul>
<b>Treatment/Interventions</b> <ul style="list-style-type: none"> <li>• <b>Individual (1:1) and Individualized Group-based Interventions</b></li> <li>• <b>Functional Training (e.g., ADLs &amp; Mobility)</b></li> </ul>	<p>Treatments should be provided by a dedicated interprofessional MSK/orthopaedic team with general knowledge about the TJR rehab assessment and treatment process, and who have access to skills/training to develop and maintain the necessary skills and knowledge base.<sup>7</sup></p> <ul style="list-style-type: none"> <li>• Timing, frequency and intensity of rehabilitative care services provided in a bedded level of care to be defined in consideration of the following:             <ul style="list-style-type: none"> <li>○ Functional tolerance and goals of the patient</li> <li>○ RCA Definitions Framework</li> <li>○ QBP Targets</li> </ul> </li> <li>• As per the RCA Definitions Framework, the functional characteristics of patients requiring inpatient rehabilitation are as follows<sup>29</sup>:             <ul style="list-style-type: none"> <li>○ Achievement of goals require:                 <ul style="list-style-type: none"> <li>▪ Daily interventions</li> <li>▪ Frequent/daily re-assessment by regulated health professionals</li> </ul> </li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>▪ A coordinated team approach by a dedicated/in-house interprofessional team of regulated health professionals</li> <li>○ Although the patient’s initial functional tolerance may fluctuate, the patient has the cognitive ability and the physical tolerance to participate in and progress through low or higher intensity rehabilitation</li> <li>○ Patients are expected to return to their previous living environment or other appropriate community environment</li> <li>• Therapy Care includes<sup>29</sup>:       <ul style="list-style-type: none"> <li>○ Direct daily therapy (in alignment with treatment plan and patient tolerance)</li> <li>○ Establishment of achievable treatment goals</li> <li>○ Daily/frequent assessment &amp; documentation of the functional status of patients</li> <li>○ Occurrence of regular case discussion amongst treating practitioners</li> </ul> </li> <li>• Therapeutic interventions include<sup>3,9</sup>:       <ul style="list-style-type: none"> <li>○ Exercise for Active ROM and Strength</li> <li>○ Functional training (e.g., gait, stairs, balance, transfers) including any applicable precautions</li> <li>○ ADL/IADL assessment and training</li> <li>○ Neuromuscular Electrical Stimulation for quadriceps, if indicated<sup>9</sup></li> </ul> </li> <li>• Both 1:1 and individualized group-based exercise programs can be beneficial.</li> <li>• In regards to function, ROM and health-related Quality of Life, group-based physiotherapy provides similar outcomes as 1:1 physiotherapy following total joint replacement surgery.<sup>30</sup></li> <li>• Progressive resistance training with sufficient intensity and dosage to enable a physiologic training effect should be a key component.<sup>7,14</sup></li> <li>• Coordinate therapy with pain management<sup>7</sup></li> <li>• Interventions to reduce knee swelling may help improve quadriceps strength and gait speed</li> </ul>
<b>Pain</b>	<ul style="list-style-type: none"> <li>• Assess pain using a standardized pain assessment instrument, e.g., The Numeric Pain Rating Scale (NPRS), VAS.<sup>7</sup></li> <li>• Use multimodal pain management and multimodal pain management education to maximize effect and outcomes.<sup>7,18</sup></li> </ul>
<b>Transition Care Planning</b>	<ul style="list-style-type: none"> <li>• Transition plans must be developed and agreed upon in partnership with the patient, their care partner/s and the health care team involved at each point of transition. A communication liaison must be designated as part of the circle of care, as needed.</li> </ul> <p><b>Transition Planning - General</b></p> <ul style="list-style-type: none"> <li>• Review therapy goals, treatment expectations and discharge criteria with patient.<sup>3</sup></li> <li>• If the patient is discharged to any provider other than the hospital where the surgery was performed, a Discharge Report must be completed, and provided to the receiving care provider.<sup>3</sup> A discharge report should include information such as relevant post-op information (PT and/or MD note) and discharge date; treatment or weight-bearing restrictions; a discharge medication list; and date of follow-up appointment.<sup>6</sup></li> <li>• Criteria for discharge home:       <ul style="list-style-type: none"> <li>○ Ambulates and transfers safely with mobility devices</li> <li>○ Able to do stairs if needed</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Able to perform safe/supported ADLs with or without assistive devices</li> <li>○ Home exercise/education program has been provided to patient and/or caregiver</li> <li>○ Rehabilitation plan is in place (Outpatient/Community Clinic/In-Home)</li> <li>● If criteria for discharge are not met, consider alternate levels of care.<sup>3</sup></li> <li>● Referral to outpatient or community service as needed.<sup>3</sup></li> <li>● Make and confirm appointments and referrals prior to discharge.<sup>7</sup></li> </ul> <p><b>Transition Planning – During Hospital Stay<sup>31</sup></b></p> <ul style="list-style-type: none"> <li>● Anticipate the expected date of discharge, and discuss it with the patient, his/her caregiver(s) and the post-discharge care provider(s).</li> <li>● Implement individualized care and discharge plan(s); revise as required based on therapeutic progress, consultations, and new information.</li> <li>● Based on discharge plan, schedule follow-up rehabilitative care and assessments. Confirm and document appointments in discharge plan.</li> <li>● Rehabilitative care team to support follow-up with most appropriate medical care practitioner.</li> </ul> <p><b>Transition Planning – At time of discharge<sup>14</sup></b></p> <ul style="list-style-type: none"> <li>● Schedule face-to-face and real time discharge conversations (“warm handoffs”) with the patient and their family or informal caregivers.</li> <li>● Provide the written individualized discharge plan to the patient and their caregiver(s) at the time of discharge from hospital. Provide written individualized care and discharge plans to patient’s primary care team, specialists and other providers within 24 hours of discharge.</li> <li>● Provide list of scheduled follow-up rehabilitation appointments and review with the patient and his/her family/caregiver(s) at time of discharge.</li> <li>● Confirm patient’s (and/or family and caregivers’) understanding of the information discussed, and document in the patient’s chart.</li> </ul>
<p style="text-align: center;"><b>Clinical Outcome Measures</b></p>	<ul style="list-style-type: none"> <li>○ Based on the needs of the patients in the pre-operative care setting, Range of Motion (ROM), Strength, and Gait Speed should be measured, along with at least one patient reported measure and performance outcome measure:</li> <li>○ Patient Reported Outcome Measures Examples<sup>2,3,7,10,19</sup>:       <ul style="list-style-type: none"> <li>▪ EQ-5D-5L</li> <li>▪ Oxford Hip &amp; Knee Score (For simultaneous bilateral TJR, complete separate measure for each joint)<sup>20</sup></li> <li>▪ Western Ontario and McMaster Universities Osteoarthritis Index WOMAC</li> <li>▪ Lower Extremity Functional Scale (LEFS)</li> <li>▪ Pain Visual Analogue Scale (VAS)/Numeric Pain Rating Scale (NPRS)</li> <li>▪ Hip Disability and Osteoarthritis Outcome Score (HOOS)/ Knee Injury and Osteoarthritis Outcome Score (KOOS)</li> <li>▪ Patient Specific Functional Scale (PSFS)</li> </ul> </li> <li>○ Performance Outcome Measure Examples<sup>2,3,7,10,19</sup>:       <ul style="list-style-type: none"> <li>▪ 30 Second Chair Stand Test (30CST)</li> <li>▪ Gait Speed (e.g., 2 Minute Walk Test, 40 Metre Walk Test)</li> </ul> </li> </ul>

