



QUICK Guides

for post-acute rehabilitation after total hip replacement surgery

There are 10 QUICK guides representing the 10 quality indicators (QIs) for the post-acute phase of rehabilitation after primary total hip replacement for osteoarthritis. Use the guides for a QUICK review of the evidence supporting the QIs, suggestions for tools and resources, and results of our Canada wide survey on rehabilitation care based on these indicators.

In the online PDF, click on the list of QIs to go directly to that QUICK guide. You can also print select QIs by using the print function.

- Rationale
- Appropriate tools
- Resources
- Evidence summary
- Supporting evidence
- Survey findings



THR POST-ACUTE QUALITY INDICATORS

IF a patient had a primary total hip replacement for osteoarthritis THEN...

QI-1: Assess and document surgical hip pain at start and prior to discharge using a standardized tool

QI-2: Perform and document a comprehensive physical exam at start and prior to discharge using standardized methods

QI-3: Assess and document physical function at start and prior to discharge using a standardized self-report tool

QI-4: Assess and document physical function at start and prior to discharge using a standardized performance-based tool

QI-5: Assess and document participation (work, leisure, sport, caregiving) using a standardized tool

QI-6a: Assess and document physical activity and sedentary behaviour using standardized tools

QI-6b: Provide tailored guidance and support to resume an active lifestyle

QI-7: Assess and document health-related quality of life using a standardized tool

QI-8: Prescribe and document physical therapy and therapeutic exercise that is individualized to patient's needs

QI-9: Provide a comprehensive therapeutic rehabilitation program

QI-10: Assess and document patient's experience and satisfaction with rehabilitation

QI-1

Assess and document surgical hip pain at start of rehab and prior to discharge using a standardized tool

Rationale

Persistent pain lasting longer than 3 months is common after THR (~20%) and is reported by as many as 42% of patients at 3 years post-op. Higher levels of pain are associated with worse functional outcomes, depression, poorer general health and lower satisfaction. Pre-op anxiety and depression scores and greater pre-op pain are associated with greater risk of persistent post-surgical pain. Pain catastrophizing is also common with 46% of patients having clinically relevant catastrophizing pre-operatively which in turn predicts pain and lower self-reported function at 1 year post-op.

Assessing and documenting a patient's pain (i.e., at rest, during activity) over the course of rehabilitation can guide clinical care, choice of treatment interventions and determine effectiveness of pain management strategies. Change in pain is the main determinant of change in self-reported physical function. Persistent pain decreases a patient's likelihood of returning to physical activity and reduces satisfaction.

Appropriate tools to measure pain

- Visual analogue scale (VAS) (100 mm line)
- Numeric pain rating scale (NPRS) (0 to 10)
- P4 Pain Questionnaire
- Pain subscale of Hip disability and Osteoarthritis Outcome Score (HOOS)*
- Pain subscale of WOMAC OA Index*

*Requires permission and/or licensing fee to use

Resources

Total Joint Arthroplasty Outcome Measures (TJAOM) Toolkit 2.0

Rehabilitation Measures Database

Physiopedia - VAS

Physiopedia - P4



- What is most important to the patient? Pain at rest? Pain with walking?
- Measure pain at the same time each session (before treatment, after treatment)

Evidence summary

Delphi panel recommended that a patient's pain level at rest and with activity be routinely assessed at the start and prior to discharge from post-acute rehab using standardized tools.

Supporting evidence

Erlenwein J, Müller M, et al. Clinical relevance of persistent postoperative pain after total hip replacement – a prospective observational cohort study. J Pain Res. 2017;10:2183-93. PMID: [28919814](#)

Ghoshal A, Bhanvadia S, et al. Factors associated with persistent postsurgical pain after total knee or hip joint replacement: A systematic review and meta-analysis. Pain Rep. 2023;8:e1052. PMID: [36699992](#)

Nam D, Nunley RM, et al. Incidence and location of pain in young, active patients following hip arthroplasty. J Arthroplasty. 2015;30(11):1971-5. PMID: [26067707](#)

Westby MD, Brittain A, et al. 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. 2014;66(3):411-23. PMID: [24023047](#)

Wood TJM Gazendam, et al. Postoperative outcomes following total hip and knee arthroplasty in patients with pain catastrophizing, anxiety, or depression. J Arthroplasty. 2021;36(6):1908-14. PMID: [33648844](#)

Wylde V, Hewlett S, et al. Persistent pain after joint replacement: prevalence, sensory qualities, and postoperative determinants. Pain. 2011;152(3): 566-72. PMID: [21239114](#)

Survey* says...

- **84%** of clinicians routinely assess post-operative hip pain **using a standardized tool**
- **68%** rated this as **very important** and **86%** as **very feasible**

*2018 Canada-wide survey of 238 TJR rehabilitation providers

Updated May 2024

 QI-2

Perform and document a comprehensive physical exam at the start and prior to discharge using standardized methods

Rationale

Varied and persistent impairment including muscle weakness, altered gait, and poor balance are common for several months following THR and limit physical activity, participation and patient satisfaction. Good ROM is needed for day-to-day function. We know that 67° of hip flexion is needed to ascend stairs, 115° to sit on a standard chair, 121° to squat or tie shoes. Even greater range is required in non-Western cultures. Soft tissue contractures and tightness are also common and persist from the pre-operative phase.

In the first month after THR, patients experience global strength loss ranging from 15 to 26% in the operated leg compared to pre-operative levels and this is most pronounced in the hip abductors. Hip extensors, quadriceps and hamstrings remain weaker than healthy age-matched peers at 12 months after THR and this is most obvious with explosive strength.

Gait biomechanics including hip and knee ROM, single leg support, step length, and gait speed remain lower than pre-op values and healthy age-matched peers 12 months after THR. Inter-limb differences can persist as much as 5 years. Both static and dynamic balance improve to pre-operative levels between 4 and 12 months after surgery but do not reach the level of healthy adults resulting in more than 1 in 3 patients falling at least once in the year following surgery. Even 5 years after THR, there remains an increased risk of falls and fall-induced injuries among older females.

Low back pain affects ~40% of patients undergoing THR and pelvic alignment post-THR is linked to less improvement in back pain 1 year after surgery. Abnormal spinopelvic alignment also places patients at greater risk of hip dislocation. Symptomatic leg length discrepancy is very common post-THR and can lead to functional impairment, altered gait pattern and reduced satisfaction.

Use standardized methods to assess and document impairments at the start of the supervised rehab program to accurately capture a patient's baseline status, individualize treatment, and prescribe and modify therapeutic exercises. Repeat these measures at appropriate intervals and prior to discharge to assess treatment effectiveness, provide feedback to the patient on their progress, and feel confident in the information you share with other members of the patient's healthcare team.

Recommended approaches for assessing each component:

Range of motion (active and passive)

- Use consistent, standardized test positioning, verbal instructions and 12" or long-arm goniometer placement
- Record test position and whether measurement is passive or active ROM
- Include (at a minimum) bilateral hip flexion, extension, abduction, external and internal rotation; knee flexion and extension are also recommended. [Note: Baseline measurements may need to be modified if hip precautions are in place.]

