

# MENISCUS REPAIR

## Rehab Protocols

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Dr. Drew Ratner

### PHASE I MAXIMUM PROTECTION (WEEKS 0-6)

Brace – Locked in Extension for 6 weeks

Crutches – 25% Weight Bearing x 3 days then 50% WB x 4 days then WBAT

#### Week 0 -2

##### Goals

- Reduce inflammation
- Normalize patella mobility with manual mobilizations
- Full extension both passive and active
- Good quadriceps activation
- No extension lag with straight leg raise
- Full extension
- Progress off crutches

##### Exercise Progression

- Gait training
- Extension – heel props for full extension
- Flexion – off table or wall slides to 90°
- Quadriceps setting using NMES as needed
- Multi-plane straight leg raises
- Bilateral calf raises

##### Recommended Loading

- Short but frequent bouts of ROM & quadriceps activation 3+x/day

#### Week 2-6

##### Goals

- Reduce Inflammation
- Full knee Extension/hyperextension
- Good Quadriceps control with no extension lag
- 90° of knee flexion

##### Exercise Progression

- Continue phase I program
- Extension – continue with hell props or add prone hangs (as needed)
- Flexion – wall or heel slides to 90°
- Ball bridge and/or isometric hamstring activation
- Open and closed chain cord kicks
- Proprioception drills

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### Cardio Exercise

- Short Walks

### Recommended Loading

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### Week 2-6

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### Phase I Clinical Pearls:

1. Control inflammation with frequent icing and elevation. Partial weight-bearing PWB for the first two weeks limits swelling. It is important for the patient avoid extensive periods with their leg in a dependent position, especially during the first week. Limit time at work and school during week 1.
2. Short frequent bouts of ROM and activation exercises is key during phase 1. Avoid over prescribing exercise sessions where a patient is trying to perform three, one-hour sessions/day. Three 20 minutes sessions is more appropriate during phase 1. Focusing on quality will limit inflammation and improve results.
3. Be sure to communicate significant motion restriction to the doctor immediately so appropriate adjustments to the brace or ROM restriction can be made.
4. Retrograde effleurage with leg elevation is beneficial for edema reduction and corresponding increases in ROM and quad control.
5. Patients may have difficulty generating an adequate VMO contraction secondary to limited weight bearing, disuse atrophy and reflex inhibition related to swelling. Use NMES for neuromuscular re-education as needed.
6. Perform PROM exercises 3x/day to maximize ROM return. Instruct patient on the importance of restoring ROM before concentrating on strength.

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7. Begin soft tissue mobilization to the hamstrings and gastrocnemius to reduce muscle tightness, myofascial restriction, and trigger points, which will subsequently improve knee extension. Integrate soft tissue mobilization and myofascial release of the quadriceps, IT band, and adductor groups as appropriate.
8. Restoring normal patellofemoral (PF) arthrokinematics is essential for restoration of normal PF tracking and ultimately a successful outcome. Manual mobilization of the patella with medial/lateral/superior/inferior glides, medial/lateral tilts. These mobilizations can be performed with the knee in full extension (loose-packed position for the patellofemoral joint) and slight knee flexion (approximately 30°).
9. Educate the patient on the importance of core strengthening. Reinforce that the patient is using and integrating “neutral spine” mechanics throughout the phase I program.

## PHASE II PROGRESSIVE STRETCHING & EARLY STRENGTHENING (WKS 6-12)

### Goals

- Full knee extension
- Gradual progression to full flexion
- Normalize patellofemoral joint and scar mobility
- Open brace 0-90° x 1 week then D/C brace as quad control permits
- Normalize gait

### Exercise Progression

- Flexion – increasing to full as tolerated
- Partial range squats
- Step-up progression with gradual increase in step height
- Multi-plane open and closed kinetic chain hip strengthening
- Hamstring activation with bridge on floor, ball or box
- Progress to unilateral heel raise off the floor then off a step
- Proprioception drills

### Cardio Exercise

- Stationary Biking
- Treadmill/outdoor walking with focus on proper gait mechanics

### Recommended Loading

- ROM: 2-3x/day
- Strength: 1x/day
- Cardio: 20-30 mins/day with low to moderate intensity

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## PHASE II CLINICAL PEARLS:

1. Continue with soft tissue mobilization and myofascial release to the quadriceps, hamstrings, gastrocnemius, IT band, and adductors prior to beginning ROM.
2. Perform patellar mobilizations and soft tissue work to the anterior interval in 0 and 30° flexion prior to beginning therapeutic exercises. Patient may begin self-maintenance of soft tissue using a foam roller or massage stick.
3. Scar tissue mobilizations to reduce adhesions.
4. Develop strength and muscular endurance through low intensity cardiovascular exercise on the bike, elliptical, walking (outside or treadmill) or deep water pool program. Aim for 20-30 minutes, 5x/week.
5. Ongoing emphasis on core integration, neutral spine and good alignment with all phase 2 exercises. Use the base core program to normalize global compensatory patterns to prepare for more complex movement patterns and loading encountered during phase 3.

