OrthoIllinois SPORTS MEDICINE

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REHABILITATION PROTOCOL

ACL Reconstruction

(Patellar Tendon, Hamstring, or Allografts)

Precautions –

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.

Meniscus Repair

If a meniscus repair was performed the patient is to remain flat foot weight bearing (25%) with crutches locked in extension for ambulation. The brace can bend to 90 degrees while resting.

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.
- Weight Bearing: Weight bearing as tolerated with the brace locked in extension. If a meniscus repair was performed, then protected WBAT with brace locked in extension until week 4.
- 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 (not more than 90 degrees if meniscus repair)
    - Passive positional stretches for extension and flexion
    - Ankle AROM

Phase II (10 days – 4 weeks post-op)

- Brace: Hinged brace set 0 – 120 and unlocked for ambulation. On at all times except in PT clinic. Discontinue brace use at night. *If meniscusrepair performed 0-90 degrees only x 6 weeks.*
- 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.
        - Add perturbations in single and multiplanes when quad shows proper stabilization
    - Balance board bilateral in multiple planes
        - Add perturbations when pt. shows proper quad control
    - 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
    - Resisted walking with push/pull sled
    - 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: progress open chain strength per patient tolerance.
  - 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 uninvolved limb dominating effort
- Exercises
  - Elliptical trainer: forward and backward
  - High/low dynamic weight sled

- 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.