The Gundersen Sports Medicine Meniscus Stable Repair Rehabilitation Program is an evidence-based and soft tissue healing dependent program allowing patients to progress to vocational and sports-related activities as quickly and safely as possible. **WB can be progressed to PWB/WBAT with brace locked starting at week 1 as long as the patient has full extension and adequate quad control and SLR.** Individual variations will occur depending on surgical technique and the patient’s response to treatment. **This program is outlined for mid body and posterior horn repairs of the meniscus** (for anterior horn repairs limit excessive extension initially).

If an **ACL Reconstruction and Meniscus Repair** are performed, limit ROM 0-90 for 2 weeks and then progress to full passively. No weightbearing flexion for 6 weeks. No squatting >90 for 4 months. Otherwise follow ACL protocol. Return to play will be 9-12 months.

Please contact us at 1-800-362-9567 ext. 58600 if you have questions or concerns.

<table>
<thead>
<tr>
<th>Phase I: 0-6 weeks</th>
<th>Immediate post op protection phase</th>
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<tbody>
<tr>
<td><strong>Goals</strong></td>
<td>• Protect anatomic repair</td>
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<td>• Minimize knee joint effusion</td>
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<td>• Gently increase ROM, emphasis on extension</td>
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<td></td>
<td>• Encourage quadriceps function</td>
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<td>• Prevent negative effects of immobilization</td>
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<td><strong>ROM / Brace</strong></td>
<td>• Wk 0-2: 0-90 deg</td>
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<td>• After 2 weeks, progress ROM as tolerated in NWB position with goal of full by 6-10 weeks but ideally ASAP. Knee flexion motion with WB should be discouraged until after 6 weeks.</td>
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<td>• Patient will use the post-op brace until wk 7-8.</td>
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<td><strong>WB</strong></td>
<td>• wk 0-1: NWB with brace locked into extension</td>
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<td>• wk 1-6: WBAT brace locked in extension with assistive device as needed as long as extension is full and able to SLR.</td>
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<td><strong>Precautions / Guidelines</strong></td>
<td>• Encourage AROM in NWB to promote healing, prevent atrophy of soft tissue and bone, and prevent a decrease in collagen content in the healing meniscus which occurs with immobilization. Early AROM does not affect the tensile properties of the meniscus.</td>
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<td>• Emphasis on regaining extension ROM ASAP as this is the most stable position for the meniscus and will decrease stress to the PF joint during ambulation.</td>
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<td>• No isolated resistance to knee flexion for 6 weeks secondary to the semimembranosus attachment to the medial meniscus / popliteus to the lateral meniscus.</td>
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<td>• At week 4 can progress to light CKC exercises – see next page</td>
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<td>• Avoid twisting and pivoting motions for 10-12 weeks to minimize shear forces.</td>
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<td>• Avoid deep squatting (&gt;90 deg) until 4-6 months</td>
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<td><strong>Modalities</strong></td>
<td>• Cryotherapy 15 minutes in duration 3x/day</td>
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<td></td>
<td>• IFC for pain/effusion if needed</td>
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<td>• NMES quadriceps if needed</td>
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Updated 11/2023
### Treatment Recommendations