Resources [Physiopedia - Goniometry](#)

Muscle length and flexibility

- Assess restrictions in the muscles crossing the joint (iliopsoas, rectus femoris, hamstrings) and those contributing to the kinetic chain (tensor fasciae latae, gastroc-soleus complex) for both limbs
- Use consistent positioning, verbal instructions, and standardized methods such as the passive knee extension in supine for hamstrings and Thomas Test for hip flexors
- Record method (degrees of motion, distance from plinth), test position (seated, supine, prone) and measure at consistent time (before/after treatment session)

Resources

[Physiopedia – Thomas Test](#)

[Physiopedia – Passive Knee Extension](#)

Muscle strength

Manual muscle testing (MMT)

- Use consistent, standardized patient test position, hand placement, technique (grading system), grading scale (i.e., 0 to 5), “make” or “break” test technique, and verbal instructions
- Record test position (i.e., supine, sitting), joint position (i.e., 90° flexion) if appropriate and grade for both limbs
- Include (at a minimum) bilateral hip flexors, extensors, abductors, quadriceps and hamstrings strength

Resources

[Rehabilitation Measures Database - MMT](#)

[Physiopedia – Strength Testing](#)

Hand-held myometry

- Recommended over manual muscle testing as an objective and clinically feasible method with good intra-rater reliability in adults with hip OA and excellent relative reliability in patients scheduled for THR. (Roxburgh 2021)
- As above, and recording use of isometric “make test”
- Record whether single test, average of 3 trials, or best of 3 trials and units of measurement (e.g., kg, nM)

Resources:[Rehabilitation Measures Database - Myometry](#)[Physiopedia - Myometry](#)[JOSPT – Myometry blog](#)**Gait**

- Assess at a consistent time (before/end of treatment) to avoid gait variation due to treatment-related fatigue or pain
- Consider assessing with/without walking aid (when safe), with/without shoes, at different speeds and on varying slopes
- Record differences in stance and swing phase, step length, step width, and altered lumbopelvic alignment including Trendelenburg sign

Resources[Physiopedia - Gait](#)**Static and dynamic balance**

- Test a patient's ability to maintain a stable position and to maintain or return the centre of gravity over the base of support (static balance) using:
 - Functional reach test
 - Single leg stance test
 - **4-stage balance test**
 - Step test
- Assess dynamic balance or a patient's ability to maintain upright posture and maintain or return the centre of gravity over the base of support while moving around (e.g., walking, turning, stepping sideways) using:
 - BESTest, BriefBESTest, MiniBESTest
 - Berg Balance Scale
 - Timed Up & Go
 - Four Square Balance Test

Resources[Total Joint Arthroplasty Outcome Measures \(TJAOM\) website](#)[Rehabilitation Measures Database](#)**Posture and alignment**

- Assess static (standing) posture and lumbopelvic and lower limb alignment including presence of scoliosis, hyperkyphosis, reduced lumbar lordosis, pelvic levels and tilt, standing position of hips (FD, externally rotated) and knees (FD, varus/valgus)
- Using plumb line, posture grid and photographs can increase accuracy
- It is also helpful to assess dynamic posture during different functional movements and positions

Resources[Physiotutors - Posture](#)

Leg length discrepancy

- If patient reports subjective feeling of LLD or it is evident when assessing posture or gait, it is helpful to measure leg lengths to identify soft tissue or alignment-related causes (e.g., chronic hip FD, pelvic rotation)
- Otherwise, surgeons suggest assessment for LLD should be delayed until closer to 3 months post-op to allow for natural recovery in hip posture, full weight bearing and soft tissue balance
- Use a consistent approach such as the supine (ASIS to medial malleolus) or standing blocks methods

Resources

Physiopedia – Leg Length

Evidence summary

Delphi panel recommended that a comprehensive physical exam be performed using standardized methods and include at a minimum: bilateral passive and active lower limb ROM, bilateral lower limb strength, gait and use of walking aids, static and dynamic balance, standing posture and lower limb alignment, bilateral lower limb soft tissue flexibility, and leg length discrepancy.

Supporting evidence

ROM

Davis KE, Ritter MA, et al. The importance of range of motion after total hip arthroplasty. Clin Orthop Relat Res. 2007;465:180-4. PMID: [18090472](#)

Han S, Kim RS, et al. The envelope of active hip motion in different sporting, recreational, and daily-living activities: A systematic review. Gait Posture. 2019;71:227-33. PMID: [31078827](#)

Mulholland SJ, Wyss UP. Activities of daily living in non-Western cultures: range of motion requirements for hip and knee joint implants. Int J Rehabil Res. 2011;24(3):191-8. PMID: [1560234](#)

Soft tissue flexibility

Bhave A, Marker DR, et al. Functional problems and treatment solutions after total hip arthroplasty. J Arthroplasty. 2007;2(Suppl 2):116-24. PMID: [17823029](#)

Muscle strength

Judd DL, Dennis DA, et al. Muscle strength and functional recovery during the first year after THA. Clin Orthop Relat Res. 2014;472:654-64. PMC: [3890211](#)

De Moraes Lopes B, de Araujo FX, et al. Patients who present with functional limitations, limited range of motion and reduced muscle strength 6 months after total hip arthroplasty: A cross-sectional study. Rev Bras Ortop (Sao Paulo). 2021;57(6):953-61. PMC: [9757974](#)

Friesenbichler B, Casartelli NC, et al. Explosive and maximal strength before and 6 months after total hip arthroplasty. J Orthop Res. 2018;36(1):425-31. PMID: [28574601](#)

Ismailidis P, Kvarda P, et al. Abductor muscle strength deficit in patients after total hip arthroplasty: A systematic review and meta-analysis. J Arthroplasty. 2021;36(8):3015-27. PMID: [33867208](#)

Roxburgh BH, Campbell HA, et al. The absolute and relative reliability of hand-held dynamometry in patients with severe lower-limb osteoarthritis scheduled for total joint replacement surgery. Int J Res Ex Phys. 2021;16(2):81-91. [Link](#)

Gait

Beaulieu ML, Lamontagne M, et al. Lower limb biomechanics during gait do not return to normal following total hip arthroplasty. *Gait Posture*. 2010;32:269-73. PMID: **20541940**

Butler RJ, Thiele RAR, et al. Unipedal balance is affected by lower extremity joint arthroplasty procedure 1 year following surgery. *J Arthroplasty*. 2015;30(2):286-9. PMID: **25257235**

Bahl JS, Nelson MJ, Taylor M, et al. Biomechanical changes and recovery of gait function after total hip arthroplasty for osteoarthritis: a systematic review and meta-analysis. *Osteoarthritis Cartilage*. 2018;26(7):847-63. PMID: **29474993**

John S, Weizel D, Heumann AS, et al. Persisting inter-limb differences in patients following total hip arthroplasty four to five years after surgery? A preliminary cross-sectional study. *BMC Musculoskelet Disord*. 2021;22(1):230. PMID: **33639901**

Kolk S, Michiel JM, et al. Gait and gait-related activities of daily living after total hip arthroplasty: a systematic review. *Clin Biomech (Bristol, Avon)*. 2014;29(6):705-18. PMID: **24951319**

Mendiolaogitia L, Rodríguez MÁ, et al. Kinematic gait analysis after primary total hip replacement: A systematic review. *Indian J Orthop*. 2020;54(6):767-76. PMID: **33133399**

