

Madigan Army Medical Center

Musculoskeletal Treatment Guidelines

KNEE PAIN (ANTERIOR)

Diagnosis/definition

- Knee pain localized to the anterior portion of the knee, either retropatellar or peripatellar. Usually a gradual, non-traumatic onset aggravated with increased activity, running, squatting, stair climbing or prolonged sitting. Symptoms normally decrease with rest.

Initial diagnosis and management

- History and physical examination
- Plain films not required
- NSAIDs
 - Adults - 200 to 400 milligrams (mg) every four to six hours as needed for up to 2 weeks. Example: Ibuprofen
 - Take tablet or capsule forms of these medicines with a full glass (8 ounces) of water.
 - Do not lie down for about 15 to 30 minutes after taking the medicine. This helps to prevent irritation that may lead to trouble in swallowing.
 - To lessen stomach upset, these medicines should be taken with food or an antacid.
- Avoidance of aggravating activities (profile for active duty soldiers)
- Strengthening exercises for quadriceps, stretching exercises for quads, hamstrings and calf muscle
- Ice PRN after activities
- Compression wrap is contraindicated
- Patient education (refer patient to PT for Retropatellar pain syndrome (RPPS) class)
- Please refer to the Clinical standard on knee pain

Ongoing management and objectives

- Resolution or decreasing symptoms in three to four weeks
- If no resolution:
 - Trial of alternate NSAID
 - Trial of neoprene sleeve with patella opening
 - Obtain plain films with sunrise views
 - Do not order an MRI. Orthopedic clinic will order if patient meets pre-surgery criteria

Madigan Army Medical Center

Musculoskeletal Treatment Guidelines

Indication a profile is needed

- Any limitations that affect strength, range of movement, and efficiency of feet, legs, lower back and pelvic girdle.
- Slightly limited mobility of joints, muscular weakness, or other musculo-skeletal defects that may prevent moderate marching, climbing, timed walking, or prolonged effect.
- Defects or impairments that require significant restriction of use.

Specifications for the profile

- Months 1-3
 - No running, jumping, marching, squatting.
- Months 4-6
 - Gradual transition into own pace and distance

Patient/Soldier Education or Self care Information

- See attached sheet
- Demonstrate deficits that exist
 - Describe/show soldier his/her limitations
- Explain injury and treatment methods
 - Use diagram attached to describe injury, location and treatment.
- Instruct and demonstrate rehab techniques
 - Demonstrate rehab exercises as shown in attached guide
 - Warm up before any sports activity
 - Participate in a conditioning program to build muscle strength
 - Do stretching exercises daily
- Ask the patient to demonstrate newly learned techniques and repeat any other instructions.
- Fine tune patient technique
 - Correct any incorrect ROM/stretching demonstrations or instructions by repeating and demonstrating information or exercise correctly.
- Encourage questions
 - Ask soldier if he or she has any questions
- Give supplements such as handouts
- Schedule follow up visit
 - If pain persists
 - The pain does not improve as expected
 - Patient is having difficulty after three days of injury
 - Increased pain or swelling after the first three days
 - Patient has any questions regarding care

Indications for referral to Specialty Care

- No relief with initial management for eight weeks

Madigan Army Medical Center

Musculoskeletal Treatment Guidelines

- History of joint locking and giving way
- Question of underlying instability
- Prolonged effusion > 10 to 14 days
- R/O fractures, septic joints, rheumatoid arthritis, etc. should be referred to appropriate specialty clinic (Orthopedics or Rheumatology)
- Refer to Physical Therapy if none of the above but progression of atrophy or persistent symptoms.
- Completed full course of rehabilitation and have plateau or not improved (Orthopedics referral indicated)

Referral criteria for return to primary care

- Resolution of symptoms

Input was provided by:

- Occupational Therapy Clinic
- Physical Therapy Clinic
- Orthopedic Clinic
- Family Practice Clinic
- Okubo Clinic
- 555 Engineers
- 1st Brigade
- 3rd Brigade
- 62nd Medical Brigade

POC:

