

# Lateral Epicondyle Tendinopathy: Summary of the Evidence for Physical Therapy Interventions

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**PURPOSE, SCOPE & DISCLAIMER:** The purpose of this document is to provide physical therapists with a summary of the evidence for interventions commonly used to manage tendinopathy of the lateral epicondyle. This decision-making tool is evidence-informed and where there is insufficient evidence, expert-informed. It is not intended to replace the clinician's clinical reasoning skills and inter-professional collaboration. 'Acute' refers primarily to symptoms of less than 3 months duration and 'chronic' to greater than 3 months. For studies which (1) included participants with symptoms that encompassed both acute and chronic stages or (2) did not clarify the duration of symptoms, the results have been reported within the 'chronic' stage.

## ABBREVIATIONS

<b>CS</b> Case study	<b>LET</b> Lateral epicondyle tendinopathy	<b>LLT</b> Low level laser therapy	<b>MA</b> Meta-analysis
<b>MWM</b> Mobilization with movement	<b>NR</b> Narrative review	<b>NSAID</b> Non-steroidal anti-inflammatory drug	<b>OS</b> Observational studies
<b>RCT</b> Randomized controlled trial	<b>SR</b> Systematic review	<b>SWT</b> Shock wave therapy	<b>US</b> Ultrasound
<b>WALT</b> World Association of Laser Therapy			

\*In the column Clinical Research Evidence the numbers in parentheses represent the number of individual studies included in each review article

Intervention	Clinical Research Evidence*	Published Expert Opinion	Take home message	Clinical Implication <small>See page 5 for description of categories</small>
<b>MANUAL THERAPY</b>				
<b>Acute</b>				
<b>Elbow joint mobilizations</b>	No	No	There is no clinical evidence to support or refute the use of elbow mobilization in the acute stage.	There is no direction provided by the literature on the use of elbow mobilization in the management of acute LET.
<b>Spinal mobilization techniques</b>	No	No	There is no clinical evidence or expert opinion on the use of spinal mobilization for patients with acute LET.	There is no direction provided by the literature on the use of spinal mobilization in the management of acute LET.
<b>Soft tissue techniques</b>	• 1 RCT		There is weak clinical evidence to support the use of deep and superficial massage to achieve immediate pain relief.	Consider using deep and superficial massage for immediate pain relieving effect in acute LET.
<b>Chronic</b>				
<b>Elbow joint mobilizations</b>	<ul style="list-style-type: none"> <li>• 4 RCT</li> <li>• 6 SR ( (21+12)</li> <li>• 1 Critically appraised topic (5)</li> </ul>		<p>There is a large amount of clinical evidence to support the use of elbow mobilizations for short-term effects. There is a small amount of evidence that supports long-term effects.</p> <p>There is a small amount of clinical evidence to support the use of radial head mobilization and neural tension techniques.</p> <p>There is weak support for the use of wrist MWM.</p>	<p>Strongly consider using MWM of the elbow as part of a multimodal treatment regime (manual therapy and exercise) in the treatment of chronic LET. The effects should be apparent within the first few treatments. (See Appendix B for details)</p> <p>Consider using radial head mobilization and neural tension techniques.</p> <p>Consider using MWM of the wrist as part of multimodal treatment regime.</p>