## PHASE III – ADVANCED STRENGTHENING & ENDURANCE (WKS 12-16)

### Goals

- Control inflammation with increasing loads
- Full knee flexion and extension with terminal stretch
- Progressive strengthening
- Increase muscular endurance

### Movement Prep

- Foam Roller
- Controlled movement series

### Exercise Progression

- Weighted squat progression – gradually increase depth and resistance
- Leg press, hamstring curls, RDL's, single leg calf raises
- Single leg squat/step-up/lunge progression (dips, retro, walk and split), focus on eccentric control and alignment. Slow and gradual progression with increasing depth
- Monster walks

### Core Program

- Front plank – full, may advance to alternating leg lift
- Bridge – marching or single leg
- Side plank – full
- Dead bug progression
- Quadruped alternating arm-leg



### Cardio Exercise

- Stationary Biking
- Treadmill/outdoor walking with focus on proper gait mechanics
- Arc trainer or elliptical
- Stadium stair walking

### Sport Specific Activity Progression

- Higher intensity interval work with CV program – week 12-14
- Basic ladder series
- Low amplitude bilateral hops
- Skipping

### Recommended Loading

- ROM: 1-2x/day
- Strength: 3x/week on closed chain loading
- Cardiovascular: 20-45 minutes 5x/week with moderate intensity and intervals.

## PHASE III CLINICAL PEARLS:

1. Manual work in this phase will begin to decline relative to treatment time spent performing therapeutic exercises for specific stretching, advanced strengthening, and higher-level functional task training. Keep in mind it is important to maintain proper PF tracking by using patella mobilization as needed.
2. Emphasize the importance of proper alignment with all bilateral and unilateral impact and non-impact closed chain loading. In the sagittal plane, the hip, knee and foot should maintain a straight alignment without the knee falling into a valgus position. With proper frontal plane alignment, the knees do not cross beyond the end of the toes, the hips drop posterior while the torso inclines forward, this allows the patient/athlete to maintain their center of gravity while dampening vertical load with take off and landing.
3. Proper dynamic warm-up, muscle activation series and self directed soft tissue mobilization using a foam roller are important preparatory exercise prior to weight room and cardiovascular activity. Patients commonly develop PF pain when they reduce their intrinsic hip stability and soft tissue mobility exercises in the later stages of their rehab program.
4. Swelling and pain will indicate when introduction to low amplitude impact loading is appropriate beyond the 12 week mark.
5. Educate patients on proper frequency and intensity for performance of their HEP; LE strengthening should be performed a maximum of 3x/week to allow for adequate muscle recovery between sessions. Higher intensity/interval cardiovascular days should be following by lighter recovery work. Follow the LE workout design outlined in phase 2 with increasing resistance. Error on the side of caution when prescribing both load and recovery!
6. Building muscular endurance is critical during phase 3. Interval training offers a higher intensity non-impact loading that will build muscular strength, endurance and girth without overstressing articular cartilage and remodeling connective tissue. 7. Increase eccentric load with all closed chain work. Retrograde elevated treadmill walking at 10-12% elevation is an excellent way to add quality eccentric work. A typical program will consist of 4 sets, 20 minutes total; 3 minutes forward at 10-15% @ 3.0-4.0 MPH and 2 minutes backward 10-12% @ 2.8-3.5 MPH, 2x/week. Reverse sled pulls and stadium stair walks may be used as an alternate exercise selection



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### PHASE IV – ADVANCED STRENGTHENING & ENDURANCE (WKS 16-20)

#### Goals

- Control inflammation with increasing loads
- Progressive strengthening
- Increase muscular strength, power and endurance

#### Movement Prep

- Foam Roller
- Controlled movement series

#### Exercise Progression

- Increasing loads from phase III

#### Core Program

- Increasing loads from phase III

#### Non-impact cardiovascular exercise

- Stationary Biking
- Arc trainer or elliptical
- Swimming

#### Running Progression

- Advanced ladder series
- Walk/jog interval
- Linear acceleration/deceleration
- Sprinting
- Change of direction and lateral agility

#### Jumping Progression (Gradual Progression)

- Low amplitude bilateral single response jumps
- Bilateral multiple response jumps
- Unilateral single response jumps

#### Sport Specific Activity Progression

- Non-contact and non-reactive field/court progression – 16-20 weeks
- Interval golf program – 20 weeks

#### Sport test and follow-up with physician

- Follow-up examination with the physician
- Sports test for return to competition at 5-6 months

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## Recommended Loading

- ROM: global stretching
- Strength: 3x/week with increasing resistance
- Cardiovascular: 20-45 minutes 5x/week. Alternate impact and non-impact days using sound recovery principles

## PHASE IV CLINICAL PEARLS:

1. Ensure proper warm-up before performance of all plyometric and functional training. Continued soft tissue maintenance with foam roller and massage stick.
2. Ideal take-off and landing mechanics include hip flexion, knee flexion and ankle dorsiflexion; teaching “foot flat” mechanics optimally transfers proper squatting alignment into ballistic impact activity offering the safest transition to impact loading.
3. Skilled supervision by a coach, therapist or trainer is needed to evaluate the athlete during field/court progressions to ensure they are using proper acceleration, deceleration and cutting mechanics. Compensatory patterns can easily develop if left unaddressed leading to inefficiency and possible injury.
4. Proper recovery with ice, rest and pool work is essential to combat swelling with gradually increasing loads. Use sound clinical judgment by resting an athlete an additional 24 hours to allow full recovery from intense bouts when necessary.
5. Create variety in the weight room program design as outlined. In phase 4 cardiovascular and functional days should be more specific to the patients sport. Remember, that each day can't be a high intensity day, otherwise a significant setback is inevitable. Heavy loading days should comprise 3 out of the 5-6 workouts in a given week. More load can be implemented when an athlete is able to break up the weight room and functional work in two separate times during the day. Many working adults don't have that luxury so it is important to structure a program that can be complete in about 90 minutes to ensure quality work.

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