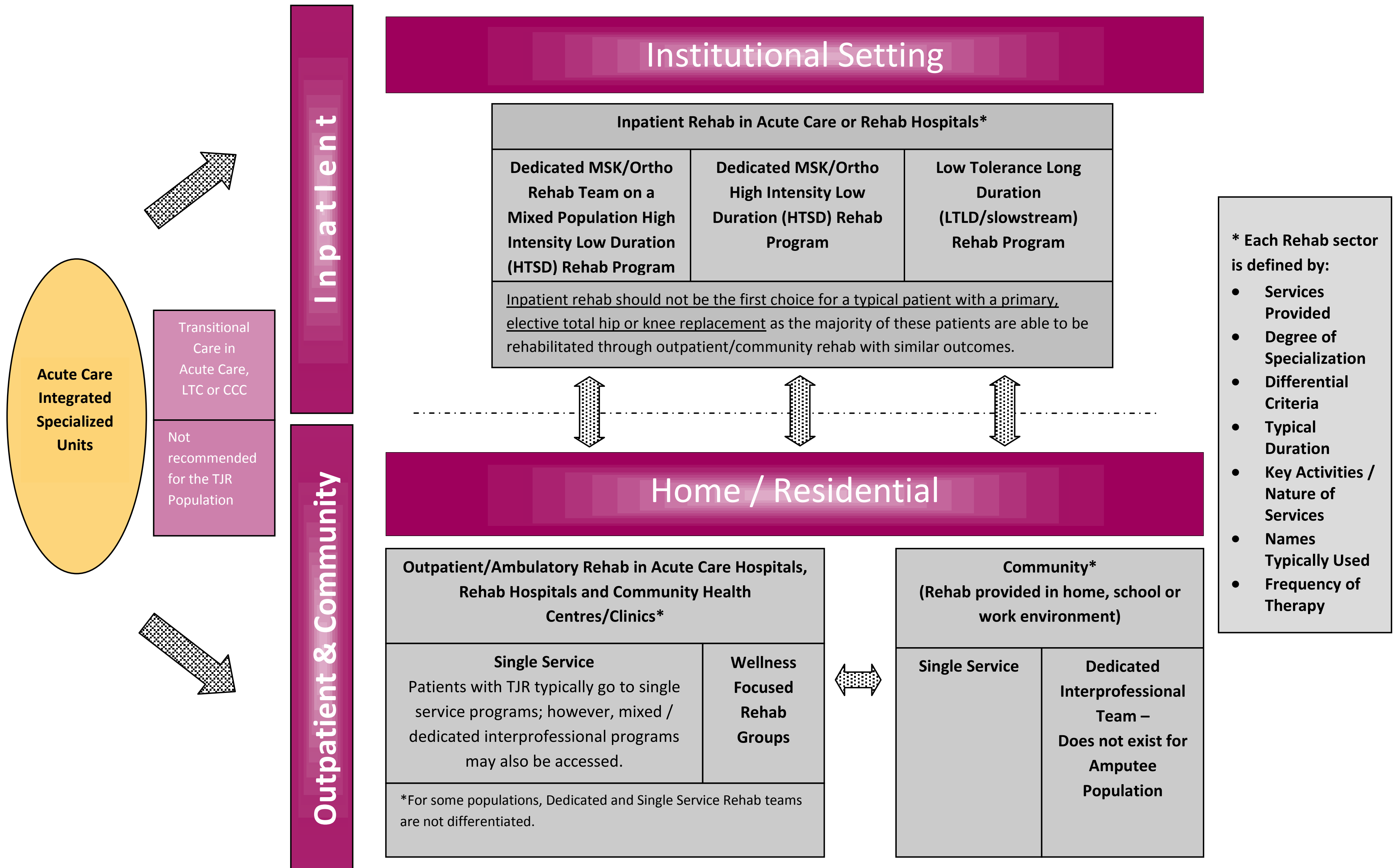
Elective, Primary, Bilateral or Revision Total Joint Replacement Rehab Framework



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Elective, Primary, Bilateral or Revision Total Joint Replacement Rehab Framework

GUIDING PRINCIPLES

Objective:

I. Increase clarity and consistency in the forms of cognitive and physical rehab across the continuum by:

1. Clarifying the distinctions between and across institutional and community-based rehab programs.
2. Classifying programs with consistent terminology.
3. Describing the key features of institutional and community-based rehabilitation programs based on the services provided, the degree of specialization, differential/critical criteria, duration, and the primary focus of the rehab program/service.

II. Inform planning and performance measurement through the development of standards for rehab program components against which rehab programs can be benchmarked.

Guiding Principles:

1. The Rehab Definitions Conceptual Framework presupposes the World Health Organization's definition of "rehabilitation" as "a *progressive, dynamic, goal-oriented and often time-limited process, which enables an individual with an impairment to identify and reach his/her optimal mental, physical, cognitive and/or social functional level. Rehabilitation provides opportunities for the individual, the family and the community to accommodate a limitation or loss of function and aims to facilitate social integration and independence.*"

2. The Rehab Definitions Conceptual Framework refers to cognitive and physical forms of rehabilitation across the continuum of care. The rehab conceptual diagram refers to acute care, inpatient rehab programs within institutional settings and outpatient and community-based rehab for clients residing at home or in a residential setting. The use of bi-directional arrows in the schematic reflects the flow of patients and continuity of care across these settings.

3. The framework identifies key features of rehab programs based on evidence-based practices where available to define the "gold standard" of rehab care (e.g. rehab beds are clustered together). In most instances these key features reflect current practices; however, some organizations may be required to implement changes within their organizations to achieve consistency with the criteria set out in the framework.

4. The term "patient" is used for individuals receiving rehabilitation in a hospital setting. The term "client" is used to refer to individuals receiving community rehab services.

5. The Rehab Definitions Conceptual Framework uses categories that have been defined based on the rehab needs of the patient and the typical services provided. Length of stay or the type of facility in which the rehab is provided is not considered essential to defining rehab sectors.