<b>MANUAL THERAPY: Chronic (continued)</b>				
<b>Spinal mobilization techniques</b>	<ul style="list-style-type: none"> <li>• 4 RCT</li> <li>• 1 RCT pilot</li> <li>• 1 chart review</li> <li>• 1 case series</li> <li>• 1 SR (12)</li> </ul>		There is clinical evidence to support the use of incorporating cervical and thoracic mobilizations into the treatment of LET. However, only 1 paper had follow up of $\geq 6/12$ - the others report immediate or very short term responses.	Consider using cervical mobilizations as part of a multimodal approach to treatment of chronic LET. Consider using cervical and thoracic mobilization techniques in those with cervical and/or thoracic signs even if they do not report spinal symptoms, in addition to local treatment to the elbow. <i>(See Appendix B for details)</i>
<b>Soft tissue techniques</b>	<ul style="list-style-type: none"> <li>• 3 SR (9)</li> <li>• 3 RCT</li> </ul>		<p>Early SR found insufficient evidence to make recommendations. More recent SR found there is weak clinical evidence to support the use of soft tissue techniques, such as frictions.</p> <p>There is a small amount of weak clinical evidence to support the use of soft tissue techniques in combination with other treatment modalities.</p> <p><i>Note: some of the studies which examined the effect of frictions included the use of Mill's manipulation.</i></p>	Consider using soft tissue techniques (deep transverse friction massage) as part of a multimodal treatment regime for chronic LET. <i>(See Appendix B for details)</i>
<b>EXERCISE</b>				
<b>Acute</b>				
	<ul style="list-style-type: none"> <li>• 2 RCT</li> </ul>		There is a small amount of clinical evidence to support the use of exercise in the acute stage.	Consider using exercise in the management of acute LET.
<b>Chronic</b>				
	<ul style="list-style-type: none"> <li>• 8 RCT</li> <li>• 3 SR (15+12+8)</li> <li>• 2 OS</li> </ul>		There is a large amount of clinical evidence to support the use of exercise in the chronic stage. Almost all exercise studies showed improvement whether it was concentric, eccentric or isometric strengthening. Stretching was also found to be effective.	<p>Strongly consider using exercise in the chronic stage. <i>(See Appendix C for details)</i></p> <p>Consider the use of pain-free isometric exercise for its analgesic effects, particularly in more irritable or severe cases.</p>
<b>ACUPUNCTURE</b>				
<b>Acute</b>				
		Yes	There is a plausible physiological rationale (short-term pain reduction) to support the use of acupuncture for patients with acute LET.	May consider the use of acupuncture for short-term pain relief in patients with acute LET.
<b>Chronic</b>				
	<ul style="list-style-type: none"> <li>• 1 SR (6)</li> </ul>		There is weak but consistent clinical evidence to support the use of acupuncture for pain control in patients with chronic LET.	Consider the use of acupuncture for short-term pain relief in patients with chronic LET.

<b>LOW LEVEL LASER THERAPY (LLLT)</b>				
<b>Acute</b>				
	<ul style="list-style-type: none"> <li>• 3 RCT</li> </ul>	Yes	Laser at 905 nm may be effective when used in accordance with the WALT guidelines, when used in combination with exercise.	Consider using laser (LLLT) at 905 nm with dosage as recommended by WALT guidelines. <i>(See Appendix D for details)</i>
<b>Low Level Laser Therapy (LLLT): Chronic</b>				
	<ul style="list-style-type: none"> <li>• 8 SR (+/- MA) (16+10)</li> <li>• 3 RCT</li> <li>• 1 case report</li> </ul>	1 expert opinion narrative review	Laser at 904 nm and possibly 832 nm or 830 nm may be effective when used in accordance with the WALT guidelines, and particularly if used in combination with other treatments. The evidence in support of laser is stronger when only those studies that use an appropriate dose are included.	Consider using laser (LLLT) at 904 nm with dosage as recommended by WALT guidelines. <i>(See Appendix D for details)</i>
<b>ULTRASOUND (US)</b>				
<b>Acute</b>				
	<ul style="list-style-type: none"> <li>• 2 RCT</li> </ul>		Weak evidence for effectiveness of US in the management of acute LET. 1 MHz or 3 MHz, 0.5 – 1.0 W/cm <sup>2</sup> 5-10 minutes (pulsed 1:2-1:4 suggested).	Consider using US in the management of acute LET.
<b>Chronic</b>				
	<ul style="list-style-type: none"> <li>• 6 RCT</li> <li>• 6 SR (13+9)</li> <li>• 1 short-cut review</li> </ul>		Weak evidence for effectiveness of US in the management of chronic LET. 1 MHz or 3 MHz, 1.0 – 1.5 W/cm <sup>2</sup> 5-10 minutes (continuous suggested).	Consider using US in the management of chronic LET.
<b>EXTRACORPOREAL SHOCK WAVE THERAPY (SWT) – Focused and Radial</b>				
<b>Acute</b>				
	<ul style="list-style-type: none"> <li>• 1 RCT</li> </ul>		Studies that have included subjects with a short period of lateral elbow pain (e.g., < 1 month) have not shown any benefit of SWT.	Consider NOT using SWT for acute stage. SWT in early onset of symptoms does not improve lateral elbow pain.

