Rehabilitation Guidelines for Meniscal Repair

The knee is the body's largest joint, and the place where the femur, tibia, and patella meet to form a hinge-like joint. These bones are supported by a large complex of muscles, tendons, ligaments, and cartilage which allow the knee joint to function.

There are two types of cartilage in the knee, articular cartilage and meniscus cartilage. Articular cartilage is made up of collagen, proteoglycans and water, which line the end of the bones that meet to form a joint. The primary function of the articular cartilage is to provide a smooth gliding surface for joint motion. Rubbing articular cartilage on articular cartilage is approximately 5 times more smooth (i.e. less friction), than rubbing ice on ice. A wide range of injuries can occur to the articular cartilage during sports injuries, trauma and degenerative processes. Smaller, partial thickness tears of the articular cartilage can cause pain, swelling, or catching in the knee.

The meniscus cartilage in the knee includes a medial (inside part of the knee) meniscus and a lateral (outside part of the knee) meniscus. Together they are referred to as menisci. The menisci are wedge shaped and are thinner toward the center of the knee and thicker toward the periphery of the knee joint. This shape is very important to its function since the primary function of the menisci is to improve load transmission. Without the menisci, the area of contact force between the femur and tibia would be relatively small, increasing the contact stress by 235-335%.

There are two categories of meniscal tears, acute traumatic tears and degenerative tears. Degenerative tears occur most commonly in middle-aged people as a result of repetitive stresses to the menisci over time, which severely weaken the tissue. This process of tissue degeneration makes it very unlikely that a surgical repair will heal or that the surrounding meniscus will be strong enough to hold the sutures used to repair it. Literature suggests that less than 10% of meniscal tears occurring in patients >40 years of age are repairable.

Symptoms of a degenerative meniscus tear include swelling, pain along the joint line, catching, and locking. If a degenerative tear is symptomatic it is usually treated with rest, activity modifications and injections. If the meniscal tear becomes symptomatic with pain from locking and catching, it may be surgically removed. This is called a partial menisectomy, which is termed partial because the surgeons only remove the segment of meniscus containing the tear as opposed to removing the entire meniscus.
Acute traumatic tears occur most frequently as a result of a twisting injury to the knee when the foot is planted. Symptoms of an acute meniscus tear include swelling, pain along the joint line, catching, locking and a specific injury. Often times these tears can be diagnosed by the history of the problem and a good physical examination. Sometimes an MRI will be used to assist in making the diagnosis. The arrow in Figure 3 shows a normal meniscus on an MRI, but the arrows in Figure 5 show a torn meniscus.

If a patient suffers a meniscal tear, the 3 options for treatment include: non-operative rehabilitation; surgery to trim out the area of torn meniscus; or surgery to repair (stitch together) the torn meniscus. The treatment chosen will depend on the location of the tear, the size of the tear, the sport to which an athlete is returning, ligamentous stability of the knee, and any associated injury.

The location of tear is important because the outer portion of the meniscus has a good blood supply whereas the inner portion has a very poor blood supply. This blood supply is necessary for a tear or a repair to heal. Without an adequate blood supply, the area of torn meniscus will have to be removed.

After meniscal surgery, rehabilitation with a physical therapist or athletic trainer is often needed to restore range of motion, strength, movement control and guide the athletes return to sport. When the meniscus is repaired there may be a period of restricted knee flexion, especially during weight bearing, to protect the repair sutures and the meniscus. Therehabilitation guidelines are presented in a criterion based progression. Specific time frames, restrictions and precautions are given to protect healing tissues and the surgical repair/reconstruction. General time frames are also given for reference to the average individual, but individual patients will progress at different rates depending on their age, associated injuries, pre-injury health status, rehabilitation compliance and injury severity. The size and location of the meniscal tear may also affect the rate of post-operative progression.
### Meniscal Repair Rehabilitation Guidelines