Moyer R, Lanting B, et al. Postoperative gait mechanics after total hip arthroplasty: A systematic review and meta-analysis. *JBJS Rev*. 2018;6(11):31. PMID: **30399120**

Balance

Di Laura Frattura G, Bordoni V, Feltri P, et al. Balance remains impaired after hip arthroplasty: A systematic review and best evidence synthesis. *Diagnostics*. 2022;12(3):684. PMID: **35328237**

Ikutomo H, Nagai K, et al. Incidences and circumstances of falls among women following total hip arthroplasty on long-term follow-up. *J Orthop Sci*. 2023;28(3):577-82. PMID: **35063335**

Labanca L, Ciardulli F, et al. Balance and proprioception impairment, assessment tools, and rehabilitation training in patients with total hip arthroplasty: a systematic review. *BMC Musculoskelet Disord*. 2021;22:1055. PMC: **8690357**

Posture and alignment

Ishida T, Inaba Y, et al. Changes in pelvic tilt following total hip arthroplasty. *J Orthop Sci*. 2011;16:682-8. PMID: **21901525**

Pourahmadi M, Sahebalam M, et al. Spinopelvic alignment and low back pain after total hip arthroplasty: a scoping review. *BMC Musculoskelet Disord*. 2022;23(1):250. PMID: **35291992**

Vigdorchik JM, Shafi KA, et al. Does low back pain improve following total hip arthroplasty? *J Arthroplasty*. 2022;37(8S):S937-40. PMID: **35304301**

Leg length discrepancy

Fujimaki H, Inaba Y, et al. Leg length discrepancy and lower limb alignment after total hip arthroplasty in unilateral hip osteoarthritis patients. *J Orthop Science*. 2013;18(6):969-76. PMID: **23963590**

Kersic M, Dolinar D, et al. The impact of leg length discrepancy on clinical outcome of total hip arthroplasty: Comparison of four measurement methods. *J Arthroplasty*. 2014;29:137-41. PMID: **23680505**

Röder C, Vogel R, et al. Total hip arthroplasty: leg length inequality impairs functional outcomes and patient satisfaction. *BMC Musculoskel Disord*. 2012;13:95. PMC: **PMC3495212**

Survey* says...

- Only **8% of clinicians** routinely perform **all** components of the physical exam using standardized methods
- **77%** rated this as **very important** and **66%** as **very feasible**

*2018 Canada-wide survey of 238 TJR rehabilitation providers

Updated May 2024

QI-3

Assess and document physical function at start and prior to discharge using a standardized self-report tool

Rationale

Self-reported function is a core recommended outcome to monitor after THR. After an initial drop in self-reported function, pre-op values are usually achieved within 3 weeks post-op, much sooner than with performance tests. The Canadian Joint Replacement Registry asks all provinces to submit pre- and post-THR patient-reported outcome measure (PROM) data using the Oxford Hip Score. PROMs contribute to patient-centred care and can evaluate whether the rehabilitation intervention(s) made a difference in the patient's functioning, quality of life or other aspects that are relevant to patients along the recovery pathway.

PROMs are responsive to rehabilitation interventions and there are a number of valid, reliable and feasible tools to use in the post-acute phase after TKR. Self-reported function can improve by as much as 50% in the 1 to 3 month-period after TKA when compared to pre-operative values. The greatest rate of recovery occurs in the first 6-12 weeks.

Using standardized PROMs to assess and document physical function at the start of the supervised rehab program helps to establish treatment goals and individualize treatment interventions. Reassessing self-reported function prior to discharge allows you to assess treatment effectiveness, provide feedback to the patient on their progress, and have confidence in the information you share with other members of the patient's healthcare team. PROMs can also be used to assess the quality of care and create a benchmark for healthcare services along the continuum of rehabilitation care and across clinical sites.

Appropriate tools

- Oxford Hip Score*
- Hip disability and Osteoarthritis Outcome Score (HOOS) or HOOS-JR*
- Lower Extremity Functional Scale (LEFS)
- WOMAC OA Index*

*Requires permission and/or licensing fee to use



- If a tool doesn't capture what is important to the patient, consider using the Patient Specific Functional Scale
- Review the scores with the patient and help them interpret what the values mean (e.g., MCID, cut points, norms)

Resources

[Total Joint Arthroplasty Outcome Measures \(TJAOM\) website](#)

[Rehabilitation Measures Database](#)

[Physiopedia](#)

[EULAR outcome measures library](#)

[Rehabilitative Care Alliance](#)

[OrthoToolkit](#)

Evidence summary

Delphi panel recommended that assessment of physical function using a standardized self-report tool should be documented at baseline and prior to discharge (at a minimum).

Supporting evidence

De Rosis S, Pennucci F, Lungu DA, et al. A continuous PREMs and PROMs observatory for elective hip and knee arthroplasty: study protocol. *BMJ Open*. 2021;11(9):3049826. [Available here](#)

Kennedy DM, Stratford PW, et al. Modeling early recovery of physical function following hip and knee arthroplasty. *BMC Musculoskelet Disord*. 2006;7:100. PMCID: [PMC1712335](#)

Sato EH, Stevenson KL, et al. Recovery curves for patient reported outcomes and physical function after total hip arthroplasty. *J Arthroplasty*. 2023;38(7S):S65-71. PMID: [37068568](#)

Total Joint Replacement Quick Reference Guides. Rehabilitative Care Alliance. October 2022. [Link](#)

Vissers MM, Bussmann JB, et al. Recovery of physical functioning after total hip arthroplasty: Systematic review and meta-analysis of the literature. *Phys Ther* 2011;91(5):615-29. PMID: [21393418](#)

Survey* says...

- Only **19%** of clinicians routinely assess function **using a patient reported outcome measure**
- **23%** rated this as **very important** and **37%** as **very feasible**

*2018 Canada-wide survey of 238 TJR rehabilitation providers

Updated May 2024

QI-4

Assess and document physical function at start and prior to discharge using a standardized performance-based tool

Rationale

Performance-based tests capture different aspects of physical function than patient-reported outcome measures (PROMs). While PROM values begin to plateau within 6 weeks after surgery, performance-based functioning recovers at a slower rate and continues to improve 12 weeks and longer post-THR. Performance tests take 6-10 weeks to achieve pre-op values while PROMs reach pre-op scores within 3 weeks. Performance tests are more responsive than self-report measures in the sub-acute phase of recovery. More complex physical functioning such as climbing stairs, squatting, putting on socks/shoes and moving laterally can remain problematic for more than a year after TKR surgery. Compared to healthy peers at ~1 year post-THR, patients were 20% and 27% ascending and descending stairs respectively.