- Timed Up and Go (TUG)
- Stair Climb Test
- Functional Reach

Processes of Care	Rehabilitation in Outpatient/Community Clinics
<b>Considerations</b>	<ul style="list-style-type: none"> <li>• <b>Rehabilitation to be provided or supervised by a regulated health care professional with knowledge and clinical experience in arthritis and TJR surgery.</b> Multidisciplinary community-based rehabilitation optimizes activity and participation outcomes.<sup>32</sup></li> <li>• Coordinated interprofessional rehabilitative care can be more easily provided in a team-based outpatient setting, than an in-home setting</li> <li>• Integrated care teams, coordinated management of biopsychosocial patient factors, and the concurrent delivery of exercise and self-management interventions can reduce pain, optimize outcomes, and improve function.<sup>14,33,34</sup></li> <li>• Evidence shows that patients discharged directly to higher intensity outpatient/community clinic rehabilitation have a more rapid recovery compared with those who receive 2 weeks of in-home rehabilitation prior to undergoing outpatient rehabilitation<sup>35</sup></li> </ul>
<b>Patient and Care Partner Engagement</b>	<ul style="list-style-type: none"> <li>• Patients and care partners must be included in the circle of care communication and care planning.</li> <li>• Designated care partners who provide care to maintain the patient’s mental and physical health and who advocate on the person’s behalf must be considered essential to rehabilitation and transition care planning and should be allowed to remain with the patient and participate as part of the circle of care</li> <li>• An approach of trust, respect and accommodation should be recognized as essential to the provision of equitable and culturally appropriate rehabilitative care. Rehabilitative care providers must learn about the health beliefs, practices and values of the cultural groups they serve and develop culturally responsive knowledge, skills and attitudes.<sup>1</sup></li> <li>• Information given to patients/caregivers? needs to be paced to avoid overload during the pre-operative and in-patient stages. Use of technology such as an app on their mobile phone, tablet etc. could support patients to revisit information at their own convenience and time of need.<sup>5</sup></li> <li>• Principles of healthy lifestyles and active living are incorporated in the rehabilitation program. This may include providing resources or referrals to external programs.<sup>3</sup></li> <li>• There is a mechanism in place to assess the patient’s learning needs. Education on all of the following topics should be available: <sup>2,3</sup> <ul style="list-style-type: none"> <li>○ Caregiver/Coaching training</li> <li>○ Safe activity resumption</li> <li>○ Mobility and precautions if applicable</li> <li>○ Expected progress</li> <li>○ Pain Management (including patient expectations and supporting the rehabilitation process)</li> <li>○ Sources of help</li> </ul> </li> <li>• The majority of the patient’s recovery will take place in the community; therefore, throughout the program, the patient needs to be provided with instruction and ongoing education regarding exercise and functional activities to be completed at home.<sup>2</sup></li> <li>• Patients may require education up to and beyond a year. Education should be consistent and available through many media including written materials, websites, primary care practitioners, telephone calls and teleconferences.<sup>2</sup></li> <li>• Educate and encourage patients to manage their own care and become more physically active following TJR surgery in order to achieve health-enhancing benefits associated with regular moderate-intensity exercise.<sup>7</sup></li> </ul>

	<ul style="list-style-type: none"> <li>• Patient education is best accomplished using a combination of methods. When education materials are provided in addition to verbal communication, patient education is more effective.<sup>31</sup></li> <li>• Providing quality health information (accurate, accessible, and actionable) enables patients to better manage their health and wellbeing, and make fully informed decisions about their treatment and care.<sup>31</sup></li> <li>• Patient education materials should be developed using plain language as a key strategy for improving health literacy and be compliant with the Accessibility for Ontarians with Disabilities Act (AODA)<sup>4</sup> requirements for accessibility.<sup>31</sup></li> <li>• Additional references to inform patient &amp; family education are included in the reference section.<sup>36–38</sup></li> </ul>
<p style="text-align: center;"><b>Assessment</b></p>	<ul style="list-style-type: none"> <li>• Rehabilitative care providers must ensure a safe, inclusive space to provide rehabilitative care with consideration for the patient’s intersecting identities, health beliefs, practices and values.<sup>1,11</sup></li> <li>• Rehabilitative care providers must use culturally appropriate language and a person-centred, history-taking approach, such as asking open-ended questions and ensuring privacy and confidentiality during interactions with all patients and care partners.<sup>1,11</sup></li> <li>• Assessments are focused on patient safety at home as well as physical and functional abilities necessary for daily activities.<sup>3,39</sup></li> <li>• Initial assessment with a PT to determine breadth of deficits and intensity of rehabilitation required.<sup>3</sup></li> <li>• Assessment of function and ADL management with validated measurement tools.<sup>3</sup></li> <li>• Assessment for and development of individualized therapy plans (e.g., 1:1 or group settings).</li> <li>• Goals need to be established in partnership with the individual, their family/carers and treating health professionals.<sup>40</sup></li> </ul>
<p><b>Treatment/Interventions</b></p> <ul style="list-style-type: none"> <li>• <b>Individual (1:1) and Individualized Group-based Interventions</b></li> <li>• <b>Functional Training (e.g., ADLs &amp; Mobility)</b></li> </ul>	<p><b>Treatment/Intervention:</b></p> <ul style="list-style-type: none"> <li>• Exercises for ROM and strength, including home exercises.<sup>3</sup></li> <li>• Functional training (e.g., gait, stairs, balance, transfers) including home exercises.<sup>3</sup></li> <li>• Progressive resistance training with sufficient intensity and dosage to enable physiologic training effect should be a key component of rehab programs.<sup>14</sup></li> <li>• Both individual and group exercise programs can be beneficial, and the level of health professional supervision should be matched to the patient’s needs.<sup>14</sup></li> <li>• Progression of functional abilities towards patient’s goals.<sup>39</sup></li> <li>• Hands-on therapy as required.<sup>3</sup></li> <li>• Standardized, evidence-based training be available to health professionals to ensure they have the most up to date knowledge and skills to provide safe and effective rehabilitation care to individuals undergoing TJR.<sup>40</sup></li> <li>• Timing of rehabilitation is important for optimal patient outcome after TJR.<sup>40</sup></li> </ul> <p><b>Total Knee Replacement</b></p> <ul style="list-style-type: none"> <li>• <u>Initiation</u> <ul style="list-style-type: none"> <li>○ Outpatient rehab should begin within 7 days of discharge from acute care.<sup>9,40</sup></li> </ul> </li> <li>• <u>Duration/Frequency:</u></li> </ul>

