

Madigan Army Medical Center

Musculoskeletal Treatment Guidelines

LOWER LEG MUSCLE STRAINS

Diagnosis/Definition

- A muscle strain is a partial tear of muscle fibers caused by forceful stretching of an already contracted muscle. Suboptimal flexibility is thought to be a predisposing factor. The gastrocnemius, because it crosses two joints, is especially vulnerable.

Initial Diagnosis and Management

- History and physical examination.
- Plain films if necessary
- Encourage active range of motion.
- Appropriate restrictions of activity.

Ongoing Management and Objectives

- Rest is individualized depending upon severity
- Immobilization is contraindicated in minor injuries however crutches should be used if ambulation is painful.
- A significant gastrocnemius tear is sometimes treated with long leg cast immobilization with the knee flexed at 60 degrees and the ankle in neutral for 3 weeks. This is followed by another 3 weeks with a boot cast and the ankle plantarflexed 10 degrees. Complete tears may require surgical repair.
- Ice for 10 to 15 minutes with hourly reapplication.
- Elevate leg frequently with compressive wraps.
- Slow and sustained active stretches

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

- Weeks 1-6
 - Restrict jumping and running
 - No road marching
 - Walking to tolerance after leg cast/boot cast removed

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- Swimming recommended

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

- To Physical Therapy: Routine referral for rehabilitation.
- Orthopedic Surgery referral for all Grade III sprains and any grade if plain radiographs are suggestive of any pathology.

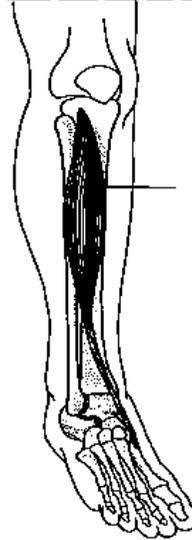
Referral criteria for Return to Primary Care

- Completed specialty care.

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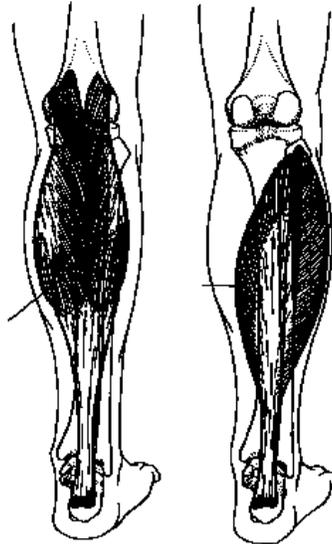
Anterior Lower Leg Muscle

- Tibialis Anterior



Posterior Lower Leg Muscles

- Gastrocnemius
- Soleus



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Lower Leg Exercises

Lower Leg Exercises			
1	Seated Calve Raise		Seated Calve Raise
2A	Smith Machine Standing Calve Raises		<p>Standing Calve Raise - Using the smith machine and the shoulder pad as shown takes some of the stress off of the back and neck area. This also takes the risk off of trying to balance heavy weights. Shown in this photo is the lower of flexed phase of the lift.</p>
	Mid Position and Finished Position		

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3	Free Standing DB Calve Raises			<p>The objective of free standing calve raises is primarily joint stabilization. Hockey is a game of balance and the stronger the ankles the better the transfer of power into skating skills. Using dumbbells, raise and lower body weight as shown feeling slight stretch at bottom (SLIGHT) and extending to full contraction. Down slowly in control and explode upwards.</p>
4	Toe Raise (anterior tibia)			<p>This exercise is used for primarily for skating skills that utilize foot/ankle flexion such as gliding, stopping, control skating etc. The muscles on the front of the leg provide stability during execution. On tight turn skills, this muscle is the primary mover on the punch in. Extend and flex as shown. Hold at top of position for 1 second. This exercise can be perform standing as in (3) but more sport specific when knees flexed.</p>

