SPORTS MEDICINE & JOINT PRESERVATION
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**PHYSICAL THERAPY PROTOCOL:**

# *ACL Reconstruction*

Name _____ Date of Surgery_____

PT 2-3 times per week x 12 weeks Signed _____

## Phase I: Weeks 0-4:

### Range of Motion:

**Goals:**
0º-90º at 10 days
Full ROM (0-125) by 2-4 weeks
Control effusion
Monitor Knee Extension ROM throughout this stage.
Begin **immediate intervention** program if **any lack of knee extension past week 1**.
(See attached solutions page)

**Exercises:** A/AA/PROM, stationary bicycle/Nu-Step, quad sets, heel slides, prone hangs, heel sags, patellar mobilizations and scar tissue mobilizations,

***patient needs to avoid prolonged standing or sitting (as in class or the office) with involved knee flexed or prolonged standing with weight shifted to uninvolved LE***

### Effusion:

Ice, elevation, electrical stimulation, ankle pumps
***Joint effusion can impact firing of the quadriceps.***

### Strength:

**Goal:** Quad activation SLR without quad lag
**Exercises:** Quad sets, SLR x 4, calf raises, assisted squats, leg press (double leg progress to single leg), leg curls, 4 way hip T-band, single leg balance, weight shifting, mini lunges, step ups, step downs, lateral T-band walk, core exercises, Long arc quad with no resistance rocker or tilt board with both legs with upper extremity support

***Electrical stimulation for quad activation as needed***
Parameters:
- 2 large electrodes placed over distal VMO and Proximal VL
- Medium frequency NMES at 2500 Hz (Russian)
- 75 burst frequency
- 10sec on, 50 sec off
- 2 sec ramp times for 10-15 minutes,
- Intensity to full tetanic contraction

### Brace:

*Without meniscus repair* –

- Until first post-op visit (first 7-10 days): locked in full extension for weight bearing (weight-bearing as tolerated), may remove for shower, may unlock for ROM exercises. Keep locked in extension for sleeping.
- Week 1-4 (until 2nd post-op visit): may unlock for weightbearing and ROM exercises. Wear brace while sleeping.
- May be d/c'ed after 2nd post-op visit if full ROM, adequate quad strength, and normal gait

*With meniscus repair* -

- First two weeks post-op: stays LOCKED IN EXTENSION during weight bearing (weight-bearing as tolerated) and while sleeping. May unlock to 90 flexion (no more!) for ROM exercises. May remove for hygiene
- Week 2-6 post op: may unlock to 90 for weight bearing (full weight-bearing) and may unlock fully for ROM exercises only. When sleeping, brace should be unlocked to 90. May come off for hygiene and ROM exercises only). When weight-bearing, cannot go more than 90 degrees for first 6 weeks
- May be d/c'ed after 6 weeks if full ROM, adequate quad strength, and normal gait

**Driving:** Surgery to **Right** knee: Begin driving when adequate quad control and when brace is D/C'd or unlocked. Study indicates delayed reaction time with drivers for 6 weeks (Nguyen, Knee Surg, Sports Trauma, Arthrosc 2000). Young drivers are cautioned against driving for 6 weeks.

Surgery to **Left** knee: Begin driving when patient is on little to no pain medication and car is an automatic

**Gait:** Please follow above parameters in Bracing section for first 4-6 weeks post-op

**Goals:**

FWB, no assistive device, and to normalize gait which includes full knee extension at initial contact and terminal stance, with 10-15 $^0$ knee flexion after initial contact.
Watch for tendency of patient to keep knee locked in mild flexion (peg legged) during gait.

WBAT with crutches up to 10 days, brace unlocked when SLR with no or minimal quad lag
D/C crutches when no or minimal quad lag with SLR and pain free single leg balance is achieved.
May need to continue with one or two crutches to aid in normalizing gait, until patient is able to do on own.