- *Usual Progression (estimated ~80% of patients):* Treatments should be offered 2 times per week for 6-7 weeks, with variation in frequency and duration depending on the patient's progress and care needs.<sup>3,39,41</sup>
- *Slower Progression (estimated ~20% of patients):* Based on patient-specific factors, some patients may require up to 12 weeks of supervised rehabilitative care.
- The greatest improvement in knee flexion occurs within the first 6-7 weeks postoperatively.<sup>41</sup>
- Rehabilitation for patients following knee replacement includes intensive exercise to achieve range of motion and function throughout the first 12 weeks post-surgery, including both supervised and independent exercise programs.<sup>2</sup>
- Duration is based on the achievement of functional goals of independence or plateau in progression.<sup>2,3</sup>
- Overall frequency of rehabilitation is important for optimal patient outcomes.<sup>40</sup>
- Personal and external factors be identified and considered for their influence on overall frequency of rehabilitation.<sup>40</sup>

- Format

- Hands-on treatment & manual therapy techniques are required to assist the patient achieve range of motion in the knee.
- Interventions to reduce knee swelling may help improve quadriceps strength and gait speed<sup>42</sup>
- Both 1:1 and individualized group-based exercise programs can be beneficial.<sup>30</sup>
- In regards to function, ROM and health -related Quality of Life, individualized group-based physiotherapy provides similar outcomes as 1:1 physiotherapy following total joint replacement surgery.<sup>30,43</sup>
- Note: Patients who need close monitoring for surgical or medical concerns are not appropriate for group-based rehabilitative care.<sup>44</sup>
- Triage into class model vs. 1:1 treatment is based on the assessment of the PT with the following considerations where class volumes permit<sup>39</sup>
  - Pre-Surgical Status
    - Longstanding contractures or muscle imbalances
    - Co-morbidities
  - Surgical Complexity
    - Fractures, osteotomy, bone graft reconstruction, non-routine follow-up.
  - Social/cultural factors
    - Language barriers, difficulty following instructions
- For the patients who require rehabilitative care in outpatient/community clinic the best practice guideline is:
  - Group based format provided to patients expected to follow usual progression based on initial assessment by the regulated rehabilitative care professional.<sup>39</sup>
  - 1:1 individual treatments provided to patients expected to require slower progression based on initial assessment by the regulated rehabilitative care professional.<sup>39</sup>

<p><b>Treatment/Interventions</b></p> <ul style="list-style-type: none"> <li>• <b>Individual (1:1) and Individualized Group-based Interventions</b></li> <li>• <b>Functional Training (e.g., ADLs &amp; Mobility)</b></li> </ul>	<p><b>Total Hip Replacement</b></p> <ul style="list-style-type: none"> <li>• <b>Initiation</b> <ul style="list-style-type: none"> <li>○ Class or 1:1 session scheduled at approximately 2-4 weeks post discharge from acute care.<sup>39</sup></li> <li>○ Variation in initiation timeline is to account for differences in surgical practices, patient profiles and other environmental factors (e.g. degree of familiarity with the patient in the Outpatient Rehab setting; patient’s geographical proximity for surgical follow-up, service availability in different geographical locations, patient’s ability to receive home-care prior to rehabilitative care in outpatient/community clinic, availability of home support and safety concerns, etc.)</li> </ul> </li> </ul> <p><b>Intensity</b></p> <ul style="list-style-type: none"> <li>• <b>Duration/Frequency</b> <ul style="list-style-type: none"> <li>○ <i>Typical Progression:</i> Average of 4 sessions (group or 1:1 format) will be suitable for the majority of patients post total hip replacement.</li> <li>○ <i>Slower Progression:</i> Some patients may require 1:1 treatment up to 8 sessions after the initial class or follow up session to support exercise progression, provide re-checks and assess need for gait aid(s) and other functional needs.<sup>39</sup> (Due to deconditioning associated with longer wait time for surgery and physical isolation, there may be an increase in the number of individuals on the slower progression pathway.)</li> <li>○ Personal and external factors need to be identified and considered for their influence on overall dose of rehabilitation.<sup>36</sup></li> <li>○ Frequency of treatment depends on achievement of goals, typically no more than once per week.<sup>3</sup></li> <li>○ Duration is based on the achievement of functional goals of independence or plateau in progression.<sup>2,3</sup></li> <li>○ Duration of the program and the need for subsequent sessions will vary and is dependent on patient needs.<sup>39</sup></li> <li>○ Rehabilitation for hip replacement patients is limited by surgical restrictions. Surgical restrictions tend to be required following the first surgeon visit and up to 3 months following surgery.<sup>2</sup></li> </ul> </li> <li>• <b>Format</b> <ul style="list-style-type: none"> <li>○ Triage into group model vs. 1:1 treatment is based on the assessment of the regulated rehabilitative care professional with the following considerations where class volumes permit<sup>39</sup> <ul style="list-style-type: none"> <li>▪ Pre-Surgical Status               <ul style="list-style-type: none"> <li>○ Longstanding contractures or muscle imbalances</li> <li>○ Co-morbidities</li> </ul> </li> <li>▪ Surgical Complexity               <ul style="list-style-type: none"> <li>○ Fractures, osteotomy, bone graft reconstruction, non-routine follow-up.</li> </ul> </li> <li>▪ Social/cultural factors               <ul style="list-style-type: none"> <li>○ Language barriers, difficulty following instructions</li> </ul> </li> </ul> </li> <li>○ Both 1:1 and individualized group-based exercise programs can be beneficial.<sup>30</sup></li> </ul> </li> </ul>
--	---

