



BRIGHAM AND WOMEN'S HOSPITAL

A Teaching Affiliate of Harvard Medical School
75 Francis St., Boston, Massachusetts 02115

Department of Rehabilitation Services Physical Therapy

Standard of Care: Non-Surgical Management of the ACL Deficient Knee

Case Type / Diagnosis:

Anterior Cruciate Ligament Tear: 844.2

APTA Practice Pattern: 4D.

Anterior Cruciate Ligament Tears Non-surgical treatment

Indications for Treatment:

Impaired ROM

Knee Instability

Lower Extremity Weakness

Impaired Function

Contraindications / Precautions for Treatment:

- Activities that result in continued locking of the knee should be avoided.
- Open Chain exercises that may cause excessive anterior translation of the tibia on the femur should be avoided.
- Continued / worsening of pain with progressed physical therapy treatment.

Examination:

Medical History: Review medical history questionnaire and medical history reported in the Hospital's Computerized Medical Record. Review any diagnostic imaging, tests, work up and operative report listed under LMR

History of Present Illness: Interview patient at the time of examination to review patient's history and any relevant information that would pertain. If the patient is unable to give a full history, then interview the patient's legal guardian or custodian. Determine any past injuries that have taken place. An ACL deficient knee is almost always the result of trauma; however, this trauma may or may not be the result of an external force. A clear description of how the injury occurred is essential. What was patient doing at time of injury? Was it a contact or non-contact injury? Patient will usually report hearing or feeling a "pop" at time of injury and swelling will occur within the first 2 hours of the

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injury. Incident will usually be followed by problems with ambulation, locking, buckling, pain, weakness and continued swelling.

Social History: Review patient's home, work, recreational and social situation. Typically patients opting for the non-surgical option are often older, and potentially less active (athletic) people. Patients with active lifestyles, whether young or older are usually better served by having a reconstruction done. Long-term instability in the knee commonly leads to further damage to the joint including meniscal tears, articular degeneration and increasing instability.

Medications: Patient may be on NSAIDS, and/or may be have been prescribed some pain medication by their physician.

Examination (Physical / Cognitive / applicable tests and measures / other)

PAIN: As measured on the VAS, activities that increase symptoms, decrease symptoms, location of symptoms.

VISUAL INSPECTION: Attention to the presence of swelling, joint deformity, and overall patient functional use of the knee.

LOWER EXTREMITY POSTURE: Q-Angle, Hip Anteversion or Retroversion , Knee Varus, Valgus or Recurvatum, Patella Baja, Alta or Squinting, Tibial Torsion, Foot Pronation or Supination.

EDEMA/ATROPHY: Typical circumference measurements of the knee joint are taken at the mid patella (joint line), 15 cm above the superior border of the patella, and either at the tibial tubercle or 5 cm below the inferior border of the patella.

PALPATION: Palpate entire knee complex. Focus on presence and extent of musculature atrophy and swelling.

ROM: Active and Passive Knee Flexion and Extension; Hip and Ankle ROM also taken.

MUSCLE PERFORMANCE: Early post-injury motor control will be assessed through standard manual muscle testing. Measure entire lower extremity with special attention paid to Hip Abduction, Knee Extension and Knee Flexion. Also make note of Vastus Medialis Oblique muscle activity.

LIGAMENT TESTING: Valgus Stress, Varus Stress, Posterior Draw (Sag Sign), Anterior Draw, Lachman, and Pivot Shift

MENISCAL TESTING: Apley's Compression, McMurray's

PATELLA MOBILITY: Medial, Lateral, Superior, and Inferior

MUSCLE LENGTH: Hamstrings, Quadriceps, Iliopsoas, Iliotibial Band, Gastro, Soleus

GAIT: Patient maybe need the assistance of either crutches or cane in order to eliminate an antalgic gait pattern. The lack of terminal knee extension may also be impacting one's gait.

BALANCE: Gross assessment to determine patient's safety to ensure Independence with transfers, gait, and stairs. Further in depth assessment to be conducted if impairments noted in screening. Typically someone with an ACL deficient knee will have compromised balance. Assessment of balance will need to be completed, when appropriate based on level of impairment. Typical balance measures include single leg stance, step-up, step-down tolerance, and response to center of gravity displacement.

