

Madigan Army Medical Center

Musculoskeletal Treatment Guidelines

LATERAL EPICONDYLITIS

Diagnosis/Definition

- An overuse injury involving the lateral epicondyle of the humerus, the wrist and finger extensor muscles and the supinator muscles.

Initial Diagnosis and Management

- History of sudden overload to wrist or finger extensors or the supinators.
- Physical examination.
- Tenderness over the lateral epicondyle of humerus.
- Pain with use of the wrist or finger extensors or supinators.
- Pain with resistance to the finger or wrist extensors or the supinator muscles.
- Loss of function of wrist or finger extension or palpable gap in the muscle.
- History of chronic use of the wrist or finger extensors or supinators.

Ongoing Management and Objectives

- Flexibility exercises for wrist and finger extensors and supinator muscles
- Strengthening exercises for wrist and finger extensor and supinator muscles.
- Physical therapy procedures
- Proper conditioning

Indication a profile is needed

- Any limitations that affect strength, range of motion, and general efficiency of upper arms.
- Slightly limited mobility of joints, muscular weakness, or other musculo-skeletal defects that may prevent hand-to-hand fighting and disqualifies for prolonged effort.
- Defects or impairments that require significant restriction of use

Specifications for the profile

- Week 1-4
 - No pushups or pull-ups or weight lifting with upper body
 - Limited lifting
 - Limit duties requiring repeated supination/pronation at forearm
 - Caution with activities requiring wrist and hand grip use e.g. driving

Patient/Soldier Education or Self care Information

- Please see attached sheet

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- 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

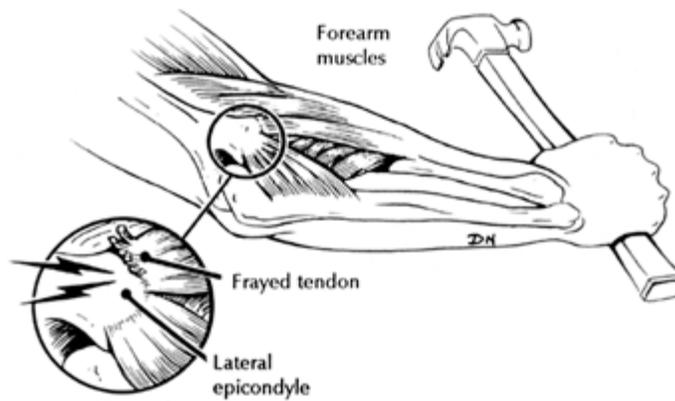
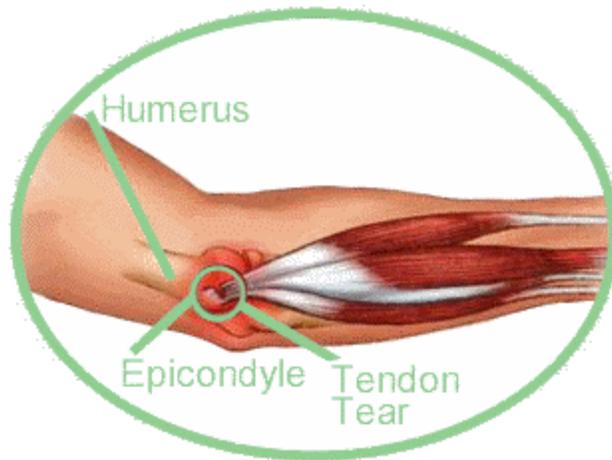
Indications for referral to Specialty Care

- If patient exhibits pain, sensory changes or decrease in AROM or strength, to the upper extremity refer to Occupational Therapy for evaluation and treatment.
- No relief with 3-4 weeks then refer to Occupational Therapy.

Referral criteria for Return to Primary Care

- Resolution of symptoms.

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Madigan Army Medical Center Musculoskeletal Treatment Guidelines Information and Exercise

EXERCISE

Epicondylitis often becomes a chronic problem if not cared for properly. For this reason, it must be stressed that the rehabilitation process should not be progressed until you experience little or no pain at the level you are performing. Regaining full strength and flexibility is critical before returning to your previous level of sports activity.

In general, the rehabilitation process can be divided into three phases:

PHASE 1

Goals: decrease inflammation and pain, promote tissue healing, and retard muscle atrophy. During the acute stage of your injury, whether the medial or lateral elbow is affected, follow the **RICE** principle:

- **Rest** - this means avoiding further overuse not absence of activity. You should maintain as high an activity level as possible while avoiding activities that aggravate the injury. Absolute rest should be avoided as it encourages muscle atrophy, deconditions tissue, and decreases blood supply to the area, all of which is detrimental to the healing process. Pain is the best guide to determine the appropriate type and level of activity.
- **Ice** - is recommended as long as inflammation is present. This may mean throughout the entire rehabilitation process and return to sports. Ice decreases the inflammatory process slows local metabolism and helps relieve pain and muscle spasm.
- **Compress and elevate** if appropriate to assist venous return and minimize swelling.