	<ul style="list-style-type: none"> <li>○ In regards to function, ROM and health-related Quality of Life, individualized group-based physiotherapy provides similar outcomes as 1:1 physiotherapy, following total joint replacement surgery.<sup>30,43</sup></li> <li>○ A model of care, which encourages and empowers patients to self-manage their care.<sup>10</sup></li> <li>○ Regardless of whether patients are attending individual or group sessions, 1-2 sessions should be used to assess the patient, review educational materials, help patient progress his/her home exercise program, review objectives of rehab with patient and address any concerns.<sup>39</sup></li> <li>○ In addition to the 1-2 sessions above, some patients may require additional sessions to support progression of the patient’s exercise program, provide re-checks, and to assess the need for gait aids and other functional needs.<sup>39</sup></li> <li>○ Timely communication of the patient’s progress should be shared with patient, caregiver and patient’s care team</li> </ul>
<b>Treatment/Interventions: Considerations for Simultaneous Bilateral TJR</b>	<p>Treatment and interventions for simultaneous bilateral TJR patients are similar to the primary unilateral best practices outlined above with the following considerations:</p> <ul style="list-style-type: none"> <li>● The length of each session, frequency and the duration of rehabilitative care may be adjusted with consideration for the rehabilitative care needs of the bilateral TJR patient. For example:           <ul style="list-style-type: none"> <li>○ For group therapy, 1 simultaneous bilateral TJR patient may be allotted 2 spots in the group</li> <li>○ For 1:1 therapy sessions, a simultaneous bilateral TJR patient may be booked for a longer session as compared to a patient with a primary unilateral TJR</li> <li>○ Duration of outpatient rehabilitation may be extended and frequency adjusted for simultaneous bilateral TJR, as needed</li> </ul> </li> </ul>
<b>Treatment/Interventions: Virtual Care Considerations</b>	<ul style="list-style-type: none"> <li>● Where mobile technology, such as an app, has been used to facilitate more communication and interaction, patient activation has been shown to be increased and outcomes improved by<sup>45</sup>:       <ul style="list-style-type: none"> <li>○ Delivering the ‘right information at the right time’.</li> <li>○ Actively integrating patients into the healthcare team and encouraging them to take control of their own care.</li> </ul> </li> <li>● The key period for improving postsurgical recovery is immediately post-discharge from acute care. For example, automated text messages improved time spent on home exercises, improved mood, decreased narcotics use and minimized calls to the surgeon’s office.<sup>45</sup></li> <li>● Hybrid rehab care models which include both in-person and virtual care may also be considered. For example<sup>46,47</sup>:       <ul style="list-style-type: none"> <li>○ Virtual assessment with in person follow up</li> <li>○ Adjunct virtual exercise programs</li> <li>○ Text/telephone connection with PT</li> </ul> </li> </ul>
<b>Pain</b>	<ul style="list-style-type: none"> <li>● Assess pain using a validated pain measurement tool (e.g., VAS, NPRS).<sup>7</sup></li> <li>● Integrate pain management into care of patient to allow active participation in rehabilitation.<sup>2</sup></li> <li>● A patient’s pain management goals should be related to returning to ADLs/ IADLs.</li> <li>● Provide individualized multi-modal pain management education<sup>18</sup> and resources to patients, including patient and/or family on pain management, and where needed, redirection to the most appropriate health care provider for pain management.</li> </ul>

<p style="text-align: center;"><b>Transition Care Planning</b></p>	<ul style="list-style-type: none"> <li>• Transition plans must be developed and agreed upon in partnership with the patient, their care partner/s and the health care team involved at each point of transition. A communication liaison must be designated as part of the circle of care, as needed.</li> <li>• Review therapy goals, treatment expectations, benefits of a healthy, active lifestyle and discharge criteria with patient.<sup>3</sup></li> <li>• Communicate to the full care team, including but not limited to the Orthopaedic Surgeon<sup>1</sup> and primary care practitioner.<sup>2</sup></li> <li>• Refer to community resources/programs as appropriate (e.g., Arthritis Society, falls prevention clinics (e.g. Stand Up), fitness and wellness centres)<sup>7</sup></li> <li>• Provide patient with name, date, and time of next care provider appointment.<sup>7</sup></li> <li>• If the patient is discharged to any provider other than the hospital where the surgery was performed, a Discharge Report must be completed, and provided to the receiving care provider.<sup>3</sup> A discharge report should include information such as relevant post-op information (PT and/or MD note) and discharge date; treatment or weight-bearing restrictions; a discharge medication list; and date of follow-up appointment.<sup>6</sup></li> <li>• Discharge Criteria<sup>3</sup>:       <ul style="list-style-type: none"> <li>○ Functional active ROM (consider pre-op status and lifestyle)</li> <li>○ Functional Strength (consider pre-op status and lifestyle)</li> <li>○ Independent ambulation (indoors and outdoors, with/without ambulation aid as required – consider pre-op status)</li> <li>○ Safe transfers as required (home, vehicle)</li> <li>○ Safe use of stairs, if required</li> <li>○ Swelling resolved or self-managed; wound healed or self-managed; pain self-managed with/without medications</li> <li>○ Long-term equipment needs identified; vendors, funding and safe use understood</li> <li>○ Knowledge of prescribed home exercise program and how to progress his/her prescribed home exercise program.<sup>39</sup></li> <li>○ Knowledge of resumption of safe activities and a return to an active lifestyle.</li> <li>○ Patients are discharged when they have achieved their discharge goals or they have reached a plateau, rather than based on a maximum number of visits.<sup>3</sup></li> <li>○ If patient’s personal goals exceed the program goals beyond that of a home exercise program, a patient may be referred to a private clinic or other community exercise facilities.<sup>3</sup></li> </ul> </li> </ul>
<p style="text-align: center;"><b>Clinical Outcome Measures</b></p>	<ul style="list-style-type: none"> <li>○ Based on the needs of the patients in the pre-operative care setting, Range of Motion (ROM), Strength, and Gait Speed should be measured, along with at least one patient reported measure and performance outcome measure:</li> <li>○ Patient Reported Outcome Measures Examples<sup>2,3,7,10,19</sup>:       <ul style="list-style-type: none"> <li>▪ EQ-5D-5L</li> <li>▪ Oxford Hip &amp; Knee Score (For simultaneous bilateral TJR, complete separate measure for each joint)<sup>20</sup></li> <li>▪ Western Ontario and McMaster Universities Osteoarthritis Index WOMAC</li> <li>▪ Lower Extremity Functional Scale (LEFS)</li> <li>▪ Pain Visual Analogue Scale (VAS)/Numeric Pain Rating Scale (NPRS)</li> </ul> </li> </ul>

- Hip Disability and Osteoarthritis Outcome Score (HOOS)/Knee Injury and Osteoarthritis Outcome Score (KOOS)
- Patient Specific Functional Scale (PSFS)
- Performance Outcome Measure Examples<sup>2,3,7,10,19</sup>:
  - 30 Second Chair Stand Test (30CST)
  - Gait Speed (e.g., 2 Minute Walk Test, 40 Metre Walk Test)
  - Timed Up and Go (TUG)
  - Stair Climb Test
  - Functional Reach

