ValleyOrtho Rehabilitation Playbook Series

Physician: Dr. Chris George **Physician Assistant:** Rachel Mazza **MA:** Michelle Gorton **ATC:** Jackie Brey
Office Phone: 970-384-7140 **Office Fax:** 970-384-8133

Surgical Procedure: Total Hip Replacement

The intent of this information is to inform the treating clinician on the evidence-based considerations to be used as a guideline regarding the surgery noted above. This is not a substitute for appropriate clinical decision making, but a supplement to that effect. If at any time a clinician feels uncertain about a given phase discrepancy or patient presentation they are strongly encouraged to discuss this with the referring physician and his/her team before alarming the patient. The goal of this rehabilitation guideline IS NOT to be used to motivate patients through fear and discouragement if they are not attaining goals in the described timeframes but to increase physician-therapist communication around established principles. It is the responsibility of the therapist to read the operative report before providing care to the patient to improve treatment communication.

Therapeutic Activity Progression Disclaimer: Progression to the next phase should be strongly based on meeting clinical criteria (not solely based on the post-operative timeframes) as appropriate and in collaboration with the referring surgeon. Exercise prescription should be clinically directed by pain and performance absent of detrimental compensation with respect to proper biomechanics of the spine, hip, knee and ankle.

Communication Recommendations from Therapist to Surgical Team: When a treating therapist feels the need to reach out to Dr. George, or a member of his team, at any point for any reason they are strongly encouraged to do so. All concerns are not explicitly written and clinical judgment is paramount. Below is a handful of reasons and suggested methods of contact to promote communication:

Urgent Red Flag Communication: the patient is in clinic and an action is required as directed by referring staff office

- Uncontrollable and unremitting pain
- Signs of infection at incision or treated limb
- Signs of specific wounds care needs
- Severe palpation tenderness, swelling, tachycardia (UE or LE DVT)
- Labored breathing (PE)
- Drastic improvement or decline in ROM (failed component)
- After a fall/trauma, or near fall/trauma, resulting in a clinical change

Preferred Contact Method: #1: Immediate phone call to speak with MA or ATC until answer.

Administrative Needs

- Rehabilitation Prescription needed or prescription change requests
- Appointment needed with the physician office, or medication refill

Preferred Contact Method: Phone call to MA/ATC

Other Patient Concerns During Office Hours M-F 9am-5pm

- Abnormal pain, comorbidities or complications that may prevent attainment of established discharge criteria
- Patient is noncompliant with rehabilitation process
- Adverse work or home practices negatively impacting recovery
- Patient expresses discontent or concerns with the current POC established by PT and/or by MD/PA

Preferred Contact Method: Phone call to MD &/or PA

Preferred Updates before checkup visits with MD/PA

During Office Hours M-F 9am-5pm

- Information regarding adherence/participation in rehab process
- Comments on progress and trends of the patient's rehab course

Preferred Contact Method: Phone call to MD &/or PA. **Or** Fax update

Phase 0: Post-Op Healing & Inpatient Education (*Day 0-3*)

Goals:
- Independent ambulation with assistive device
- Independent with ADL's and transfers
- Reduce pain and swelling to tolerable levels

Precautions:
***There are NO ROM Restrictions* (Motion is as tolerated)**
- No forceful or unsupported A/PROM EXT
- No forceful or unsupported A/PROM rotation
- Log roll policy for bed mobility until 6 weeks
- WBAT
- No Repetitive Active SLR for 4 weeks
  - LIMIT AROM hip flexion repetitions to decrease iliopsoas and pectineus strain for 4 weeks

Phase 0 Therapeutic Activities:
- Gait training with assistive device[8]
- CKC activities for improved confidence for D/C
- Transfer training as appropriate (bed, car, chair, shower etc.)
- DVT and Infection education
- Hip ROM: AA/AROM within precautions
- Manual therapy as appropriate for pain/edema control

Minimum Criteria for Progression to Phase 1:
- Verbalizes understanding of preferred post op activities and positions
- Independent ambulation with assistive device for household distances
- Independent with home exercise protocol
- Begin outpatient physical therapy within 3 weeks of procedure[20]