6. The Rehab Definitions Conceptual Framework is based on the assumption that clients participating in the programs described have rehab potential and rehab goals. For criteria regarding rehab potential, medical stability and rehab readiness for inpatient rehab, refer to the GTA Rehab Network's Inpatient Rehab Referral Guidelines (www.gtarehabnetwork.ca).

7. The framework uses terminology that is consistent with the MOHTLC guidelines for inpatient rehabilitation beds and can be applied to community and ambulatory service delivery.

8. While it is appreciated that much of rehabilitation occurs in third-party payer assessment centres or private clinics, the framework refers to publicly-funded rehabilitation. However, it is hoped that the framework will promote consistency in standards of care and equitable access across all rehab programs.

9. Input from healthcare providers representing acute care, regional rehab centres and community-based organizations that provide adult (including geriatric) and paediatric rehab has been obtained to validate the Rehab Definitions Conceptual Framework.

10. The MSK – TJR Rehab Definitions Framework will be reviewed every 3 years to incorporate any newly emerging research in MSK rehab.

Elective, Primary, Bilateral or Revision Total Joint Replacement Rehab Framework

GLOSSARY OF REHAB COMPONENT TERMS

Core Team: Refers to the team members who are essential, actively involved in the assessment and treatment of MSK patients on the unit. In acute care, although team members collaborate closely, they may not participate regularly in team rounds due to the nature of this setting.

Consultation: Consultation would be expected to be available within 24 hours in acute care and 48 hours in rehab.

Dedicated Interprofessional Team (Community): Rehab provided in the home, school or work environment by an interprofessional team using a coordinated, integrated approach for specific rehab populations or to reduce the impact of a particular disability.

Dedicated Interprofessional Team (Outpatient/Ambulatory Rehab): Outpatient rehab provided by an interprofessional team with expertise in the treatment and assessment of a particular patient population. Outpatient/Ambulatory dedicated interprofessional teams are located in acute care hospitals, rehab hospitals and community health centres/clinics. They provide rehab to patients who require more than one rehab service and a coordinated rehab approach.

Dedicated Rehab Unit: An inpatient rehab unit located in acute care and rehab hospitals that serves a single patient population group and provides intensive rehabilitation. Some units may specialize in more than one diagnosis in related populations (e.g. Cardio/Respiratory, Orthopaedic/Amputation, etc.). A dedicated rehab unit is suitable for individuals who require 24-hour hospital care and who are in need of an interprofessional rehab program using a coordinated rehab approach.

Low Tolerance Long Duration (LTLD/slowstream) Rehab Program: Suitable for individuals in need of an interprofessional rehab approach to address specific rehab goals who also have chronic/complex conditions requiring 24-hour hospital care and who are expected to benefit from a slower-paced rehab program for a longer duration than is offered in dedicated or mixed rehab programs. LTLD rehab is most commonly delivered in a complex continuing care bed but may also be provided in a designated rehab bed. LTLD rehab programs may be located in acute care, rehab or complex continuing care hospitals.

Mixed Population Interprofessional Team (Outpatient/Ambulatory Rehab): Outpatient rehab that is provided by an interprofessional team, which typically assesses and treats patients from a variety of patient population groups. Outpatient/Ambulatory mixed population interprofessional teams are located in acute care hospitals, rehab hospitals and community health centres/clinics. They provide rehab to patients who require more than one rehab service and a coordinated rehab approach.

Mixed Rehab Unit: Formerly referred to as a General inpatient rehab unit, this type of unit is located in acute care and rehab hospitals, provides intensive rehabilitation and serves a variety of patient population groups. The mixed rehab unit is suitable for individuals who require 24-hour hospital care and are in need of an interprofessional rehab program using a coordinated approach.

Single Service (Community): Individual rehab services that are usually provided through Community Care Access Centres. Single rehab services are suitable for individuals who are in need of one or more rehabilitation services in single specialty area(s)/profession(s) provided in the home, school or work environment. Although clients may receive more than one service, a coordinated approach is not used as rehab providers typically work as individual providers. However, some communication with other health providers may occur on an as-needed basis.

Single Service (Outpatient/Ambulatory Rehab): An outpatient rehab service located in acute care hospitals, rehab hospitals and community health centres/clinics that is suitable for individuals who are in need of an outpatient rehabilitation service in a single specialty area/profession. Clients may receive more than one rehab service; however, the services are not provided by way of a coordinated rehab approach. Services may include assessment only or assessment and treatment. Services may be provided during a one-time visit or multiple visits.

Wellness Focused Rehab Groups: These groups are provided in an outpatient/ambulatory setting and led by an individual rehab provider or team or rehab specialists to enhance an individual's ability to cope with a particular disability or impairment. These time-limited groups are publicly-funded although a small fee may be charged for materials.