- Outcome Management

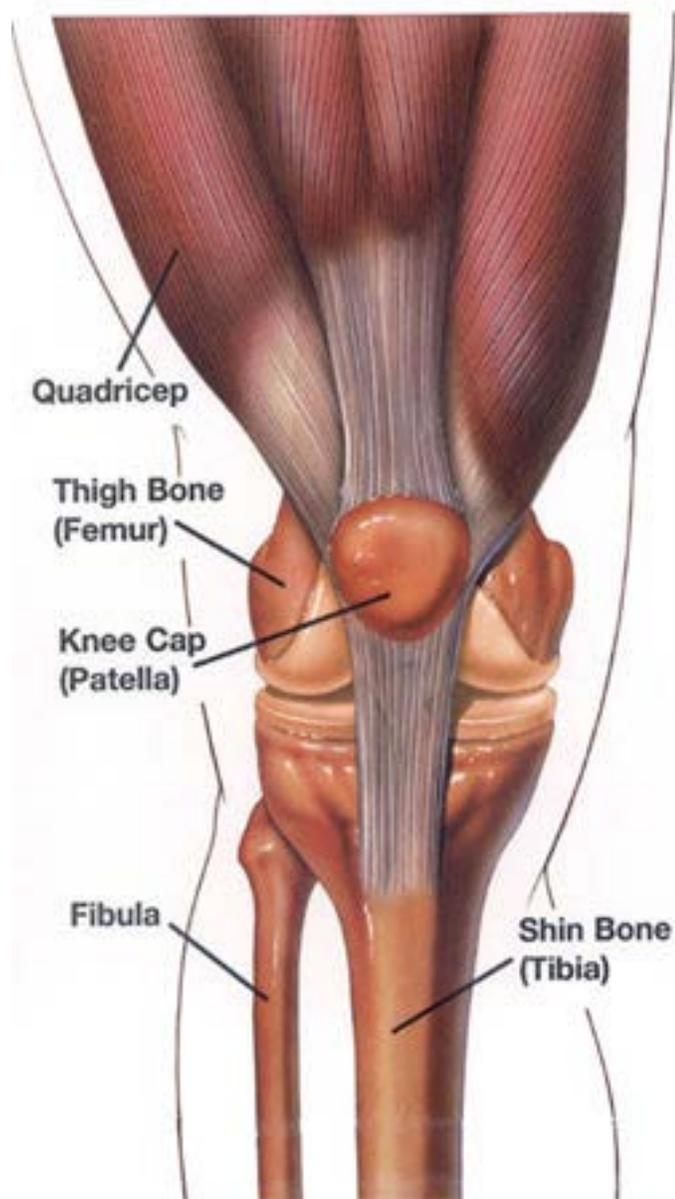
References:

- Mellion, I., Morris B. (2002). Team Physician's Handbook, 3rd Edition. Hanley & Belfus, Inc: Philadelphia, PA.
- Lillegard, Rucker. (1999). The Handbook of Sports Medicine. A symptom-oriented approach, 2nd Edition. Butterworth-Heinemann Medical: Burlington, MA.
- Baechle, Thomas, Earle, Roger. (2000) Essentials of Strength Training and Conditioning, 2nd Edition. Human Kinetics Pub: Champaign, IL
- Schenck, Robert, Jr. et al. (1999). Athletic Training and Sports Medicine, 3rd Edition. American Academy of Orthopedics: Tucson, AZ.
- http://www.mamc.amedd.army.mil/referral/Documents/Common/Knee_Pain_Anterior.pdf

Madigan Army Medical Center Musculoskeletal Treatment Guidelines

- Knee Exercises for patients was downloaded with permission from: Center of Excellence for Medical Multimedia (CEMM). <http://www.cemm.org/>. Downloadable PDFs. Lt Col (Dr.) Randy Mauffray, Director, CEMM. 2011

Madigan Army Medical Center Musculoskeletal Treatment Guidelines



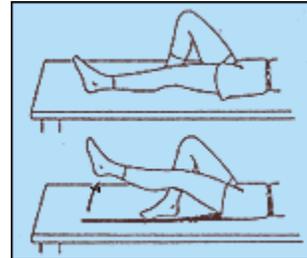
Madigan Army Medical Center

Musculoskeletal Treatment Guidelines

Exercises

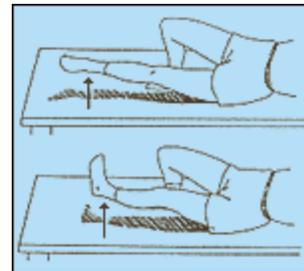
1. Straight Leg Raise -- Knee Extension Raise

Lie on back, with right knee bent and right foot flat on ground. Gradually lift the left leg up about thirty centimeters (twelve inches) in the air. Keep the knee straight and the toes pointed up. Hold this elevated position for six seconds. Slowly return leg to ground and start again. Repeat six times, and then start again by lifting the right leg. Slowly add weights to ankles to increase resistance.



