

## **Knee Capsular Disorder**

"Knee Capsulitis"

ICD-9-CM: 719.56 Stiffness in joint of lower leg, not elsewhere classified

### *Diagnostic Criteria*

History: Stiffness  
Aching with prolonged weight bearing

Physical Exam: ROM loss - more loss of flexion than extension  
Pain at end ranges

## **Knee Capsulitis**

ICD-9: 719.56 stiffness in joint of lower leg, not elsewhere classified

Description: This disorder is particularly disabling because of it results in difficulty with rising from a chair, climbing stairs, kneeling, and walking. The primary complaints are pain, stiffness, instability, and loss of function and sometimes with impaired muscle function.

Etiology: It is considered a sequela of traumatic and age-dependent changes which result in a loss of cartilage and impairment of function. Capsulitis has been essentially classified as primary (idiopathic) or secondary, that is a process related to infection, trauma, inflammation, metabolism, or aging. The portion of the capsule that becomes extended on joint sliding or rolling may thicken and act to restrict motion in that direction. This capsular thickening subsequent to synovitis accompanies the destruction of the articular cartilage, and thus the joint mechanism becomes gradually impaired.

### *Physical Examination Findings (Key Impairments)*

#### Acute Stage / Severe Condition

- Restricted knee motion
- Pain worse with end-range stretch positions
- Tibiofemoral accessory movements and joint play movements are considerably limited. Patellofemoral accessory and joint play movements may also be limited
- Quadriceps femoris muscles may be weak and painful due to the tension transmitted to an inflamed joint capsule by the contracting musculotendinous units that attach to the capsule
- Palpable tenderness around the joint capsule

#### Sub Acute Stage / Moderate Condition

As above with the following differences

- Resisted tests of the quadriceps femoris are strong and relatively painless when the tibio-femoral joint positioned in slight flexion (thus lessening tension on the capsule)

Now (when less acute) examine the patient for common coexisting lower quadrant impairments. For example:

- Lumbar, hip and ankle movement abnormalities
- Muscle flexibility deficits – especially of the hamstrings, tensor fascia lata, iliotibial band and sartorius
- Nerve mobility deficits – especially tibial and common peroneal nerves in the knee area

- Weak quadriceps femoris commonly vastus medialis
- Restricted knee extension

### Settled Stage / Mild Condition

As above with the following differences

- Pain with repetitive activities of the knee especially at end range
- Passive movements are painful only with overpressures at end range

## Intervention Approaches / Strategies

### Acute Stage / Severe Condition

Goals: Prevent movement induced inflammatory reactions.

Avoid muscle guarding

Pain free with daily activities that use knee with low range and amplitude of movements

Pain free sleep

- Physical Agents
  - Phonophoresis/iontophoresis or pulsed ultrasound to assist in reducing inflammation
  - Ice and/or TENS for relief of acute pain as well as to reduce muscle guarding
  - Elevation/compression of knee to assist in reducing inflammation
- External Devices (Taping/Splinting/Orthotics)
  - Fit patient with knee support if pain relief requires temporary use of an external device
  - Use of assistive device for unloading tissue
- Therapeutic Exercises
  - Pain free active mobility exercises
  - Pain free walking
  - Pain free walking and swimming in a pool
- Re-injury Prevention Instruction
  - Temporarily limit end range of flexion or stretches or activities that aggravate the patient's condition.

### Sub Acute Stage / Moderate Condition

Goals: Improve tibiofemoral and patellofemoral mobility

Prevent re-injury to the joint capsule

Restore strength of the muscles around knee

- Physical agents
  - May use ultrasound to the joint capsule prior to active or passive stretching procedures/exercises.
- Manual Therapy
  - Soft tissue mobilization to adaptive shortened myofascia around the knee
  - Joint mobilization to restricted accessory and joint play motions of the tibiofemoral and patellofemoral articulations

- Therapeutic Exercises
  - Provide stretching exercises to enhance carryover of manual stretching procedures
  - Provide strengthening exercises to weak knee and hip muscles
- Neuromuscular Reeducation
  - Provide proprioception exercises to facilitate correct knee position
- Therapeutic Exercise
  - Initiate lumbar stabilization exercises (i.e., trunk flexor and extensor strengthening to maintain the lumbar spine in its neutral positions during performance of daily activities
  - Initiate stretching exercises to myofascia with flexibility deficits (e.g., hamstrings)
  - Initiate nerve mobility exercises the nerve with mobility limitations (e.g., sciatic nerve)
  - Promote daily performance of low-stress aerobic activity (e.g., walking)

#### Settled Stage / Mild Condition

Goals: Normalize tibiofemoral and patellofemoral mobility  
 Normalize lower quadrant muscle flexibility and muscle strength  
 Progress activity tolerance

- Approaches / Strategies listed above
- Manual Therapy
  - Increase intensity and duration of soft tissue mobilization and myofascial stretching to the maximal tolerable
  - Increase intensity and duration of joint mobilization procedures to the maximal tolerable
- Therapeutic Exercises
  - Progresses intensity and duration of the stretching exercises as tolerated.
  - Maximize muscle performance of the relevant lower quadrant (hip, knee, ankle and lumbar) muscles required to perform the desired occupational or recreational activities
- Ergonomic Instruction
  - Provide job/sport specific training

## Intervention for High Performance / High Demand Functioning in Workers or Athletes

Goal: Return to desired occupational or leisure time activities.

- Approaches / Strategies listed above

### Selected References

Deyle GD, Henderson NE, Matekel RL, Ryder MG, Garber MB, Allison SC. Effectiveness of manual physical therapy and exercise in osteoarthritis of the knee. *Ann Int Med.* 2000;132:173-181.

Puett DW, Griffin MR. Published trials of non medicinal and noninvasive therapies for hip and knee osteoarthritis. *Ann Int Med.* 1994;121:133-140.

Rogind H, Bibow-Nielsen B, Jensen B, Moller H, Frimodt-Moller H, Bliddal H. The effects of a physical training program on patients with osteoarthritis of the knees. *Arch Phys Med Rehabil.* 1998;79:1421-1427.

Impairment: Limited and Painful Knee Flexion



Knee Flexion MWM

Cues: Position the patient supine with the involved knee flexed and a strap around the patient's ankle (approximately 80 degrees of knee flexion is required for this procedure)  
Place one palm on the anterior aspect of the distal femur and the other on the anterior aspect of the proximal tibia  
Posteriorly glide the tibia  
Sustain the posterior glide while the patient actively flexes his/her knee and assists the active flexion with a pull on the strap  
This procedure uses long levers so instruct the patient to apply the force cautiously

The following reference provides additional information regarding this procedure:  
Brian Mulligan MNZSP, DipMT: Manual Therapy, p. 101-103, 1995

Impairment: Limited Knee Extension  
Limited Tibial Anterior Glide



Tibial Anterior Glide

Cues: Position patient with his/her involved thigh supported on the treatment table with the patella just distal to the end of the table – a strap securing the proximal femur and/or pelvis to the table adds to the stabilization  
A belt holding the involved knee in flexion instead of hanging off the edge of the table is a nice courtesy  
Use a “Chuck Berry” stance - hug the limb like a guitar and generate the force with a trunk weight shift and a slight knee bend  
Stand on the lateral side of the involved limb to do an anterior glide of the medial condyle – stand on the medial side of the involved limb to do an anterior glide of the lateral condyle

The following reference provides additional information regarding this procedure:  
Freddy Kaltenborn PT: Manual Mobilization of the Extremity Joints, p. 169, 1989