Elective, Primary, Bilateral or Revision Total Joint Replacement Rehab Framework

<table>
<tr><th colspan="2">ACUTE CARE</th></tr>
<tr><th colspan="2">Pre-operative Care Planning and Assessment</th></tr>
<tr><td colspan="2">• There should be at least one pre-operative assessment and care planning[1] session for primary replacement surgeries and for revisions as appropriate.
• The pre-op session should include the following: (1) Patient and/or family education[2] regarding what to expect during the rehab process, including transitions across the continuum of care and living with a joint replacement; (2) Pre-op exercises[3] ; (3) Post-op Physiotherapy protocol[4]; (4) How to manage everyday activities (e.g. THR precautions, addressing equipment needs[5]); (5) Review of medical status and social supports; (6) Assessment of function to determine discharge destination post-surgery.</td></tr>
<tr><th colspan="2">Integrated Specialized Units</th></tr>
<tr><td>Typical Name</td><td>• MSK Orthopaedic Unit</td></tr>
<tr><td>Services Provided</td><td>• Interdisciplinary team[6] includes:
▶ Nurse
▶ Occupational Therapist
▶ Pharmacist
▶ Physiotherapist
▶ Surgeon
• Consultation services available[7] include:
▶ Anaesthetist
▶ Chaplain/Pastoral Care provider
▶ Dietitian
▶ Discharge planning role (e.g. care coordinator, patient flow coordinator, social worker)
▶ Geriatrician
▶ Pain Service
▶ Physician specialized in Internal Medicine
▶ Psychiatrist and/or Psychologist
▶ Respiratory Therapist
▶ Social Worker
▶ Speech Language Pathologist.
Frequency of therapy varies, but at a minimum, staffing levels are sufficient to support provision of therapy at least once a day.[8, 9]</td></tr>
<tr><td>Specialization</td><td>• All core team members should be experienced in orthopaedic care[10]
• There is a critical mass of 50 cases[11] per year to support the development and maintenance of clinical expertise among nursing, allied health and medical staff and the acquisition of special equipment and other resources required to treat this population.</td></tr>
<tr><td>Differential Criteria</td><td>• Patient should have identifiable rehab goals as established by patient and team.</td></tr>
<tr><td>Typical Duration</td><td>• Current system goal is for a typical length of stay of 3 days if patient is expected to go to inpatient rehab and 4 days if patient is expected to go home after acute care[12] However, as strong evidence regarding LOS does not currently exist, benchmarks for duration are not being included in this framework. Ideally, the length of stay is not constrained by a maximum duration, but is linked to the patient’s needs and goals.</td></tr>
<tr><td>Key Activities / Nature of Service</td><td>• Focussed multi-disciplinary assessment to determine breadth of deficits and rehab intensity required.
• Acute care stay should include: (1) Review of pre-operative exercises, progression of exercise program and related education; (2) Early mobilization</td></tr>
</table>

Elective, Primary, Bilateral or Revision Total Joint Replacement Rehab Framework

ACUTE CARE	
	and ambulation, including weight bearing within 24-48 hrs[13, 14, 15] or as indicated by physician; (3) Pain management; (4) Education re: self management of medication administration; (5) Assessment of function and ADL management with appropriate intervention as required; (6) Re-assessment of discharge plans. A relatively small percentage of patients with primary, elective total joint replacements are referred to inpatient rehab. A formal process is used to determine candidacy for inpatient rehab which takes into consideration: (1) Limited or no access to adequate supports for discharge to a home environment which allows patients to safely recover and limited or no access to alternate levels of rehab; (2) Poor pre-operative function and/or comorbidities which impact functional status and may slow recovery; (3) High risk of developing complications (e.g. bone quality issues, deconditioning)[16,17]

TRANSITIONAL CARE

Transitional Care is not appropriate for the elective, primary, revision, or bilateral total hip or knee replacement population. Patients should go directly to outpatient/community rehab. If the patient is more complex, they may require inpat

Elective, Primary, Bilateral or Revision Total Joint Replacement Rehab Framework

INPATIENT REHAB

Dedicated MSK/Ortho Rehab Team on a Mixed or Dedicated Population Rehab Unit in Acute Care and Rehab Hospitals
Suitable for individuals in need of an interprofessional rehab program who also require 24-hour hospital care.

Inpatient rehab should not be the first choice for the typical patient with a primary, elective total hip or knee replacement as the majority of these patients are able to be rehabilitated through outpatient/community rehab with similar outcomes.[18]

A relatively small percentage of patients with primary, elective total hip or knee replacements should be admitted to inpatient rehabilitation[19]. However, inpatient rehab may be appropriate for patients with total hip or knee replacement (whether primary, bilateral, revision, etc.) who present with a combination of factors which include:

- Limited or no access to adequate supports for discharge to a home environment which allows patients to safely recover and limited or no access to alternate levels of rehab[20]
- Poor pre-operative function and/or comorbidities which impact functional status and may slow recovery[21]
- High risk of developing complications (e.g. bone quality issues, deconditioning)[22]

A very small percentage of TJR patients may require LTLD level of services.

Typical Names	• General Rehabilitation or Medical Rehabilitation; Specialized MSK/Ortho Rehabilitation Program
Services Provided	• A coordinated, interprofessional team provides rehab as early as possible for those who are appropriate[23]. • The core team[*1] includes all of the following: ► Discharge planning role (e.g. Care Coordinators, Patient Flow Coordinators, or Social Workers) ► Nursing ► Occupational Therapist ► Pharmacist ► Physician ► Physiotherapist ► Social Worker • Consultation is available* from: ► Chaplain/ Pastoral Care provider ► Clinical Dietitian ► Geriatrician ► Psychiatrist and/or Psychologist ► Therapeutic Recreationist.

[*1] Core team refers to the team members who are essential, actively involved in the assessment and treatment of MSK patients on the unit. In acute care, although team members collaborate closely, they may not participate regularly in team rounds due to the nature of this setting

[*] Consultation is expected to be available within 24 hours in acute care and 48 hours in rehab.