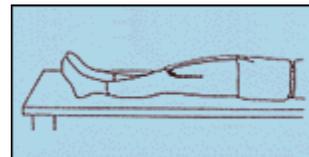
2. Straight Leg Raise -- With Internal and External Rotation

Lie on back, with right knee bent and foot flat. Move left foot to 10 o'clock position. Lift left leg in air about thirty centimeters (twelve inches). Keep your left knee straight. Hold this position for six seconds. Then move left foot to 2 o'clock position. Lift the leg up 30 centimeters and hold. Repeat this exercise six times and then switch legs. Slowly add weights to ankle. (Check weights with physiotherapist.)



3. Quadriceps Set -- Knee Extension

Lie on your back and slowly press left knee into the mat. Then tighten the muscles on front of your



Madigan Army Medical Center

Musculoskeletal Treatment Guidelines

thigh. Try not to hold your breath. Hold the muscles tight for six seconds. Repeat six times and then tighten right leg muscle.

4. Hip Abduction

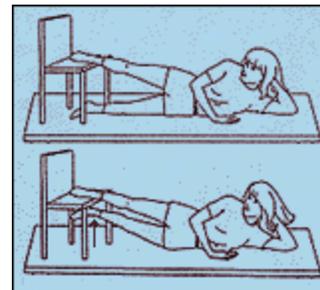
Lie on left side with bottom knee bent, Raise top leg. Keep knee straight and toes pointed forward. Do not let top hip roll backward. Hold this position for six seconds. Do six repeats and then switch sides. Progress slowly to just under 1 Kg at the ankle.
(Check weights with physiotherapist.)



5. Hip Adduction

Lie on left side with top leg on chair. Slowly raise the bottom leg up to the chair seat. Hold leg up for six seconds.

Do six repeats and then switch sides.



