This protocol guides a controlled progression back to full competitive return to activity at 9 months if all other criteria are achieved. If the criteria are met sooner, the patient must restrict his/her activity level until the end of the ninth post operative month and perform neuromuscular training, controlled sport specific agility training, and fitness.

If Meniscal repair, the following modifications are necessary:
- NWB → TTWB first 4 weeks then WBAT after 4 weeks
- Brace ROM restricted 0°-90° first 4 weeks; then progress to open as appropriate
- D/C brace after 6 weeks if criteria met
- No isolated hamstrings until after week 6
- No squats below 60° until after week 6

Post-Op Weeks 0-1:
Goals:
1) Ambulation/Brace Use: NWB → TTWB, brace to be worn with all ambulation. Sleep with brace locked in full extension
2) Pain and Effusion Management
3) Full Knee Extension
4) Initiate Knee flexion ROM
5) Initiate patella mobility activities
6) Restore quadriceps muscle activation

Exercises:
- Gait Training
- Effusion management (elevation, cryotherapy, compression)
- Knee PROM
  a. Knee extension (Passive extension with heel prop, prone dangle, Hamstring/Calf Stretches)
  b. Knee flexion (Wall Slides, Seated Active Assistive Knee Flexion)
- CPM Machine – start at 0 – 30 degrees and increase 5-10 degrees per day as tolerated
- Patella mobilization
- Isometric Quadriceps setting
- NMES/FES to quadriceps
- Ankle Pumps
- Home Exercise Program (2-3 times per day)
**Post-OP Week 2 to 4:**

**Goals:**

1. **Ambulation/Brace Use:**
   - Continue crutch use if needed, WBAT and Brace locked in full extension
   - Continue to sleep with brace locked in full extension until end of week 4
2. Minimize Effusion and pain
3. Maintain Full Knee Extension
4. Promote Knee Flexion
   - 90° by end of week 2
   - 120° by end of week 4
5. Normal patellar mobility
6. Initiate proprioception/balance activities

**Exercises:** *(During supervised physical therapy may WBAT without brace)*

- Continue with week 1 exercises
- Scar Mobilization/Massage
- Initiate Stationary Bike, Stair stepper and Elliptical as able
- Mini-Squats (0-60 degrees)
- Leg Press (0-60 degrees)
- Hip strengthening (SLR x 3, clam shells, supine bridging)
- Step ups
- Balance/Proprioception activities
- Trunk Stabilization
- Review HEP

**Post-Op Weeks 4 to 12:**

**Goals:**

1) Normalize Gait

**Ambulation/Brace Use:**

- **After 4 weeks,** unlock post-op brace for ambulation (90° – progress to open) if following criteria are met:
  - SLR without quadriceps lag (10 repetitions)
  - Active knee flexion range to greater than angle of brace
- **After 6 weeks,** wean and discontinue post-op brace if criteria met
  - ROM ≥ 100°
  - Single Leg Squat 30° with good knee control

5) Full knee ROM
6) Progress lower quarter strength and neuromuscular control exercises
7) Enhance Proprioception/Balance
8) Improve local muscular endurance
9) Improve cardiovascular conditioning
10) **May initiate open chain knee extension through full range at 10 weeks**
Exercises:
- Functional Strengthening
- Resistive Exercises
- Unilateral leg press
- Balance (various surfaces and distraction)
- Bilateral Squats < 90 degrees of knee flexion
- Single leg squats
- Lunges (progress to multi directional)
- Step ups
- Retro Treadmill/Stairmaster

Post-Op Weeks 12 to 16:
Goals:
1) **At 3 months - Clearance by Surgeon must be obtained** to initiate straight ahead running and double-leg jumping when the following criteria are met:
   - Isokinetic Strength Test:
     - Quad Peak Torque Deficit ≤ 25% at 180º/sec
     - Hamstring to Quad Ratio 60-65% of uninvolved limb
   - Lateral Step Down Test: ≤ 3 errors
   - Y-Balance Test: Anterior Reach only, ≤ 4 cm as compared to uninvolved
   - Full knee ROM
   - Minimal effusion