Phase 1: Healing & ROM Recovery (*weeks 1- 2*)

Goals:
- Reduce pain and swelling with steadily improving hip ROM
- Maintain knee strength using progressive resistance training with unloaded exercises[3, 10, 17]
- Improve hip muscle balance and control via OKC focused activity
- Identify patient as a **Low Activity Patient (LAP)** or **High Activity Patient** (**HAP**) for appropriate progression:
  - **LAP** = Older, unhealthy tissue, lower PLOF, lower D/C goals
  - **HAP** = Younger, healthy tissue, higher PLOF, and higher D/C goals. Advance this patient directly to Phase 2 if:
    - No gait abnormalities exist (besides a minor hip EXT loss)
    - Single leg stance > 5 seconds on operative side
    - Minimal to no edema around the operative side
    - Pain at worst on VAS of 4/10

Precautions:
- Hip EXT and rotation precautions as stated in Phase 0 until week 6
- Log roll policy for bed mobility until 6 weeks
- No Repetitive Active SLR for 4 weeks
  - LIMIT AROM hip flexion repetitions to decrease iliopsoas and pectineus strain for 4 weeks

Phase 1 Therapeutic Activities:
- Hip ROM: P/AA/AROM as tolerated in all planes
- Sub-max Hip Isometrics:[5]
  - Iliopsoas in supine and side lying
  - Gluteus maximus activation prone and supine
  - Gluteus medius activation supine knee flexed and extended
- Progress isometric muscle activation to OKC in standing
- Quadriceps and HS RROM OKC progressive resistance training [3, 10, 17]
- Manual therapy as appropriate for pain/edema/scar management[5]
- Gait training with assistive device, wean from AD ≠ limp
- Transfer training as appropriate
- Begin OKC proprioception activities[4]
- Integrate gentle flexibility for bilateral lower extremities

Minimum Criteria for Progression to Phase 2:
- Minimal pain within available hip ROM: 0^0 EXT to 90^0 Flexion
- Full closure of surgical incision
  - Follow up with physician if these criteria are not met

Phase 2: ROM & Early Strengthening (*weeks 3-5*)

Goals:
- Reduce swelling and pain with steadily improving hip ROM
- Improve gait pattern quality and distance
- Patient able to progress from reduced BW CKC to FWB CKC activities without pain

Precautions:
- Hip EXT and rotation precautions as stated in Phase 0 until week 6
- Log roll policy for bed mobility until 6 weeks
- No Repetitive Active SLR for 4 weeks
    - LIMIT AROM hip flexion repetitions to decrease iliopsoas and pectineus strain for 4 weeks

Phase 2 Therapeutic Activities:
- Hip ROM: P/AA/AROM to meet ROM goals
- Strength: progress from standing hip RROM OKC to standing CKC[6, 7] as tolerated
    - **LAP**: Focus on muscle **ENDURANCE** during rehabilitation course
    - **HAP**: Focus on muscle **HYPERTOPHY** during rehabilitation course
- Neuro Re-education: Reduced BW and repetitions CKC activities for balance & proprioception focus
- Static balance training
    - Progress to dynamic balance training when patient can maintain tandem walking pattern for 25ft ≠ excessive UE balance reaction
- Gentle flexibility to major muscle groups in the lower extremities
- Manual therapy as indicated
- Stationary bike: **HAP** with resistance, **LAP** without resistance
- Hydrotherapy (closed incision only)[20]: OKC and CKC activities

Minimum Criteria for Progression to Phase 3:
- Pt able to perform sit to stand 5x without UE assist
- Minimal residual swelling
- Pain free hip ROM to 75% of contralateral hip
- Independent gait to 150 feet or greater ≠ Trendelenburg or circumduction[1]
    - Follow up with physician if these criteria are not met

Phase 3: AROM & Intermediate Strengthening (*week 6+*)[2]

Goals:
- Full hip ROM
- Normalized gait pattern and distance
- Eliminate swelling
- Return to normal ADLs without pain