Elective, Primary, Bilateral or Revision Total Joint Replacement Rehab Framework

INPATIENT REHAB	
Dedicated MSK/Ortho Rehab Team on a Mixed or Dedicated Population Rehab Unit in Acute Care and Rehab Hospitals **Suitable for individuals in need of an interprofessional rehab program who also require 24-hour hospital care.**	
	• Services may be supplemented by OTA/PTA/CDA/PSW/RA under the direct supervision of respective health care professionals (e.g. OT directing OTA, PT directing PTA, etc.) as legislated by their respective colleges. Assistants can provide support to the therapists, but the overall care is directed by the regulated health professional and the OTA/PTA/CDA/PSW/RA usually does not exceed 50% of therapy time • At a minimum, staffing ratios are sufficient to support an intensive rehab program which provides therapy 7 days a week, where therapeutic activity includes professional therapy (e.g. Occupational Therapy, Physiotherapy, OTA/PTA services under the guidance of an OT/PT) and nursing activities.[24] Note that the therapy levels indicated in this framework are not to be interpreted as admission criteria, but rather as an indication of the minimum amount of therapy the program should be able to provide. • A mechanism exists for re-assessment and change of discharge plan if the patient's status changes during course of therapy • Where a patient has more than one rehab need (e.g. geriatric & MSK) there is a mechanism in place to cross consult to another rehab service to acquire expertise in other rehab areas
Specialization	• For both mixed and dedicated population units, there is a dedicated interprofessional MSK/Ortho team which has general knowledge about TJR rehab assessment and treatment process and the appropriate clinical pathways[25] • Some programs may specialize in two related diagnostic groups (e.g. ortho and rheumatology) • The interprofessional team has access to skills/training to develop and maintain the necessary skills and knowledge base. • Core competency of rehab professionals (e.g. PT)
Differentiating Criteria	• Rehabilitation programs are suitable for individuals requiring an intensive interprofessional rehab program. • Determination of appropriateness for inpatient rehab (irrespective of whether the patient has a primary, revision, or bilateral replacement) takes into consideration: (1) Limited or no access to adequate supports for discharge to a home environment which allows patients to safely recover and limited or no access to alternate levels of rehab; (2) Poor pre-operative function and/or comorbidities which impact functional status and may slow recovery; (3) High risk of developing complications (e.g. bone quality issues, deconditioning)[26,27] • When referrals are received for patients with routine primary, elective total joint replacements with none of the complicating factors listed above, referrals are not accepted because the majority of these patients can be rehabilitated through outpatient/community rehab. • Expectation is that patients will either be discharged home or to their preferred accommodation in the community • All patients with mild to moderate cognitive impairment are considered equally with those who are cognitively intact with regards to admission to inpatient rehab. • Coordinated team approach is used with regular team meetings/conferences. • Patients and families are encouraged to participate in interprofessional family meetings. • A mechanism is in place for communication of goals between patient/family and the rehab team • Geographically clustered beds (with other MSK/Ortho patients)
Typical Duration	• Current care pathways recommend a length of stay of approximately 7 days[28]; however, ideally, the length of stay is not constrained by a maximum duration, but is linked to the patient's needs and goals.
Key Activities /	• PT intervention should include:

INPATIENT REHAB	
Dedicated MSK/Ortho Rehab Team on a Mixed or Dedicated Population Rehab Unit in Acute Care and Rehab Hospitals **Suitable for individuals in need of an interprofessional rehab program who also require 24-hour hospital care.**	
Nature of Service	► Assessment for and development of individualized therapy plans (i.e. 1:1 or group settings) ► Exercises for ROM and strength, including home exercises[29] ► Functional training (e.g. gait, stairs, balance, transfers), including home exercises ► Hands on therapy as required ► Pain management • Principles of healthy lifestyles and active living are incorporated into the rehabilitation program. This may include providing resources or referrals to external programs (e.g. Arthritis Society, YMCA). • There is a mechanism in place to assess the patient's learning needs. Education on all of the following topics is available and reviewed with patients/families as appropriate[30] : ► Caregiver training ► Safe activity resumption ► Medications ► Mobility ► Expected progress ► Pain management and ► Sources of help. • Communication with the patient's surgeon and family physician is established around the time of discharge to support continuity of care and support long term TJR rehabilitation plans as needed. • Appropriate outcome measures should be used to document progress and recovery and guide treatment selection, including: performance measures, self report measures and clinical measures • Comprehensive discharge planning is provided in a timely manner.

Elective, Primary, Bilateral or Revision Total Joint Replacement Rehab Framework

<table>
<tr><th colspan="2">OUTPATIENT / AMBULATORY REHAB PROGRAMS
If outpatient services are required, patients with a total hip or knee replacement typically need a single service outpatient rehab program. Should a patient have an opportunity to access a mixed or dedicated program, the recommendations listed for single service should be met.</th></tr>
<tr><td colspan="2">Single Service in Acute Care Hospitals, Rehab Hospitals and Community Health Centres/Clinics/Family Health Teams
(Also applies to Mixed/Dedicated Interprofessional Team Rehab Programs)
Suitable for individuals who are in need of an outpatient rehabilitation service in a single specialty area/profession. Services may include assessment only or assessment and treatment. Services may be provided during a one-time visit or multiple visits. Treatment could be in group or individual format.</td></tr>
<tr><td>Names Typically Used</td><td>• Usually outpatient + profession (e.g. Outpatient Physiotherapy).
• Ambulatory Outpatient Clinic</td></tr>
<tr><td>Services Provided</td><td>• Health professionals provide:
► a specialty service for a specific impairment or disability (e.g. gait, mobility) or
► general profession-specific assessment, treatment plan recommendations or implementation of treatment plan and/or referral to other service providers
• Note: an interprofessional approach may be used
• Specialized focused assessment and/or treatment to promote re-integration to community living and to maximize functional level.
• There is a mechanism for consult with other professions/services as required (e.g. with OT).
• Treatment needs vary in protocol (frequency, content, timing, goals, and intensity) based on appropriate clinical pathways for Total Hip and Knee Replacement populations.</td></tr>
<tr><td>Specialization</td><td>• Core competency of PT. At a minimum, all health professionals should have general knowledge about TJR rehab assessment and treatment process and the appropriate clinical pathways[31]</td></tr>
<tr><td>Differential Criteria</td><td>• Patients are residing in the community with a specific rehab need which may be an impairment, activity or participation issue that requires assessment and/or treatment by a health professional.
• Patients may not have required an inpatient rehab program or other outpatient rehab programs. Some patients may be discharged from an inpatient rehab program or from acute care and require ongoing rehab to achieve higher functional goals.
• Referrals are accepted from all sources including community (e.g. family physicians, CCAC), acute care, inpatient rehab, other health professionals.
• Typically, these are community patients who are responsible for arranging their own transportation to and from their outpatient appointments.</td></tr>
<tr><td>Typical Duration</td><td>• Varies depending on the type of service/program.
• Specialty clinics may provide one or a few visits until the target goals are achieved.
• Total Knee Replacements: Treatment begins in a timely manner for all patients based on individual needs; specifically, treatment for patients referred from acute care should begin within 2-3 days of acute care discharge.
• Total Hip Replacements: Access to treatment and/or increased frequency of treatment is available, particularly when post-operative restrictions are lifted (i.e. 6-8 weeks post-op), based on patient needs[32,33]
• Frequency of treatment depends on achievement of goals, but may be as frequent as 2-3 times per week. Patients are discharged when they have achieved their discharge goals, or they have reached a plateau[34] rather than based on a maximum number of visits.</td></tr>
<tr><td>Key Activities/ Nature of Service</td><td>• Assessments and treatment are focused on patient safety at home as well as physical and functional abilities for daily activities.[35]</td></tr>
</table>

Elective, Primary, Bilateral or Revision Total Joint Replacement Rehab Framework

OUTPUTPATIENT / AMBULATORY REHAB PROGRAMS

If outpatient services are required, patients with a total hip or knee replacement typically need a single service outpatient rehab program. Should a patient have an opportunity to access a mixed or dedicated program, the recommendations listed for single service should be met.