Processes of Care	In-Home Rehabilitative Care
<p style="text-align: center;"><b>Considerations For both primary unilateral and simultaneous bilateral TJR</b></p>	<ul style="list-style-type: none"> <li>• According to the Provision of Community Services under the Home Care and Community Services Act (2014):             <ul style="list-style-type: none"> <li>○ In the case of physiotherapy services and medical supplies, dressings and treatment equipment necessary to the provision of physiotherapy services,                 <ul style="list-style-type: none"> <li>▪ if the services are provided in the patient’s home in accordance with clause 3.5 (3) (a), the patient must be unable to access the services in a setting outside the home because of his or her condition<sup>48</sup></li> </ul> </li> </ul> </li> <li>• For a patient to access in-home physiotherapy, at least one of the following criteria should be met:             <ul style="list-style-type: none"> <li>○ Home bound – patient did not leave the home previously and participating in an outpatient rehabilitation program would negatively impact the patient’s progress</li> <li>○ Presence of cognitive impairment such that participating in an outpatient rehabilitation program would negatively impact the patient’s progress</li> <li>○ Where the waitlist for an outpatient rehabilitation facility cannot provide timely access to rehabilitation as recommended by best practice</li> <li>○ Other extenuating circumstances to be reviewed on an individual basis with “Care Coordinator/Manager and the referral source</li> </ul> </li> <li>• Please note that difficulty in finding transportation will not, on its own, be considered a reason for authorizing in home services.</li> <li>• The patient may require a short-term “Transition to Outpatient from Home” service to overcome physical barriers of their home setting (e.g., stairs) in order to attend rehabilitative care in outpatient/community clinic.</li> <li>• Patients receiving in-home rehabilitation should be monitored for their progress and regularly reassessed to determine whether their functional goals can be met in an outpatient/community setting outside of the home.</li> <li>• The rehab setting should be based on the care needs of the patient (e.g., pain level, limitations, mobility, frailty, etc.).</li> </ul>
<p style="text-align: center;"><b>Patient and Care Partner Engagement</b></p>	<ul style="list-style-type: none"> <li>• Patients and care partners must be included in the circle of care communication and care planning</li> <li>• Designated care partners who provide care to maintain the patient’s mental and physical health and who advocate on the person’s behalf must be considered essential to rehabilitation and transition care planning and should be allowed to remain with the patient and participate as part of the circle of care</li> <li>• An approach of trust, respect and accommodation should be recognized as essential to the provision of equitable and culturally appropriate rehabilitative care. Rehabilitative care providers must learn about the health beliefs, practices and values of the cultural groups they serve and develop culturally responsive knowledge, skills and attitudes.<sup>1</sup></li> <li>• Information given needs to be paced to avoid overload during the pre-operative and in-patient stages. Use of technology such as an app on their mobile phone, tablet etc. could support patients to revisit information at their own convenience and time of need.<sup>5</sup></li> <li>• There is a mechanism in place to assess the patient’s learning needs. Education on all of the following topics is available<sup>3</sup>:             <ul style="list-style-type: none"> <li>○ Caregiver/coaching training</li> <li>○ Safe activity resumption</li> <li>○ Mobility and precautions if applicable</li> <li>○ Expected progress</li> <li>○ Pain Management</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Community Resources</li> <li>● Education on the principles of a healthy lifestyle and active living should be incorporated into the rehabilitation program. This may include providing resources or referrals to external programs.<sup>3</sup></li> <li>● Patient education should reinforce the benefits of ongoing independent participation in exercise.<sup>3</sup></li> <li>● Patient education is best accomplished using a combination of methods. When education materials are provided in addition to verbal communication, patient education is more effective.</li> <li>● Providing quality health information (accurate, accessible, and actionable) enables patients to better manage their health and wellbeing, and make fully informed decisions about their treatment and care.<sup>31</sup></li> <li>● Patient education materials should be developed using plain language as a key strategy for improving health literacy and be compliant with the Accessibility for Ontarians with Disabilities Act (AODA) requirements for accessibility.<sup>4</sup></li> <li>● Educate and encourage patients to manage their own care and become more physically active following TJR surgery in order to achieve health-enhancing benefits associated with regular moderate-intensity exercise.<sup>7</sup></li> <li>● A self-management component should be included in the treatment plan to empower patients to continue post-discharge of rehabilitative care.</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>● Rehabilitative care providers must ensure a safe, inclusive space to provide rehabilitative care with consideration for the patient’s intersecting identities, health beliefs, practices and values.<sup>1,11</sup></li> <li>● Rehabilitative care providers must use culturally appropriate language and a person-centred, history-taking approach, such as asking open-ended questions and ensuring privacy and confidentiality during interactions with all patients and care partners.<sup>1,11</sup></li> <li>● Assessments are focused on physical and functional abilities as well as safety at home necessary for daily activities.<sup>3</sup></li> <li>● Goals need to be established in partnership with the individual, their family/carers and treating health professionals.<sup>3</sup></li> <li>● Assessment of function and ADL management with appropriate intervention as required is recommended.<sup>3</sup></li> <li>● Assessment of fall risk with appropriate intervention as required is recommended.<sup>3</sup></li> <li>● Ensure that a measurement of cognitive status is completed when needed/indicated and the results are considered for potential impact.</li> </ul>
<b>Treatment/Interventions</b> <ul style="list-style-type: none"> <li>● <b>Individual (1:1) and Individualized Group-based Interventions</b></li> <li>● <b>Functional Training (e.g., ADLs &amp; Mobility)</b></li> </ul>	<b>Total Knee Replacement</b> <ul style="list-style-type: none"> <li>● <u>Initiation</u> <ul style="list-style-type: none"> <li>○ Patient care, as defined by delivery of direct services by a PT and/or OT, should be started within 7 days of discharge from acute care or earlier if patient has been identified as high risk. This does not include in-home Care Coordinator assessment or equipment delivery.<sup>3,7,49</sup></li> <li>○ First post discharge patient care visit should be based on patient’s need and circumstances (wound care, safety issues or other concerns). The first visit could be needed as early as 24-48 hours but should be no later than 7 days from discharge from acute care.<sup>7,49</sup></li> </ul> </li> <li>● <u>Intensity</u> <ul style="list-style-type: none"> <li>○ Frequency is more intense in the first few weeks (2-3 times per week, as needed<sup>3,18</sup>) as there is a risk of contracture or loss of range of motion and is based on the progress of the patient.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Personal and external factors should be identified and considered for their influence on overall dose of rehabilitation.<sup>40</sup></li> <li>○ Overall dose of rehabilitation is important for optimal patient outcomes.<sup>39</sup></li> <li>● <u>Duration</u> <ul style="list-style-type: none"> <li>○ The greatest improvement in knee flexion occurs within the first 6-7 weeks postoperatively.<sup>43</sup></li> <li>○ Rehabilitation for knee replacement patients includes intensive treatment to achieve range of motion and function up to the first 12 weeks post-surgery if patient is unable to access outpatient clinics.<sup>2</sup></li> <li>○ Duration is based on the achievement of functional goals of independence or plateau in progression.<sup>2,3</sup></li> <li>○ Duration of the program and the need for subsequent sessions will vary and is dependent on patient needs.<sup>39</sup></li> </ul> </li> <li>● <u>Format</u> <ul style="list-style-type: none"> <li>○ Timely communication of the patient’s progress should be shared with patient, caregiver and patient’s care team.<sup>7</sup></li> <li>○ Model of care which encourages and empowers patients to self-manage their care.<sup>10</sup></li> <li>○ Hands-on treatment &amp; manual therapy techniques are required to assist the patient achieve range of motion in the knee.</li> <li>○ Interventions to reduce knee swelling may help improve quadriceps strength and gait speed<sup>42</sup></li> </ul> </li> </ul>
<b>Treatment/Interventions</b> <ul style="list-style-type: none"> <li>● <b>Individual and Group Exercise Interventions</b></li> <li>● <b>Functional Training (e.g., ADLs &amp; Mobility)</b></li> </ul>	<b>Total Hip Replacement</b> <ul style="list-style-type: none"> <li>● <u>Initiation</u> <ul style="list-style-type: none"> <li>○ Patient care, as defined by delivery of direct services by a PT and/or OT should be started within 7 days of discharge from acute care. This does not include in-home Care Coordinator assessment or equipment delivery. High risk patients should be identified as per normal hospital process for earlier initiation of service.<sup>3,7,49</sup></li> <li>○ First post discharge visit should be based on patient’s need and circumstances (wound care, safety issues or other concerns). The first visit could be needed as early as 24-48 hours but should be no later than 7 days from discharge from acute care.<sup>7,49</sup></li> </ul> </li> </ul> <b>Intensity</b> <ul style="list-style-type: none"> <li>● <u>Frequency</u> <ul style="list-style-type: none"> <li>○ Typical number of visits is once per week in the first few weeks and then based on the progress of the patient thereafter.<sup>3</sup></li> <li>○ Personal and external factors should be identified and considered for their influence on overall dose of rehabilitation.<sup>40</sup></li> </ul> </li> <li>● <u>Format</u> <ul style="list-style-type: none"> <li>○ Timely communication of the patient’s progress should be shared.<sup>7</sup></li> <li>○ Model of care which encourages and empowers patients to self-manage their care should be considered.<sup>10</sup></li> </ul> </li> <li>● <u>Duration</u> <ul style="list-style-type: none"> <li>○ Duration is based on the achievement of functional goals of independence or plateau in progression.<sup>3</sup></li> <li>○ Duration of the program and the need for subsequent sessions will vary and is dependent on patient needs.<sup>39</sup></li> <li>○ The typical maximum duration of therapy is up to 12 weeks if patient is unable to access outpatient clinic.<sup>3</sup></li> </ul> </li> </ul>

