

Rehabilitation following Total Knee Arthroplasty

William Coggin, PT, CSCS

Objectives

- Patient History Considerations
- Rehab Goals
- Phases of Rehab
- Functional/Discharge Testing

Patient History Considerations

- Prior Level of function
 - Use of AD
 - Functional vs Recreational Limitations
- Associated Orthopedic History
- Pathologies delaying healing
 - Osteoporosis
 - Cardiovascular Issues
 - BMI
 - Diabetes

Rehab Goals

- Wound Care
- Swelling
- Range of Motion
- Flexibility
- Strength
 - **Correlated with function**
- Balance
- Gait
- **EDUCATION**

Research

- 37% of patients have limited functional ability at 1 yr
 - Factors: Age, BMI, emotional health, quadriceps strength
 - Franklin & Ayers, 2008
- Hip abductor strength associated with function
 - Assessed 2-6 mo following surgery
 - Piva et al, 2011
- Improved preoperative strength associated with functional outcomes at 1 yr
 - Mizner et al, 2005

Rehab Progression

- Acute Phase (0-2 wks)
 - Wound Care
 - Swelling
 - DVT Prevention
 - Passive Range of Motion
 - Open Kinetic Chain Exercises
 - Quad Sets
 - SLR
 - SAQ
- Criteria to Progress:
 NPRS <5/10 at rest
 PROM 0-90
 Quad Control

Rehab Progression

- Intermediate Phase (2-6 wks)
 - Range of Motion-Active
 - Strength
 - SLRs
 - Clamshells
 - Bridges
 - LAQ
 - Balance
 - Static
 - Bilateral Support
 - Gait
 - Forward
 - Lateral, Backwards
 - Functional Movements
 - Squats
 - Steps (forward, lateral)

Criteria to Progress:
NPRS <3/10 at rest
AROM 0-110
Normal gait

Rehab Progression

- Final Phase of Rehab (6-12 wk)
 - Cardiorespiratory Endurance
 - Strength
 - Wall Sits
 - Squats-Unstable Surface
 - Single Leg
 - » Machines
 - Balance
 - Unstable Surface with tasks
 - Single Leg
 - Dynamic Stability
 - Lunges
 - Steamboats
 - Eccentric Closed Kinetic Chain

Recommend: Movement Analysis during this phase for higher functioning individuals

Discharge/Functional Tests

- Return to Functional Tasks
 - TUG
 - Stair Test
 - Five time sit to stand
 - Chair test
 - Dynamic Gait Index
- Recreational Exercise
 - Sub-Max Leg Press
 - SL Stance
 - Dynamic Gait Index

Tests

- TUG
 - Time taken to rise from chair, walk 3 m, turn, walk back to chair, then sit down (able to use walking aid if needed)
 - <10 seconds
- Stair Test
 - Time taken to ascend and descend 8 in step (handrail or aid if needed)
 - 9-12 steps recommended
- Chair test
 - Maximums sit->stand repetitions possible in 30 sec
- Five time sit to stand
 - <13 seconds
- SL stance
 - Relative to uninjured
 - 10 seconds, Firm Surface, Eyes Open or Closed

Dynamic Gait Index

- <19 increased risk of falls (out of 24)
- Recommend 22 or greater
- Tasks
 - Gait level surface
 - Change in gait speed
 - Gait with horizontal head turns
 - Gait with vertical head turns
 - Gait with Pivot turn
 - Step over obstacle
 - Step around obstacle
 - Steps

Case Report

- 69 yo, Male
- Avid Tennis Player (level 4.0)
- Lt TKA 1 yr ago
- Diagnosis: Lt Hamstring Strain

Case Report

- Objective Finding:
 - Supine AROM 0-125 degrees
 - Symmetrical Gait
 - Good Quad & Hip abductor MMT
 - Unable to assess Hamstring
 - SL Balance Symmetrical
 - Flexibility:
 - Anterior Chain Deficit

Video



Remember

- Exercise Advancement based on patient's prior level of function and goals
 - Must meet demands of activity
- Find appropriate tests & measures for patient demands
 - Assess muscle strength and functional ability
- Education in key

References

- Bade, M., Sevens-Lapsley, J. Early high-intensity rehabilitation following total knee arthroplasty improves outcome. *J Orthop Sports Phys Ther.* 2011;41(12):932-41.
- Franklin, P., Ayers, L. The Chitranjan Ranawat Award: functional outcome after total knee replacement varies with patient attributes. *Clin Orthop Relat Res.* 2008;466(11):2597-604
- Mizner, R., Petterson, S., Sevens, J., Axe, M., Snyder-Mackler, L. Preoperative quadriceps strength predicts functional ability one year after total knee arthroplasty. *J Rheumatol.* 2005;32(8):1533-9.
- Piva, S., Teixeira, P., Almeida, G., Gil, A., DiGoia III, A., Levison, T., Fitzgerald, G. Contribution of hip abductor strength to physical functional in patients with total knee arthroplasty. *Phys Ther.* 2011;91(2):225-233.