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PHYSICAL PROFILE			
For use of this form, see AR 40-501, the proponent agency is the Office of The Surgeon General			
1. MEDICAL CONDITION LOWER LEG MUSCLE STRAINS	2.	P	U
		L	H
		E	S
3. ASSIGNMENT LIMITATIONS ARE AS FOLLOWS WEEKS 1 -4 , RESTRICT JUMPING AND MARCHING, NO ROAD MARCHING, RECOMMEND SWIMMING, WALKING TO TOLERANCE.		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			
<input checked="" type="checkbox"/> Groin Stretch	<input checked="" type="checkbox"/> Thigh Stretch	<input checked="" type="checkbox"/> Lower Back Stretch	<input checked="" type="checkbox"/> Neck & Shoulder Stretch
<input checked="" type="checkbox"/> Hip Raise	<input checked="" type="checkbox"/> Quads Stretch & Bal.	<input checked="" type="checkbox"/> Single Knee to Chest	<input checked="" type="checkbox"/> Upper Back Stretch
<input checked="" type="checkbox"/> Knee Bender	<input checked="" type="checkbox"/> Calf Stretch	<input checked="" type="checkbox"/> Straight Leg Raise	<input checked="" type="checkbox"/> Chest Stretch
<input type="checkbox"/> Side-Straddle Hop	<input checked="" type="checkbox"/> Long Sit	<input checked="" type="checkbox"/> Elongation Stretch	<input checked="" type="checkbox"/> One-Arm Side Stretch
<input type="checkbox"/> High Jump	<input checked="" type="checkbox"/> Hamstring Stretch	<input checked="" type="checkbox"/> Turn and Bounce	<input checked="" type="checkbox"/> Two-Arm Side Stretch
<input type="checkbox"/> Jogging in Place	<input checked="" type="checkbox"/> Hams. & Calf Stretch	<input checked="" type="checkbox"/> Turn and Bend	<input checked="" type="checkbox"/> Side Bender
<input checked="" type="checkbox"/> Neck Stretch	<input checked="" type="checkbox"/> Ankle Stretch	<input checked="" type="checkbox"/> Hip Stretch	<input checked="" type="checkbox"/> Upper Body Wt Tng
<input checked="" type="checkbox"/> Lower Body Wt Tng	<input checked="" type="checkbox"/> All		
6. AEROBIC CONDITIONING EXERCISES		7. FUNCTIONAL ACTIVITIES	
<input checked="" type="checkbox"/> Walk at Own Pace and Distance		<input checked="" type="checkbox"/> Wear Backpack (40 Lbs.)	
<input checked="" type="checkbox"/> Run at Own Pace and Distance		<input checked="" type="checkbox"/> Wear Helmet	
<input checked="" type="checkbox"/> Bicycle at Own Pace and Distance		<input checked="" type="checkbox"/> Carry Rifle	
<input checked="" type="checkbox"/> Swim at Own Pace and Distance		<input checked="" type="checkbox"/> Fire Rifle	
<input checked="" type="checkbox"/> Walk or Run in Pool at Own Pace		With Hearing Protection	
<input type="checkbox"/> Unlimited Walking		<input type="checkbox"/> KP/Mopping/Mowing Grass	
<input type="checkbox"/> Unlimited Running		<input type="checkbox"/> Marching Up to <u>2</u> Miles	
<input type="checkbox"/> Unlimited Bicycling		<input checked="" type="checkbox"/> Lift Up to <u>15</u> Pounds	
<input type="checkbox"/> Unlimited Swimming		<input type="checkbox"/> All	
<input type="checkbox"/> Run at Training Heart Rate for ___ Min.		PHYSICAL FITNESS TEST	
<input type="checkbox"/> Bicycle at Training Heart Rate for ___ Min.		<input type="checkbox"/> Two Mile Run	
<input type="checkbox"/> Swim at Training Heart Rate for ___ Min.		<input type="checkbox"/> Walk	
		<input checked="" type="checkbox"/> Push-Ups	
		<input checked="" type="checkbox"/> Sit-Ups	
		<input type="checkbox"/> Swim	
		<input type="checkbox"/> Bicycle	
8. TRAINING HEART RATE FORMULA			
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	
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	
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	
PATIENT'S IDENTIFICATION (For typed or written entries give: Name (last, first, middle); grade; SSN; hospital or medical facility)		UNIT	
		ISSUING CLINIC AND PHONE NUMBER	
		DISTRIBUTION	
		UNIT COMMANDER - ORIGINAL & 1 COPY	
		HEALTH RECORD JACKET - 1 COPY	
		CLINIC FILE - 1 COPY	
		MILPO - 1 COPY	

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

USAPPC V 100

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PATIENT INFORMATION

Causes

A strain is really a small tear in either the muscle or tendon, which joins the muscle to the bone. (Sprain is a stretch or tear to a ligament joining two bones together.) Poor warm-up, over stretching, or a sudden, intense contraction of the muscle can all cause stress to the muscle for which it is unprepared, resulting in a small tear. More severe strains are simply referred to as muscle tears. Tears to the hamstrings are more common than tears to the quadriceps.