<b>Treatment/Interventions: Virtual Care Considerations</b>	<ul style="list-style-type: none"> <li>• Where mobile technology, such as an app, has been used to facilitate more communication and interaction, patient activation has been shown to be increased and outcomes improved by<sup>45</sup>:             <ul style="list-style-type: none"> <li>○ Delivering the ‘right information at the right time’.</li> <li>○ Actively integrating patients into the healthcare team and encouraging them to take control of their own care.</li> </ul> </li> <li>• The key period for improving postsurgical recovery is immediately post-discharge from acute care. For example, automated text messages improved time spent on home exercises, improved mood, decreased narcotics use and minimized calls to the surgeon’s office.<sup>45</sup></li> <li>• Hybrid models which include both in-person and virtual care may also be considered. For example<sup>46,47</sup>:             <ul style="list-style-type: none"> <li>○ Virtual assessment with in person follow up</li> <li>○ Adjunct virtual exercise programs</li> <li>○ Text/telephone connection with PT</li> </ul> </li> </ul>
<b>Pain</b>	<ul style="list-style-type: none"> <li>• Assess pain using a validated pain measurement tool (e.g., VAS, NPRS)<sup>7</sup></li> <li>• Integrate pain management into care of patient to allow active participation in rehabilitation.<sup>2</sup></li> <li>• Provide individually tailored multi-modal pain management education and resources to patients, including patient and/or family on pain management, and where needed, redirection to the most appropriate health care provider for pain management.</li> </ul>
<b>Transition Care Planning</b>	<ul style="list-style-type: none"> <li>• Transition plans must be developed and agreed upon in partnership with the patient, their care partner/s and the health care team involved at each point of transition. A communication liaison must be designated as part of the circle of care.</li> <li>• There may be a need for equipment and/or assistive devices to be in place within the home to assist with function. These may include but are not limited to<sup>2</sup>:             <ul style="list-style-type: none"> <li>○ Raised toilet seat/Versa frame</li> <li>○ Bath seat/chair/bench</li> <li>○ Grab bars</li> <li>○ Non-slip surfaces</li> <li>○ Raised cushion</li> <li>○ Reachers</li> <li>○ Elastic shoe laces</li> <li>○ Long handled scrub brush</li> <li>○ Long handled shoe horn</li> <li>○ Gait aid</li> <li>○ Furniture risers</li> </ul> </li> <li>• If patient’s personal goals exceed the rehab goals beyond that of a home exercise program, a patient may explore other community resources that best meet his/her needs (e.g., YMCA Program or private services).<sup>3</sup></li> <li>• Refer to community resources/programs as appropriate.</li> <li>• Patients are discharged when they have achieved their discharge goals or they have reached a plateau, rather than based on a maximum number of visits</li> </ul>

	<ul style="list-style-type: none"> <li>• If the patient is discharged to any provider other than the hospital where the surgery was performed, a Discharge Report must be completed, and provided to the receiving care provider.<sup>3</sup> A discharge report should include information such as relevant post-op information (PT and/or MD note) and discharge date; treatment or weight-bearing restrictions; a discharge medication list; and date of follow-up appointment<sup>6</sup></li> <li>• Discharge Criteria<sup>3</sup>:       <ul style="list-style-type: none"> <li>○ If the patient’s in-home community rehabilitation is temporary, the discharge criterion is:           <ul style="list-style-type: none"> <li>○ Patient is able to get in and out of home and vehicle safely to attend outpatient clinic.</li> </ul> </li> <li>○ If the patient’s entire rehabilitation is provided in a home environment, the discharge criteria are:           <ul style="list-style-type: none"> <li>○ Functional active ROM (consider pre-op status and lifestyle)</li> <li>○ Functional Strength (consider pre-op status and lifestyle)</li> <li>○ Independent ambulation (indoors and outdoors, with/without ambulation aid as required – consider pre-op status)</li> <li>○ Safe transfer as required (home, vehicle)</li> <li>○ Safe use of stairs as required</li> <li>○ Swelling resolved or self-managed; wound healed or self-managed</li> <li>○ Pain is self-managed with/without medications</li> <li>○ Long-term equipment needs identified; vendors, funding sources and safe use are understood</li> </ul> </li> </ul> </li> </ul>
<b>Clinical Outcome Measures</b>	<ul style="list-style-type: none"> <li>○ Based on the needs of the patients in the pre-operative care setting, Range of Motion (ROM), Strength, and Gait Speed should be measured, along with at least one patient reported measure and performance outcome measure:</li> <li>○ Patient Reported Outcome Measures Examples<sup>2,3,7,10,19</sup>:       <ul style="list-style-type: none"> <li>▪ EQ-5D-5L</li> <li>▪ Oxford Hip &amp; Knee Score (For simultaneous bilateral TJR, complete separate measure for each joint)<sup>20</sup></li> <li>▪ Western Ontario and McMaster Universities Osteoarthritis Index WOMAC</li> <li>▪ Lower Extremity Functional Scale (LEFS)</li> <li>▪ Pain Visual Analogue Scale (VAS)/Numeric Pain Rating Scale (NPRS)</li> <li>▪ Hip Disability and Osteoarthritis Outcome Score (HOOS)/ Knee Injury and Osteoarthritis Outcome Score (KOOS)</li> <li>▪ Patient Specific Functional Scale (PSFS)</li> </ul> </li> <li>○ Performance Outcome Measure Examples<sup>2,3,7,10,19</sup>:       <ul style="list-style-type: none"> <li>▪ 30 Second Chair Stand Test (30CST); Stair Climb Test</li> <li>▪ Gait Speed (e.g., 2 Minute Walk Test, 40 Metre Walk Test); Timed Up and Go (TUG); Functional Reach</li> </ul> </li> </ul>