Single Service in Acute Care Hospitals, Rehab Hospitals and Community Health Centres/Clinics/Family Health Teams (Also applies to Mixed/Dedicated Interprofessional Team Rehab Programs)

	• PT intervention should include: ► Assessment for and development of individualized therapy plans (i.e. 1:1 or group settings) ► Exercises for ROM and strength, including home exercises[36] ► Functional training (e.g., gait, stairs, balance, transfers), including home exercises[37] ► Hands on therapy as required ► Pain management • Principles of healthy lifestyles and active living are incorporated into the rehabilitation program. This may include providing resources or referrals to external programs (e.g. Arthritis Society, YMCA). • There is a mechanism in place to assess the patient's learning needs. Education on all of the following topics is available and reviewed with patients/families as appropriate [38] : ► Caregiver training ► Safe activity resumption ► Medications ► Mobility ► Expected progress ► Pain management and ►Sources of help. • Communication with the patient's surgeon <u>and</u> family physician is established around the time of discharge to support continuity of care and support long term TJR rehabilitation as needed. • Appropriate outcome measures are used to document progress and recovery and guide treatment selection including: performance measures self report measures and clinical measures.

Elective, Primary, Bilateral or Revision Total Joint Replacement Rehab Framework

COMMUNITY – SINGLE SERVICE	
Rehab is provided in the home environment	
Typical Names	• Community Care Access Centre (CCAC)
Services Provided	• All of the following providers are available based on patient needs: Case Manager, Nurse, Personal Support Worker, Occupational Therapist, Physiotherapist, Social Worker. • If both OT and PT are needed by the patient, both are provided. If more than one service is needed, they are provided. • Rehab providers typically work as individual providers; however, communication with other health providers occurs on an as-needed basis. • CCACs provide in-home rehab services through contracts with Provider Agencies and manage clients through a Case Management collaborative model. • Treatment needs vary in protocol (frequency, content, timing, goals, and intensity) based on appropriate clinical pathways for the total hip and knee replacement populations.
Specialization	• At a minimum, all health professionals should have general knowledge about total hip and knee replacement rehab, including the assessment and treatment process and the appropriate clinical pathways[39].
Differential Criteria	• Service is provided in the home • Some patients may require CCAC services after discharge from inpatient rehab based on pre-operative screening criteria indicating appropriateness for discharge home with CCAC (e.g. function, comorbidities, availability of outpatient services within local area, medical status, social supports, availability of transportation) • Some patients may be discharged from an inpatient rehab or acute care program and require ongoing rehab to achieve higher functional goals • Referrals are accepted from all sources including community (e.g. family physicians, CCAC), acute care, inpatient rehab, other health professionals.
Typical Duration	• Varies depending on the type of service/program. • Patient care (as defined by delivery of direct services by OT and/or PT and *not including* case coordinator assessment or equipment delivery) should be started (1) within 48 hours of discharge from acute care or from inpatient rehab; or (2) within 1 week of referral from other sources. • Patients are discharged when they have achieved their discharge outcome (functional goals), or are able to access appropriate community resources (e.g. outpatient services), or they have reached a plateau[40] rather than based on a maximum number of visits.

Key Activities/ Nature of Service	• Assessments and treatment are focused on patient safety at home as well as physical and functional abilities for daily activities.[41]
	• A mechanism is in place to refer for further medical management[42] and/or rehab services.
	• PT intervention should include:
	  ○ Assessment for and development of individualized treatment plans (i.e. 1:1 or group settings)
	  ○ Supervised and unsupervised exercises for ROM and strength[43]
	  ○ Supervised and unsupervised functional training (e.g., gait, stairs, balance, transfers)
	  ○ Hands on therapy as required
	  ○ Pain management
	• Principles of healthy lifestyles and active living are incorporated into the rehabilitation program. This may include providing resources or referrals to external programs (e.g. Arthritis Society, YMCA) on or before discharge from CCAC.

COMMUNITY – SINGLE SERVICE	
Rehab is provided in the home environment	
	• There is a mechanism in place to assess the patient's learning needs. Education on all of the following topics is available and reviewed with patients/families as appropriate[44] : (1) caregiver training; (2) safe activity resumption; (3) medications; (4) mobility; (5) expected progress; (6) pain management; and (7) sources of help. • Communication with the patient's surgeon and family physician is established around the time of discharge to support continuity of care and support long term TJR rehabilitation plans as needed. • A mechanism is in place to liaise with referring providers for consultation when patients have multiple comorbidities. • Patients are referred to outpatient rehab for ongoing rehabilitation needs following CCAC services based on need. • Appropriate outcome measures are used to document progress and recovery and guide treatment selection including: performance measures, self report measures and clinical measures.

