**Altru Advanced Orthopedics Knee Meniscus Repair Rehabilitation Protocol**

The intent of this protocol is to provide the therapist with a guideline for the post-op rehab of a patient who has had a meniscus repair, meniscal root repair, or meniscal transplant. It is not intended to be a substitute for appropriate clinical decision making regarding the progression of a patient’s rehab. The actual therapy plan of care must be based on the surgical approach, physical exam and findings, individual progress, any post-op complications, and/or co-morbidities. If a therapist needs assistance or has questions regarding the progression of a patient post surgically they should consult the referring surgeon.

**For meniscal root repair/meniscal transplant see specific precautions at end of protocol.**

**PHASE I: Weeks 1-3**

Precautions:
- NWB for 1 week to let knee settle until post-op visit
- Progress to WBAT with brace locked in extension after 1 week
- Limit knee flexion to 0-90º for first 4 weeks
- If posterior horn repair no hamstring exercises for 6 weeks

Goals:
- Reduce pain and swelling
- Restore full knee extension
- Restore quad control

Bracing:
- Wear knee brace locked in extension for ambulation, unlock 0-90º to sit or move when not walking
- Wear brace at all times
- Lock brace in full extension at night to facilitate full extension ROM

Therapeutic Exercise:
- ROM
  - Passive and AAROM only, 0-90º flexion
  - Heel slides: 0-90º flexion
  - Wall slides: 0-90º flexion
  - Prone hangs
- Hamstring, gastroc stretch
- Strengthening
  - Quad sets with EMS or biofeedback if needed
- Ham sets (if posterior horn repair, no hamstring exercises for 6 weeks)
- Ankle pumps
- Hip abd and adduction
- Proprioception exercises and SLR with brace locked at 0°

**Manual Therapy:**

- Patella mobilization
- Scar tissue mobilization

**Modalities:**

- E-stim- NMES, TENs, IFC
- Cold compression

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**PHASE II: Weeks 3-6**

**Precautions:**

- Deep flexion in weight bearing should be avoided
- Limit closed chain exercise to 90°
- If posterior horn repair no hamstring exercises for 6 weeks

**Goals:**

- Slow progression of ROM to 0-125° flexion
- WBAT ambulation without AD or brace
- Improve quad control
- Improve strength
- Improve static balance control

**Bracing:**

- D/C brace at 4 weeks if good quad tone and control

**Therapeutic Exercise:**

- ROM
  - Passive up to 0-125° gradually (in PT)
  - Heel slides: seated and/or supine
  - Heel prop
- Continue with HS and calf stretching
- Strengthening
  - Quad set/SAQ
  - Standing or prone HS curl (if no posterior horn repair)
  - SLR without extensor lag, initiate weight as control improves
  - Theraband hip strengthening
  - Leg press (limit to 90°)
  - Step-ups: forward and lateral
o Wall slides, chair squat, mini-squats (limit to 90º)
o Calf raises
• Stationary bicycle: start when 110º flexion is achieved
• Balance and proprioception:
o Begin with brace on but unlocked, then progress out of the brace as tolerated
o Weight shifting: lateral, forward/backward
o Single leg stance: even and uneven surfaces
o Rebounder ball toss

Manual Therapy:
• Patella mobilization
• Scar tissue mobilization

Modalities:
• E-stim- NMES, TENs, IFC
• Cold compression

**PHASE III: Weeks 6-12**

Precautions:
• Avoid exercises that cause pain at the patella
• Avoid pivoting or twisting on the involved leg
• Avoid deep knee bends and squats

Goals:
• Restore full ROM
• Restore full LE strength
• Normalized gait pattern without AD or brace (FWB status)
• Normalized pattern and control with ascending/descending stairs

Therapeutic Exercise:
• ROM
  o Quad, hamstring, and calf stretches
• Strength
  o Continue with previous exercises, increase resistance and intensity as able
  o Initiate hamstring curls at week 7 if posterior horn repair
  o Squats, leg press
  o Step ups: forward and lateral with emphasis on slow controlled movement
  o Lunges: forward and reverse (to no more than 90º)
  o Single leg squats, single leg wall squats, single leg chair squat
  o Stationary bicycle
• Balance and proprioception
  o Rebounder ball toss on even and uneven surfaces
Squats on balance board, foam roll, air ex
Steamboats – 4 way on even and uneven surfaces

