

# Madigan Army Medical Center

## Musculoskeletal Treatment Guidelines

### KNEE PAIN (TRAUMATIC)

#### Diagnosis/Definition

- Knee pain, instability or loss of motion related to a specific traumatic event.

#### Initial Diagnosis and Management

- History (special attention to mechanism of injury) and physical examination.
- Radiographs to rule out fractures.
- Obvious fracture, instability, or motor disruption: refer (see below).
- Initial exam may be difficult due to pain and/or significant effusion.
  - In these cases, treat w/ice and compression for 4-14 days and re-assess.
  - Exercises should be initiated immediately to prevent loss of muscle tone and bulk (\*consult PT for instruction and/or supervision of exercises).

#### Ongoing Management and Objectives

- Repeat examination at 4 to 14 days for more definitive physical evaluation.
- Medial or lateral collateral ligament strains (w/o instability): treat with bracing, activity limitations and appropriate knee rehabilitation exercises. Treat for 6-8 weeks.
- MRI if effusion or other symptoms persist beyond 6-8 weeks.

#### 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

- Demonstrate deficits that exist
  - Describe/show soldier his/her limitations

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## **Musculoskeletal Treatment Guidelines**

- 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**

- Patients with the following should be referred to Orthopedics:
  - Any patient with obvious varus or valgus, or anterior or posterior drawer instability.
  - All fractures about the knee.
  - Any mechanical disruption.
- Refer to Physical Therapy for above mentioned acute and rehabilitation exercises.

### **Referral criteria for Return to Primary Care**

- Patients may be returned to Primary Care following evaluation, with suggestions for ongoing management.
- Patients will be returned to Primary Care following rehabilitation and stabilization of their orthopedic condition if they require surgical intervention. In such cases, there may be a necessity for periodic orthopedic evaluation.

### **Input was provided by:**

- Occupational Therapy Clinic
- Physical Therapy Clinic
- Orthopedic Clinic
- Family Practice Clinic

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## **Musculoskeletal Treatment Guidelines**

- Okubo Clinic
- 555 Engineers
- 1<sup>st</sup> Brigade
- 3<sup>rd</sup> Brigade
- 62<sup>nd</sup> Medical Brigade

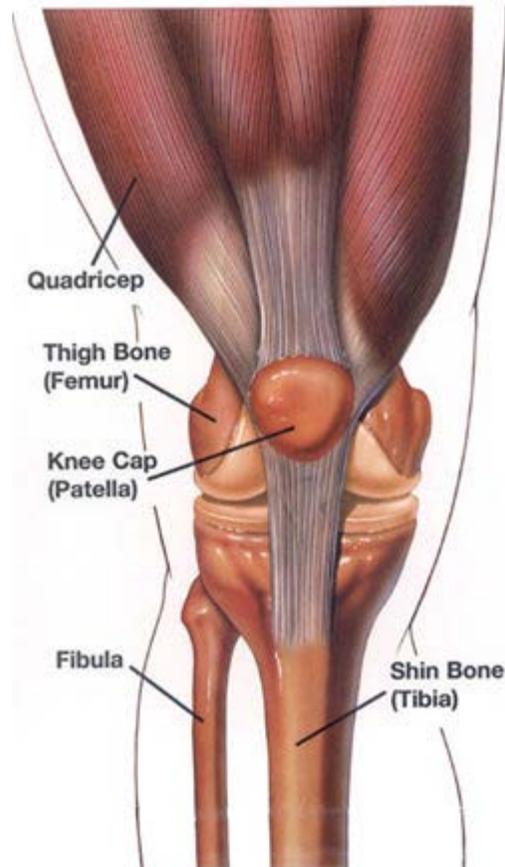
### **POC:**

- Outcome Management

### **References:**

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

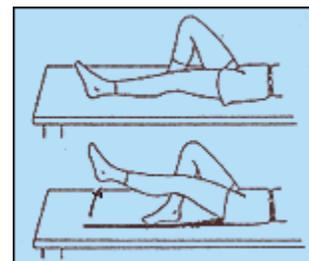
# Madigan Army Medical Center Musculoskeletal Treatment Guidelines