Elective, Primary, Bilateral or Revision Total Joint Replacement Rehab Framework

The GTA Rehab Network would like to acknowledge the members of the MSK Rehab Definitions Task Group for their contribution to the development of the MSK Total Joint Replacement Rehab Definitions Framework:

Dr. Susan Jaglal *(Chair)*	University of Toronto/Toronto Rehab Institute
Maggie Bruneau	Providence Health care
Angela Chan	Baycrest
Sang Choi	Credit Valley Hospital
Dr. Aileen Davis	University Health Network
Lori Edwards	Toronto East General Hospital
Dr. John Flannery	Toronto Rehabilitation Institute
James Fox	Providence Healthcare
Derek Glazier	Toronto East General Hospital
Maureen Hunt	Rouge Valley Health System
Gerry Hubble	Sunnybrook Health Sciences Centre
Debbie Kennedy	Sunnybrook Health Sciences Centre
Julie Langton	Lakeridge Health
Crystal MacKay	ACREU
Dr. Kathy McGilton	Toronto Rehabilitation Institute
Mandy McGlynn	Toronto Rehabilitation Institute
Janet Mulgrave	West Park Healthcare Centre
Leeanne Smith	Lakeridge Health
Leslie Soever	Mt. Sinai Hospital
Ruth Ann Sullivan	Providence Healthcare
Dr. Sharon Switzer-McIntyre	University of Toronto
Dr. Fiona Webster	Sunnybrook Health Sciences Centre
Riki Yamada	Southlake Regional Health Centre
Bayla Zahler	Bridgepoint Health
Charissa Levy	GTA Rehab Network
Judy Moir	GTA Rehab Network
Hannah Seo	GTA Rehab Network

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ENDNOTES

[1]"There is "Silver" level evidence that education before surgery does not seem to decrease pain, improve function or decrease the number of days in hospital after surgery. But education before surgery may decrease anxiety before surgery. Education and information that is individually geared to a person and given before surgery may improve recovery in people who need support or do not move well."
McDonald, S., Hetrick, S. E., & Green, S. Pre-operative education for hip or knee replacement. Cochrane Database of Systematic Reviews 2004, Issue 1. Art. No.: CD003526. DOI: 10.1002/14651858.CD003526.pub2.

[2] Authors of a randomized control trial reported that "[Their] findings suggest that the key to successful early discharge of THR patients may be adequate preoperative education, exercise and training in the use of devices for assistance, and also rehearsal of postoperative physical exercise."
Siggeirsdottir, K., Olafsson, O., Jonsson Jr., H., Iwarsson, S., Gudnason, V. & Jonsson, B. Y. (2005). Short hospital stay augmented with education and home-based rehabilitation improves function and quality of life after hip replacement. Acta Orthopaedica,76(4), 555-562.

[3] A randomized control trial found that: "A 6-week presurgical exercise program can safely improve preoperative functional status and muscle strength levels in persons undergoing THA. Additionally, exercise participation prior to total joint arthroplasty dramatically reduces the odds of inpatient rehabilitation."
Rooks, D.S., Huang, J., Bierbaum, B.E., Bolus, S.A., Rubano, J., Connolly, C.E., Alpert, S., Iversen, M.D., & Katz, J.N. (2006). Effect of preoperative exercise on measures of functional status in men and women undergoing total hip and knee arthroplasty. Arthritis & Rheumatism, 55(5), 700-708.

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[6] Core team refers to the team members who are essential, actively involved in the assessment and treatment of MSK patients on the unit. In acute care, although team members collaborate closely, they may not participate regularly in team rounds due to the nature of this setting.

[7] Consultation is expected to be available within 24 hours in acute care and within 48 hours in rehab.

[8] "Adequate numbers of trained orthopaedic nurses and members of AHPs [Allied Health Professionals], especially physiotherapists, must be available. There must be adequate social services support."
British Orthopaedic Association. Primary total hip replacement: A guide to good practice. 1999; revised 2006.

[9] "Adequate numbers of trained nurses and the skills of Professions Allied to Medicine must be available. There must be social services back-up."
British Association for Surgery of the Knee. Knee replacement: A guide to good practice. 1999.

[10] "Patients should be nursed in dedicated elective orthopaedic wards, staffed by a team experienced in the management of patients with musculoskeletal disease."
British Orthopaedic Association. Primary total hip replacement: A guide to good practice. 1999; revised 2006.

[11] A study of TKAs in Ontario demonstrated that: "Hospitals in which fewer than 48 TKA procedures were done per year (< 40th percentile) had 2.2-fold greater 1-year revision rates than hospitals performing more than 113 TKAs annually (> 80th percentile). Complications during admission were associated with increased patient age and comorbidity, and higher hospital volume."
Paterson, J.M., Williams, J.I., Kreder, H.J., Mahomed, N.N., Gunraj, N., Wang, X. & Laupacis, A. (2010). Provider volumes and early outcomes of primary total joint replacement in Ontario. Canadian Journal of Surgery, 53(3), 175-183.

[12] The integrated model of care developed by the Bone and Joint Network indicates a length of stay of 3 days in acute care if the patient is to be discharged to inpatient rehab and a length of stay of 4 days in acute care if the patient is to be discharged directly home.
Bone and Joint Network. (2008). Clinical Pathway Total Hip and Knee Replacement: Acute Care. Toronto: Bone and Joint Network.

[13] "Under normal circumstances, early mobilisation (24 to 48 hours following surgery) should take place."
British Orthopaedic Association. Primary total hip replacement: A guide to good practice. 1999; revised 2006.

[14] Under normal circumstances, early mobilisation (24 to 48 hours) after surgery should always be considered as should the use of mechanical methods of reducing deep venous thrombosis although rigorous scientific evidence that these are effective is also lacking. These measures are free of significant side effects.
British Association for Surgery of the Knee. Knee replacement: A guide to good practice 1999.

[15] The acute care clinical pathway developed by the Bone and Joint Network includes bed exercises on Day 0 post-op and weight bearing on Day 1 post-op, as listed in the care pathway, unless specified by the MD.
Bone and Joint Network. (2008). Clinical Pathway Total Hip and Knee Replacement: Acute Care. Toronto: Bone and Joint Network.

[16] The authors of a randomized controlled trial of patients undergoing primary hip and knee replacements state: "Inpatient rehabilitation remains the optimal treatment pathway for patients with an increased likelihood of having postoperative complications develop and for those with preexisting complicating medical conditions that may require regular monitoring by health-care providers"
Mahomed, N.N., Davis, A.M., Hawker, G., Badley, E., Davey, J.R., Khalid, A.S., Coyte, P.C., Gandhi, R., & Wright, J.G. (2008). Inpatient compared with home-based rehab following primary unilateral total hip or knee replacement: A randomized control trial. Journal of Bone and Joint Surgery, 90,1673-80.