Using standardized performance-based tests to assess and document physical function at the start of the rehab program helps to establish patient's baseline status, identify specific limitations to target, and create an individualized treatment program. Reassessing function prior to discharge allows you to assess treatment effectiveness, provide feedback to the patient on their progress, and have confidence in the information you share with other members of the patient's healthcare team

Appropriate tools

- 30 sec chair stand test (30s CST) (recommended over 5 sit-to-stand test)
- Walking speed (self-paced or fast-paced) over short distance (e.g., 10 m, 40 m)
- Timed stair climb test
- Timed Up & Go (TUG)
- 6-minute walk test (6MWT)



- Specific limitations identified in a PROM can inform your choice of performance test
- Review the scores with the patient and help them interpret what the values mean (e.g., MCID, cut points, normative values)

Resources

Total Joint Arthroplasty Outcome Measures (TJAOM) website

Rehabilitation Measures Database (type in name of outcome measure)

OARSI Physical Performance Measures (+ links to videos)

Evidence summary

Delphi panel recommended that physical functioning be assessed at the start and again before discharge from supervised rehab using one or more standardized performance-based test.

Supporting evidence

De Moraes Lopes B, de Araujo FX, et al. Patients who present with functional limitations, limited range of motion and reduced muscle strength 6 months after total hip arthroplasty: a cross-sectional study. Rev Bras Ortop (Sao Paulo). 2021;57(6):953-61. PMCID: **PMC9757974**

Dobson F, Hinman RS, et al. OARSI-recommended performance-based tests to assess physical function in people diagnosed with hip or knee osteoarthritis. Osteoarthritis Cartilage. 2013;21:1042-52. PMID: **23680877**

Luna IE, Kehlet H, et al. Early patient-reported outcomes versus objective function after total hip and knee arthroplasty: a prospective cohort study. Bone Joint J. 2017;99-B(9):1167-75. PMID: **28860396**

Mark-Christensen T, Kehlet H. Assessment of functional recovery after total hip and knee arthroplasty: An observational study of 95 patients. Musculoskelet Care. 2019;17(4):300-12. PMID: **31489996**

Perron M, Malouin F, et al. Assessing advanced locomotor recovery after total hip arthroplasty with the timed stair test. Clin Rehabil. 2003;17(7):780-6. PMID: **14606746**

Peters MCWM, Pronk Y, et al. Return to daily activities, work, and sports at 3 months after total hip arthroplasty. JBJS Open Access. 2023;8(4):e23.00048. PMCID: **PMC10697593**

Stratford PW, Kennedy DM, et al. Quantifying self-report measures' overestimation of mobility scores postarthroplasty. Phys Ther 2010;90:1288-96. PMID: **20592271**

Total Joint Replacement Quick Reference Guides. Rehabilitative Care Alliance. October 2022. [Link](#)

Survey* says...

- **34%** of clinicians routinely assess function **using a performance-based test**
- **38%** rated this as **very important** and **51%** as **very feasible**

*2018 Canada-wide survey of 238 TJR rehabilitation providers

Updated May 2024

 QI-5

Assess and document participation (work, leisure, sport, caregiving) using a standardized tool

Rationale

Rehabilitation after THR typically focuses on restoring strength, function and normal gait pattern. However, participation including social participation and return to work and leisure activities, are also important in meeting patients' expectations and achieving satisfaction.

Based on data from the Canadian Joint Replacement Registry 2023 annual report, 37% of males and 25% of females undergoing elective THR surgery are of working age (<65 years old). This proportion will likely increase with higher retirement ages. A majority who were working before surgery are able to return to work within 6 months and up to 87% within 12 months after surgery. Average time to return to work was 2 to 14 months and is typically sooner than after TKR. Post-operative precaution impact patient's return to work <6 weeks after THR.

Other participation restrictions are reported after THR with ~50% of patients having problems with using transportation, shopping and participating in recreation and leisure activities 6 months after surgery. Using the International Classification of Functioning, researchers found concerns with the participation domain became increasingly more important after the first 2 weeks post-op. By 6 weeks, shopping, returning to hobbies, and going back to regular exercise classes or sports were all moderately important to patients.

Using a standardized tool or set of questions to assess and document participation at the start of the supervised rehab program helps to identify the patient's baseline status and goals for return to valued activities, and create an individualized treatment program that addresses impairments and functional limitations contributing to participation restrictions. Reassessing participation prior to discharge allows you to assess treatment effectiveness, provide feedback to the patient on their progress, identify ongoing restrictions, and suggest strategies and resources to help the patient achieve their goals.

Appropriate tools

- Hip disability and Osteoarthritis Outcome Score (KOOS) – Sports and Rec subscale
- Keele Assessment of Participation
- SF-36 Social functioning subscale

Resources

[Total Joint Arthroplasty Outcome Measures \(TJAOM\) website](#)

[Rehabilitation Measures Database](#)

[SF-36 Ortho Toolkit](#)

Evidence summary

Delphi panel recommended that participation including ability to perform care-giving activities, participate in paid/unpaid work and participate in leisure activities should be documented by a member of the healthcare team using a standardized tool because return to work, leisure and sporting activities are important outcomes for patients early in recovery and associated with greater satisfaction.

Supporting evidence

Leichtenberg CS, Tilbury C, et al. Determinants of return to work 12 months after total hip and knee arthroplasty. *Ann R Coll Surg Engl*. 2016;98(6):387-95. PMCID: [PMC5209980](#)

Peters MCWM, Pronk Y, et al. Return to daily activities, work, and sports at 3 months after total hip arthroplasty *JBJS Open Access*. 2023;8(4):e23.00048. PMCID: [PMC10697593](#)

Pisoni C, Giardini A, et al. International Classification of Functioning, Disability and Health (ICF) core sets for osteoarthritis: A useful tool in the follow-up of patients after joint arthroplasty. *Eur J Phys Rehabil Med*. 2008;44:1-9. PMID: [18469736](#)

Sankar A, Davis AM, et al. Return to work and workplace activity limitations following total hip or knee replacement. *Osteoarthritis Cartilage*. 2013;21:1485-93. PMID: [23774473](#)

Soleimani M, Babagoli M, et al. Return to work following primary total hip arthroplasty: a systematic review and meta-analysis. *J Orthop Surg Res*. 2023;18:95. PMCID: [PMC9926652](#)

Tilbury C, Schaasberg W, et al. Return to work after total hip and knee arthroplasty: a systematic review. *Rheumatology*. 2014;53(3):512-25. PMID: [24273048](#)

Survey* says...

- Only **8%** of clinicians routinely assess participation using a standardized tool
- **22%** rated this as **very important** and **31%** as **very feasible**

*2018 Canada-wide survey of 238 TJR rehabilitation providers

Updated May 2024

 QI-6a

Assess and document physical activity and sedentary behaviour using standardized tools

Rationale

Physical activity (PA) after THR remains well below guideline recommended levels and those of healthy peers. Despite it resulting in decreased joint pain and improved physical function, THR does not lead to a natural increase in moderate or vigorous PA two years after surgery. Like TKR, the post-acute phase of structured, supervised rehabilitation provides a window of opportunity to screen, support and guide patients on resuming or starting a physically active, health-promoting lifestyle. Prolonged physical inactivity can limit recovery after surgery, increase risk of falls and worsen or lead to other chronic health conditions such as heart disease, diabetes and obesity.

Approximately 50% of individuals meet the PA recommendations of 150 minutes of moderate intensity exercise per week 12 months or more after TKR based on self-report. Using accelerometry data, PA levels were much lower and did not change from pre-operative to 6-months post-op with patients spending 84% of their time engaged in sedentary activities. In a large survey of >1,100 patients, 69% participated in sports or were physically active one year prior to surgery and this increased slightly to 73% at 1 year and 76% at 4 years post-op. The most common sports and activities both pre- and post-THR are recreational walking, cycling, swimming and golf with highest participation levels 5 years prior to surgery and declining levels leading up to surgery. After THR, 20% of patients reported activity restrictions and these were more commonly self-imposed than surgeon-directed. Higher rates of participation in PA and sports are associated with higher levels of satisfaction.

