

Rehabilitation Guidelines for Knee Arthroscopy

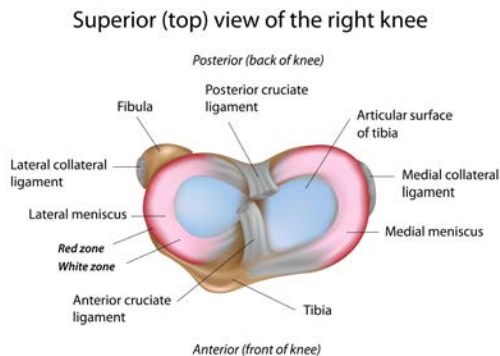
Dr. Matthew Werger
Hip & Knee Replacement



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



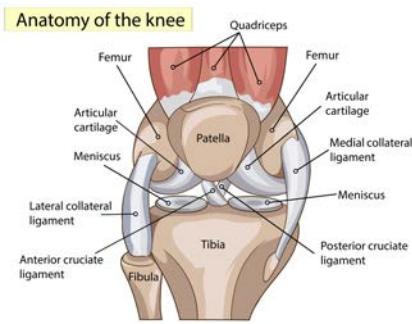
used to repair it. Literature suggests that less than 10% of meniscal tears occurring in patients >40 years of age are repairable.

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 meniscectomy, which is termed partial because the surgeons only remove the segment of meniscus containing the tear as opposed to removing the entire meniscus.

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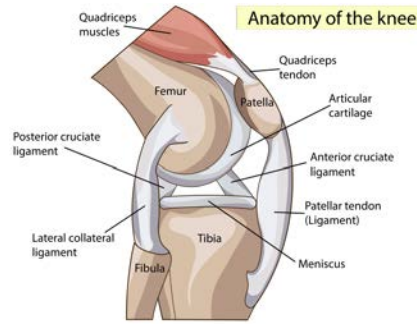


Anterior Anatomy of the Knee

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.

Arthroscopy is a surgical procedure in which the joint is viewed using a small camera. This technique allows the surgeon to have a clear view of



Lateral Anatomy of the Knee

the inside of the knee, which helps diagnose and treat knee problems. According to the American Orthopaedic Society for Sports Medicine, more than 4 million knee arthroscopies are performed worldwide each year. It can be used to treat meniscal and articular cartilage tears, fat pad impingement, loose bodies, ligament injuries, etc.

After knee arthroscopy, rehabilitation is usually required to optimize the outcome. Rehabilitation will focus on restoring range of motion and developing strength/movement control. The rehabilitation guidelines are presented in a criterion based



MRI of a medial meniscus tear

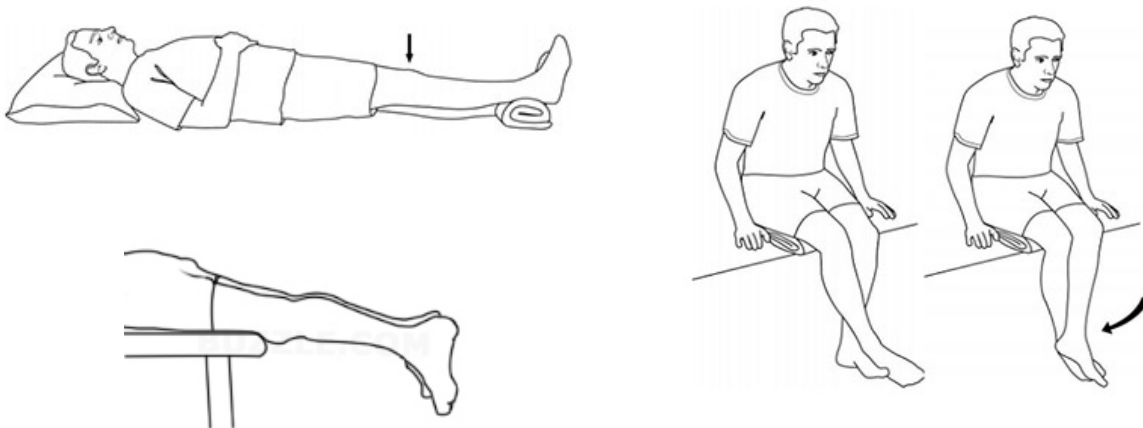
progression. Specific time frames, restrictions and precautions are given to protect healing tissues and any surgical repair/reconstruction. General time frames are also given for reference to the average, but individual patients will progress at different rates depending on their age, associated injuries, pre-injury health status, rehabilitation compliance and injury severity. The size and location of the meniscal/cartilage tear will also may affect the rate of post-operative progression.