[17] A review of evidence by the Medical Advisory Secretariat concluded that, "with respect to physiotherapy rehabilitation and physical functioning 1 year after primary TKR or THR surgery: There is high-quality evidence from 1 large RCT to support the use of home-based physiotherapy instead of inpatient physiotherapy after primary THR or TKR surgery."
Medical Advisory Secretariat. Physiotherapy rehabilitation after total knee or hip replacement: an evidence-based analysis. Ontario Health Technology Assessment Series 2005; 5(8).

[18] The authors of a retrospective study of 96 patients stated, "Our study at a mean followup of 8 months after surgery failed to detect any significant differences in functional outcomes between those who received inpatient versus home based rehabilitation. Both groups had comparable physical function, pain relief, and high level of satisfaction with the outcomes of surgery. Indeed the mean scores on the WOMAC and SF-36 scales were nearly identical." Note that "the routine preadmission assessment by a physical therapist also failed to detect any significant difference between the 2 groups with respect to their presurgery ability to ambulate"
Mahomed, N. N., Lin, M. J. K. S., Levesque, J., Lan, S., & Bogoch, E. R. (2000). Determinants and outcomes of inpatient versus home based rehabilitation following elective hip and knee replacement. Journal of Rheumatology, 27, 1753-1758.

[19] Although current evidence supports the recommendation that many patients with primary, elective total joint replacements can be supported in the community with similar outcomes, a specific target is not yet available for the ratio of patients who should and should not be transferred to inpatient rehab.

[20] Based on expert task group consensus.

[21] The authors of a randomized controlled trial of patients undergoing primary hip and knee replacements state: "Inpatient rehabilitation remains the optimal treatment pathway for patients with an increased likelihood of having postoperative complications develop and for those with preexisting complicating medical conditions that may require regular monitoring by health-care providers"
Mahomed, N.N., Davis, A.M., Hawker, G., Badley, E., Davey, J.R., Khalid, A.S., Coyte, P.C., Gandhi, R., & Wright, J.G. (2008). Inpatient compared with home-based rehab following primary unilateral total hip or knee replacement: A randomized control trial. Journal of Bone and Joint Surgery, 90,1673-1680.

[22] The authors of a randomized controlled trial of patients undergoing primary hip and knee replacements state: "Inpatient rehabilitation remains the optimal treatment pathway for patients with an increased likelihood of having postoperative complications develop and for those with preexisting complicating medical conditions that may require regular monitoring by health-care providers"
Mahomed, N.N., Davis, A.M., Hawker, G., Badley, E., Davey, J.R., Khalid, A.S., Coyte, P.C., Gandhi, R., & Wright, J.G. (2008). Inpatient compared with home-based rehab following primary unilateral total hip or knee replacement: A randomized control trial. Journal of Bone and Joint Surgery, 90,1673-1680.

[23] "There is silver level evidence that following hip or knee joint replacement, early multidisciplinary rehabilitation can improve outcomes at the level of activity and participation… For inpatient settings early commencement of rehabilitation and clinical pathways led to more rapid attainment of functional milestones shorter hospital stay, fewer post-operative complications and reduced costs in the first three to four months"
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 2008, Issue 2. Art. No.: CD004957. DOI: 10.1002/14651858.CD004957.pub3.

[24] Currently, there is no evidence-based literature to support the amount of staffing required.

[25] "The results of this meta-analysis show that clinical pathways can significantly improve the quality of care." "The aggregate overall results showed significantly fewer patients suffering postoperative complications in the clinical pathways group when compared with the standard care group. A shorter length of stay in the clinical pathway group was also observed and lower costs during hospital stay were associated with the use of the clinical pathways. No significant differences were found in the rates of discharge to home."
Barbieri A, Vanhaecht, K., Van Herck, P., Sermeus, W., Faggiano, F., Marchisio, S., & Panella, M. (2009). Effects of clinical pathways in the joint replacement: A meta-analysis. BMC Medicine, 7:32. DOI 10.1186/1741-7015-7-32

[26] The authors of a randomized controlled trial of patients undergoing primary hip and knee replacements state: "Inpatient rehabilitation remains the optimal treatment pathway for patients with an increased likelihood of having postoperative complications develop and for those with preexisting complicating medical conditions that may require regular monitoring by health-care providers"
Mahomed, N.N., Davis, A.M., Hawker, G., Badley, E., Davey, J.R., Khalid, A.S., Coyte, P.C., Gandhi, R., & Wright, J.G. (2008). Inpatient compared with home-based rehab following primary unilateral total hip or knee replacement: A randomized control trial. Journal of Bone and Joint Surgery, 90,1673-80.

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Medical Advisory Secretariat. Physiotherapy rehabilitation after total knee or hip replacement: an evidence-based analysis. Ontario Health Technology Assessment Series 2005; 5(8).

[28] Total Joint Network. (2005). Unilateral Hip and Knee Replacement Project: Integrated Model of Care. Retrieved April 28, 2009 from http://www.totaljointnetwork.org/uniKneeHip.cfm

[29] "Suggestive evidence supports the premise that exercise interventions following TJR contribute to positive outcomes; emerging evidence exists that rehabilitation interventions specifically impact ADLs in a positive manner."
O'Callaghan, L., McConnell, S., & Soever, L. (2009). Phase III of the Bone and Joint Canada Hip and Knee Surgery Wait Times Strategy: Preliminary Literature Review in Support of Toolkit Development. Bone and Joint Canada.

[30] "Written information on medication, mobility, expected progress, pain control and sources of help and advice should be available to patient and carer"
Scottish Intercollegiate Guidelines Network. (2002). Prevention and Management of Hip Fracture in Older People: A National Clinical Guideline. Edinburgh, Scotland

[31] "The results of this meta-analysis show that clinical pathways can significantly improve the quality of care." "The aggregate overall results showed significantly fewer patients suffering postoperative complications in the clinical pathways group when compared with the standard care group. A shorter length of stay in the clinical pathway group was also observed and lower costs during hospital stay were associated with the use of the clinical pathways. No significant differences were found in the rates of discharge to home."