Madigan Army Medical Center Musculoskeletal Treatment Guidelines

PHYSICAL PROFILE																																
For use of this form, see AR 40-501, the proponent agency is the Office of The Surgeon General																																
1. MEDICAL CONDITION ANTERIOR KNEE PAIN	2.	<table border="1" style="margin: auto;"> <tr> <td>P</td><td>U</td><td>L</td><td>H</td><td>E</td><td>S</td> </tr> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> </table>	P	U	L	H	E	S																								
P	U	L	H	E	S																											
3. ASSIGNMENT LIMITATIONS ARE AS FOLLOWS NO RUNNING, JUMPING, MARCHING OR SQUATTING		CODES																														
4. THIS PROFILE IS <input type="checkbox"/> PERMANENT <input checked="" type="checkbox"/> TEMPORARY EXPIRATION DATE:																																
5. THE ABOVE STATED MEDICAL CONDITION SHOULD NOT PREVENT THE INDIVIDUAL FROM DOING THE FOLLOWING ACTIVITIES																																
<table style="width: 100%; border: none;"> <tr> <td><input checked="" type="checkbox"/> Groin Stretch</td> <td><input type="checkbox"/> Thigh Stretch</td> <td><input checked="" type="checkbox"/> Lower Back Stretch</td> <td><input checked="" type="checkbox"/> Neck & Shoulder Stretch</td> <td><input checked="" type="checkbox"/> Neck Stretch</td> </tr> <tr> <td><input type="checkbox"/> Hip Raise</td> <td><input type="checkbox"/> Quads Stretch & Bal.</td> <td><input type="checkbox"/> Single Knee to Chest</td> <td><input checked="" type="checkbox"/> Upper Back Stretch</td> <td><input checked="" type="checkbox"/> Ankle Stretch</td> </tr> <tr> <td><input type="checkbox"/> Knee Bender</td> <td><input type="checkbox"/> Calf Stretch</td> <td><input type="checkbox"/> Straight Leg Raise</td> <td><input checked="" type="checkbox"/> Chest Stretch</td> <td><input checked="" type="checkbox"/> Hip Stretch</td> </tr> <tr> <td><input type="checkbox"/> Side-Straddle Hop</td> <td><input type="checkbox"/> Long Sit</td> <td><input checked="" type="checkbox"/> Elongation Stretch</td> <td><input checked="" type="checkbox"/> One-Arm Side Stretch</td> <td><input checked="" type="checkbox"/> Upper Body Wt Tng</td> </tr> <tr> <td><input type="checkbox"/> High Jump</td> <td><input type="checkbox"/> Hamstring Stretch</td> <td><input checked="" type="checkbox"/> Turn and Bounce</td> <td><input checked="" type="checkbox"/> Two-Arm Side Stretch</td> <td><input type="checkbox"/> Lower Body Wt Tng</td> </tr> <tr> <td><input type="checkbox"/> Jogging in Place</td> <td><input type="checkbox"/> Hams. & Calf Stretch</td> <td><input checked="" type="checkbox"/> Turn and Bend</td> <td><input checked="" type="checkbox"/> Side Bender</td> <td><input type="checkbox"/> All</td> </tr> </table>			<input checked="" type="checkbox"/> Groin Stretch	<input type="checkbox"/> Thigh Stretch	<input checked="" type="checkbox"/> Lower Back Stretch	<input checked="" type="checkbox"/> Neck & Shoulder Stretch	<input checked="" type="checkbox"/> Neck Stretch	<input type="checkbox"/> Hip Raise	<input type="checkbox"/> Quads Stretch & Bal.	<input type="checkbox"/> Single Knee to Chest	<input checked="" type="checkbox"/> Upper Back Stretch	<input checked="" type="checkbox"/> Ankle Stretch	<input type="checkbox"/> Knee Bender	<input type="checkbox"/> Calf Stretch	<input type="checkbox"/> Straight Leg Raise	<input checked="" type="checkbox"/> Chest Stretch	<input checked="" type="checkbox"/> Hip Stretch	<input type="checkbox"/> Side-Straddle Hop	<input type="checkbox"/> Long Sit	<input checked="" type="checkbox"/> Elongation Stretch	<input checked="" type="checkbox"/> One-Arm Side Stretch	<input checked="" type="checkbox"/> Upper Body Wt Tng	<input type="checkbox"/> High Jump	<input type="checkbox"/> Hamstring Stretch	<input checked="" type="checkbox"/> Turn and Bounce	<input checked="" type="checkbox"/> Two-Arm Side Stretch	<input type="checkbox"/> Lower Body Wt Tng	<input type="checkbox"/> Jogging in Place	<input type="checkbox"/> Hams. & Calf Stretch	<input checked="" type="checkbox"/> Turn and Bend	<input checked="" type="checkbox"/> Side Bender	<input type="checkbox"/> All
<input checked="" type="checkbox"/> Groin Stretch	<input type="checkbox"/> Thigh Stretch	<input checked="" type="checkbox"/> Lower Back Stretch	<input checked="" type="checkbox"/> Neck & Shoulder Stretch	<input checked="" type="checkbox"/> Neck Stretch																												
<input type="checkbox"/> Hip Raise	<input type="checkbox"/> Quads Stretch & Bal.	<input type="checkbox"/> Single Knee to Chest	<input checked="" type="checkbox"/> Upper Back Stretch	<input checked="" type="checkbox"/> Ankle Stretch																												
<input type="checkbox"/> Knee Bender	<input type="checkbox"/> Calf Stretch	<input type="checkbox"/> Straight Leg Raise	<input checked="" type="checkbox"/> Chest Stretch	<input checked="" type="checkbox"/> Hip Stretch																												
<input type="checkbox"/> Side-Straddle Hop	<input type="checkbox"/> Long Sit	<input checked="" type="checkbox"/> Elongation Stretch	<input checked="" type="checkbox"/> One-Arm Side Stretch	<input checked="" type="checkbox"/> Upper Body Wt Tng																												
<input type="checkbox"/> High Jump	<input type="checkbox"/> Hamstring Stretch	<input checked="" type="checkbox"/> Turn and Bounce	<input checked="" type="checkbox"/> Two-Arm Side Stretch	<input type="checkbox"/> Lower Body Wt Tng																												
<input type="checkbox"/> Jogging in Place	<input type="checkbox"/> Hams. & Calf Stretch	<input checked="" type="checkbox"/> Turn and Bend	<input checked="" type="checkbox"/> Side Bender	<input type="checkbox"/> All																												
6. AEROBIC CONDITIONING EXERCISES	7. FUNCTIONAL ACTIVITIES	8. TRAINING HEART RATE FORMULA																														
<input type="checkbox"/> Walk at Own Pace and Distance <input type="checkbox"/> Run at Own Pace and Distance <input type="checkbox"/> Bicycle at Own Pace and Distance <input checked="" type="checkbox"/> Swim at Own Pace and Distance <input type="checkbox"/> Walk or Run in Pool at Own Pace <input type="checkbox"/> Unlimited Walking <input type="checkbox"/> Unlimited Running <input type="checkbox"/> Unlimited Bicycling <input type="checkbox"/> Unlimited Swimming <input type="checkbox"/> Run at Training Heart Rate for ____ Min. <input type="checkbox"/> Bicycle at Training Heart Rate for ____ Min. <input type="checkbox"/> Swim at Training Heart Rate for ____ Min.	<input checked="" type="checkbox"/> Wear Backpack (40 Lbs.) <input checked="" type="checkbox"/> Wear Helmet <input checked="" type="checkbox"/> Carry Rifle <input checked="" type="checkbox"/> Fire Rifle With Hearing Protection <input type="checkbox"/> KP/Mopping/Mowing Grass <input type="checkbox"/> Marching Up to ____ Miles <input checked="" type="checkbox"/> Lift Up to <u>15</u> Pounds <input type="checkbox"/> All PHYSICAL FITNESS TEST <input type="checkbox"/> Two Mile Run <input type="checkbox"/> Walk <input checked="" type="checkbox"/> Push-Ups <input checked="" type="checkbox"/> Swim <input type="checkbox"/> Sit-Ups <input type="checkbox"/> Bicycle	MALES 220 FEMALES 225 MINUS (-) AGE MINUS (-) RESTING HEART RATE TIMES (X) % INTENSITY PLUS (+) RESTING HEART RATE _____ 50% EXTREMELY POOR CONDITION 60% HEALTHY, SEDENTARY INDIVIDUAL 70% MODERATELY ACTIVE, MAINTENANCE 80% WELL TRAINED INDIVIDUAL																														
9. OTHER																																
TYPED NAME AND GRADE OF PROFILING OFFICER		SIGNATURE																														
TYPED NAME AND GRADE OF PROFILING OFFICER		SIGNATURE																														
TYPED NAME AND GRADE OF PROFILING OFFICER		SIGNATURE																														
ACTION BY APPROVING AUTHORITY																																
PERMANENT CHANGE OF PROFILE <input type="checkbox"/> APPROVED <input type="checkbox"/> NOT APPROVED																																
TYPED NAME, GRADE & TITLE OF APPROVING AUTHORITY		SIGNATURE																														
TYPED NAME, GRADE & TITLE OF APPROVING AUTHORITY		SIGNATURE																														
ACTION BY UNIT COMMANDER																																
THIS PERMANENT CHANGE IN PROFILE SERIAL <input type="checkbox"/> DOES <input type="checkbox"/> DOES NOT REQUIRE A CHANGE IN MEMBER'S																																
<input type="checkbox"/> MILITARY OCCUPATIONAL SPECIALTY <input type="checkbox"/> DUTY ASSIGNMENT BECAUSE:																																
TYPED NAME AND GRADE OF UNIT COMMANDER		SIGNATURE																														
TYPED NAME AND GRADE OF UNIT COMMANDER		SIGNATURE																														
TYPED NAME AND GRADE OF UNIT COMMANDER		SIGNATURE																														
PATIENT'S IDENTIFICATION (For typed or written entries give: Name (last, first, middle); grade; SSN; hospital or medical facility)		UNIT																														
PATIENT'S IDENTIFICATION		ISSUING CLINIC AND PHONE NUMBER																														
PATIENT'S IDENTIFICATION		DISTRIBUTION UNIT COMMANDER - ORIGINAL & 1 COPY HEALTH RECORD JACKET - 1 COPY CLINIC FILE - 1 COPY MILPO - 1 COPY																														