Accelerometers are considered the gold standard for measuring non-specific physical activity; however, being expensive and resource demanding, they are often not feasible in clinical settings. These objective measures also do not necessarily reflect the difficulty of the activities or how important an activity is to a patient.

Establishing previous and expected PA levels after THR provides important clinical information on which to base PA guidance, establish a patient's readiness to change PA and sedentary behaviour, and set realistic goals and strategies towards achieving health-enhancing PA over the long term.

Appropriate tools

- Physical Activity Vital Sign
- International Physical Activity Questionnaire (IPAQ) - short form
- UCLA Activity Score
- Short Questionnaire to Assess Health-Enhancing Physical Activity (SQUASH)
- Lower-Extremity Activity Scale (LEAS)

Resources

Exercise is Medicine-PA Vital Sign

EULAR outcome measures library (type in IPAQ, SQUASH or LEAS)

UCLA Activity Score



- With patient consent, use their smart phone or watch to collect valuable data on steps, PA level and sedentary time.
- A simple pedometer can also be very helpful in determining basic PA level.

Evidence summary

Delphi panel recommended that physical activity level and sedentary behaviour be assessed using a standardized tool(s) because patients are less physically active than recommended after TKR and regular physical activity has many health enhancing benefits.

Supporting evidence

Arshi A, Khan IA, et al. Participation in sports and physical activities after total joint arthroplasty. J Arthroplasty. 2023;38(5):806-14.e5. PMID: **36470366**

Coenen P, Straat C, et al. Knee arthroplasty: a window of opportunity to improve physical activity in daily life, sports and work. BMJ Open Sport Exerc Med. 2020;6(1):e000822. PMCID: **PMC7312336**

Harding P, Holland AE, et al. Do activity levels increase after total hip and knee arthroplasty? Clin Orthop Relat Res. 2014;472:1502-11. PMCID: **PMC3971219**

Mooiweer Y, van den Akker-Scheek I, et al. Amount and type of physical activity and sports from one year forward after hip or knee arthroplasty-A systematic review. PLoS One. 2021;16(12):e0261784. PMCID: **PMC8714096**

Survey* says...

- Only **18%** of clinicians routinely assess physical activity and sedentary behaviour using a standardized tool
- **28%** rated this as **very important** and **32%** as **very feasible**

*2018 Canada-wide survey of 238 TJR rehabilitation providers

Updated May 2024

 QI-6b

Provide tailored guidance and support to resume an active lifestyle

Rationale

With physical activity (PA) remaining well below recommended levels and those of healthy peers after THR, it is important to educate patients on the benefits of PA and provide supports and resources to help them achieve an active lifestyle. Patients report a number of barriers to being physically active after THR including limited range of motion, reduced standing and walking tolerance, muscle weakness, and fatigue. Psychological factors include lack of motivation, low mood and fear of falling. Some patients report being unsure of where to start and receiving inconsistent advice from healthcare providers on what activities are safe to do after THR. In a Danish study, researchers found patients were motivated to resume usual activities but many had little interest in achieving greater levels of physical activity than they had before the hip restricted their functioning.

Patients have also identified a number of motivators to being active such as scheduling PA into their day, setting goals, tracking their activity, and being active with a friend/family member. For some, using a wearable device, activity tracker or smartphone App is helpful. Inactive individuals will benefit from just learning the importance of breaking up sedentary time (e.g., standing/walking every 30-60 minutes) and this might be the first move towards being more active.

Discuss the benefits of PA with patients prior to discharge from rehabilitation. Provide PA resources in different formats including evidence-informed websites, print materials, videos and Apps. Work with patients to identify their readiness to be more physically active (stage of change) and select resources with appropriate guidance and behavioural change strategies. Many community and recreation centres offer arthritis-friendly or even joint replacement specific PA programs and exercise classes. The social aspect of such programs can be a strong motivator for some patients.

Resources

Active for Health – **Provider resources**

Active for Health – **Patient resources**

Get Moving: Maximizing Your Activity After a Hip or Knee Replacement

24 hour Movement Guidelines

Evidence summary

Delphi panel recommended that patients be provided tailored guidance and support to resume a physically active lifestyle including:

- Benefits of regular physical activity
- Recommended level of physical activity for health benefits
- Available community-based physical activity or exercise programs appropriate for individuals with THR
- Helpful online or print resources to support regular physical activity

Supporting evidence

Beaule PE, Dorey FJ, et al. The value of patient activity level in the outcome of total hip arthroplasty. J Arthroplasty. 2006;21(4):547-52. PMID: [16781408](#)

Hawke LJ, Taylor NF, et al. In the dark about physical activity – Exploring patient perceptions of physical activity after elective total joint replacement: A qualitative study. Arthritis Care Res. 2022; 74(6):965-974. PMID: [34057314](#)

Poulsen AG, Gravesen JD, et al. Patient perspectives on home-based rehabilitation exercise and general physical activity after total hip arthroplasty: A qualitative study (PHETHAS-2). F1000 Res. 2023;10:382. PMCID: [PMC10285331](#)

Smith TO, Latham S, et al. Patients' perceptions of physical activity before and after joint replacement: a systematic review with meta-ethnographic analysis. Postgraduate Med J. 2015;91(1079):483–91. PMID: [26306502](#)

Westby MD, Brittain A, et al. 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. 2014;66(3):411-23. PMID: [24023047](#)

Survey* says...

- **91%** of clinicians routinely provide tailored guidance and support to help patients become more physically active
- **91%** rated this as **very important** and **82%** as **very feasible**

*2018 Canada-wide survey of 238 TJR rehabilitation providers

Updated May 2024

 QI-7

Assess and document health-related quality of life using a standardized tool

Rationale

Patients rank improvements in pain, function and health-related quality of life (HRQoL) as priority outcomes after THR. A French study found that pre-operative HRQoL levels were exceeded within 2 weeks after THR. It continues to improve following surgery and is similar to population norms 3 to 7 years after surgery. Greatest gains are reported for the domains of bodily pain, physical functioning and role emotional in the SF-36 questionnaire and these plateau at 3 years. Rehabilitation programs that include effective pain management, reduce kinesiophobia and identify and discuss patient expectations for recovery are associated with better HRQoL.

Using a standardized tool or set of questions to assess and document HRQoL at the start of the supervised rehab program helps to identify the patient's baseline status and expectations, and create an individualized treatment program that addresses factors contributing to reduced HRQoL. Reassessing HRQoL prior to discharge allows you to assess treatment effectiveness, provide feedback to the patient on their progress, and suggest strategies and resources to help the patient achieve their goals.

