

Meniscus Repair Protocol

Revised 2023

*****Please refer to written prescription for any special instructions for each case*****

The following protocol utilizes a blend of both criteria and timeframes as the determinants for advancement. It is recognized that many athletes will feel pain free relatively early in their rehabilitation and want to advance to higher level activities as a result. It is important to respect the biological healing component of recovery and limit advancement if the timeframe for a given stage has not been completed. Overall, this protocol targets gradual return to full activity beginning no sooner than 4-6 months if all other criteria are also met.

WEEK 0 to 4: (Initial PT evaluation to be scheduled within 2 weeks of surgery date)

Goals:

- Pain and effusion management
- Weight bearing: NWB
 - After 4 weeks, TTWB with bilateral axillary crutches
- Brace Use: always locked in full extension (-10° on brace), including ambulation and sleep
- Range of Motion:
 - Achieve and maintain full knee extension ROM
 - Increase knee flexion ROM – no greater than 90° until after week
- Restore optimal patellar mobility
- Restore and progress quadriceps muscle activation and strength
- Initiate and progress proximal strengthening

Interventions:

- **No active isolated hamstring exercises**
- Effusion management (elevation, cryotherapy, compression, ankle pumps)
- Gait training
- ROM/Flexibility:
 - Knee extension: passive extension with heel prop, prone hang, and hamstring/calf stretches
 - Knee flexion: heel slides, wall slides, and seated active assisted knee flexion (no active hamstring with knee flexion stretches)
 - CPM Machine (if provided): start at $0-30^{\circ}$ and increase 10° daily within ROM restrictions
- Strength:
 - Isometric quadriceps setting (consider different knee angles within ROM restrictions)
 - NMES/FES for quadriceps activation:
 - Suggested settings: 20-50 sec OFF, 10 sec ON, 2 sec RAMP, 10-15 mins total, 75 Hz pulse rate, 400 μ sec pulse width, symmetrical waveform
 - Achieve an amplitude (in mA) for strong muscle contraction
 - Hip strengthening: SLR x4 (flexion, adduction, abduction, extension), clamshells
 - Gradually progress opened chain knee extension strengthening as tolerated
 - Ankle strengthening
 - Core strengthening
- Home exercise program

WEEK 4 to 12:

Goals:

- Normalize gait pattern
- Weight-bearing/brace use:
 - **At week 4:** TTWB → WBAT (continue crutch/assistive device use as needed)
 - Brace on and locked in full extension during ambulation
 - Discontinue use of brace at night if able to achieve and maintain full extension
 - **At week 6:** Unlock post-op brace for ambulation (start with 30°, gradually increase) if able to perform SLR without quadriceps lag (10 repetitions)
 - Wean from and discontinue post-op brace if criteria met:
 - Knee flexion ROM $\geq 100^\circ$
 - Perform three single-leg squats to 30° on involved side with proper frontal plane control
- Restore full, pain-free knee ROM
- Emphasize involved quadriceps strengthening
- Progress involved proximal lower extremity muscle strength and core/trunk stabilization
- Progress neuromuscular control, proprioception/balance, and muscular endurance exercises
- Improve cardiovascular conditioning

Interventions (in addition to those listed in previous weeks):

- **At week 6:** begin isolated hamstring strengthening ($\leq 90^\circ$ flexion until week 8)
- Gait training (at week 4 during supervised physical therapy, may WBAT without brace)
- Weight machine/resistance exercises (bilateral-to-unilateral leg press, wall sit, knee extension; lateral band walking; retro treadmill)
- Functional Strengthening:
 - Bilateral-to-unilateral bridges (after 6 weeks) and squats (closed-chain knee flexion limited to 60° until week 8)
 - Lunges (forward/lateral), lateral step-downs, step-ups, deadlifts, single-leg RDL (closed-chain knee flexion limited to 60° until week 8)
- Balance/Proprioception (progression of surfaces, distractions, and visual input)
- Core stabilization
- Stationary bike, stair stepper, treadmill walking and/or elliptical for mobility and cardiovascular conditioning