Madigan Army Medical Center

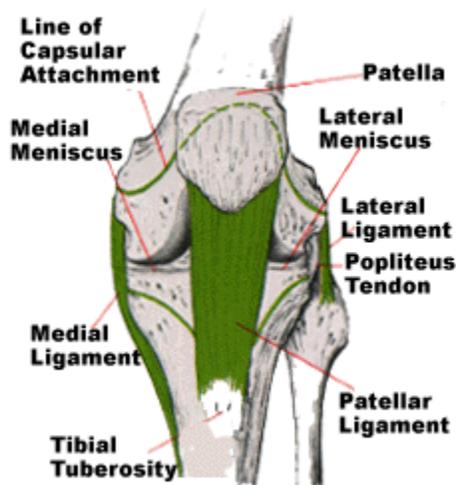
Musculoskeletal Treatment Guidelines

PATIENT INFORMATION

Anterior knee pain (patella femoral syndrome) is very common in athletes. Typically, pain is increased during activities involving stair climbing, squatting or kneeling. Patella femoral syndrome is caused by an irritation on the undersurface of the patella or kneecap, which can lead to softening and eventual loss of the cartilage lining the bone of the joint. There are many causes for patella femoral syndrome including malalignment of the lower extremity expressed as flat feet, knock knees, or internally rotated hips. The patella glides up and down in a shallow groove at the front of the femur or thighbone. Patella femoral syndrome is generally caused by an imbalance of the muscle forces around the kneecap causing it to pull laterally and produce abnormal stresses on the undersurface of the kneecap. This is similar to having the front tire of your car slightly out of alignment leading to abnormal wear on the tire.