Appropriate tools

- Hip disability and Osteoarthritis Outcome Score (HOOS)-QoL subscale
- Short Form-36 (SF-36)
- Osteoarthritis Knee and Hip Quality of Life (OAKHQOL)
- World Health Organization Quality of Life-Brief Version (HOQOL-BREF)
- EuroQoL-5D-5L (EQ-5D-5L)

Resources

Total Joint Arthroplasty Outcome Measures (TJAOM) website

EULAR outcome measures library (type in name of tool)

Rehabilitation Measures Database (type in name of tool)

SF-36 Ortho Toolkit

Evidence summary

Delphi panel recommended that health-related quality of life be assessed and documented using a standardized tool or set of questions because reduced quality of life is a primary reason for having a TKR, and is an important outcome for patients. Better quality of life is associated with greater satisfaction after TKR.

Supporting evidence

Ethgen O, Bruyere O, et al. Health-related quality of life in total hip and knee arthroplasty. J Bone Joint Surg. 2004;86-A(5):963-74. [Link](#)

Perrin T, Bonnomet, et al. Early perioperative quality of recovery after hip and knee arthroplasty: a retrospective comparative cohort study. Int Orthop. 2023;47(11):2637-43. PMC: [37542539](#)

Shan L, Shan B, et al. Total hip replacement: a systematic review and meta-analysis on mid-term quality of life. Osteoarthritis Cartilage. 2014;22:389-406. PMID: [24389057](#)

Snell D, Siegert L, et al. Evaluating quality of life outcomes following joint replacement: Psychometric evaluation of a short form of the WHOQOL-Bref. Quality of Life Research. 2016;25(1):51-61. PMID: [26068734](#)

Survey* says...

- Only **2%** of clinicians routinely assess health-related quality of life using a standardized tool
- **14%** rated this as **very important** and **22%** as **very feasible**

*2018 Canada-wide survey of 238 TJR rehabilitation providers

Updated May 2024

 QI-8

Prescribe and document physical therapy and therapeutic exercise that is individualized to patient's needs

Rationale

Evidence-based guidelines and standards of care for primary THR recommend physiotherapy and exercise interventions aimed at restoring hip ROM, lower extremity muscle strength, mobility, function, balance and physical activity. Evidence and clinical experience have shown that certain rehabilitation parameters are associated with greater effectiveness and treatment adherence, and better patient outcomes and experiences after THR. While no one approach, treatment format, timing or mode of delivery can be universally recommended for optimal outcomes, there are key parameters of exercise prescription that are consistent with a physiologic training effect and supported by research evidence.

Parameters**Individualized to patient's needs (goals)**

A Canada-US consensus panel strongly recommended patient-specific needs and preferences be considered when applying rehabilitation best practice recommendations for THR. UK-based NICE guidelines 2020 recommend that patients who primarily do self-directed rehabilitation with minimal PT contact have clearly established rehabilitation goals, understand the importance of doing the prescribed home exercise program and have a person to contact for advice and support. A one size fits all approach is not recommended.

Supervised

The Rehabilitation Care Alliance and Canada-US consensus panel recommend rehabilitation be provided or supervised by a regulated health care professional with knowledge and clinical experience in arthritis and TJR surgery. A 2019 systematic review, however, found only small and inconsistent differences in patient outcomes comparing supervised rehabilitation to no or little supervision after THR. Required supervision levels (e.g., 1:1, rehab assistant led, group, telerehab) will vary by patient need, preferences and cognitive status.

Appropriately dosed

It is helpful to establish a baseline or starting point when prescribing exercises such as use of 1RM or 10RM. This approach will help to establish optimal loads for individual patients and reduce the risk of injury and muscle soreness.

Contributing to appropriate dose are the principles of specificity, overload, and progression. The proper use of these principles ensures that the loads assigned are sufficient to challenge the involved muscles to become stronger, faster, or more resistant to fatigue. High intensity resistance training based on 8RM or more traditional strengthening loads of 60-80% 1RM are safe and effective compared to lower intensity exercise.

Regularly progressed

Progression of exercises is necessary to provide a sufficient stimulus to the muscle and evoke a therapeutic training effect. This is most important with resistance, balance and functional training. Regular exercise progression also improves motivation, adherence and enjoyment. The American College of Sports Medicine recommends progressing strengthening exercises by 5-10% (e.g., 20 lbs - to 22 lbs) once a patient can do the same intensity and volume 2 sessions in a row. Rate of perceived exertion (RPE), reps in reserve and momentary muscle fatigue can also be used to guide progression.

Provide clear rationale for when and how to progress and encourage the patient to monitor responses to change in exercise intensity/dosage. Progression strategies can include increase in training frequency, reps/sets, resistance (load), range of motion, body position, speed of movement, and exercise complexity as well as decreased rest intervals between sets.

Monitored for adherence

Exercise adherence reflects the extent to which patients undertake the prescribed program accurately and at the recommended frequency, intensity and duration. Adherence to exercise after THR is not well studied but has been reported as low as 30%. Some studies based adherence on attendance at scheduled exercise sessions while other recognized the importance of tracking more detailed information on exercises performed at home to the extent that overall dosage could be determined.

Strategies to increase adherence include using an activity log, exercise journal, activity monitor, App or even recording exercise sessions on a calendar. Tracking efforts can motivate patients to do their prescribed exercise and help physiotherapists determine the effectiveness of the intervention and identify any need for behaviour change strategies.

At least 6 weeks in duration

Increased muscle strength can occur within 2 to 4 weeks of training due to neuromuscular and connective tissue adaptations. Changes in muscle mass occur more gradually over 6 to 12 weeks of training. A majority of strength training interventions included in recent systematic reviews were 6 weeks in duration. Recognizing that not all patients have access to longer periods of supervised rehabilitation, the Delphi panel reached consensus on a minimum of 6 weeks while acknowledging longer term supervised strength training will have additional benefits.

Resources

Rehab Care Alliance Quick Reference Guide

Evidence summary

Delphi panel recommended physiotherapy interventions including therapeutic exercise that is individualized to the patient's functional needs, supervised, appropriately dosed, regularly progressed, at least 6 weeks in duration and monitored for adherence in order to optimize patient recovery after THR.

Supporting evidence

Individualized

Total Joint Replacement Quick Reference Guides. Rehabilitative Care Alliance. October 2022. [Link](#)

Westby MD, Brittain A, et al. 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. 2014;66(3):411-23. PMID: [24023047](#)

Supervised

Hansen S, Aaboe J, et al. Effects of supervised exercise compared to non-supervised exercise early after total hip replacement on patient-reported function, pain, health related quality of life and performance-based function—a systematic review and meta-analysis of randomized controlled trials. Clinical Rehabilitation. 2019;33(1):13–23. PMID: [30073856](#)

Total Joint Replacement Quick Reference Guides. Rehabilitative Care Alliance. October 2022. [Link](#)

Westby MD, Brittain A, et al. 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. 2014;66(3):411-23. PMID: [24023047](#)

Dosage

ACSM's Guidelines for Exercise Testing and Prescription, 1th ed. American College of Sports Medicine, 2021. Liguori G (ed): Wolters Kluwer, Netherlands.