Manual Therapy:
- Patella mobilization
- Scar tissue mobilization

Modalities:
- E-stim- NMES, TENs, IFC
- Cold compression

**PHASE IV: Weeks 12-36**

Precautions:
- Avoid exercises that cause pain at the patella
- Wait until 16 weeks post-op to initiate lateral exercises if meniscal root repair/meniscal transplant
- Wait until 18 weeks post-op to initiate plyometrics, agility, running, and swimming if meniscal root repair/meniscal transplant

Goals:
- Improve functional control
- Improve dynamic balance
- Improve strength, power, endurance, agility
- Prepare for return to full unrestricted activities

Therapeutic Exercise:
- Strength, balance and proprioception:
  - Continue with focus on increasing intensity and reducing repetition to increase strength
  - Initiate lateral movements and sports cord lunges, forward, backward, sideways, lateral step-up, step overs
- Plyometrics: bilateral progressing to unilateral
  - Include squat jumps, tuck jump, box jumps, depth jumps, broad jumps, scissor hops
  - Power skipping
  - Bounding in place and for distance
- Agility
  - Quick feet on step – forward and side to side sports cord
  - Progress lateral movements: shuffles with sports cord, slide board
  - Ladder drills
- Swimming: all strokes
Running Progression:

**Trace or less effusion, 80% or > strength of involved/uninvolved**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Treadmill/track walking</td>
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<tr>
<td>2.</td>
<td>Treadmill walk/run intervals</td>
</tr>
<tr>
<td>3.</td>
<td>Treadmill running/track: run straights walk turns</td>
</tr>
<tr>
<td>4.</td>
<td>Track: run straights and turns</td>
</tr>
<tr>
<td>5.</td>
<td>Run outside on path/road</td>
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</tbody>
</table>

- Progress until 2 miles tolerated without increased pain and swelling.
- No more than 4 times/week and only every other day.
- Do not progress more than 2 levels in 7 days.

**PHASE V: 6+ Months**

Goals:
- Return to normal functional activities
- Return to normal sporting and recreational activities

Assessments for Return to Sport:
- Biodex testing

**Biodex/Cybex goals:**

<table>
<thead>
<tr>
<th>Peak Torque/BW %</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 deg/sec</td>
<td>110-115</td>
<td>80-95</td>
</tr>
<tr>
<td>180 deg/sec</td>
<td>60-75</td>
<td>50-65</td>
</tr>
<tr>
<td>300 deg/sec</td>
<td>30-40</td>
<td>30-45</td>
</tr>
</tbody>
</table>

- Advanced functional assessment at 6 months for return to sports (Hop Testing)

**Criteria for D/C from Skilled Therapy:**
- Normalized gait pattern
- Full pain-free ROM
- Involved LE strength 4 to 5/5
- Independent HEP
- Normal age appropriate balance and proprioception
**For meniscal root repair, and/or meniscal transplant use the following guidelines:**

<table>
<thead>
<tr>
<th>Weight Bearing Status</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>At 2 weeks post-op</td>
<td>Toe touch weight bearing, locked in extension</td>
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<tr>
<td>At 5 weeks post-op</td>
<td>25% body weight bearing, locked in extension</td>
</tr>
<tr>
<td>At 6 weeks post-op</td>
<td>50% body weight bearing, locked in extension</td>
</tr>
<tr>
<td>At 7 weeks post-op</td>
<td>75% body weight bearing, locked in extension</td>
</tr>
<tr>
<td>At 8 weeks post-op</td>
<td>100% body weight bearing, locked in extension</td>
</tr>
<tr>
<td>At 9 weeks post-op</td>
<td>Full weight bearing, gradually wean from brace</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bracing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-op day 1 to 4 weeks</td>
<td>Locked in full extension</td>
</tr>
<tr>
<td>At 4 weeks post-op</td>
<td>Unlocked with 0-90° flexion block</td>
</tr>
<tr>
<td>At 5 weeks post-op</td>
<td>Unlocked with 0-100° flexion block</td>
</tr>
<tr>
<td>At 6 weeks post-op</td>
<td>Unlocked with 0-120° flexion block</td>
</tr>
<tr>
<td>At 7 weeks post-op</td>
<td>D/C brace if good quad control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ROM</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-op day 1 to 4 weeks</td>
<td>0-90°</td>
</tr>
<tr>
<td>At 5 weeks post-op</td>
<td>0-100°</td>
</tr>
<tr>
<td>At 5 weeks post-op</td>
<td>0-120°</td>
</tr>
<tr>
<td>At 8 weeks post-op</td>
<td>Full ROM</td>
</tr>
</tbody>
</table>