Barbieri A., Vanhaecht, K., Van Herck, P., Sermeus, W., Faggiano, F., Marchisio, S., & Panella, M. (2009). Effects of clinical pathways in the joint replacement: A meta-analysis. BMC Medicine, 7:32. DOI 10.1186/1741-7015-7-32

[32] The authors of a study on patients with unilateral total hip replacement reported that, "The brief postsurgical rehabilitation program received by patients with THA may not be sufficient. A second phase of rehabilitation implemented 4 months or more after surgery that emphasizes weight bearing and postural stability may be advisable."
Trudelle-Jackson, E., Emerson, R., & Smith, S. (2002). Outcomes of total hip arthroplasty: A study of patients one year postsurgery. Journal of Orthopaedics and Sports Physiotherapy, 32(6), 260-267.

[33] The authors of a single blinded, randomized control trial found that, "An exercise program emphasizing weight bearing and postural stability significantly improved muscle strength, postural stability, and self-perceived function in patients 4 to 12 months after THA."
Trudelle-Jackson, E., & Smith, S.S. (2004). Effects of a late-phase exercise program after total hip arthroplasty: A randomized controlled trial. Archives of Physical Medicine and Rehabilitation, 85(7), 1056-1062.

[34] The Bone and Joint Health Network developed a care map to standardize outpatient physiotherapy care for patients who have had an uncomplicated Primary Elective Total Knee Replacement in Ontario. This care map states: "Discharge is recommended if any of the following conditions show no improvement for 2 weeks, physician has been notified, and all other program goals have been attained: strength, pain, ROM, swelling"
Bone and Joint Network. (2009). Community Care Program: Program of Care for Elective Primary Total Knee Replacements. Toronto: Bone and Joint Network.

[35] The Bone and Joint Health Network developed a care map to standardize outpatient physiotherapy care for patients who have had an uncomplicated Primary Elective Total Knee Replacement in Ontario. This care map states: "Although the patient may identify long term personal goals, the goals defined within the Program of Care need to ensure the patient's safety in their home environment and provide them with the physical abilities and functional tolerances to manage their necessary daily living activities."
Bone and Joint Network. (2009). Community Care Program: Program of Care for Elective Primary Total Knee Replacements. Toronto: Bone and Joint Network.

[36] "Suggestive evidence supports the premise that exercise interventions following TJR contribute to positive outcomes; emerging evidence exists that rehabilitation interventions specifically impact ADLs in a positive manner."
O'Callaghan, L., McConnell, S., & Soever, L. (2009). Phase III of the Bone and Joint Canada Hip and Knee Surgery Wait Times Strategy: Preliminary Literature Review in Support of Toolkit Development. Bone and Joint Canada.

[37] The authors of a systematic review and meta-analysis reported that, "Functional physiotherapy exercise soon after discharge results in short term benefit after elective primary knee arthroplasty."
Minns Lowe, C.J., Barker, K.L., Dewey, M. & Sackley, C.M. (2007). Effectiveness of physiotherapy exercise after knee arthroplasty for osteoarthritis: systematic review and metaanalysis of randomised controlled trials. British Medical Journal, 335: 812. DOI: 10.1136/bmj.39311.460093.BE.

[38] "Written information on medication, mobility, expected progress, pain control and sources of help and advice should be available to patient and carer"
Scottish Intercollegiate Guidelines Network. (2002). Prevention and Management of Hip Fracture in Older People: A National Clinical Guideline. Edinburgh, Scotland

[39] "The results of this meta-analysis show that clinical pathways can significantly improve the quality of care." "The aggregate overall results showed significantly fewer patients suffering postoperative complications in the clinical pathways group when compared with the standard care group. A shorter length of stay in the clinical pathway group was also observed and lower costs during hospital stay were associated with the use of the clinical pathways. No significant differences were found in the rates of discharge to home."
Barbieri, A., Vanhaecht, K., Van Herck, P., Sermeus, W., Faggiano, F., Marchisio, S., & Panella, M. (2009). Effects of clinical pathways in the joint replacement: A meta-analysis. BMC Medicine, 7:32. DOI 10.1186/1741-7015-7-32.

[40] The Bone and Joint Health Network developed a care map to standardize outpatient physiotherapy care for patients who have had an uncomplicated Primary Elective Total Knee Replacement in Ontario. This care map states: "Discharge will occur when patient achieves discharge outcomes, or plateaus with/without further medical management arranged as appropriate."
Bone and Joint Network. (2009). Community Care Program: Program of Care for Elective Primary Total Knee Replacements. Toronto: Bone and Joint Network.

[41] The Bone and Joint Health Network developed a care map to standardize outpatient physiotherapy care for patients who have had an uncomplicated Primary Elective Total Knee Replacement in Ontario. This care map states: "Although the patient may identify long term personal goals, the goals defined within the Program of Care need to ensure the patient's safety in their home environment and provide them with the physical abilities and functional tolerances to manage their necessary daily living activities."
Bone and Joint Network. (2009). Community Care Program: Program of Care for Elective Primary Total Knee Replacements. Toronto: Bone and Joint Network.

[42] The Bone and Joint Health Network developed a care map to standardize outpatient physiotherapy care for patients who have had an uncomplicated Primary Elective Total Knee Replacement in Ontario. This care map states: "Presence of red flags requires that further medical management be provided. This means that an appointment be made for the patient to see the surgeon, Advanced Practice Physiotherapist or the patient be referred directly to their primary care provider or an emergency department."
Bone and Joint Network. (2009). Community Care Program: Program of Care for Elective Primary Total Knee Replacements. Toronto: Bone and Joint Network.

[43] "Suggestive evidence supports the premise that exercise interventions following TJR contribute to positive outcomes; emerging evidence exists that rehabilitation interventions specifically impact ADLs in a positive manner."
O'Callaghan, L., McConnell, S., Soever, L. (2009). Phase III of the Bone and Joint Canada Hip and Knee Surgery Wait Times Strategy: Preliminary Literature Review in Support of Toolkit Development. Bone and Joint Canada.

[44] "Written information on medication, mobility, expected progress, pain control and sources of help and advice should be available to patient and carer"
Scottish Intercollegiate Guidelines Network. (2002). Prevention and Management of Hip Fracture in Older People: A National Clinical Guideline. Edinburgh, Scotland.