Hughes DC, Ellefsen S, et al. Adaptions to endurance and strength training. Perspectives in Medicine. 2018;8:a029769 [Link](#)

Zech A, Hendrich S, et al. Association between exercise therapy dose and functional improvements in the early post-operative phase after hip and knee arthroplasty: An observational study. PM&R. 2015;7(10):1064-72. PMID: [25892356](#)

Progression

Ratamess NA, Alvar BA, et al. Progression models in resistance training for healthy adults. Med Sci Sports Exerc. 2009;41(3):687-708. PMID: [19204579](#)

Duration

Skoffer B, Dalgas U, et al. Progressive resistance training before and after total hip and knee arthroplasty: a systematic review. Clinical Rehabil. 2015;29(1):14-29. PMID: [24994766](#)

Adherence

Jan MH, Hung JY, et al. Effects of a home program on strength, walking speed, and function after total hip replacement. Archives Phys Med Rehabil. 2004;85:1943-51. PMID: [15605331](#)

Meng Y, Deng B, et al. Effectiveness of self-efficacy-enhancing interventions on rehabilitation following total hip replacement: a randomized controlled trial with six-month follow-up. J Orthop Surg Res. 2022;17:225. PMCID: [PMC8995056](#)

Survey* says...

- **28%** of clinician routinely include all parameters when prescribing a comprehensive exercise program with individual parameters ranging from **42 to 97%**
- **67%** rated the prescription parameters as **very important** and between **48%** as **very feasible**

*2018 Canada-wide survey of 238 TJR rehabilitation providers

Updated May 2024

 QI-9

Provide a comprehensive therapeutic rehabilitation program

Rationale

Many MSK impairments and activity limitations that develop over the progressive course of hip osteoarthritis are not resolved by THR surgery. Further, the surgery and surgical approach causes pain, altered gait and proprioception, and increased fall risk. As many as 1 in 4 patients fall in the first year after THR. Muscle atrophy and activation deficits contribute to chronic strength impairments which in turn has the potential to limit the long-term functional outcomes after TKA. Rehabilitation, primarily through a therapeutic exercise program, is strongly recommended. While no one approach, set of exercises, mode of delivery or therapeutic dosage has been identified, there are key components that are recommended and supported by research evidence.

Evidence-based guidelines and standards of care for primary THR recommend interventions aimed at reducing surgical hip pain, and restoring hip ROM, lower extremity muscle strength, normal gait pattern, function, balance and physical activity. Most patients will benefit from performing exercises in both legs as contralateral hip OA is common.

Components**Pain management**

Non-pharmacological pain management strategies with weak and inconsistent evidence include providing guidance on sleeping positions, massage (effleurage) to promote circulation and lymphatic drainage, use of TENS over areas with sufficient sensation, bracing, and cognitive strategies such as deep breathing, imagery, distraction and music.

Resource

[Pain BC](#)

Active ROM

A Canada-US consensus panel recommended active and passive ROM as well as stretching exercises to address reduced flexibility in muscles that cross the joint (e.g., iliopsoas, rectus, rectus femoris). ROM exercises for the knee and ankle may also be helpful if found to be restricted at baseline assessment.

Resource

[Exercise Guide for Hip Replacement Surgery](#)

Progressive resistance training for lower limb muscles

Regaining muscle strength early following THR is key to achieving a normal gait pattern, improving activities of daily living and reducing fall risk. Gluteus medius weakness prior to surgery is linked to limping post-operatively as it is a primary hip stabiliser during single legged functional movements such as gait. Progressive resistance training is safe and effective in improving muscle strength and rate of muscle force development after THR. Maximum or high-intensity training includes loads at 6-8RM and often to the point of momentary muscle fatigue. A resistance training program should include all forms including strength, endurance and power. Power decreases at a greater rate than strength over a patient's lifespan and is needed for balance and fall prevention.

Resistance can be in the form of body weight, elastic bands, cuff and free weights, machines or pulley systems. Include forms of resistance that are well tolerated and can be continued at home to make transitioning to independent exercise easier upon completion of supervised rehabilitation.

Resource

[Exercise Guide for Hip Replacement Surgery](#)
[NEMEX-TJR training program](#)

Balance training

Balance interventions improve walking function as measured by gait speed, stair-climbing time, TUG test and balance-specific performance measures immediately and 6 months after training. Better self-reported function, improved reaching and single-leg standing are also reported. Few studies have looked at the effect of balance training on rate of falls in the year after THR and less than 50% of patients report receiving fall prevention education.

Static balance activities may include single leg stance, adding arm movements and head turning, tandem standing, forward/sideways reaching out of the base of support and resisting perturbations. Dynamic balance training includes tandem walking, side stepping, stepping in different directions, stepping over objects, using an agility ladder, turning, and completing an obstacle course. Dual task training offers an added challenge to all of these balance activities.

Resources

[Exercise Guide for Hip Replacement Surgery](#)
[NHS Balance exercises](#)
[Finding Balance BC](#)

Postural and core stability training

Pain, inactivity, decreased proprioception, altered gait patterns, and proximal lower limb muscle weakness can all contribute to poor posture and impaired activation of core muscles (e.g., transversus abdominus, lower gluts, pelvic floor). Low intensity, repetitive exercises that activate these key muscles will lead to better trunk stabilization and reduced risk of back strain. Exercises might include simple activation of these muscles in different lying, sitting and standing positions or progression to Sahrmann's exercises such as leg slide, bent knee fall out and single leg raise. Pilates-based approaches can be very helpful in localizing these muscles and improving balance. A Canada-US consensus panel recommended postural training after THR.

Resources

[Exercise Guide for Hip Replacement Surgery](#)

[Sahrmann core exercise progressions](#) (May not be accessible through Health Authority server)

[NEMEX-TJR training program](#)

Gait training

A Canada-US consensus panel recommended gait training include: correct use/progression of walking aids, correction of altered gait pattern, indoor/outdoor training, and variable surface training. It is also helpful to train patients at different walking speeds and on different slopes to mimic what they might encounter in the real world.

Resource

[Exercise Guide for Hip Replacement Surgery](#)

[AAHKS Gait Training](#)

Functional exercises

Patients experience greater improvement in self-reported and performance-based measures of function when rehabilitation programs include functional training. Identifying specific activity limitations at baseline can guide the functional training such as breaking down the movements needed to lower to and rise from the floor. Difficulty rising from a standard chair can be addressed through progressively lower chair heights, staggered foot position and addition of loads (e.g., holding free weights). Additional functional exercises valued by patients after THR include stair ascent/descent, squatting, and picking up a load from the floor.

Resource

[Exercise Guide for Hip Replacement Surgery](#)

[NEMEX-TJR training program](#)

Home exercise program

Supervised rehabilitation after THR is particularly is time-limited and cannot fully address or optimize all aspects of patient functioning. Patients are encouraged to continue with a home exercise program for as long as a year after surgery. Implementing the home program while the patient is actively participating in supervised rehabilitation, allows for guidance on exercise technique, modifications and progressions. Home exercises are also important in supplementing the limited supervised sessions and ensuring sufficient exercise dosage to improve strength and function. A home program should be accompanied by printed exercises sheets (ideally with illustrations), videos, web or App-based exercises with instructions on frequency, intensity, reps/sets, and how/when to progress or regress exercises. An exercise log or tracker will help the patient track their exercise adherence and progress.

Resource

[Exercise Guide for Hip Replacement Surgery](#)

Evidence summary

Delphi panel recommended pain management strategies, active hip range of motion exercise, progressive resistance training for bilateral lower limb muscles, static and dynamic balance training, postural and core stability training, gait training, functional exercises, provision of a home exercise program with guidance on how to progress exercises.

