The Gundersen Sports Medicine Meniscus 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. 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 is performed in conjunction with the meniscus repair**, follow the meniscus repair program for 0-3 wks, then switch to the ACL Reconstruction Rehabilitation Program with restrictions including:

- progress to WBAT with brace locked in extension for WB until wk 6,
- no forced WB flexion stretch > 90 deg until 6 wks with goal of full ROM by 6-10 wks,
- no isolated hamstring strengthening for 6 wks,
- no deep squatting >90 deg for 6 months.

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

### Phase I: 0-6 weeks

<table>
<thead>
<tr>
<th>immediate post op maximum protection phase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goals</strong></td>
</tr>
<tr>
<td>- Protect anatomic repair</td>
</tr>
<tr>
<td>- Minimize knee joint effusion</td>
</tr>
<tr>
<td>- Gently increase ROM per guidelines, emphasis on extension</td>
</tr>
<tr>
<td>- Encourage quadriceps function</td>
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<tr>
<td>- Prevent negative effects of immobilization</td>
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<tr>
<td><strong>ROM</strong></td>
</tr>
<tr>
<td>- wk 0-2: 0-90 deg</td>
</tr>
<tr>
<td>- wk 2-6: progress as tolerated. Goal of full ROM by 6-10 weeks</td>
</tr>
<tr>
<td>- Patient will use the post-op brace until wk 7-8.</td>
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<tr>
<td><strong>WB</strong></td>
</tr>
<tr>
<td>- wk 0-2: NWB with brace locked into extension</td>
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<tr>
<td>- wk 2-6: NWB with brace unlocked if good extension ROM and quadriceps control.</td>
</tr>
<tr>
<td><strong>Precautions</strong></td>
</tr>
<tr>
<td>- Encourage AROM 0-90 deg 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 in limited range does not affect the tensile properties of the meniscus.</td>
</tr>
<tr>
<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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<tr>
<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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<tr>
<td>- Must follow the WB restrictions as mentioned above to protect the healing meniscus.</td>
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<tr>
<td>- Avoid twisting and pivoting motions for 10-12 weeks to minimize shear forces.</td>
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<tr>
<td>- Avoid squatting &gt; 90 degrees until 5-6 months</td>
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<tr>
<td><strong>Modalities</strong></td>
</tr>
<tr>
<td>- Cryotherapy 15 minutes in duration 3x/day</td>
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<tr>
<td>- IFC for pain/effusion if needed</td>
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<tr>
<td>- NMES quadriceps if needed</td>
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</tbody>
</table>

Updated 11/2016
Meniscus healing phases: (Based on canine study)
- wk 2: Fibrin clot
- wk 5: Meniscal regeneration
- wk 10: Complete vascular healing
- wk 24 (6 months): Complete scar remodeling

<table>
<thead>
<tr>
<th>Phase I: 0-6 weeks</th>
<th>Maximum protection phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Recommendations</td>
<td></td>
</tr>
<tr>
<td>Guidelines for progression based on tolerance</td>
<td></td>
</tr>
<tr>
<td>Visits may be decreased if ROM 0-90 deg, SLR w/out a lag, no excessive swelling or pain</td>
<td></td>
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<tr>
<td>- Active warm-up through ROM (Bike with limited motion)</td>
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<tr>
<td>- Wk 0-2: Gentle stretching to attain full extension and 90 degrees of flexion. Emphasis on full return of knee extension ASAP.</td>
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<tr>
<td></td>
<td>Low-load long duration stretching for extension with heat if needed</td>
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<tr>
<td></td>
<td>(1st TERT = Total End Range Time)</td>
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<tr>
<td></td>
<td>Manual stretching for extension with overpressure or recurvatum</td>
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<tr>
<td></td>
<td>Patellar mobilizations</td>
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<tr>
<td></td>
<td>PROM / AAROM / AROM</td>
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<tr>
<td></td>
<td>Wk 2+: progress range of motion per tolerance in NWB</td>
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<tr>
<td>- Flexibility exercises for hamstring, gastoc-soleus</td>
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<tr>
<td>- Scar tissue massage</td>
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<tr>
<td>- Therapeutic exercises. Gentle strengthening protecting the healing meniscus. Exercise in a pain-free manner. Encourage quadriceps activation. No isolated resisted knee flexion</td>
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<tr>
<td></td>
<td>wks 1-6 Biofeedback QS, SLR</td>
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<tr>
<td></td>
<td>Short arc 0-30 quadriceps with biofeedback (if no chondrosis)</td>
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<tr>
<td></td>
<td>Hip NWB: 4 way SLR, sidelye resisted ER</td>
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<tr>
<td></td>
<td>Gastroc soleus strengthening NWB</td>
</tr>
<tr>
<td></td>
<td>Core stability and upper body exercises if desired</td>
</tr>
<tr>
<td>- IFC for pain/effusion, NMES for quadriceps activation and control as needed</td>
<td></td>
</tr>
<tr>
<td>- Ice (in stretch for extension if needed) 2nd TERT</td>
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<tr>
<td>- HEP for 3rd TERT</td>
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</tbody>
</table>
**Phase II: 6-12 weeks**  
**Moderate protective phase**