## 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.



# Madigan Army Medical Center

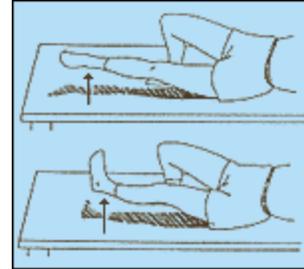
## Musculoskeletal Treatment Guidelines

Slowly add weights to ankles to increase resistance.

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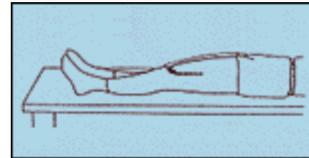
### 2. Straight Leg Raise -- With Internal and External Rotation

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.)



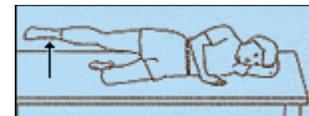
### 3. Quadriceps Set -- Knee Extension

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

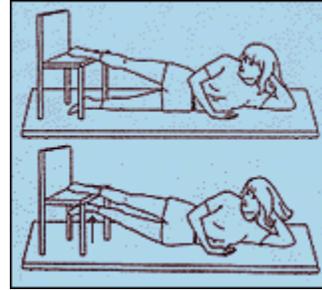
Lie on left side with bottom knee bent, Raise top leg. Keep knee straight and toes pointed forward. Do not let top hip roll backward. Hold this position for six seconds. Do six repeats and then switch sides. Progress slowly to just under 1 Kg at the ankle. (Check weights with physiotherapist.)



# Madigan Army Medical Center Musculoskeletal Treatment Guidelines

## 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

<b>PHYSICAL PROFILE</b> <small>For use of this form, see AR 40-501, the proponent agency is the Office of The Surgeon General</small>																																
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6. AEROBIC CONDITIONING EXERCISES	7. FUNCTIONAL ACTIVITIES	8. TRAINING HEART RATE FORMULA																														
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DA FORM 3349, MAY 86

REPLACES DA FORM 5302-R (TEST) DATED FEB 84 AND DA FORM 3349 DATED 1 JUN 80, WHICH ARE OBSOLETE

USAP PC V1.00

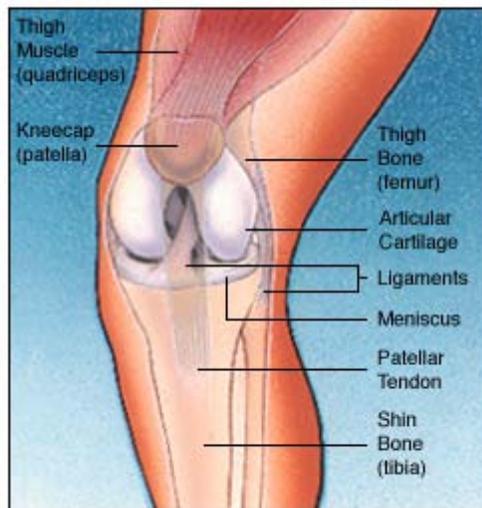
# Madigan Army Medical Center

## Musculoskeletal Treatment Guidelines

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### How the Normal Knee Works

The knee is the largest joint in the body. Nearly normal knee function is needed to perform routine everyday activities. The knee is made up of the lower end of the thighbone (*femur*), which rotates on the upper end of the shinbone (*tibia*), and the kneecap (*patella*), which slides in a groove on the end of the femur. Large ligaments attach to the femur and tibia to provide stability. The long thigh muscles give the knee strength.



Normal Knee Anatomy

The joint surfaces where these three bones touch are covered with *articular cartilage*, a smooth substance that cushions the bones and enables them to move easily.