**Please Note:**

As per the Physiotherapy Act 1991, the practice of physiotherapy is the assessment of neuromuscular, musculoskeletal and cardio respiratory systems, the diagnosis of diseases or disorders associated with physical dysfunction, injury or pain and the treatment, rehabilitation and prevention or relief of physical dysfunction, injury or pain to develop, maintain, rehabilitate or augment function and promote mobility.<sup>50</sup> Where a physiotherapist is not otherwise available, assessment and treatment may be provided by another regulated rehabilitative care professional with experience and expertise with this patient population to determine the breadth of deficits and intensity of rehabilitation required and to provide orthopaedic assessment and treatment.

**Best Practice References**

1. Stanford School of Medicine. Culturally Appropriate Geriatric Care: Promoting Cross-Cultural Understanding. <https://geriatrics.stanford.edu/ethnomed/hmong/understanding.html> (2021).
2. Bone and Joint Canada. Hip and Knee Replacement Toolkit. [http://boneandjointcanada.com/wp-content/uploads/2014/05/11-2821-RR\\_HipKnee\\_Replacement\\_Toolkit\\_V3.pdf](http://boneandjointcanada.com/wp-content/uploads/2014/05/11-2821-RR_HipKnee_Replacement_Toolkit_V3.pdf) (2011).
3. Champlain LHIN. Hip and Knee Replacements – Standardized Rehabilitation and Treatment . [http://www.gtarehabnetwork.ca/uploads/File/reports/Champlain\\_LHIN\\_-\\_Standard\\_Treatment\\_Approaches\\_-\\_Merged\\_Doc.pdf](http://www.gtarehabnetwork.ca/uploads/File/reports/Champlain_LHIN_-_Standard_Treatment_Approaches_-_Merged_Doc.pdf) (2014).
4. Accessibility for Ontarians Act. <https://www.ontario.ca/laws/statute/05a11> (2005).
5. Specht, K., Agerskov, H., Kjaersgaard-Andersen, P., Jester, R. & Pedersen, B. D. Patients' experiences during the first 12 weeks after discharge in fast-track hip and knee arthroplasty – a qualitative study. *Int J Orthop Trauma Nurs* **31**, 13–19 (2018).
6. GTA Rehab Network. Guidelines for Pre-operative TJR Processes. [http://www.gtarehabnetwork.ca/uploads/File/tools/Guideline\\_for\\_Pre-Operative\\_TJR\\_Processes\\_\\_January\\_2016\\_.pdf](http://www.gtarehabnetwork.ca/uploads/File/tools/Guideline_for_Pre-Operative_TJR_Processes__January_2016_.pdf) (2015).
7. Waterloo Wellington Rehabilitative Care System. Total Joint Arthroplasty Care Pathway. (2014).
8. Konopka, J. et. al. Risk Assessment Tools Used to Predict Outcomes of Total Hip and Total Knee Arthroplasty. *Orthopedic Clinics of North America* **46**, (2015).
9. Jette, D. U. et al. Physical Therapist Management of Total Knee Arthroplasty. *Phys Ther* **100**, 1603–1631 (2020).
10. Mississauga Halton LHIN. *Ambulatory Rehabilitation for the Total Joint Replacements Project*. (2015).
11. RNAO. Promoting 2SLGBTQI+ Health Equity. [https://rnao.ca/sites/rnaoca/files/bpg/2SLGBTQI\\_BPG\\_June\\_2021.pdf](https://rnao.ca/sites/rnaoca/files/bpg/2SLGBTQI_BPG_June_2021.pdf) (2021).
12. North East Specialized Geriatric Centre. Baseline Functional Status. [http://rehabcarealliance.ca/uploads/File/Initiatives\\_and\\_Toolkits/Frail\\_Seniors/NESGC\\_-\\_Baseline\\_Functional\\_Status.pdf](http://rehabcarealliance.ca/uploads/File/Initiatives_and_Toolkits/Frail_Seniors/NESGC_-_Baseline_Functional_Status.pdf) (2021).
13. Australian Health Service Alliance. Risk Assessment and Prediction Tool (RAPT). [https://www.ahsa.com.au/web/patient\\_info/rapt\\_form/download](https://www.ahsa.com.au/web/patient_info/rapt_form/download) · (2017).
14. Westby, M. Rehabilitation and Total Joint Arthroplasty. *Clin Geriatr Med* **28**, 489–508 (2012).
15. Enhanced Recovery Canada. Clinical Pathway for Inpatient and Outpatient Hip and Knee Arthroplasty. [https://www.healthcareexcellence.ca/media/k0mbozhc/erc\\_clinicalpathway\\_arthro\\_july2021\\_en.pdf](https://www.healthcareexcellence.ca/media/k0mbozhc/erc_clinicalpathway_arthro_july2021_en.pdf) (2021).
16. Ageberg, E., Link, A. & Roos, E. M. Feasibility of neuromuscular training in patients with severe hip or knee OA: The individualized goal-based NEMEX-TJR training program. *BMC Musculoskelet Disord* **11**, 126 (2010).
17. Zywiell MG & McGlasson R. *GLA:DTM Canada Implementation and Outcomes: 2019 Annual Report*. . <https://gladcanada.ca/> (2020).
18. Kennedy, D. et al. A qualitative study of patient education needs for hip and knee replacement. *BMC Musculoskelet Disord* **18**, 413 (2017).