| Goals | • Minimize knee joint effusion  
• Progress ROM as tolerated  
• Progress WB and promote a normal heel-toe walking program  
• Gradual progression of therapeutic exercises for strengthening, stretching, and balance |
| ROM / WB / Brace | • Progress ROM as tolerated with goal of full ROM by 6-10 weeks  
• WBAT with brace unlocked for ambulation if good quadriceps control. Utilize crutches as needed until patient demonstrates a normal heel-to-toe pattern.  
• wks 7-8 D/C brace |
| Modalities | • Cryotherapy 15 minutes in duration 1-2x/day  
• IFC for pain/effusion if needed  
• NMES quadriceps if needed |
| Precautions | • No WB stretching into flexion until 8 wks  
• Avoid descending stairs reciprocally until adequate quadriceps control and lower extremity alignment  
• Avoid twisting and pivoting motions for 10-12 wks to minimize shear forces.  
• Avoid squatting > 90 degrees until 5-6 months |
| Treatment Recommendations | • Active warm-up: Bike with resistance, Nu Step, Treadmill walking  
wk 9-10: Elliptical Runner  
• Stretching for full extension and flexion  
  PROM / AAROM / AROM  
  Patellar mobilizations if needed  
  Manual stretching for extension and flexion  
  Low-load long duration stretching with heat if needed  
  (1st TERT= Total End Range Time)  
  wk 8: WB knee flexion stretch on leg press with light resistance  
• Flexibility exercises for hamstring, gastocsoleus, iliopsoas, quadriceps if indicated  
• Therapeutic exercises: Exercise in a pain-free manner. Gradual progression with avoiding medial collapse during strengthening and functional activities (focus on hip abductor and external rotator strengthening). Incorporate total leg strengthening and balance / proprioception exercises.  
  Biofeedback QS SLR,  
  CKC knee extension  
  Hip 4 way SLR  
  Hamstring OKC isotonics 0-90 deg in seated position with light resistance (15 reps/set initially). Progress to prone at wk 9, progress to physioball wk 12  
  CKC exercises: Progress from 0-60 deg to 0-90 deg: leg press, wall squats, lateral step-overs, step-ups, bridges  
  wk 7: leg press 2:1, partial BW squats and partial lunges with UE support as needed  
  wk 8: Resisted sidestep with T-band, leg press 1:1, partial dead lifts, Bosu partial squats 0-60,  
  wk 9: Progress to full lunges, squats to 90 deg prone hamstring curls, Stair master  
  wk 10: Progress to full lunges |
<table>
<thead>
<tr>
<th>wk 11: Isokinetic quadriceps / hamstrings VSRP 150-300 deg/sec submax to max, progressing to 90 deg/sec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quadriceps OKC isotonics short arc with progression to full ROM (if no chondrosis)</td>
</tr>
<tr>
<td>Gastroc soleus strengthening</td>
</tr>
<tr>
<td>Total leg strengthening</td>
</tr>
<tr>
<td>Balance / Proprioception training: Double leg progress to single leg, static progressing to dynamic activities</td>
</tr>
<tr>
<td>CV conditioning / Core Stability</td>
</tr>
<tr>
<td>• Ice (in stretch if needed) 2(^{nd}) TERT</td>
</tr>
<tr>
<td>• HEP for 3(^{rd}) TERT if needed</td>
</tr>
</tbody>
</table>

**Independent strengthening**

- wk 12: Progress to independent strengthening program with monthly or bimonthly rechecks if good ROM, minimal effusion or pain, and good muscle control

**Phase III: 12+ wks**

**Advanced strengthening and Gradual Return to activity phase**

**Goals**

- Progress muscle strength, endurance, and balance activities. Ideally 3x/week of exercises at a fitness center, step-down, or home program
- Progress to higher level activities depending on functional demands and MD approval

**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**

- No deep squatting until 6 months.