Functional Assessment:

Use of a knee specific functional capacity questionnaire is recommended to establish early post-injury status and to track progress.

Possible tools:

- Lysholm Knee Score
- Lower Extremity Functional Score
- LIFEware Knee Assessment form (Modified Lysholm Knee Score)

Differential Diagnosis: MCL, LCL, PCL Tear, Meniscal Tear, Patellar Dislocation and Fracture.

Evaluation / Assessment:

Establish Diagnosis and Need for Skilled Services

Problem List (Identify Impairment(s) and/ or dysfunction(s))

- Edema/Atrophy
- Decreased Patellar Mobility
- Decreased Knee ROM
- Decreased Muscle Performance of Quads, Hamstrings and Hip Abductors
- Knee Instability
- Antalgic gait

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- Decreased Balance reactions

Sub-Acute Intervention Plan: Reduce Edema, restore Patellar Mobility, Reestablish Quad muscle firing, increase ROM, and Gait Training.

Prognosis: Patient's prognosis typically greatly depends upon the level of instability of the knee joint following the injury. All patients will be at greater risk for further knee damage such as: other ligament injuries, meniscal injuries, articular degeneration and patello-femoral dysfunction.

Goals:

1. Independent with home exercises, including understanding of open chain vs. closed chain quad strengthening at discharge.
2. Increase strength throughout LE musculature to 5/5 in 8-12 weeks.
3. Full A/PROM Knee in 3-4 weeks
4. Ambulation without device or deviation in 3-4 weeks.
5. Full ADL's in 6 weeks.
6. Return to Sports activity with brace in 12 weeks.

Age Specific Considerations:

Longer recoveries may be expected in older individuals; due to slower healing characteristics in this population. However, the older the individual the less likely a surgical intervention will be necessary to restore the patient's functional status because the older patient's functional status/activity typically does not require full ACL efficiency.

Treatment Planning / Interventions

Established Pathway	<input type="checkbox"/> Yes, see attached.	<input checked="" type="checkbox"/> No
Established Protocol	<input type="checkbox"/> Yes, see attached.	<input checked="" type="checkbox"/> No

Interventions most commonly used for this case type/diagnosis.

Edema Control: Cryotherapy.

Strengthening: Entire lower extremity should be strengthened. Special attention should be paid to Quads, Hamstrings for the ability to help stabilize knee in lieu of an intact ACL and Hip abductors to maintain proper alignment of lower extremity.

Closed Chain exercises are used for Quadriceps strengthening.

Open Chain exercises that may cause excessive anterior translation of the tibia on the femur should be avoided.

Joint ROM/ Muscle Stretching

Proprioception Training

Endurance Training

Electrical Stimulation- To strengthen the VMO and to prevent development of patello-femoral dysfunction.

ROM- Active and Passive of knee

Stretching- Quads, Hamstring and ITB

Balance Training- incorporating entire Lower extremity.

Gait Training- Progressing from possible assistive device to walking, ascending and descending stairs and finally Jogging/ Running.

Bracing- Derotational knee brace. Used during athletic activities.

Frequency & Duration

Outpatient Care: 2-3x/week for 2-3 months as indicated by patient's status and progression.

Patient / family education

1. Instruction in HEP (home exercise program) of ROM, Strength and flexibility training
2. Instruction in pain control and ways to minimize inflammation
3. Instruction in activity level modification / joint protection
4. Donning and Doffing of Brace (if applicable for the patient)

Recommendations and referrals to other providers

Orthotist- Bracing

Re-evaluation / assessment

Standard Time Frame- Once every 30 days

Other Possible Triggers- A significant change in signs and symptoms. Such as any new incident of locking or buckling or a sudden increase in edema.

Discharge Planning

Commonly expected outcomes at discharge- Return to full functional activities with brace. Keeping in mind that the majority of patients with very active lifestyles are considered surgical candidates.

Transfer of Care - Possibly a physical therapist closer to where the patient lives if traveling to BWH is too inconvenient for consistent rehabilitation care.

Patient's discharge instructions- Continue Strengthening and Stretching through HEP. Wear brace for active pursuits like hiking and exercise.

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