

ACL Protocol

Goals:

1. Protect graft.
2. Restore normal patellar mobility
3. Restore normal range of motion
4. Restore normal muscular tone
5. Restore normal muscular strength
6. Restore normal balance
7. Return to full activity

Pre-op:

1. Patient is familiarized with surgical procedure
2. Patient is familiarized with rehabilitation
3. Patient is taught and performs:
 - a. Leg carry
 - b. Crutch walking
 - c. Quad sets
 - d. Straight leg raises
 - e. Heel slides
 - f. Ankle pumps

Post-op:

General Instructions:

1.
 - A. The range of motion brace should be progressed as instructed by MD
 - B. Keep brace locked while walking and at night. Unlock to perform range of motion
2. Weight bearing as tolerated should begin at (___ wks/immediately) and progress to full weight-bearing at ____wks

Phase I – Early Protection Phase

1. Use of CPM if elected to rent. 6-8 hours/day
2. Use of polar care. As needed basis.
3. Weight bearing as instructed by MD.
4. Brace range of motion as instructed by MD.
5. Home exercises: Quad sets, SLR, ROM (heel slides, prone hangs), ankle pumps

Phase II – Intermediate Protection Phase (Week 1-4)

Range of Motion:

1. Patellar mobilization all glides
2. Range of motion, passive from 0 to tolerance
3. Range of motion, heel slide 0 to tolerance
4. Bicycle for range of motion, no resistance

Quadriceps Tone and Strengthening

1. Electric stimulation to quadriceps. Leg must be at least at 10 degrees or <, otherwise stimulated at 45 degrees. 12 seconds on/8 seconds off for 10-15 minutes. 10 lb. Counterweight over proximal tibia.
2. Biofeedback assisted quadriceps sets. 5 second hold. 2 sets of 10 on table. 2 sets of 10 standing if partial weight bearing.
3. Mini-squat 0-45 degrees. 3 sets of 20. Hips flexed with shoulders kept over the knees. Add hand weights as tolerated.

4. Basketball slide begun when FWB- start in the position similar to the minisquat. Slowly shuffle 10-15 ft to the right, then change direction and slowly shuffle back to the left. Perform this activity 3x for 1 min.
5. Stairmaster. Level 3-4. Slow controlled steps beginning at week 2 for patellar tendon grafts, week 4 for hamstring grafts. Begin with 5 minutes and progress as tolerated
6. **NO OPEN CHAINED QUADRICEPS EXERCISES.**

Hip, Hamstring, and calf strengthening

1. Hip Group

** (Hold extension and adduction with medial meniscus repairs until 4 wks. Post-op)

** (Hold extension and abduction with lateral meniscus repairs until 4 wks. Post-op)

- A. Four way leg raises (hip flexion, extension, abduction, and adduction) Add weight proximal to knee as patient tolerates.
- B. Multi-hip machine as tolerated. Keep knee flexed to 90 degrees with flexion movement. D/C cuff weights when performing multi-hip.

2. Hamstrings

- A. Theraband exercises. 2 sets of 10 seated and 2 sets of 10 standing.
- B. Isotonics with cuff weights, standing using table for support. Increase weight as tolerated

3. Calf Group

- A. Seated heel raises with weight on thigh
- B. Theraband dorsiflexion and plantarflexion
- C. Standing heel raises using table for support and balance as soon as partial weight-bearing

Phase III – Late Protection Phase (Week 4-8)

Range of Motion:

1. Patellar mobilization – all glides
2. Range of motion. Passive ROM 0 to full ROM
3. Bicycle, slowly lowering RPM's to 80-90 up to 20 minutes

Quad Tone and Strengthening

1. E-stim to quadriceps
 - a. Isometric quad setting in full EXTENSION with 10 pound counterweight. 12 seconds on/8 seconds off. 10 minutes.
2. Continue with biofeedback assisted quad sets until normal quad tone, VMO sequencing achieved
3. Continue with minisquat 0-45 degrees adding hand weights as tolerated. Progress to a unilateral minisquat using a table for support.
4. Leg Press 60-0 degrees in bilateral stance. Start with approximately half of patient's body weight and progress as tolerated.
5. Step-ups starting with 2" step and progressing to 6" step.

Hip, Hamstring, Calf Strengthening

1. Hip Groups
 - a. Continue with multihip A/O 4-way leg raises. Progress weight as tolerated.
2. Hamstrings – 3 ways
 - a. D/C isotonics with cuff weights. Continue with theraband exercises progressing resistance as tolerated
 - b. Isotonics on N/K table (in seated position). 2 sets of 10 reps.

- c. Hamstring bench exercise. Perform concentric exercise 2 sets of 10 and eccentric exercise 2 sets of 10 adding 10 pounds for eccentric exercise).
3. Calf Groups
- a. D/C seated heel raises and theraband exercises
 - b. Continue with standing heel raises. Add hand weights as tolerated

Balance and Proprioceptive Exercises

- A. BAPS and or KAT performing bilateral exercises
- B. PNF for hamstrings in open and closed chains.

Phase IV – Functional Rehabilitation Phase (Week 8-16)

Range of Motion:

- 1. D/C patellar mobilization when ROM is full, all glides normal and lateral tilt is positive.
- 2. Continue with range of motion until full ROM is achieved

Aerobic/Endurance Exercises

- 1. Continue bike lowering resistance to 60 RPM's
- 2. Continue with stairmaster increasing time to 20-30 minutes
- 3. Nordic Trac starting at 8-10 minutes. Minimal resistance. Progress time to 15 minutes and increase resistance as tolerated.
- 4. Treadmill – walk at 8 weeks post-op, jog at 12 weeks or when instructed by MD

Quad Strengthening Exercises

- 1. D/C E-Stim. Biofeedback when quad tone and VMO sequencing equal to uninvolved side.
- 2. Continue with minisquats and leg press, bilateral and unilateral, progressing weight as tolerated
- 3. Continue with step-ups adding hand weights to contralateral side to increase resistance.

Continue with Hip, Hamstring, Calf, Proprioceptive exercise, Increasing weight and / or intensity as tolerated

Phase V – Return to Activity (Week 16-36)

- 1. Continue with all exercises.
- 2. Isokinetic strength test and KT 2000 test as prescribed by MD
- 3. Implement running program as per MD
 - a. Adequate KT 2000 test
 - b. Isokinetic strength: 70% I/U Ratio
 - Q/BW Ratio < 20% WNL
 - H/Q Ratio WNL
- 4. Implement agility program as per MD
 - a. Adequate KT 2000 test
 - b. Isokinetic strength: 80 I/U Ratio
 - Q/BW Ratio < 1% WNL
 - H/Q Ratio WNL
- 5. Return to activity as per MD
 - a. Adequate KT 2000 test
 - b. Isokinetic strength: 85% I/U Ratio
 - Q/BW Ratio WNL
 - H/Q Ratio WNL