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ACL Reconstruction

(patellar tendon, hamstring, or allografts)

Precautions - For Revision ACL Reconstructions

Per specific physician recommendation, follow protocol until 12 weeks, then extend weeks 12 to 16 through to 5- to 6-month timeline, when patients can then begin running and progress to functional sports activities.

Phase I (1 – 10 days post-op)

- Wound care: Observe for signs of infection. OK to remove dressing on post-operative day 5 and begin showering. Keep covered until day 5. Cover incision with gauze and ace wrap.
- Modalities: prn for pain and inflammation (ice, IFC)
- Brace: Immobilizer or brace if prescribed (hinged brace locked in full extension) To be worn at all times including when sleeping.
- ROM: Goal: Minimum 0 – 90 degrees, not more than 120 degrees
 - Passive positional stretches for extension and flexion
 - Ankle AROM

Phase II (10 days – 4 weeks post-op)

- Wound care: Observe for signs of infection and begin scar management techniques when incision is closed. OK to remove dressing on post-operative day 5 and begin showering. Keep covered until day 5. Cover incision with gauze and ace wrap.
- Brace: Hinged brace set 0 – 120 and unlocked for ambulation. On at all times except in PT clinic. Discontinue brace use at night.
- ROM: Goal: Minimum 0 – 90 degrees, not more than 120 degrees until 3 weeks, then gradually to full AROM.
 - Passive positional stretches and AROM for extension and flexion
 - Half revolutions on stationary bike and progress to full revolutions
 - Increase / maintain patellar mobility with emphasis on superior glide
- Strengthening:
 - No resisted open chain strengthening
 - Quad sets (open and closed chain multi angle)
 - SLR (eliminate extensor lag)
 - Emphasize closed chain activities for strengthening (step ups, light leg press etc.)
 - Proprioceptive activities added as soon as quad control allows.
 - Balance board bilateral in multiple planes
 - Single-leg balance eyes open/closed, variable surfaces
- Modalities:
 - NMES to quads if unable to perform quad sets and extensor lag with SLR

- IFC and ice for pain and edema prn
- sEMG neuromuscular re-education for quad sets
- Conditioning
 - Upper Body Cycle
 - Stationary bike with gradual progressive resistance

Phase III (4 – 8 weeks post-op)

- Wound care: Continue scar mobs
- Brace: Gradually discontinue brace from week 4 to 6
- ROM:
 - Emphasize full extension
 - Full flexion by end of 8 weeks
 - Patellar mobility
 - Rectus femoris/ hip flexor stretches
- Strengthening:
 - Continue Phase II, adding resistance as tolerated
 - Stationary bike: increase resistance and some light intervals
 - Squats/leg press: bilateral to unilateral (0–60 degrees) with progressive resistance
 - Lunges (0–60 degrees)
 - Stairs: concentric and eccentric (not to exceed 60 degrees of knee flexion)
 - Calf raises: bilateral to unilateral
 - Rotational stability exercises: static lunge with lateral pulley repetitions
 - Sport cord resisted walking all four directions
 - Treadmill walking all four directions
 - Balance board: multiple planes, bilateral stance
 - Ball toss to mini-tramp or wall in single-leg stance
 - Core strengthening: supine and prone bridging, standing with pulleys
 - Gait activities: cone obstacle courses at walking speeds in multiple planes
- Modalities:
 - Continue E-stim for re-ed or edema
 - sEMG to continue (for balance of VL to VMO or overall contraction)
 - Continue ice and IFC prn
- Conditioning:
 - Stepper (retro and / or forward)
 - Stationary bike
 - UBC
 - Pool if available
- Gait: Normalize gait pattern on level surfaces and progress to step-over-step pattern on stairs

Phase IV (8 - 12 weeks post-op)

- Wound care: Continue scar mobs
- ROM: Full ROM
- Strengthening:

- Increase weights and reps of previous exercises
- Squats/leg press: bilateral to unilateral (0–60 degrees) progressive resistance
- Lunges (0–60 degrees)
- Calf raises: bilateral to unilateral
- Advance hamstring strengthening
- Core strengthening
- Combine strength and balance (e.g., ball toss to trampoline on balance board, mini-squat on balance board, Sport Cord cone weaves, contrakicks)
- Advanced balance exercises (e.g., single-leg stance while reaching to cones on floor with hands or opposite foot, single-leg stance while pulling band laterally)
- Lap swimming generally fine with exception of breaststroke; caution with deep squat push-off and no use of fins yet
- Stationary bike intervals
- Modalities: continue prn

Phase V (12 – 16 weeks)

- Important – Focus on correct technique
 - Landing during exercises at low knee flexion angles (too close to extension)
 - Landing during exercises with genu varum/valgum (watch for dynamic valgus of knee and correct)
 - Landing and jumping with uninjured limb dominating effort
- Exercises
 - Elliptical trainer: forward and backward
 - Perturbation training*: balance board, roller board, roller board with platform
 - Shuttle jumping: bilateral to alternating to unilateral, emphasis on landing form
 - Mini-tramp bouncing: bilateral to alternating to unilateral, emphasis on landing form
 - Jogging in place with sport cord: pulling from variable directions
 - Movement speed increases for all exercises
 - Slide board exercises
 - Aqua jogging

Phase VI (16 – 24 weeks)

- Exercises
 - Progressive running program
 - Always begin with warmup on the stationary bike or elliptical for >10 minutes prior to initiation of running.
 - Patient should have no knee pain following run.
 - Week 1: Run: walk 30 seconds: 90 seconds every other day (qod) (10–15 minutes)
 - Week 2: Run: walk 60:60 qod (10–20 minutes)
 - Week 3: Run: walk 90:30 qod (15–20 minutes)
 - Week 4: Run: walk 90:30 3-4x/week (20–25 minutes)
 - Week 5: Run continuously 15–20 minutes 3–5x/week
 - Hop testing and training

- Single-leg hop for distance: 80% minimum compared to nonsurgical side for running, 90% minimum for return to sport
- Single-leg triple hop for distance: 80% for running, 90% for return to sport
- Triple crossover hop for distance: 80% for running, 90% for return to sport
- Timed 10-m single-leg hop: 80% for running, 90% for return to sport
- Timed vertical hop test: 60 seconds with good form and steady rhythm considered passing
- Vertical, horizontal jumping from double to single leg
- Progressive plyometrics (e.g., box jumps, bounding, standing jumps, jumps in place, depth jumps, squat jumps, scissor jumps, jumping over barriers, skipping)
- Speed and agility drills (e.g., T-test, line drills) (make these similar in movement to specific sport of athlete).
- Cutting drills begin week 20
- Progress to sport-specific drills week 20
- Return to Sport at 6 months

Adapted From

1) Brotzman SB, Manske RC. Clinical Orthopedic Rehabilitation. 3rd Ed. Elsevier; 2011.