

Functionality of the Osteoarthritic Knee Exercise Protocol

Protocol is based on the three components of function:

1. Mobility or motion of the knee
2. Recruitment known as strengthening of muscles: Open Kinetic Chain (OKC)
3. Tri-planar stabilization for controlling the loading forces of the knee: Closed Kinetic Chain (CKC)

Exercise protocol has three phases and will include home program instructions.

Phase I – Pre-functional – Acute Phase

1. Mobility/motion of joint

- Hamstrings re-lengthening seated or supine
- Heel cord stretching – standing if able or seated assisted stretch
- Flexion R.O.M. for quadriceps stretch
- Patellar mobilization with glides & tilt
- Anterior to posterior joint mobilization

* All stretching exercises are performed for 30 seconds times 5 reps

2. Recruitment/strengthening

- Hamstrings isometrics revue leading toward hamstrings over quadriceps con-contraction
Co-contraction exercises are used to decompress the knee
- Sub-max isometrics quad set
- Standing Straight Leg Raises (SLR) for abduction

3. Closed Kinetic Chain Exercises: (CKC)

- Standing Terminal Extension (STE)
- Double leg mini squat with proper alignment of heel to toe loading assisted as needed with hand/arm

support

Phase II – Functional Phase

1. Mobility

- Advanced hamstrings re-lengthening progress to standing if able
- Slant board stretch for heel cord mobility
- Patella mobilization if needed
- Re-check core mobility (Hip)

2. Strengthening

- PRE hamstrings
- CORE hip strengthening – abductors
- Short arc quadriceps 90 to 45 degrees
- Low angle terminal extension with 15 degrees of flexion or less

2. CKC – Functional Loading

- Short arc leg press – PRE
- Mini-squat progression to single leg balance vector training – single plane
- Mini-squat with adductor strengthening

Phase III – Return to Function Phase

1. Mobility

- Stretching activities as needed
- Bicycle for R.O.M. as tolerated
- Aquatic activities/ swimming

2. Strengthening

- OKC strengthening as needed for CORE/Hip (adduction & abduction)
- Quad set plus if able for advanced VMO training

3. Tri-plane CKC progression

- Balance vector training in three planes of stabilization
- Lateral step-ups – low angles at first

- Leg press with increase angle as tolerated

References:

1. Deyle GD, Allison SC, Matekel RL, et al. Physical Therapy Treatment Effectiveness for Osteoarthritis of the Knee: A randomized comparison of supervised clinical exercise and manual therapy procedures versus a home exercise program. *Phys Ther.* 2005; 85: 1301-1317.
2. Lewis C, McAndrew JM. Treatment for Osteoarthritis Of the Knee. *Advance for PT and PT Assistants;* April 15, 2002: 6-7
3. Brandy WD, Irion JM, Briggler M. The Effect of static Stretch and dynamic Range of Motion training on the flexibility of the hamstring muscles. *J. Orthop Sports Phys Ther.* 1998; 27: 295-300
4. Mohomed NH. Manual Physical Therapy and exercise improved function in Osteoarthritic Knee. *J. Bone Joint Surg AM.* 2000; 82: 1324
5. Eckhoff DG, Johnston RJ, Stamm ER, et al. Version of The Osteoarthritic Knee. *J Arthroplasty* 1994; 9: 73-80
6. Eckhoff DG, Brown AW, Kilcoyne RF, Stamm ER. Knee Version Associated with Anterior Knee pain. *Clin Orthop* 1997; 339: 152-155