Precautions:
- Limit antalgic ambulation; continue AD as necessary

Phase 3 Therapeutic Activities:
- Hip ROM: P/AA/AROM to meet ROM goals
- Strength: Total LE Dynamic functional OKC and CKC
    - **LAP**: Focus on muscle **ENDURANCE** during rehabilitation course
    - **HAP**: Focus on muscle **HYPERTOPHY** during rehabilitation course
- Neuro Re-education: Emphasize single leg stance activities on operative side
- Progress balance/proprioception based on functional demands
- Introduce cardio: stationary bike with resistance, elliptical trainer if tolerated; discuss appropriateness for return to recreation[9]

Minimum Low Activity Patient D/C Criteria:
- Ascend and descend stairs reciprocally without pain or compensations
- Independent, continuous gait for ¼ mile OR walks 10 meters in ≤ 12 seconds[14]
- Ability to attend to occupational demands, as applicable
- Understands home exercise program and follow-up plans
- Single leg stance of 5 seconds with eyes open
- Hip AROM 10-20^0 EXT to ≥ 95^0 Flexion[13, 21]
    - Follow up with physician if these criteria are not met

High Activity Patient D/C Criteria (includes above):
- Limb symmetry of 90% or greater in strength and ROM
- Able to walk 1 mile continuously without AD
- Single leg stance time with eyes closed based on age[23]:
    - (50-59yo = 25 seconds) (60-69yo = 15 seconds) (70-79yo = 6 seconds)

Abbreviation List:

AAROM: Active assisted range of motion
ABD: Abduction
AD: Assistive device
ADD: Adduction
ADL: Activity of daily Living
AROM: Active range of motion
BW: Body Weight
CKC: Closed kinetic chain
DVT: Deep vein thrombosis
D/C: Discharge
ER: External rotation
EXT: Extension
FWB: Full weight bearing
HAP: High activity patient
HEP: Home exercise program
IR: Internal rotation
LAP: Low activity patient
LE: Lower extremity
MA: Medical assistant
MD: Medical doctor
NWB: Non weight bearing
OKC: Open Kinetic Chain
PA: Physician assistant
PE: Pulmonary embolism
PROM: Passive range of motion
ROM: Range of motion
RP: Resting position
RROM: Resisted range of motion
SLR: Straight leg raise
UE: Upper extremity
WB: Weight bearing
WBAT: Weight bearing as tolerated
≠: Absent/Without
≈: Approximately
#: Pounds

References

1. Andrews AW, Chinworth SA, Bourassa M, Garvin M, Benton D, Tanner S. Update on distance and velocity requirements for community ambulation. *J Geriatr Phys Ther.* 2010;33(3):128-134.
2. Brosseau L, Wells GA, Pugh AG, et al. Ottawa Panel evidence-based clinical practice guidelines for therapeutic exercise in the management of hip osteoarthritis. *Clin Rehabil.* 2016;30(10):935-946.
3. Di Monaco M, Vallero F, Tappero R, Cavanna A. Rehabilitation after total hip arthroplasty: a systematic review of controlled trials on physical exercise programs. *European Journal of Physical and Rehabilitation Medicine.* 2009;Volume 45(Number 3):303-317.
4. Dominguez-Navarro F, Igual-Camacho C, Silvestre-Munoz A, Roig-Casasus S, Blasco J. Effects of balance and proprioceptive training on total hip and knee replacement rehabilitation: A systematic review and meta-analysis. *Gait and Posture.* 2018;62:68-74.
5. French HP, Cusack T, Brennan A, et al. Exercise and manual physiotherapy arthritis research trial (EMPART) for osteoarthritis of the hip: a multicenter randomized controlled trial. *Arch Phys Med Rehabil.* 2013;94(2):302-314.
6. Grimaldi A, Richardson C, Durbridge G, Donnelly W, Darnell R, Hides J. The association between degenerative hip joint pathology and size of the gluteus maximus and tensor fascia lata muscles. *Man Ther.* 2009;14(6):611-617.
7. Grimaldi A, Richardson C, Stanton W, Durbridge G, Donnelly W, Hides J. The association between degenerative hip joint pathology and size of the gluteus medius, gluteus minimus and piriformis muscles. *Man Ther.* 2009;14(6):605-610.
8. Jesudason C, Stiller K. Are bed exercises necessary following hip arthroplasty? *Aust J Physiother.* 2002;48(2):73-81.
9. Klein GR, Levine BR, Hozack WJ, et al. Return to athletic activity after total hip arthroplasty. Consensus guidelines based on a survey of the Hip Society and American Association of Hip and Knee Surgeons. *J Arthroplasty.* 2007;22(2):171-175.

