

ACL Rehabilitation Protocol

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PHASE I

Time frame: estimated surgery through weeks 2-4.

Objectives:

- Protect graft fixation through early phase of healing.
- Comfort.
- Neuromuscular activation.
- Range of motion with full extension and flexion to minimum 90°-100°. Hamstring graft do not work passive flexion beyond 100° in first 4 weeks.
- Educate patient about rehabilitation progression.

Restrictions:

- Foot-Flat, Touchdown Weight-Bearing (reciprocal gait, only touch weight) advance to WBAT only when quadriceps control adequate.

*If MENISCAL REPAIR performed:

- Hinged brace locked 0°-30° for weight bearing first 6 weeks.
- No flexion beyond 90° first six weeks.

Modalities:

- Ice.
- If quad activation is progressing slowly: NMES-in clinic. Consider home unit.

Therapeutic Exercises

- Heel slides, standing leg curls, ankle PRE including standing heel raises.
- Quad sets, hamstring sets.
- Patellar mobilization.
- PROM to tolerance (within above limits)/(wallslides, bike for motion, rowing machine).
- Gastoc/soleus, hip flexor stretches. Avoid hamstring stretch x 4 weeks for hamstring graft.
- BAPS (seated or on total gym) PWB.
- SLR, all planes, until quad strength is sufficient to prevent extension lag (hip PREs).
- Quadriceps isometrics at 60° and 90°.
- Open chain knee extension 0°-90° OK with no resistance (begin at 4 weeks for hamstrings graft).
- Total gym leg press.
- Aerobic exercise-airdyne or stationary bike with surgical leg supported/braced until flexion sufficient for crank cycle.
- Aquatic therapy when wounds are well-healed (minimum 2 weeks). OK to swim freestyle/crawl with flutter kicks or buoy between legs. No fins. No breaststroke kick. No butterfly kick (dolphin kick).

Functional Milestones During Phase I:

- Normal walking pattern without crutches on level surfaces.

PHASE II

Time frame: estimated weeks 2-4 through weeks 6-8.

Criteria for Advancement to Phase II:

- Good quad set, SLR without extension lag.
- At least 90-100° of flexion.
- Full extension.
- 3 weeks post-op for hamstring auto graft.

Objectives:

- Restore normal gait.
- Maintain full extension, progress flexion range of motion.
- Protect graft fixation.
- Control swelling.

Weight Bearing:

- Discontinue use of crutches when the patient has full extension, can SLR without extension leg and has normal gait.

Modalities:

- NMES if necessary.
- Ice.

Therapeutic Exercises:

- Mini squats.
- Stationary bike with minimum to moderate resistance. Begin with high seat/low tension to promote ROM. Progress resistance and/or RPM to increase quadriceps challenge.
- Closed chain terminal extension (0°-90°) with resistive tubing or weight machine.
- FWB balance exercises (e.g. single leg balance, BAPS).
- Resisted hamstring exercise for patella tendon grafts. (May begin with hamstring grafts of allografts at 6-8 weeks).
- Aquatic therapy when wounds are well-healed (minimum 2 weeks). OK to swim freestyle/crawl with flutter kick. No fins. No breaststroke. No butterfly kick (dolphin kick).
- Continue hamstring stretches, progress to weight-bearing gastroc/soleus stretches.
- Stairmaster.
- Sport cord home program instruction.

Functional Milestones During Phase II:

- Normal walking pattern without crutches.
- Spin on a bike. Consider progression to outside (on level roads) when patient has adequate ROM and no balance or safety issues. Flat pedals only. No trail biking.

PHASE III

Time frame: estimated weeks 10-12

Criteria for Advancement to Phase III:

- Normal gait level surfaces. Reciprocal stairs.
- Active ROM: 0°-120° flexion.

Objectives

- Full ROM.
- Improve strength, endurance and proprioception on the lower extremity to prepare for functional activities.
- Avoid overstressing graft during ligamentization.
- Protect the patellofemoral joint.

Therapeutic Exercises:

- Continue flexibility exercises as appropriate for patient.
- Stationary cycle-intervals.
- Advance closed kinetic chain strengthening (one-leg squats, leg press 0°-45°, step-ups and step-downs begin at 2 inches and progress to 8 inches, etc.).
- Progress proprioception activities (slide board, fitter, use of ball, racquet with balance activities, etc.).
- Progress aquatic program to include pool running in vest. Swimming: all strokes and kicks are OK after 8 weeks.
- Walk/jog progression. Straight ahead, beginning after 8 weeks post-op if no evidence of patellofemoral irritation, at therapist's discretion.

Functional Milestones During Phase III:

- Running after 8-12 weeks.
- Golf (for TRAIL leg) chipping and putting after 8 weeks. Swinging at 50% power at 10-12 weeks. Add 4 weeks if involving LEAD leg.
- Road biking, with hills.

PHASE IV

Time frame: estimated weeks 10-12 through 4-6 months.

Criteria for Advancement to Phase IV:

- Full, pain free ROM.
- Normal gait on stairs (ascending and descending).
- No evidence of patellofemoral joint irritation.
- Sufficient strength (75% RM leg press/hamstring curl) and control to initiate functional activities.

Objectives:

- Strengthen, strengthen, strengthen!
- Neuromuscular control in functional situations.
- Patient education of gradual return to activities.

Therapeutic Exercises:

- Continue progression of flexibility and strengthening program.
- Initiate plyometric program as appropriate for patient's functional goals.
- Functional progression including, but not limited to: forward running, backward running, at 1/2 speed, 3/4 speed and full speed. Also cutting, cross-over, carioca, agility drills, etc.
- Initiate sport-specific drills as appropriate for patient.
- Advance proprioceptive balance exercises.

Functional Milestones During Phase IV:

- Swimming.
- Golfing. Progress to full swing (more cautiously if operative leg is pivot/lead leg).
- Hiking without pack (hydration pack is OK).

- Racquet and field sport drills when approved by physician and therapist at end of phase, if strength appropriate.
- Road biking and non-technical mountain biking.

PHASE V

Time frame: estimated beyond 4-6 months.

Criteria for Advancement in Phase V:

- No patellofemoral or soft tissue complaints.
- Adequate performance on strength and performance test.
- Physician clearance to resume partial or full activity.

Objectives:

- Safe return to athletics.
- Transition from anticipatory drills (athlete knows what is coming) to reactive competitive situations.
- Maintenance of strength, endurance and proprioception.
- Patient education in regard to any possible limitations.

Therapeutic Exercises:

- Gradual return to sports participation.
- Maintenance program for strength, endurance and proprioception.

Functional Milestones During Phase V:

- Sport activities/return to play.
- Skiing or other strenuous recreational activities.

Bracing:

- Functional brace is occasionally recommended by the physician for use during sports for the first one to two years after surgery.
- Not standard protocol to brace for return to sport.



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