## Rehabilitative Care Best Practices for Patients with Hip &amp; Knee Replacements

19. University of British Columbia. Total Joint Arthroplasty and Outcome Measures Toolkit. <http://physicaltherapy.med.ubc.ca/physical-therapy-knowledge-broker/total-joint-arthroplasty-and-outcome-measures-tjaom-toolkit/> (2014).
20. CIHI. PROMs Data Collection Manual: Hip and Knee Arthroplasty . <https://www.cihi.ca/sites/default/files/document/proms-data-collection-manual-may2019-en-web.pdf> (2019).
21. McDonough, C. M. *et al.* Physical Therapy Management of Older Adults With Hip Fracture. *Journal of Orthopaedic & Sports Physical Therapy* **51**, CPG1–CPG81 (2021).
22. GTA Rehab Network. Outpatient Rehab Referral Form. : *Microsoft Word - 1 Outpatient Rehab Referral\_Hip Knee Shoulder Sx package (002) (gtarehabnetwork.ca)* (2022).
23. Health Quality Ontario & Ministry of Health and Long-Term Care. Quality-Based Procedures: Clinical Handbook for Primary Hip and Knee Replacement. <http://www.hqontario.ca/Portals/0/Documents/evidence/clinical-handbooks/hip-knee-140227-en.pdf> (2013).
24. Access to Care & Ministry of Health & Long Term Care. *Orthopaedic Quality Scorecard*. (2014).
25. Wizowski, T., L., H. & Hutchings, T. *Writing health information for patients and families*. (Hamilton Health Sciences, 2014).
26. Canadian Orthopaedic Foundation. Patient information, “Get moving, maximizing your activity after hip or knee replacement” . <https://whenithurtstomove.org/>.
27. Vogel L, Carontenuto G, Basti J & Levine W. Physical Activity After Total Joint Arthroplasty. *Sports Health* **3**, 441–450 (2011).
28. Golant A, Christoforou DC, Slover JD, Zuckerman JD & Bull. Athletic participation after hip and knee arthroplasty. *NYU Hosp Jt Dis* **68**, 76–83 (2010).
29. Rehabilitative Care Alliance. Definitions Framework for Bedded Levels of Rehabilitative Care. [http://rehabcarealliance.ca/uploads/File/Toolbox/Definitions/Definitions\\_Framework\\_for\\_Bedded\\_Levels\\_of\\_Rehabilitative\\_Care\\_\\_FINAL\\_Dec\\_2014\\_.pdf](http://rehabcarealliance.ca/uploads/File/Toolbox/Definitions/Definitions_Framework_for_Bedded_Levels_of_Rehabilitative_Care__FINAL_Dec_2014_.pdf) (2014).
30. Coulter CL, Weber JM & Scarvell JM. Group physiotherapy provides similar outcomes for participants after joint replacement surgery as 1-to-1 physiotherapy: a sequential cohort study. *Arch Phys Med Rehabil* **90**, 1727–1733 (2009).
31. Health Quality Ontario. Evidence Informed Improvement Package – Transitions of Care. <http://www.hqontario.ca/Portals/0/documents/qi/health-links/bp-improve-package-transitions-en.pdf> (2012).
32. Khan F, Ng L, Gonzalez S, Hale T & Turner-Stokes L. Multidisciplinary rehabilitation programmes following joint replacement at the hip and knee in chronic arthropathy. *Cochrane Database of Systematic Reviews* **2**, (2008).
33. Hurley MV & Walsh N. Effectiveness and clinical applicability of integrated rehabilitation programs for knee osteoarthritis. *Curr Opin Rheumatol* **21**, 171–176 (2009).
34. Quack V, Ippendorf AV & Betsch M, *et al.* Multidisciplinary rehabilitation and fast-track rehabilitation after knee replacement: faster, better, cheaper? A survey and systematic review of literature. *Rehabilitation* **54**, 245–251 (2015).
35. Christensen, J. C. *et al.* Benefits of direct patient discharge to outpatient physical therapy after total knee arthroplasty. *Disabil Rehabil* **42**, 660–666 (2020).

## Rehabilitative Care Best Practices for Patients with Hip &amp; Knee Replacements

36. Webster, F. *et al.* Understanding why people do or do not engage in activities following total joint replacement: a longitudinal qualitative study. *Osteoarthritis Cartilage* **23**, 860–867 (2015).
37. Groen, J. W., Stevens, M., Kersten, R. F. M. R., Reininga, I. H. F. & van den Akker-Scheek, I. After total knee arthroplasty, many people are not active enough to maintain their health and fitness: An observational study. *J Physiother* **58**, 113–116 (2012).
38. Harding P, Holland AE, Delany C & Hinman RS. Do activity levels increase after total hip and knee arthroplasty? . *Clin Orthop Relat Res* **472**, 1502e11 (2014).
39. GTA Rehab Network. Outpatient Rehab Process Maps for Total Knee and Total Hip Replacements. <https://drive.google.com/file/d/0By4k4zop-0eOYng4QlNoVFBCcEk/view?pref=2&pli=1> (2014).
40. Westby, M., Brittain A. & Backman C. Expert consensus on best practices for post-acute rehabilitation after total hip and knee arthroplasty; a Canada and United States delphi study. *Arthritis Care Res (Hoboken)* **6**, (2014).
41. Ebert J, Munsie C & Joss B. Guidelines for the Early Restoration of Active Knee Flexion After Total Knee Arthroplasty: Implications for Rehabilitation and Early Intervention. *Archives Of Phys Med & Rehab* **95**, 1135–1140 (2014).
42. Yong-Hao Pua, P. The Time Course of Knee Swelling Post Total Knee Arthroplasty and Its Associations with Quadriceps Strength and Gait Speed. *J Arthroplasty* **30**, 1215–1219 (2015).
43. Artz et al. Physiotherapy Provision Following Discharge after Total Hip and Total Knee Replacement: A Survey of Current Practice at High-Volume NHS Hospitals in England and Wales. *Musculoskeletal Care* **11**, (2013).
44. Wainright, A. et al. The Group Experience: Remodeling Outpatient Physiotherapy after Knee Replacement Surgery. *Physiotherapy Canada* **67**, 350–356 (2015).
45. Wolfstadt, J. I., Soong, C. & Ward, S. E. Improving patient outcomes following total joint arthroplasty: is there an app for that? *BMJ Qual Saf* **28**, 775–777 (2019).
46. Zachwieja, E. *et al.* Web-Based Self-Directed Exercise Program Is Cost-Effective Compared to Formal Physical Therapy After Primary Total Knee Arthroplasty. *J Arthroplasty* **35**, 2335–2341 (2020).
47. Wang, X., Hunter, D. J., Vesentini, G., Pozzobon, D. & Ferreira, M. L. Technology-assisted rehabilitation following total knee or hip replacement for people with osteoarthritis: a systematic review and meta-analysis. *BMC Musculoskelet Disord* **20**, 506 (2019).
48. Ontario. *Provision of Community Services under the Home Care and Community Services Act.* (<https://www.ontario.ca/laws/statute/94l26> , 1994).
49. GTA Rehab Network. Selection of Key Criteria in the MSK Rehab Definitions Framework for TJR. <http://www.gtarehabnetwork.ca/uploads/File/tools/rehab-definitions-conceptual-framework-msk-totaljoint.pdf> (2010).
50. Ontario. *Physiotherapy Act.* <https://www.ontario.ca/laws/statute/91p37>. (1991).