**Treatment Recommendations**

- Active warm-up: Bike, Elliptical Runner, Nu Step, Treadmill walking
- Continue with stretching and flexibility exercises as needed
- Strengthening and endurance exercises: Advance as tolerated with emphasis on functional strengthening. Avoid medial collapse during strengthening and functional activities.
  - Total leg strengthening
  - Single leg strengthening
  - Hip strengthening
  - Heel raises
  - Hamstring full ROM isotonics. Add in physioball HS curls
  - Quadriceps isotonics in ROM without chondrosis
  - CKC exercises: Leg press, multiple direction lunges, step-ups, squats, Gastroc soleus exercise
  - Isokinetic quadriceps/hamstrings in ROM without chondrosis
  - Stairmaster,
  - Dynamic balance exercises
  - Foot placement drills submax:: agility ladder / line jumps /submax anterior-lateral hop to stabilization
  - CV conditioning and core stability
  - Wk 16: (4 months): Return to running program if meets criteria – see next page
  - 4 ½-5 months: Plyometric program – submax with gradual progression
  - 6-9 months: Return to play if meets criteria – see next page

**Return to running**

**Return to sport**
Meniscus Repair Rehabilitation Program
Testing and Return to Running/Sports Recommendations

Testing:

12 weeks (3 months)
SL 60 deg Stork test
Hip strength:
  Abduction MMT
  Hip Abduction Side plank test
Biodex test :
  No block
  2 speeds: 180 deg/sec (5 reps) 300 deg/sec (30 reps)
Y balance test
FOTO

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

20 weeks (6 months)
Biodex test: Full ROM with no ext block
  3 speed test: 60 deg/sec (5 reps), 180 deg/sec (5 reps), 300deg/sec (30 reps)
Single Hop test: no arm swing
Triple hop/Cross over hop test: arm swing- Tuck Jump

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), 300deg/sec (30 reps)
Hip Abduction Side Plank test
Tuck Jump or Landing Assessment
Jump test
Single Hop test
Triple Hop test/Cross Over Hop: arm swing
Agility test: LEFT test components or time
FOTO

Return to Running Criteria:

Return to Running Requirements:
Time: at least 4 months post-op
MD / PT clearance
No knee joint effusion
ROM: limb symmetry:
  extension within 5 deg
  flexion within 10 deg
Biodex:
  Limb symmetry of PT:
    Quad: 75%
    Hams: 80-90%
Proper running form: Treadmill running (6-10 mph, 5 min) with equal audibly rhythmic foot strike
Anterior lateral hop to stabilization drill completed with no apprehension and good movement control

Return to Running Recommendations:
Biodex:
  180 deg/sec:
    Quad PT/BW: Males: 65%
    Females: 55%
    H/Q ratio: 65%
  300 deg/sec:
    Quads Power :Limb symmetry:75%
    Hams Power: Limb symmetry: 75%
SL 60 deg stork test:
  Limb symmetry: 90%
Hip Abduction Side Plank test:
  Level II or greater
Y balance: Limb symmetry: < 4cm
Meniscus Repair Rehabilitation Program
Testing and Return to Running/Sports Recommendations

Return to Play Criteria:

Return to Play Requirements:
Time: at least 6-9 months
MD/PT clearance
No knee joint effusion
ROM: limb symmetry:
  extension within 5 deg
  flexion within 10 deg
Biodex:
  Limb symmetry of PT:
    Quad: 90%
    Hams: 90%
Tuck Jump or Landing Assessment: no faulty movement patterns
Single Hop test: Limb symmetry: 90%,
Triple Hop test or Cross-Over Hop Test  Limb symmetry: 90%
LEFT test or Agility Test with no compensation

Return to Play Recommendations:
Biodex:
  60 deg/sec:
    Quad PT/BW: Males: 100%
    Females: 80%
    Hams PT/BW: Males: 60%
    Females: 60%
    H/Q ratio: 60 deg/sec : 60%
    180 deg/sec: 70%
    300 deg/sec: 80%
  300 deg/sec:
    Quads Power: Limb symmetry:90%
    Hams Power: Limb symmetry: 90%

Hip Abduction Side Plank test:
  Level III or greater
Y balance: Limb symmetry: < 4cm
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.