Knee Arthroscopy Rehabilitation Guidelines

PHASE I (surgery to 2-3 weeks after surgery)

Appointments	<ul style="list-style-type: none"> Rehabilitation appointments begin 3-5 days after surgery
Rehabilitation Goals	<ul style="list-style-type: none"> Protect the post-surgical knee Restore normal knee range of motion Normalize gait Eliminate swelling (i.e. effusion) Restore leg control
Precautions	<ul style="list-style-type: none"> Use axillary crutches for normal gait Avoid impact exercises for the first 4-6 weeks if the articular cartilage was debrided
Range of Motion (ROM) Exercises (Please do not exceed the ROM specified for each exercise and time period)	<ul style="list-style-type: none"> Knee extension on a bolster Prone hangs Supine wall slides Heel slides
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> Quadriceps sets Isometric wall press 4 way leg lifts in standing for balance and hip strength Gait drills
Cardiovascular Exercise	<ul style="list-style-type: none"> Upper body circuit training or Upper Body Ergometer (UBE)
Progression Criteria	<ul style="list-style-type: none"> Normal gait No effusion Full knee range of motion

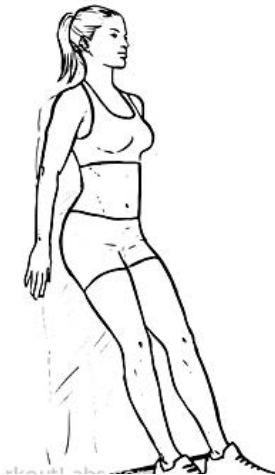


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Knee Arthroscopy Rehabilitation Guidelines

PHASE II (begin after meeting Phase I criteria)

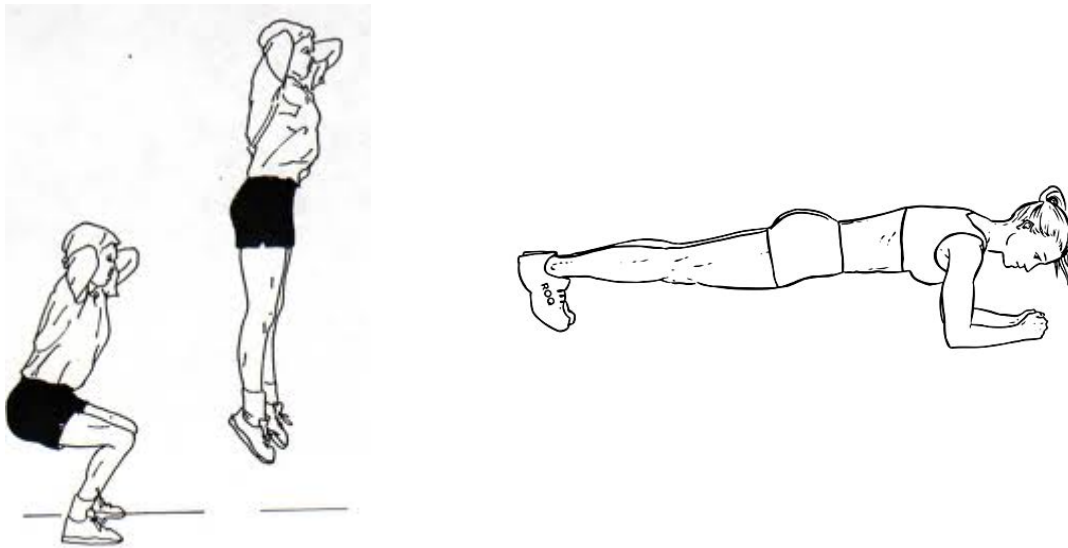
Appointments	<ul style="list-style-type: none"> Rehabilitation appointments begin once every 1 to 2 week, if needed
Rehabilitation Goals	<ul style="list-style-type: none"> Good control with single leg stand Good control and no pain with functional movements, including step up/down, squat, partial lunge
Precautions	<ul style="list-style-type: none"> Post-activity soreness should resolve within 24 hours Avoid post-activity swelling
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> Non-impact balance and proprioceptive drills Stationary bike Hip and core strengthening Stretching for patient specific muscle imbalances Quadriceps strengthening
Cardiovascular Exercise	<ul style="list-style-type: none"> Non-impact endurance training; stationary bike; Nordic track; swimming; deep water run; and cross trainer
Progression Criteria	<ul style="list-style-type: none"> 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



Knee Arthroscopy Rehabilitation Guidelines

PHASE III (begin after meeting Phase II criteria)

Appointments	<ul style="list-style-type: none"> Rehabilitation appointments are once every 1 to 2 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> Good control and no pain with sport and work specific movements, including impact
Precautions	<ul style="list-style-type: none"> Post-activity soreness should resolve within 24 hours Avoid post-activity swelling
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> Impact control exercises beginning 2 feet to 2 feet, progressing from 1 foot to other and then 1 foot to same foot Movement control exercises beginning with low velocity, single plane activities and progressing to higher velocity, multi-plane activities Sport/work specific balance and proprioceptive drills Hip and core strengthening Stretching for patient specific muscle imbalances
Cardiovascular Exercise	<ul style="list-style-type: none"> Replicate sport or work specific energy demands
Return To Sport/Work Criteria	<ul style="list-style-type: none"> Dynamic neuromuscular control with multi-plane activities, without pain or swelling



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.