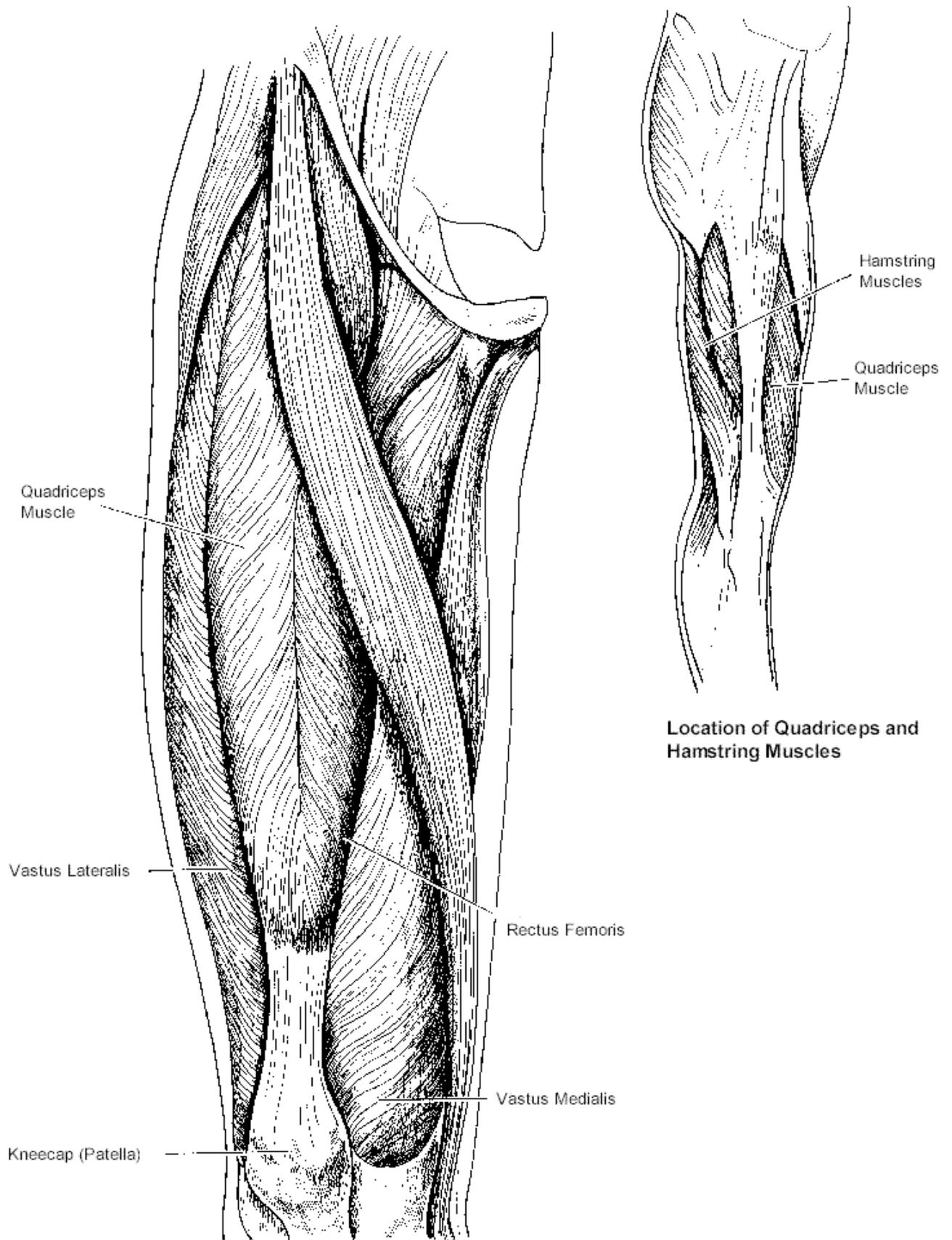
Diagnosis and Treatment

Strains are common in all three areas of the thigh with high inner thigh strains often referred to as “groin pulls.” An individual experiencing a muscle strain may or may not have instant pain or bruising. Pain will likely have increasing pain and swelling. More severe strains will have greater pain and swelling. Tears may actually be felt as a gap in the muscle with the fingers when truly severe. Use of the affected muscle is limited by pain, resulting in decreased range of motion. Typically strains occur where the muscle and tendon join, but may occur anywhere in the muscle or tendon.

While physical therapy is often beneficial for muscle strains and tears, acute management (first 48 hours) of a strain consists of RICE – Rest, Ice, Compression, and Elevation. RICE can significantly reduce the complexity of a strain by limiting inflammation, which untreated will result in increased swelling and scar tissue formation. Consult a qualified medical professional regarding treatment after the first 48 hours.

Muscle strains can often become chronic if not cared for properly, especially in body parts that are frequently used, such as the calf. Simply walking, while not being strenuous enough to cause further damage, may be enough to prevent the injury from healing properly. Additionally, premature return to high activity can often lead to re-injury.

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Location of Quadriceps and Hamstring Muscles

Anatomy of Quadriceps Muscle

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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://orthoinfo.aaos.org/fact/thr_report.cfm?Thread_ID=45&topcategory=Sports&searentry=sprains%20and%20strains