**Exercises**
- Full ROM
- Gradual return to sports participation
- Maintenance program for strength, endurance – continue regular strengthening
- Cardiovascular conditioning
- Running and cycling

**Return to sports criteria**
- Medical clearance
- Full range of motion
- No swelling
- Good stability on ligament testing
- Full strength compared with the other leg
- Completed sport-specific functional progression
- Running and jumping without pain or limp

**EXERCISE FIGURES**

**Passive extension** – Sit in a chair and place your heel on the edge of a stool or chair; relax thigh muscles and let the knee sag under its own weight until maximum extension is achieved.

**Heel props** – Place rolled-up towel under the heel and allow leg to relax

**Prone hang** – Lie face down on a table/bed with the legs hanging off the edge of the table; allow the legs to sag into full extension.

**Passive flexion** – Sit on chair/edge of bed and let knee bend under gravity; may use the other leg to support and control flexion.

**Wall slides** – Lie on your back with the involved foot on the wall and allow the foot to slide down the wall by bending the knee; use other leg to apply pressure downward.

**Heel slides** – Use your good leg to pull the involved heel toward the buttocks, flexing the knee. Field for 5 seconds; straighten the leg by sliding the heel downward and hold for 5 seconds.

**Anterior Cruciate Ligament (ACL) Injury Rehabilitation Exercises**
- Heel slide
- Quad sets
- Straight leg raise
- Wall squat with a ball
- Balance and reach exercise A
- Balance and reach exercise B
- Knee stabilization A
- Knee stabilization B
- Knee stabilization C
- Knee stabilization D
- Resisted terminal knee extension

**Proprioception** (Balance and postural maintenance activities)
- Eyes open – Eyes closed
- Stable surfaces → Unstable surfaces
- Bilateral stance → Unilateral stance

**Knee Range of Motion (ROM)**

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**ACL Reconstruction**

**Post-Operative Rehabilitation Protocol**

**International Health Services**
This handout serves as a general outline for you as a patient to better understand guidelines and time frames associated with ACL reconstruction rehabilitation. Please keep in mind that these may not be met by all patients at the specific timeline.

**PHASE I** (Week 0 – 2)

**Goals**
- Control pain and swelling
- Start early range of motion (ROM) with emphasis on full extension, patella (knee cap) mobilization and flexion *caution: avoid hyperextension greater than 10 degrees
- Restore normal gait on level surfaces
- Maintain muscle strength

**Brace**
- Wear brace locked in extension for ambulation and sleeping
- May unlock for ROM exercises

**Weight bearing status**
- Weight bearing as tolerated with crutches and with brace locked in extension
- No weight bearing for 6 weeks if repair of meniscus was done or in case of microfracture.

**Exercises**
- Continuous Passive Motion (CPM) machine
  - 2 hour session x 3 times a day
  - At slow, comfortable speed
  - Start at 50 degrees flexion, and increase up to 90 degrees x 10 times a day
- ROM exercises
  - Partial ROM up to 90 degrees
  - Extension – no active terminal extension from 40 to 0 degrees

**PHASE II** (Week 3 – 6)

**Goals**
- Control pain and swelling
- Restore normal gait with stair climbing
- Maintain full extension, progress toward full flexion range of motion
- Increase hip, quadriceps, hamstring and calf strengthens
- Improve proprioception
- Gain full weight bearing (with crutches)

**Brace**
- May wear out of brace when good quad control is demonstrated

**Weight bearing status**
- Weight bearing as tolerated, wear off crutches

**Exercises**
- Continue as above, maintaining full extension. Progress to 120 degrees
- Stationary bicycling, stair master. Start slow. Progress to low resistance
- Hamstring curls
- Hip abduction, adduction and extension
- Neuromuscular exercises (proprioceptive)
- Strengthening exercises: SLR, squats (0–60°), leg press (0–60°)
- Isometric exercises: knee extension (safe range: 90–40°)

**PHASE III** (Week 6 – 12)

**Goals**
- Gain full active range of motion
- Increase strength
- Become sufficient for normal gait and activities of daily living

**Exercises**
- Hamstring stretching
- Full ROM or bike with low seat
- Strengthening exercises: unilateral leg press, step ups, advance muscle strength
- Stationary bicycling, stair master or elliptical to increases resistance
- Treadmill walking
- Swimming, water conditioning (kicker kick only)
- Balance and proprioceptive training
- Closed chain quad strengthening. No knee flexion greater than 90 degrees with leg press

**PHASE IV** (Month 3 – 6)

**Goals**
- Improve strength, endurance and proprioception
- Begin agility training

**Brace**
- Functional ACL brace

**Exercises**
- Pull ROM
- Continue and progress strengthening
- Cardiovascular conditioning - may start jogging program, forward/straight running only
- Progress to running program at 5 months
- Begin agility training at 3 months
  - Side steps
  - Crossovers
  - Shuttle running
  - One leg and two leg jumping
  - Cutting
  - Acceleration/deceleration/sprints
  - Agility ladder drills

- Neuromuscular exercises (proprioceptive)
  - Initiate sport-specific drills as appropriate. Progress as tolerated on gradually unstable surfaces

**PHASE V** (Post-op 6 months)

**Goals**
- Maintain strength, endurance and proprioception
- Return to sport safely

**Brace**
- Functional ACL brace for contact sports, jumping and landing or cutting and twisting until 1 year after surgery, then per patient preference