CRITERIA TO ADVANCE – 3-month assessment

- **Surgeon clearance** (assessment to be completed at CHOP sports PT location prior to surgeon office visit)
- **At least 90% ROM compared to uninvolved side (at least 0° extension)**
- **Minimal effusion**
- **Isokinetic strength testing** - Quadriceps and hamstring peak torque and total work $\leq 25\%$ deficit at 180°/sec
- **Lateral step-down test (Set step height to achieve ~60° knee flexion):** $\leq 3/6$ errors
- **Y balance test (anterior reach only):** ≤ 4 cm difference as compared to uninvolved

WEEK 12 to 16:

Goals:

- Initiate straight plane running via a gradual running progression
- Initiate straight plane double-leg jumping
- Improve muscular strength, power, and endurance
- Initiate agility and sport-specific training under supervision of PT (not with sports team)

Interventions (in addition to those listed in previous weeks):

- Advanced strength, balance, and proprioception exercises
- Running progression
 - Start with a level surface
 - Focus on a pain-free and symmetrical gait pattern
- Plyometric progression
 - Begin with double-leg jumps, focusing on soft/symmetrical landings
 - Progress double-leg jumps (height/distance, multiple jumps in same direction, varying surfaces, hopping over/onto objects)
 - Advance to single-leg jumps once patient demonstrates adequate and symmetrical neuromuscular control with all double-leg jumping and single-leg squats
- High intensity aerobic/anaerobic training (progress resistance, speed, time)

WEEK 16+:

Goals:

- Improve muscular strength, power, and endurance
 - Normalize hamstring-to-quadriceps ratio, bilaterally (goal is > 60%)
- Improve neuromuscular control and dynamic stability
- Promote sport-specific fitness
- Prepare athlete for return to sport progression

Interventions (in addition to those listed in previous weeks):

- Education on lower extremity injury prevention program
- Emphasize symmetrical movement patterns/weight acceptance and good neuromuscular control during all exercises, including plyometric and agility training
- Controlled sport-specific agility drills, with and without equipment (progressing to different planes and changes in direction, non-contact activities)
- Focus on demonstrating good tolerance for individual non-contact sport-specific activities without knee pain/effusion, perceived instability, or asymmetrical movement patterns
- Final home exercise program and injury prevention education
- Once return to sport criteria are met (see below), the patient will be advised to follow a specific and gradual return to sport progression program, which will be provided by surgeon or physical therapist.
 - If all criteria are not met, surgeon/physical therapist will make recommendations for retesting on an individual basis

CRITERIA TO ADVANCE – 4–6 month assessment

- **Surgeon clearance** (assessment to be completed at CHOP sports PT location prior to surgeon office visit)
- **No pain or swelling in the involved knee**
- **Isokinetic strength testing** - Quadriceps and hamstring peak torque and total work $\leq 10\%$ deficit at $180^\circ/\text{sec}$
- **Lateral step-down test (Set step height to achieve $\sim 60^\circ$ knee flexion):** $\leq 1/6$ errors
- **Y balance test (all directions):**
 - Composite score $\geq 90\%$
 - ≤ 4 cm difference for anterior reach, ≤ 6 cm difference for posteromedial and posterolateral reach as compared to uninvolved limb
- **Functional hop testing battery:** $\geq 90\%$ limb symmetry, 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
- **Drop vertical jump using Landing Error Scoring System (LESS):** < 2 errors
- **Tuck jump:** < 6 errors (if patient age and skill level 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

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

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

Specialty Care at Virtua
200 Bowman Dr. Suite D-260
Voorhees, NJ 08043
215-590-6919

This protocol is designed to be administered by a licensed physical therapist and/or certified athletic trainer. Please do not hesitate to contact our office should you have any questions concerning the rehabilitation process.