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OrthoIllinois SPORTS MEDICINE

REHABILITATION PROTOCOL

ACL Reconstruction

(Patellar Tendon, Hamstring, or Allografts)

Revision ACL Reconstructions:
- Follow protocol through Phase IV (12 weeks)
- Extend Phase V through week 20-24
- Start Phase VI only after week 20

Meniscus Repair:
- 25% WB with brace locked into extension with use of crutches 4 weeks
- ROM while NWB 0 to 90 degrees

Phase I (1 – 10 days post-op)

- Wound care: Observe for signs of infection. OK to remove dressing on post-operative day 3 and begin showering. Keep covered until day 3. 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 25% FFWB with brace locked in extension until week 4 s/p.
- Modalities:
  - NMES to quads if unable to perform quad sets
  - IFC and ice for pain and edema prn
- Brace: hinged brace locked in full extension to be worn at all times including when sleeping.
- ROM: Goal: Minimum 0 – 90 degrees
  - Passive positional stretches for extension and flexion
  - Ankle AROM

Phase II (10 days – 4 weeks post-op)

- Brace:
  - On at all times except in PT clinic. Discontinue brace use at night at 4 weeks
  - Continue use of crutches if needed to maintain a symmetrical gait pattern. Should wean off crutches by week 2-3

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    - Brace may be unlocked after the patient has achieved full extension and can perform a straight leg raise without an extension lag (usually 2-3 wks).
        - Unlocking Brace: start at 45 degrees and progress based on appropriate Quad control all the way up to 120 degrees by week 4
    - Brace may be discontinued at week 6 (Patient has to have appropriate quad control and NO extension lag during 10 SLRs)
- 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
- 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

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

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- 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.

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  - 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.

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- 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

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