Exercises:
- Continue strength, endurance, proprioception progression
- Incremental running progression
- Bilateral jumping- progress to multi planer where appropriate

Post-Op Weeks 16 to 24:
Goals:
1) Begin gradual and progressive lateral activity and plyometric progression from bilateral to unilateral:
   - Pain-free running and plyometrics
   - Appropriate quality of movement
   - Cardiovascular endurance to subjective pre-morbid level

Exercises:
- Single-leg plyometrics
- Sport specific slides/pivoting drills
- High intensity aerobic/anaerobic training
- Advanced lower extremity strengthening
- Advanced proprioceptive training
Post-OP Months 6 to 9:

Goals:

1) **At 6 months - Clearance by Surgeon must be obtained** to initiate sports specific drills and training as guided by PT over next 3 months when the following criteria are met:
   - Isokinetic Strength test
     - Quad Peak Torque Deficit $\leq 15\%$ at 180º/sec
     - Hamstring to Quad Ratio: 60% of uninvolved limb
   - Lateral Step Down Test: Passing Score $\leq 1$ error
   - Y-Balance Test: $\geq 90\%$ on composite; $\leq 4$ cm difference as compared to uninvolved for reach in any direction
   - Drop Vertical Jump using Landing Error Scoring System (LESS): $< 4$ errors
   - Functional Hop Tests battery: $\geq 85\%$, pain free and good neuromuscular control
     - Single Hop for distance
     - Triple Hop for distance
     - Crossover triple hop for distance
     - Timed 6 meter hop
     - Unilateral Vertical Jump for height

2) Prepare athlete for unrestricted return to sport progression

3) Improve neuromuscular control and dynamic stability

4) Improve muscular strength, power and endurance

5) Promote sport specific fitness

Exercises:

- Lower extremity injury prevention program
- Controlled sport specific agilities (progressing to different planes and changes in direction)
- Controlled sport specific drills with equipment (no contact)
- Continue with strength and neuromuscular control exercises
- Guidance on progressive and incremental return to unrestricted activity and/or play following attainment of above criteria
Post-Op Month 9:
Goals:

1) **At 9 months - Clearance by Surgeon must be obtained** to initiate return to unrestricted activity and/or play **progression** when the following criteria are met:

- Isokinetic Strength test
  - Quad Peak Torque Deficit ≤ 10% at 180º/sec
  - Hamstring to Quad Ratio: 60% of uninvolved limb
- Lateral Step Down Test: Passing Score < 1 error
- Y-Balance Test: ≥ 90% on composite; ≤ 4 cm difference as compared to uninvolved for reach in any direction
- Drop Vertical Jump using Landing Error Scoring System (LESS): < 2 errors
- Functional Hop Tests battery: ≥ 90%, pain free and good neuromuscular control
  - Single Hop for distance
  - Triple Hop for distance
  - Crossover triple hop for distance
  - Timed 6 meter hop
  - Unilateral Vertical Jump for height
- Tuck Jump Test: Score < 6 (if patient age appropriate)

Sports Medicine and Performance Center at the Children’s Hospital of Philadelphia

Specialty Care Center in King of Prussia
550 South Goddard Blvd.
King of Prussia, PA 19046
215-590-6919

Buerger Center for Advance Pediatric Care
3500 Civic Center Boulevard
Philadelphia, PA 19104
215-590-5819

Specialty Care Center in Chalfont
500 W Butler Pike
Chalfont, PA 18914
215-590-6930

Buerger Center for Advance Pediatric Care
3500 Civic Center Boulevard
Philadelphia, PA 19104
215-590-5819

Specialty Care at Virtua
Health and Wellness Center, 2nd Floor
200 Bowman Dr. Suite D-260
Voorhees, NJ 08043
866-486-3225 (x37524)