

Millbrook Orthopedic & Sports Physical Therapy ACL Rehabilitation Guidelines

Pre-operative:

- **Goals:**
 - Full ROM
 - Minimal swelling/effusion
 - Address any hip/lower body strength imbalances (esp. quads and hamstrings)
 - Improve proprioception and balance
 - Patient education – biomechanics, pain management, expectancies of operation/rehabilitation
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Surgery:

- **Following surgery, it is imperative that the overseeing physician(s) communicates information to rehabilitative team regarding which structures were damaged/repared and any special post-surgical restrictions to ensure safe and effective post-surgical rehabilitation with minimal (if any) setbacks**
 - **Special considerations:**
 - HS graft
 - No active HS exercises until 2 weeks post-op, no OKC resisted HS until 4 weeks
 - Patellar tendon graft
 - Monitor and address signs/symptoms of patellar tendonitis if/as they arise
 - Involved meniscal repair
 - Brace locked at 0 deg for first 3 weeks, NWB 2 weeks → PWB after 2 weeks progressing to FWB over next 2 weeks
 - ROM only to 90 deg knee flexion until 4 weeks, then progress as pain-free
 - Delay leg press unilaterally until 6 weeks
 - No isolated HS contraction (posterior horn repair only), no squatting > 60 deg knee flexion, no lunges > 75 deg knee flexion until 8 weeks
 - No squatting with rotation or twisting for 12 weeks
 - Involved MCL repair
 - Brace 4-6 weeks, progress ROM as pain-free
 - No OKC HS for 6-8 weeks
 - Involved LCL
 - Limit extension 0-30 deg for 3-6 weeks, dependent on extent of repair
 - Involved PCL
 - Active flexion avoided 4 weeks
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Post-operative: *Rehabilitative team will provide monthly progress notes to overseeing physician until discharged.*

- **Phase 1: day 1 to 2 weeks**
 - **Goals:**
 - Protect graft and graft fixation
 - Decrease pain and swelling, control inflammation
 - AROM 0-115 deg
 - Regain quad NM control and patellar mobility
 - Patient educated on HEP for phase 1 and wound care
 - **Limitations:**
 - WB as tolerated with 2 crutches
 - Brace locked in ext for walking and sleeping
 - No OKC knee ext PREs
 - **Additional notes:**
 - Recommend accommodative foot orthosis once full WB to limit STJ/midfoot overpronation → tibial rotation → stress to graft (D/C @ 3 months if desired and gait mechanics OK)
- **Phase 2: 2 weeks to 6 weeks**
 - **Goals:**
 - Regain normal gait mechanics (2 crutches→1 crutch → D/C crutches as gait mechanics return)
 - AROM full by 6 weeks
 - Patient educated on HEP for phase 2
 - Progressively regain strength and endurance in hips, quads, HS, and low leg with PREs as appropriate to prepare for functional activities
 - Improve balance and proprioception
 - Hip, ankle, patella mobility WNL and equal bilateral
 - No increased knee pain or swelling during/after exercises
 - **Limitations:**
 - No OKC knee ext PREs
 - Brace worn for ambulation (off for rehabilitation) until acceptable quad NM control and dynamic balance achieved
- **Phase 3: 6 weeks to 12 weeks (maximum protection phase)**
 - **Goals:**
 - Maintain full, normal ROM
 - Improve confidence in knee
 - Progressively regain strength and endurance in hips, quads, HS, and low leg with PREs as appropriate to prepare for functional activities
 - Improve dynamic balance, proprioception, and core stability
 - Progress from bike to non-impact standing aerobic conditioning (elliptical, stairmaster)
 - Aquatic jogging 8-10 weeks <50% WB (when available and if wounds fully healed)
- **Phase 4 : 12 weeks to 20 weeks**
 - **Goals:**
 - 3 MONTH FUNCTIONAL KNEE ASSESSMENT (see below)
 - Quads strength and endurance within 20% of unaffected
 - HS strength and endurance within 10% (may be delayed when limited by posterior horn lateral meniscus and/or MCL/LCL involvement)
 - Dynamic balance within 10% of unaffected leg
 - Girth within 5% of unaffected (mid patella, 3” superior to patella, 1/2 way b/t patella→ASIS)
 - Initiate progressive intensity/volume jogging program as appropriate

