All Epiphyseal Anterior Cruciate Ligament Reconstruction Protocol  
(Revised 11/8/2012)

This protocol guides a controlled progression back to full competitive return to activity at 9-12 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, utilize the following modifications:**

- **a.** PWB first 4 weeks then WBAT after 4 weeks
- **b.** ROM restricted to 0°-90° for first 4 weeks; then progress as appropriate
- **c.** D/C brace after 6 weeks
- **d.** No isolated hamstrings until after week 6
- **e.** No squats below 60° until after week 6

**Week 1:**

**Goals:**

1) Ambulation/Brace Use: Toe-Touch Weight Bearing
   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, muscle pumping)
- 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
- Home Exercise Program (2-3 times per day)
**Week 2 to 4:**

**Goals:**

1) **Ambulation/Brace Use:** -
   - Continue crutch use WBAT and Brace locked in full extension until end of week 4
   - 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
- 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

**Weeks 4 to 16:**

**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:
     a. SLR without quadriceps lag (10 repetitions)
     b. Active knee flexion range to greater than angle of brace
   - **After 6 weeks,** wean and discontinue post-op brace if criteria met
     a. ROM ≥ 100°
     b. Single Leg Squat 30° with good knee control
2) Full knee ROM
3) Progress lower quarter strength and neuromuscular control exercises
4) Enhance Proprioception/Balance
5) Improve local muscular endurance
6) Improve cardiovascular conditioning
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
- May initiate open chain knee extension through full range at 12 weeks

Weeks 16 to 24:
Goals:
1) Initiate straight ahead running and double-leg hopping when the following criteria are met:
   - Isokinetic Quad Peak Torque Deficit ≤ 25% at 180º/sec.
   - Full knee ROM
   - Minimal effusion
   - Satisfactory KT-1000 arthrometer assessment (when available)

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

Months 6 to 9:
Goals:
1) Begin gradual and progressive return to unrestricted sports when the following criteria are met
   - Pain-free running
   - Satisfactory KT-1000 arthrometer assessment: (when available)
   - Isokinetic Strength test
     - Quadriceps Peak Torque Deficit ≤ 10%
   - Functional Hop Tests battery (>90%) and Pain free
     - Single Hop for distance
     - Triple Hop for distance
     - Crossover triple hop for distance
     - Timed 6m hop
     - Unilateral Vertical Jump for height
   - Appropriate quality of movement
   - Cardiovascular endurance to subjective pre-morbid level
Exercises:
- Single-leg plyometrics
- Sport specific cutting/pivoting drills
- High intensity aerobic/anaerobic sport specific training
- Advanced lower extremity strengthening
- Proprioceptive training
- Implement Lower Extremity Prevention Program
- Guidance on progressive and incremental return to unrestricted activity
  and/or play following attainment of above criteria

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