ACL and MCL Reconstruction/Repair

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)
- Weight Bearing: Toe touch weight bearing.
- Brace: Locked in extension for ambulation and sleeping. To be worn at all times including when sleeping.
- ROM: Goal: 0 – 90 degrees with gentle progression, 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 locked in extension for ambulation. On at all times except in PT clinic. Discontinue brace use at night.
- Weight Bearing: Toe touch weight bearing.
- 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
o Single-leg balance eyes open/closed, variable surfaces

• Modalities:
  o NMES to quads if unable to perform quad sets and extensor lag with SLR
  o IFC and ice for pain and edema prn
  o sEMG neuromuscular re-education for quad sets

• Conditioning
  o Upper Body Cycle
  o Stationary bike with gradual progressive resistance

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