- Initiate progressive intensity agilities (linear → multidirectional) as appropriate
 - Develop good dynamic hip/knee/ankle strategy
 - Initiate progressive plyometric program (as appropriate) focusing on training force absorption NM control
 - **Limitations:**
 - OKC knee ext OK 90-30 deg after week 12 (focus on eccentrics)
 - **Phase 5: 20 weeks +**
 - **Goals:**
 - 5 MONTH FUNCTIONAL KNEE ASSESSMENT (see below)
 - No patellofemoral or soft-tissue complaints
 - If present, must be minimal and patient effectively able to self-manage.
 - Normal gait mechanics and appropriate dynamic biomechanics (landing technique, avoidance of dynamic genu valgus, postural proprioceptive control)
 - Dynamic balance within 5% of unaffected leg
 - HS/Quad ratio b/t 65-75%
 - Quads and hamstring strength and endurance within 5% of unaffected leg
 - Progressive, full return to pre-injury speed, agility, power, conditioning & level of activity/sports with goal of full return to sport at 6-9 months (dependent on risk of sport)
 - Resolve any residual lower extremity weaknesses or functional deficits
 - Patient educated regarding any possible remaining limitations
 - **Additional notes:**
 - Brace recommended to be used for 1 year for contact/potential-contact sports
 - **1-year follow-up: contact patient (telephone or in person) to check status**
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Functional Performance Test – ACL

3 months post-op:

- Dynamic Warm-up
- Girth and ROM measurements
- Five 1-leg step-downs (6-10", depending on height of patient)
 - Looking for technique, NM control, and ability
- 1-leg hop for distance (landing on unaffected leg)
 - Checking for power differences b/t legs and dynamic NM control during take-off
 - 1 practice, 3 trials – average of 3 trials
- Biodex Isokinetic Test knee extension/flexion
 - 90-30 degrees
 - 5 reps at 60 d/s (for muscular strength)
 - 20 reps at 300 d/s (for muscular endurance)
 - In addition to strength and endurance, looking at HS/Q ratio
- Biodex 1-leg Dynamic Balance Test
 - 3 x 20"
- 1-leg step downs (same height as used earlier) to fatigue
 - Looking for overall muscular endurance and NM control in fatigued state

5 months post-op:

- Same as 3 month test, except add:
 - 1-leg hop for distance landing on affected leg, triple hop test for distance
 - Looking again at power, but also force absorption and NM control
 - Agility tests:
 - Box test (fwd, side shuffle, retro, side shuffle)
 - "T" test (sprint, 90 deg COG, 180 COG (2), retro sprint)
 - Sport/activity-specific drills

Protocols Referenced:

- *Accelerated ACL Protocol*: Lonnie Paulos, MD
- *Accelerated ACL Rehabilitation*: Alex Pinto, MS, ATC; Hugh West Jr, MD; K. Donald Shelbourne, MD
- *Accelerated Rehabilitation Following ACL-PTG Reconstruction*: Health South Sports Medicine & Rehabilitation Center
- *ACL Patellar Tendon Autograft Reconstruction Protocol*: Duke Sports Medicine
- *ACL Protocol*: Orthopedics & Sports Medicine, P.C.
- *ACL Rehabilitation (Evidence-based Interventions for the Treatment of Knee Disorders)*: Robert Mangine, PT, ATC, Andrew Rokito, MD
- *ACL Reconstruction Rehabilitation Protocol – Progression of Program*: Orthopedic Therapy Associates
- *ACL Reconstruction Rehabilitation Protocol*: Orthopedic Associates of Portland
- *ACL Reconstruction – Utilizing 4 strand hamstring with endobutton*: Thomas Wickiewicz, MD
- *ACL Rehabilitation Protocol*: Chicago Bears Sports Medicine
- *ACL Rehabilitation*: Syracuse University Athletic Training guidelines
- *Guidelines for ACL Reconstruction Rehabilitation*: Sports Medicine Center – Lexington Clinic
- *Knee-Meniscal Repair Rehabilitation Protocol*: Chicago Bears Sports Medicine
- *Post-Arthroscopic Repair of Torn Lateral Meniscus*: Ryan Stevens, ATC, CSCS
- *Post-operative Rehabilitation*: Science direct (online) – [The Knee: Meniscus preservation, rationale, and repair techniques](#)
- *Rehabilitation Protocol After ACL Reconstruction*: D'Amato, MD; Back, MD; Wilk, MD. [Clinical Orthopedic Rehabilitation](#)
- *Rehabilitation Protocol Summary for Accelerated ACL Reconstruction*: Cincinnati Sports Medicine and Orthopedic Center.