Supporting evidence

Pain management

Aldanyowi SN. Novel techniques for musculoskeletal pain management after orthopedic surgical procedures: A systematic review. *Life (Basel)*. 2023;13(12):2351. PMCID: [PMC10744474](#)

Total Joint Replacement Quick Reference Guides. Rehabilitative Care Alliance. October 2022. [Link](#)

Range of motion

Total Joint Replacement Quick Reference Guides. Rehabilitative Care Alliance. October 2022. [Link](#)

Strength training

Bull T, Erzen A, et al. Hypertrophy training following a total hip replacement: A literature review. *Int J Sports Phys Ther*. 2024;19(3):337-50. PMCID: [PMC10909313](#)

Konnyu KJ, Pinto D, et al. Rehabilitation for total hip arthroplasty: a systematic review. *Am J Phys Med Rehabil*. 2023;102(1):11-18. PMCID: [PMC9464790](#)

Peter WF, Nelisse RGHH, et al. Guideline recommendations for post-acute postoperative physiotherapy in total hip and knee arthroplasty: are they used in daily clinical practice? *Musculoskelet. Care*. 2014;12:125–31. PMID: [24497426](#)

Skofter B, Dalgas U, et al. Progressive resistance training before and after total hip and knee arthroplasty: a systematic review. *Clin Rehabil*. 2015;29(1):14-29. PMID: [24994766](#)

Saueressig T, Owen PJ, et al. Evaluation of exercise interventions and outcomes after hip arthroplasty: A systematic review and meta-analysis. *JAMA Netw Open*. 2021;4(2):e210254. PMCID: [PMC7910817](#)

Winther SB, Foss OA, et al. Pain and load progression following an early maximal strength training program in total hip and knee arthroplasty patients. *J Orthop Surg (Hong Kong)*. 2020;28(2):230949902091632. PMID: [32301372](#)

Balance training

Adebero T, Bobos P, et al. Implementation of falls risk evaluation at one-year after total hip arthroplasty: a cross-sectional study. *Arch Physiother*. 2022;12(1):16. PMCID: [PMC9284763](#)

Labanca L, Ciardulli F, et al. Balance and proprioception impairment, assessment tools, and rehabilitation training in patients with total hip arthroplasty: a systematic review *BMC Musculoskelet Disord*. 2021;22(1):1055. PMCID: [PMC8690357](#)

Core stability

Levine B, Kaplanek B, et al. Pilates training for use in rehabilitation after total hip and knee arthroplasty: a preliminary report. *Clin Orthop Relat Res*. 2009;467(6):1468-75. PMCID: [PMC2674181](#)

Sahrmann S. *Diagnosis and Treatment of Movement Impairment Syndromes*. 1st edition. St. Louis, MO: Mosby; 2001.

Gait training

Park SJ, Kim BG, et al. Effects of exercise therapy on the balance and gait after total hip arthroplasty: a systematic review and meta-analysis. J Exerci Rehabil. 202;19(4):190-7. PMCID: [PMC10468294](#)

Peter WF, Nelisse RGHH, et al. Guideline recommendations for post-acute postoperative physiotherapy in total hip and knee arthroplasty: are they used in daily clinical practice? Musculoskelet. Care. 2014;12:125–31. PMID: [24497426](#)

Functional training

Monaghan B, Grant T, et al. Functional exercise after total hip replacement (FEATHER) a randomised control trial. BMC Musculoskelet Disord. 2012;13:237. PMCID: [PMC3517757](#)

Peter WF, Nelisse RGHH, et al. Guideline recommendations for post-acute postoperative physiotherapy in total hip and knee arthroplasty: are they used in daily clinical practice? Musculoskelet. Care. 2014;12:125–31. PMID: [24497426](#)

Survey* says...

- **39%** of clinician routinely include all components when prescribing a comprehensive exercise program with individual components ranging from **65 to 98%**
- Between **76 and 99%** of the components were rated as **very important** and between **61 and 96%** as **very feasible**

*2018 Canada-wide survey of 238 TJR rehabilitation providers

Updated May 2024

 QI-10

Assess and document patient's experience and satisfaction with rehabilitation

Rationale

Patient reported experience measures (PREMS) gather information on patients' actual experience while receiving care. They are an indicator of the quality of patient care, although do not measure it directly. PREMs do not look at the outcomes of care but the impact of the process of the care on the patient's experience. Aspects of care including shared decision making, communication among providers, and patient-provider relationships are associated with higher overall care ratings. PREMS differ from satisfaction by reporting objective patient experiences, removing the ability to report subjective views. Patients can be highly satisfied with the outcomes of THR surgery and rehabilitation independent of their care experience and vice versa. Greater positive patient experience is associated with higher levels of patient safety and clinical effectiveness across a range of health conditions. Assessment of patient experience with rehabilitation and satisfaction with outcomes provides a way to evaluate the many facets of rehabilitation care and identify areas for improvement.

Collect patient experience and satisfaction data soon after completion of rehabilitation to facilitate patient recall. Questionnaires should be completed away from the providers and after discharge from care to avoid affecting the patient-provider relationship. PREMS and satisfaction questionnaires can be distributed via online surveys, Apps, email and text messages.

Resource

No single questionnaire is recommended. Programs and clinics should create their own set of questions specific to their setting and aspects of care they would like to assess. For an example see:

[Health Quality Ontario Patient Experience Survey](#)

Evidence summary

Delphi panel recommended the assessment of patient's experience and satisfaction with the rehabilitation process and outcomes of care using a standardized form or questionnaire such as a program evaluation form or questionnaire emailed after discharge from treatment.

Supporting evidence

De Rosis S, Pennucci F, et al. A continuous PREMs and PROMs observatory for elective hip and knee arthroplasty: study protocol. BMJ Open. 2021;11(9):3049826. PMCID: [PMC8458328](#)

Doyle C, Lennox L, et al. A systematic review of evidence on the links between patient experience and clinical safety and effectiveness. BMJ Open 2013;3(1). PMCID: [PMC3549241](#)

Gleeson H, Calderon A, et al. Systematic review of approaches to using patient experience data for quality improvement in healthcare settings. BMJ Open 2016;6:e011907. PMCID: [PMC5013495](#)

Kingsley C, Patel S. Patient-reported outcome measures and patient-reported experience measures. BJA Education. 2017;17(4):137-44. [Link](#)

Rossettini G, Latini TM, et al. Determinants of patient satisfaction in outpatient musculoskeletal physiotherapy: a systematic qualitative meta-summary, and meta-synthesis. Disabil Rehabil. 2020;42(4):460-72. PMID: [30428722](#)

Wang MC, Chan PH, et al. Factors influencing patient satisfaction with care and surgical outcomes for total hip and knee replacement. Perm J. 2021;25:21.043. PMCID: [PMC8784075](#)

Survey* says...

- **Only 11%** of clinicians routinely assess patient's experience and satisfaction with rehabilitation using a standardized measure
- **31%** rated this as **very important** and **31%** as **very feasible**

*2018 Canada-wide survey of 238 TJR rehabilitation providers

Updated May 2024