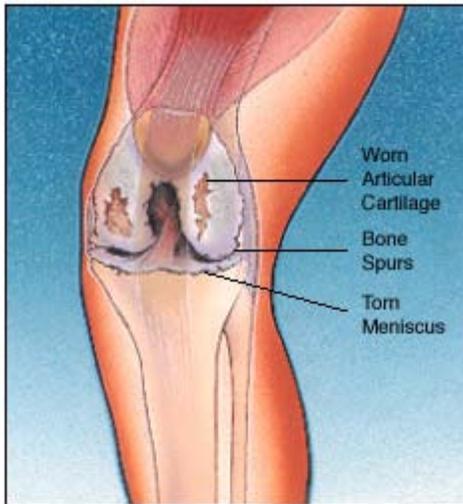
All remaining surfaces of the knee are covered by a thin, smooth tissue liner called the *synovial membrane*. This membrane releases a special fluid that lubricates the knee which reduces friction to nearly zero in a healthy knee.

Normally, all of these components work in harmony. But disease or injury can disrupt this harmony, resulting in pain, muscle weakness, and less function.

# Madigan Army Medical Center Musculoskeletal Treatment Guidelines

## Common Causes of Knee Pain and Loss of Knee Function

The most common cause of chronic knee pain and disability is *arthritis*. Osteoarthritis, rheumatoid arthritis, and traumatic arthritis are the most common forms.



Knee with Arthritis

**Osteoarthritis** usually occurs after the age of 50 and often in an individual with a family history of arthritis. The cartilage that cushions the bones of the knee softens and wears away. The bones then rub against one another causing knee pain and stiffness.

**Rheumatoid Arthritis** is a disease in which the synovial membrane becomes thickened and inflamed, producing too much synovial fluid which over-fills the joint space. This chronic inflammation can damage the cartilage and eventually cause cartilage loss, pain and stiffness.

**Post Traumatic Arthritis** can follow a serious knee injury. A knee fracture or severe tears of the knee's ligaments may damage the articular cartilage over time, causing knee pain and limiting knee function.

## KNEE EXERCISES FOR PATIENTS

# Knee Exercises

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## 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.

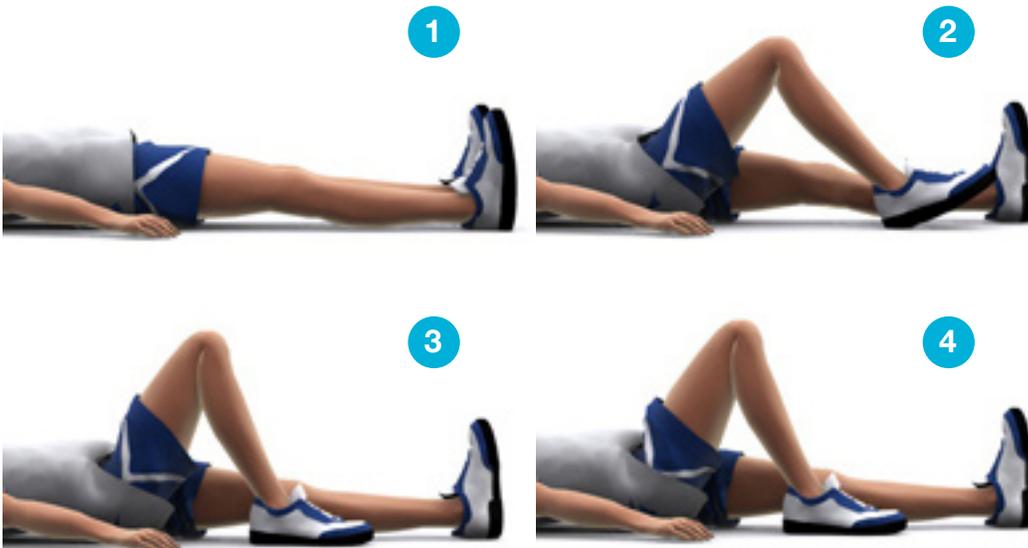
## Short Arc Quads

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

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## 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.

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