PHASE 2

Goals: Improve flexibility, increase strength and endurance, increase functional activities and return to function.

Stretching

Gentle stretching exercises including wrist flexion, extension and rotation. The elbow should be extended and not flexed to increase the amount of stretch as required. These stretches should be held for 20-30 seconds and repeated 5-10 times, at least twice a day. Vigorous stretching should



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be avoided - do not stretch to the point of pain that reproduces your symptoms.

Strengthening

With the elbow bent and the wrist supported perform the following exercises:

1. *Wrist Extension.* Place 1 lb. weight in hand with palm facing downward (pronated); support forearm at the edge of a table or on your knee so that only your hand can move. Raise wrist/hand up slowly (concentric contraction), and lower slowly (eccentric contraction).



2. *Wrist Flexion.* Place 1 lb. weight in hand with palm facing upward (supinated); support forearm at the edge of a table or on your knee so that only your hand can move. Bend wrist up slowly (concentric), and then lower slowly (eccentric)(similar to exercise above).
3. *Combined Flexion/Extension.* Attach one end of a string to a cut broomstick or similar device; attach the other end to a weight. In standing, extend your arms and elbows straight out in front of you. Roll the weight up from the ground by turning the wrists. Flexors are worked with the palms facing upward. Extensors are worked with the palms facing downward.

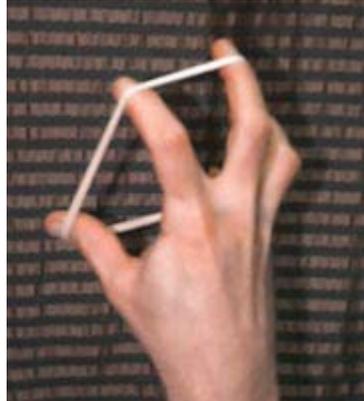
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4. *Forearm Pronation/Supination.* Grasp hammer (wrench, or some similar device) in hand with forearm supported. Rotate hand to palm down position, return to start position (hammer perpendicular to floor), rotate to palm up position, repeat. To increase or decrease resistance, by move hand farther away or closer towards the head of the hammer.



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5. *Finger Extension.* Place a rubber band around all five fingertips. Spread fingers 25 times, repeat 3 times. If resistance is not enough, add a second rubber band or use a rubber band of greater thickness which will provide more resistance.



6. *Ball Squeeze.* Place rubber ball or tennis ball in palm of hand, squeeze 25 times, repeat 3 times. If pain is reproduced squeeze a folded sponge or piece of foam.



For all of the exercises (except combined flexion\extension) perform 10 repetitions 3-5 times a day. With the combined flexion/extension perform until you feel fatigue. With all exercises use pain as your guide - all exercises should be pain free.

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When to progress. Begin with a 1 lb. weight and perform 3 sets of 10 repetitions. When this becomes easy, work up to 15 repetitions. Increase the weight only when you can complete 15 repetitions 3 times without difficulty. The axiom "No Pain No Gain" does **NOT** apply here.

After exercising, massage across the area of tenderness with an ice cube for about 5 minutes. You might also try filling a paper cup half-full with water and freeze; peel back a portion of the paper cup to expose the ice.

PHASE 3

Goals: Improve muscular strength and endurance, maintain and improve flexibility, and gradually return to prior level of sport or high level activity. Continue the stretching and strengthening exercises emphasizing the eccentric contractions of wrist flexion and extension. In this regard, since the eccentric contractions are movements with gravity, do not let the weight drop too quickly; lower the weight in a controlled fashion. With the combined wrist flexion/extension exercise, work on increasing speed when rolling up the string with the attached weight as this will improve endurance.