<table>
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<tr>
<th>Guidelines for progression based on tolerance</th>
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<tr>
<td>• Active warm-up</td>
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<td>• ROM: Gentle stretching to attain full extension and gradual return of flexion. Progress as tolerated. Emphasis on full return of knee extension ASAP. Low-load long duration stretching for extension with heat if needed. (1st TERT = Total End Range Time) Manual stretching for extension with overpressure or recurvatum Patellar mobilizations PROM / AAROM / AROM</td>
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<td>• Scar tissue massage / tissue effleurage to decrease sensitivity</td>
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<td>• Flexibility exercises for hamstring, gastoc-soleus</td>
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<td>• Consider Personalized Blood Flow Restriction to decrease muscle atrophy</td>
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<td>• Therapeutic exercises. Gentle strengthening protecting the healing meniscus. Exercise in a pain-free manner. Encourage quadriceps activation. <strong>No isolated resisted knee flexion.</strong> Posterior chain extensibility exercises if indicated. Add gentle CKC exercises at week 4</td>
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<tr>
<td>Wk:1-3: QS, SLR</td>
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<td>Short arc 0-30 quadriceps</td>
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<td>Gastroc soleus strengthening NWB</td>
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<td>Hip strengthening: 4 way SLR, sidelye resisted ER Bridging</td>
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<td>Hip circles for posterior chain extensibility</td>
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<td>Core stability exercises if desired Hollow holds, hollow holds with rotation, dead bugs Balance exercises with brace locked in extension: Weight shifts/ SLS, lateral step overs</td>
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<tr>
<td>wk 4-6: Progress to light CKC exercises in limited ROM (0-45 deg) Leg press 2:2 with light resistance, sit to stand, partial wall squats, body weight partial squat, step-up/step downs partial lunge Balance exercises Core strengthening: Pallof press, dead bug chop/lift</td>
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<td>• IFC for pain/effusion, NMES for quadriceps activation and control as needed</td>
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<td>Phase II: 6-12 weeks</td>
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<tr>
<td><strong>Goals</strong></td>
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<td><strong>Modalities</strong></td>
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<td>Phase III: 12+ wks</td>
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| **Goals**         | • Progress muscle strength and N-M control, endurance, balance activities. Ideally 3x/wk exercises at a fitness center, step-down, or home program  
• Progress to higher level activity depending on demands and MD/PT approval  
• Initiate a return to running program at 4 months if passes criteria and has no compensations with running pattern.  
• Initiate working on landing mechanics and agility drills at 4-5 months if passes criteria  
• **Return back to vocational, recreational, and sport activities at 6-9 months if passes criteria. Sports progression may take 2-4 weeks for full clearance back to full competition** |
| **Brace**         | Your MD may recommend a knee sleeve or functional brace to be used until 12 months from your surgery for higher level activities |
| **Modalities**    | • Cryotherapy 15 minutes 1x/day or after strenuous activity |
| **Precautions/ Guidelines** | • Correct asymmetrical loading patterns: off-set stance, uni-lateral load, RNT  
• Address fear avoidance behaviors with graded exercise progression, cuing, positive reinforcement, referral if necessary  
• No deep squatting until 4-6 months. |
| **Treatment Recommendations** | • Active warm-up: Bike, Elliptical Runner, Treadmill walking,  
• Continue with stretching and flexibility exercises as needed  
  
  o Strengthening / N-M control / endurance exercises: **Focus on strengthening and N-M control activities.** Advance as tolerated with emphasis on functional strengthening. Avoid dynamic valgus during strengthening and functional activities. Progress with balance / proprioception exercises. Progress agility drills and working on landing mechanics. Progress to sports specific activities.  
  
  Total leg strengthening: hip/quadriceps/hamstring  
  Hip strengthening – neuromuscular control to prevent knee valgus  
  Core strengthening – prevent frontal plane trunk lean during landing  
  Single leg strengthening  
  CKC exercises: lunge progression, squat progression, step-up/downs  
  Hamstring full ROM isotonics. Add in physioball HS curls  
  Quadriceps isotonics in ROM without chondrosis  
  Isokinetic quads/hams 0-full flexion if minimal chondrosis  
  Balance exercises: Single leg, progress to dynamic and reactive  
  
  • Wk 12-14: if adequate strength scores (quads 75%, hamstrings 75%), add in sub-max foot placement drills, anterior lateral hop to stabilization, skaters to prepare for **return to running at 4 months**  
  
  • 4 months: continue with strengthening and dynamic balance. Start running program. progress to the following exercises if clinical appropriate  
  
  Landing drills: Low amplitude sub-max drills:  
  Shallow jump landings, double to single line jumps, hopping progress to higher level if meets criteria (see sidebar)  
  Agility drills: low amplitude sub-max drills:  
  Skipping F/B, jogging F/B, skaters, carioca, agility ladder.  
  
  • 5 months to 6 months: continue with strength and control drills related to sports specific movements. progress with:  
  
  Landing drills/ jump hopping drills  
  Agility drills: progress to higher level with speed and complexity: agility ladder drills, cutting/pivoting (changing directions), changing speeds, anticipated to un-anticipated  
  
  • 6 months+: possible clearance for return to sport, depending on testing – **see next page for testing algorithm** |

**Gundersen Health System**
Meniscus Repair Rehabilitation Program
Testing and Return to Running/Sports Recommendations

Return to running and return to play depends on:
- Timeframe from surgery
- Test performance
- MD and PT approval

Return to Running Benchmarks:
1. Time: at least 4 months post-op
2. MD / PT clearance
3. No knee joint effusion
4. ROM: limb symmetry: extension within 5 deg
   flexion within 10 deg
5. Biodex:
   Limb symmetry of PT:
   Quad: 75%
   Hams: 75%
6. Anterior lateral hop to stabilization drill completed with no apprehension and good movement control
7. Proper running form: treadmill running (sub-max at self selected speed)

Recommendations:
1. Biodex:
   Quad PT/BW:
   Males: 75%, 50% at 180,300deg/sec
   Females: 65%, 35% at 180,300deg/sec
   H/Q ratio: 65%, 90% at 180,300deg/sec
   Total work at 300 deg/sec:
   Quad: limb symmetry 75%
   Hams: limb symmetry:75%
2. SL 60 deg stork test:
   Limb symmetry: 90%
3. Hip Abduction Side Plank test:
   Level II or greater
4. Squat WB symmetry with near equal WB
5. Y balance: Limb symmetry: < 4cm
Testing:

12 weeks (3 months)
SL 60 deg Stork test
Hip strength:
  Abduction MMT or dynamometry
  Hip Abduction Side plank test
Biodex test:
  No block
  2 speeds:  180 deg/sec (5 reps)  300 deg/sec (30 reps)
Y balance test
Deep squat WB symmetry:  2D video or force plate
FOTO

16 weeks (4 months) – RETURN to RUNNING –
See benchmarks
Repeat previous tests not passed
Anterior lateral hop to stabilization
Trial of running.
Landing assessment
Jump test: no arm swing – submax for apprehension/technique
Single Hop test: no arm swing- submax for apprehension/technique

Return to Landing Drills Benchmarks:
1.Time: at least 4 months
2.MD/ PT clearance
3.No knee joint effusion
4.Biodex: Limb symmetry of PT:
   Quadriceps and hamstrings: 80-90% = sub-max landing drills
   Quadriceps and hamstrings: 90% = max landing drills

*Minimize the following 4 variables with landing drills:
  1. Stiff landing (<30 deg knee flexion)
  2. Knee valgus
  3. Hip IR / pelvic drop
  4. Decreased dynamic balance
Meniscus Repair Rehabilitation Program
Testing and Return to Running/Sports Recommendations

24 weeks (6 months)
Repeat previous tests not passed
Biodex test: Full ROM with no ext block
   3 speed test: 60 deg/sec (5 reps),
   180 deg/sec (5 reps),
   300 deg/sec (30 reps)

Landing assessment:
Jump test: no arm swing
Single Hop test: no arm swing
Triplet hop/Cross over hop test: arm swing
Agility test: LEFT test components or time
FOTO

9 months/ 1 year / 2 years
Knee ROM
Biodex test: Full ROM with no ext block
3 speed test: 60 deg/sec (5 reps),
   180 deg/sec (5 reps),
   300 deg/sec (30 reps)

Hip Strength:
   MMT or hand held dynamometry
   Abduction Side Plank test

Landing Assessment
Jump test
Single Hop test
Triplet Hop test/Cross Over Hop: arm swing
Agility test: LEFT test components or time
FOTO

Return to running and return to play depends on:
Timeframe from surgery
Test performance
MD and PT approval
Return to Play Benchmarks:

1. Time: at least 6-9 months
2. MD/ PT clearance
3. No knee joint effusion
4. ROM: limb symmetry: extension within 5 deg, flexion within 10 deg
5. Biodex: Limb symmetry of PT 90% quad and hams
6. Landing Assessment: no faulty movement patterns
7. Single Hop test: Limb symmetry: 90%
8. Triple Hop test or Cross-Over Hop Test Limb symmetry: 90%
9. Agility Testing with no compensation

Recommendations:

1. Biodex:
   a. *Quad PT/BW: (+/-5%)
      i. Males: 95%, 75%, 50% at 60, 180, 300 deg/sec
      ii. Females: 85%, 65%, 35% at 60, 180, 300 deg/sec
   b. H/Q ratio: (+/- 5%)
      i. 65%, 75%, 90% at 60, 180, 300 deg/sec
   c. Hams PT/BW: (+/- 5%)
      i. Males: 60%, 35%, 25% at 60, 180, 300 deg/sec
      ii. Females: 60%, 35%, 25% at 60, 180, 300 deg/sec
   d. Total work: 300 deg/sec
      i. Quads: Limb symmetry:90%
      ii. Hams: Limb symmetry: 90%
2. Hip HHD 90% ABD/ER/extension
3. Y balance: Limb symmetry: < 4cm
4. Jump test:
   a. Males: 90%-100% height
   b. Females: 80%-90% height
5. Single hop test:
   a. Males: 80-90% height
   b. Females: 70-80% height

Return-to-Sports Progression: (2-4 wk, depends on tolerance)

Step 1:
1-on-1 drills (non-contact) sport specific
Step 2:
1-on-1 drills (contact) full speed sport specific
Step 3:
Team scrimmage (non-contact)
Step 4:
Team scrimmage no restrictions
Step 5:
Game activities with restricted playing time
Step 6:
Game activities with no restrictions
Meniscus Repair Program References


Barber FA, Harding NR: Meniscal Repair Rehabilitation. AAOS Instructional Course Lectures, 2000; 49, 207-209.


Sapega AA, Quedenfeld TC. Biophysical factors in range of motion exercises. Physician and Sports Medicine, 1981; 9, 57-65.