**PHASE I (surgery to 4-6 weeks after surgery)**

<table>
<thead>
<tr>
<th>Appointments</th>
<th>• Rehabilitation appointments begin 3-5 days after surgery</th>
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</thead>
</table>
| Rehabilitation Goals | • Protect the post-surgical knee  
• Restore normal knee range of motion  
• Eliminate swelling (i.e. effusion)  
• Restore leg control |
| Precautions | • Gradually wean from crutches when there is no pain with knee locked in brace  
• Knee brace locked for all weight bearing activities for 4 weeks  
• Do not flex the knee past 90° |
| Range of Motion (ROM) Exercises (Please do not exceed the ROM specified for each exercise and time period) | • Knee extension on a bolster  
• Prone hangs  
• Supine wall slides  
• Heel slides (caution with posterior medial meniscus repair secondary to the semimembranosus insertion)  
• Knee flexion off the edge of the table |
| Suggested Therapeutic Exercise | • Quadriceps sets  
• Straight leg raises  
• 4 way leg lifts in standing with brace on for balance and hip strength  
• Abdominal isometrics |
| Cardiovascular Exercise | • Upper body circuit training or Upper Body Ergometer (UBE) |
| Progression Criteria | • 4 weeks after surgery  
• Pain-free gait without crutches  
• No effusion (swelling) |
# Meniscal Repair Rehabilitation Guidelines

## PHASE II (begin after meeting Phase I criteria, usually 4-6 weeks)

<table>
<thead>
<tr>
<th><strong>Appointments</strong></th>
<th>• Rehabilitation appointments begin once every 1 to 2 week</th>
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</table>
| **Rehabilitation Goals** | • Single leg stand control  
• Normalize gait  
• Good control and no pain with functional movements, including step up/down, squat, partial lunge (between 0 and 60 of knee flexion) |
| **Precautions** | • No forced flexion with passive range of motion with knee flexion or weight bearing activities that push the knee past 60 of knee flexion  
• Avoid post-activity swelling  
• No impact activities |
| **Suggested Therapeutic Exercise** | • Non-impact balance and proprioceptive drills  
• Stationary bike  
• Gait drills  
• Hip and core strengthening  
• Stretching for patient-specific muscle imbalances  
• Quadriceps strengthening, making sure that closed chain exercises occur between 0 and 60 of knee flexion |
| **Cardiovascular Exercise** | • Non-impact endurance training: stationary bike, Nordic track, swimming, deep water running or cross trainer |
| **Progression Criteria** | • Normal gait on all surfaces  
• Ability to carry out functional movements without unloading the affected leg or pain, while demonstrating good control  
• Single leg balance greater than 15 seconds |
# Meniscal Repair Rehabilitation Guidelines

**PHASE III (begin after meeting Phase II criteria, usually >3 months after surgery)**

<table>
<thead>
<tr>
<th>Appointments</th>
<th>• Rehabilitation appointments are once every 1 to 2 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehabilitation Goals</td>
<td>• Good control and no pain with sport and work specific movements, including impact</td>
</tr>
<tr>
<td>Precautions</td>
<td>• Post-activity soreness should resolve within 24 hours</td>
</tr>
<tr>
<td></td>
<td>• Avoid post-activity swelling</td>
</tr>
<tr>
<td>Suggested Therapeutic Exercise</td>
<td>• Impact control exercises beginning 2 feet to 2 feet, progressing from 1 foot to other and then 1 foot to same foot</td>
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<tr>
<td></td>
<td>• Movement control exercises beginning with low velocity, single plane activities and progressing to higher velocity, multi-plane activities</td>
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<tr>
<td></td>
<td>• Sport/work specific balance and proprioceptive drills</td>
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<tr>
<td></td>
<td>• Hip and core strengthening</td>
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<tr>
<td></td>
<td>• Stretching for patient specific muscle imbalances</td>
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<tr>
<td>Cardiovascular Exercise</td>
<td>• Replicate sport or work specific energy demands</td>
</tr>
<tr>
<td>Return To Sport/Work Criteria</td>
<td>• Dynamic neuromuscular control with multi-plane activities, without pain or swelling</td>
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</table>

Patients may have advanced diagnostic and/or treatment options, or may receive educational materials that vary from this information. Please be aware that this information is not intended to replace the care or advice given by your physician or health care provider. It is neither intended nor implied to be a substitute for professional advice. Call your health provider immediately if you think you may have a medical emergency. Always seek the advice of your physician or other qualified health provider prior to starting any new treatment or with any question you may have regarding a medical condition.