Other causes for patella femoral syndrome include weak quadriceps muscles, injury to the knee, obesity and overuse. Initial treatment involves reducing inflammation and re-establishing the proper alignment between the kneecap and its groove. Rest is used for the painful swollen knee until symptoms improve. Stair climbing and squatting are avoided. Ice and anti-inflammatory medications are also used to decrease inflammation. Treatment is directed at strengthening the thigh muscles of the inside of the knee and stretching of the tight muscles and connective tissues of the outside of the knee. Malalignments of the flat feet are corrected with shoes with good medial arch support or through the use of orthotics. Hip rotation is improved through stretching exercises.

Most athletes will respond to this regimen return to sports. Rarely surgery may be indicated in cases of gross malalignment or unresponsiveness to appropriate activity modification, stretching, icing, and strengthening.



Knee Exercises



Quad Sets

Laying flat on a bed, hold your injured knee straight. Flex your foot up, push the back of your knee into the bed and tighten the muscles on top of your thigh. Hold for 5 seconds and relax.



Straight Leg Raises

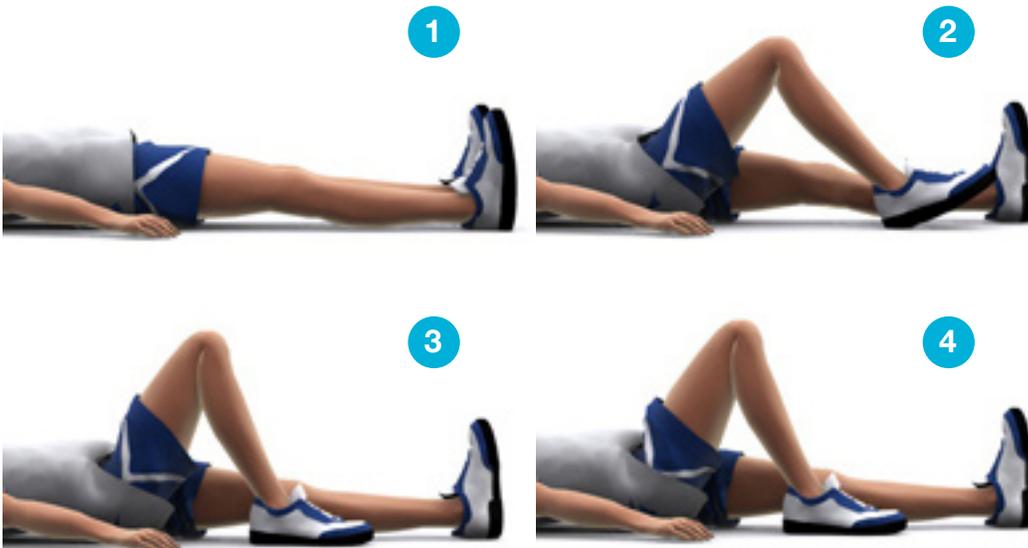
Laying flat on a bed, hold your injured knee straight. Flex your foot up, tighten the muscles on top of your thigh and slowly raise your leg off of the bed approximately 4-6 inches. Hold for 5 seconds and slowly return to starting position.

Short Arc Quads

Laying flat on a bed, place a rolled towel or pillow under your injured knee. Slowly raise the foot until the knee is straight. Hold for 5 seconds and slowly return to starting position.



Knee Exercises



Hip/Knee Flexion and Extension

Laying flat on a bed, start with the injured leg held straight. Slowly slide the foot of your injured knee back towards your buttock, bending the knee and hip. Hold for 5 seconds and slowly return to starting position.

Quad Sets with a Stool

Sitting on a chair, put your injured knee up on a stool or chair in front of you. Flex your foot up, push the back of your knee down and tighten the muscles on top of your thigh. Hold for 5 seconds and relax.



Sitting Knee Flexion

Sit on a chair with your injured knee slightly bent. Slowly bend your injured knee back and at the same time, slide your buttocks forward to the edge of the chair. Hold for 5 seconds and slowly return to starting position.