10. Mikkelsen LR, Mechlenburg I, Søballe K, et al. Effect of early supervised progressive resistance training compared to unsupervised home-based exercise after fast-track total hip replacement applied to patients with preoperative functional limitations. A single-blinded randomised controlled trial. *Osteoarthritis Cartilage.* 2014;22(12):2051-2058.
11. Mikkelsen LR, Petersen AK, Mechlenburg I, Mikkelsen S, Søballe K, Bandholm T. Description of load progression and pain response during progressive resistance training early after total hip arthroplasty: secondary analyses from a randomized controlled trial. *Clin Rehabil.* 2017;31(1):11-22.
12. Okoro T, Whitaker R, Gardner A, Maddison P, Andrew JG, Lemmey A. Does an early home-based progressive resistance training program improve function following total hip replacement? Results of a randomized controlled study. *BMC Musculoskelet Disord.* 2016;17:173.
13. Rancho Los Amigos Medical Center. Pathokinesiology Service. *Observational gait analysis.* Downey, CA: Pathokinesiology Service & Physical Therapy Dept., Rancho Los Amigos Medical Center; 1993.
14. Shumway-Cook A, Patla AE, Stewart A, Ferrucci L, Ciol MA, Guralnik JM. Environmental demands associated with community mobility in older adults with and without mobility disabilities. *Phys Ther.* 2002;82(7):670-681.
15. Singh JA, Schleck C, Harmsen S, Lewallen D. Clinically important improvement thresholds for Harris Hip Score and its ability to predict revision risk after primary total hip arthroplasty. *BMC Musculoskelet Disord.* 2016;17:256.
16. Skoffer B, Dalgas U, Mechlenburg I. Progressive resistance training before and after total hip and knee arthroplasty: a systematic review. *Clin Rehabil.* 2015;29(1):14-29.
17. Toigo M, Boutellier U. New fundamental resistance exercise determinants of molecular and cellular muscle adaptations. *Eur J Appl Physiol.* 2006;97(6):643-663.
18. Tsukagoshi R, Tateuchi H, Fukumoto Y, et al. Functional performance of female patients more than 6 months after total hip arthroplasty shows greater improvement with weight-bearning exercise than with non-weight-bearing exercise. Randomized controlled trial. *European Journal of Physical and Rehabilitation Medicine.* 2014;50(6):665-675.
19. Van Arkel R, Amis A, Jeffers J. The envelope of passive motion allowed by the capsular ligaments of the hip. In. Vol 48: Journal of Biomechanics; 2015.
20. Westby MD, Brittain A, Backman CL. Expert consensus on best practices for post-acute rehabilitation after total hip and knee arthroplasty: a Canada and United States Delphi study. *Arthritis Care Res (Hoboken).* 2014;66(3):411-423.
21. Wylde V, Lenguerrand E, Brunton L, et al. Does measuring the range of motion of the hip and knee add to the assessment of disability in people undergoing joint replacement? *Orthop Traumatol Surg Res.* 2014;100(2):183-186.
22. Łyp M, Kaczor R, Cabak A, et al. A Water Rehabilitation Program in Patients with Hip Osteoarthritis Before and After Total Hip Replacement. *Med Sci Monit.* 2016;22:2635-2642.
23. Bohannon et al. Decrease in timed balance test scores with aging. Phys Ther. 1984; 64:1067-1070.
24. George, C. M.D. Expert opinion and consultation.

ValleyOrtho
VALLEY VIEW