**Reminders:**

- *Avoid rotation*
- *watch for patellar tendonitis symptoms*
- *Notify Physician if ROM loss is severe*

**Red Flags:**

***Cellulitis, drainage 2° possible infection, calf pain could indicate DVT (Call doctor ASAP)***

**Pink Flags:**

***Lacks more than 5° of knee extension by week 3, lack of quadriceps firing, knee flexion <90° at 2 weeks post op, unsure of HMP, not weight bearing on leg when using crutches (email doctor if concerns and how it will be handled)***

## Phase II: Weeks 4-8:

### Range of Motion:

**Goals:** Full ROM by 4-6 weeks
**Exercises:** Flexion, extension and patellar mobilizations, general LE flexibility

### Strength:

**Goals:** Single leg squat and/or 6 inch medial step down with good pelvic/hip/quads control

**Exercises to add**: Stairmaster @ week 4, elliptical @ week 6, knee extension with low resistance (90-30°), progressive single leg balance activities including changes in surface, single leg squats, LE reaches, anterior and lateral lunges, single leg tilt or rocker board, roller board with both legs

### *Reminders:*

- *Make exercises functional while protecting the ACL graft*
- *Avoid patellofemoral pain or patellar/hamstring tendonitis symptoms*
- *Avoid rotation*
- *HFHS Staff can refer to ACL manual or intranet for exercise ideas*

## Phase III: Weeks 8-12

### Range of Motion:

**Goals:** Full pain-free ROM, no effusion

### Strength:

**Goals:** Transverse plane activities slowly, controlled single leg balance in all planes, Single leg squat ROM ≥80% of uninvolved side,.

**Exercises to add:** *Begin transverse plane activities slowly*. Rotational lunges, lunges with upper body rotations, rotational step downs, rotational step ups, transverse plane balance exercises, perturbation training, and roller board single leg.

### Reminders:

- *Good pelvic, hip, quadriceps control with all exercises*
- *Advance exercises when appropriate to patient's required level of function*
- *Avoid patellofemoral pain or patellar/hamstring tendonitis symptoms*
- *HFHS Staff can refer to ACL manual and intranet for exercise ideas*

At 12 weeks:

Progress to independent strengthening program with monthly rechecks if good ROM and muscle control.

## Phase IV: 3-6 Months

### Strength:

**Goals:** Good pelvic, hip, quad control with progressive multi-planar sport specific activities, begin plyometric exercises (supervised) if criteria are met (start with low intensity and progress to medium and high intensity), begin agility and early sport-specific activities. Return to sports at 6+ months when **cleared by physician**.

**Exercises to add:** Agility exercises (speed and agility exercise ideas can be found in HFHS ACL manual and intranet), plyometric exercises- 2 feet first than progress to 1 foot (jumping/hopping progression ideas can be found in HFHS ACL manual and intranet), sport-specific training

### Return to jog, pre-jump and agility criteria:

- ▪full knee extension
- ▪no joint effusion
- ▪normal gait
- ▪2 legged squat with symmetry
- ▪good single limb control all planes
- ▪adequate strength to perform run without a limp and without pain
- ▪good control with early functional tests (i.e. 6-8 inch medial steps downs and/or single leg squat at 80% of uninvolved leg)

### Pre-Jump & early agility activities:

Calf jumps at edge of table, jumping on leg press, skipping, shuffle, carioca, jumping rope, back pedal, ice skaters to single leg balance

**Running Programs**: Beginning a running program and return to sport running program can be found in the HFHS ACL manual and intranet site.

### Return to plyometric program criteria:

- ▪Full knee extension
- ▪Good single limb control in all planes (watch for knee valgus and femoral internal rotation and hip adduction)
- ▪No pain or effusion
- ▪Normal gait
- ▪Good control with early functional tests

### Plyometric Guidelines:

- ▪Maximum 3 days per week
- ▪Limit foot contacts to 100 in early sessions
- ▪Form is crucial
- ▪Begin with double leg take offs and landings
- ▪Progress to single leg take offs with double leg landings
- ▪Progress to single leg take offs with single leg landings
- ▪Begin with jumps in place, progress to all other planes

### Reminders:

- ▪*Good pelvic, hip, quadriceps control with all exercises*
- ▪*Advance exercises when appropriate to patient's required level of function*
- ▪*Good take off and landing techniques*
- ▪*Avoid patellofemoral pain or patellar/hamstring tendonitis symptoms*
- ▪*HFHS Staff can refer to ACL manual for exercise ideas*

## Discharge Criteria

- ▪*Pass appropriate functional tests within 85% (Functional Assessment Tests ideas can be found in HFHS ACL manual)*
- ▪*Independent with written progressive HMP*