When your symptoms are resolved and have regained full range of motion and strength, you may gradually increase your level of playing activity. An example of one gradual progressive return to tennis is as follows:

Lateral Epicondylitis	Medial Epicondylitis
15 minutes forehand only	15 minutes backhand and lobs
30 minutes forehand only	30 minutes backhand and lobs
30 minutes forehand and two handed backhand	30 minutes backhand, lobs, forehand (no top spin)
45 minutes forehand and backhand	45 minutes backhand, lobs, forehand
45 minutes all strokes	45 minutes all stokes
Serve	Serve
Full play	Full play
Competitive play	Competitive play

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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 LATERAL EPICONDYLITIS					2.	
					P	U
					L	H
					E	S
3. ASSIGNMENT LIMITATIONS ARE AS FOLLOWS WEEKS 1 -4 , NO PUSH UPS, PULL UPS OR UPPER BODY WEIGHT LIFTING, LIMITED LIFTING, LIMITED DUTIES REQUIRING REPEATED SUPINATION OR PRONATION OF FOREARM, CAUTION WITH ACTIVITIES REQUIRING WRIST AND HAND GRIP USE.					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"/> Neck 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"/> Ankle 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 checked="" type="checkbox"/> Hip Stretch		
<input checked="" 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"/> Upper Body Wt Tng		
<input checked="" 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 checked="" type="checkbox"/> Lower Body Wt Tng		
<input checked="" 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 type="checkbox"/> All		
6. AEROBIC CONDITIONING EXERCISES		7. FUNCTIONAL ACTIVITIES		8. TRAINING HEART RATE FORMULA		
<input checked="" type="checkbox"/> Walk at Own Pace and Distance		<input checked="" type="checkbox"/> Wear Backpack (40 Lbs.)		MALES 220 FEMALES 225 MINUS (-) AGE MINUS (-) RESTING HEART RATE TIMES (X) % INTENSITY PLUS (+) RESTING HEART RATE		
<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		50% EXTREMELY POOR CONDITION 60% HEALTHY, SEDENTARY INDIVIDUAL 70% MODERATELY ACTIVE, MAINTENANCE 80% WELL TRAINED INDIVIDUAL		
<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 checked="" type="checkbox"/> Two Mile Run		<input checked="" type="checkbox"/> Wak		
<input type="checkbox"/> Swim at Training Heart Rate for ____ Min.		<input type="checkbox"/> Push-Ups		<input checked="" type="checkbox"/> Swim		
		<input checked="" type="checkbox"/> Sit-Ups		<input checked="" type="checkbox"/> Bicycle		
9. OTHER						
TYPED NAME AND GRADE OF PROFILING OFFICER		SIGNATURE			DATE	
TYPED NAME AND GRADE OF PROFILING OFFICER		SIGNATURE			DATE	
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			DATE	
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			DATE	
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

What is Tennis Elbow?

Tennis elbow is an injury to the muscles and tendons on the outside (lateral aspect) of the elbow that results from overuse or repetitive stress. The narrowing of the muscle bellies of the forearm as they merge into the tendons create highly focused stress where they insert into the bone of the elbow.

Mechanism of Injury

Lateral epicondylitis

Injury to the lateral aspect of the elbow is the most common upper extremity tennis injury. Tennis elbow is generally caused by overuse of the extensor tendons of the forearm, particularly the extensor carpi radialis brevis. Commonly experienced by the amateur player, this injury is often a result of (1) a one-handed backhand with poor technique (the ball is hit with the front of the shoulder up and power generated from the forearm muscles), (2) a late forehand swing preparation with resulting wrist snap to bring the racquet head perpendicular to the ball, or (3) while serving, the ball is hit with full power and speed with wrist pronation (palm turned downward) and wrist snap which increases the stress on the already taught extensor tendons.

It should be kept in mind that elbow epicondylitis is not limited to those persons playing tennis, golf, baseball or swimming and can result from any activity that puts the lateral or medial compartments of the elbow under similar repetitive stress and strain (e.g., hammering, turning a key, screw driver use, computer work, excessive hand shaking).

Signs and Symptoms

General

- difficulty holding onto, pinching, or gripping objects
- pain, stiffness, or insufficient elbow and hand movement
- forearm muscle tightness
- insufficient forearm functional strength
- point tenderness at or near the insertion sites of the muscles of the lateral or medial elbow

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Specific

Lateral Epicondylitis	Medial Epicondylitis
painful resisted wrist extension	painful resisted wrist flexion
painful resisted radial deviation (bending wrist toward pinky)	painful resisted forearm pronation (palm facing downward)
palpation tenderness of the lateral epicondyle	palpation tenderness of the medial epicondyle

Rehabilitation - What You Can Expect

Epicondylitis, both medial and lateral, is a common and often lingering pathologic condition. It is critical, therefore, that you progress your rehabilitation only when you experience minimal or no pain. For more on when and how to progress, see below. As a general guideline, the more chronic or longer you have experienced the condition, the longer the recovery time is to be expected (up to 8 weeks).

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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:

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- 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.nismat.org/ptcor/tennis_elbow/
- <http://www.tennis-elbow.net/tenniselbow.htm>