**EXTRACORPOREAL SHOCK WAVE THERAPY (SWT) – Focused and Radial (continued)**

<b>Chronic</b>			
	<ul style="list-style-type: none"> <li>• 7 RCT</li> <li>• 1 RCT Pilot</li> <li>• 4 SR (8+17)</li> <li>• 2 comparative Studies</li> </ul>		<p>The benefits from SWT are dose-dependent. Most studies and reviews of high energy SWT (&gt; 0.17 mJ/mm<sup>2</sup>) do not support SWT for lateral elbow pain compared to low energy SWT (&lt; 0.15 mJ/mm<sup>2</sup>). Studies suggest that the use of anesthetic at the treatment site diminishes the effect of SWT. Studies also suggest that the delivery of focused or radial energy sources is equivalent. There is conflicting evidence for the use of low energy SWT for lateral elbow pain, and a need to create consistent protocols when comparing treatment outcomes. Qualitative reviews of low energy SWT with similar study designs support SWT. Systematic reviews that pool data in studies with dissimilar designs by meta-analysis do not support SWT for lateral elbow pain. An adequate follow-up time &gt;3 months is recommended to measure the benefit of SWT.</p> <p>Consider using low energy SWT for subjects that have failed to respond to other conservative treatment; however, the patient should be informed that SWT is experimental.</p> <p><i>Recommended dosage:</i></p> <ul style="list-style-type: none"> <li>• Low energy SWT (focused or radial) &lt;0.1.5 mJ/mm<sup>2</sup></li> <li>• 2,000 shocks</li> <li>• 3 sessions, weekly intervals</li> </ul>

**IONTOPHORESIS USING DEXAMETHASONE**

<b>Acute</b>			
	<ul style="list-style-type: none"> <li>• 1 RCT</li> </ul>		<p>A small amount of evidence supports the delivery of corticosteroid (Dexamethasone) by iontophoresis to treat acute lateral elbow pain for short term pain reduction, allowing the subject to participate in an earlier increase in exercise activity or return to work. Iontophoresis may have advantages over injection (less pain, decreased trophic changes in tissue), but may not be as cost effective.</p> <p>Consider a trial of iontophoresis with Dexamethasone for short-term pain control for acute LET.</p> <p><i>Recommended dosage:</i></p> <p>0.4% Dexamethasone Sodium Phosphate (aqueous)            40-80 mA-min            4-6 sessions, alternate days</p> <p>Physician prescription required.</p>
<b>Chronic</b>			
	<ul style="list-style-type: none"> <li>• 1 RCT</li> <li>• 1 comparative Study</li> </ul>		<p>Application of iontophoresis with Dexamethasone for degenerative lateral elbow tendon pain has no long term benefit and may be no better than placebo. Studies comparing the delivery of corticosteroids for lateral elbow pain by iontophoresis or by injection have similar outcomes. In general, corticosteroids for chronic lateral elbow tendinopathy are not supported in the literature. (See Appendix C- Medical Interventions - corticosteroids.)</p> <p>Consider NOT using iontophoresis with Dexamethasone for the treatment of chronic LET.</p>

IONTOPHORESIS USING NSAID OR LIDOCAINE				
<b>Acute</b>				
	<ul style="list-style-type: none"> <li>• 2 comparative studies</li> <li>• 1 experimental study</li> </ul>		<p>There is a small amount of weak evidence to support the delivery of NSAID (Diclofenac, Salicylate, Naproxen) or local analgesic (Lidocaine) by means of iontophoresis for LET. Studies demonstrate short term benefit in pain management, which may be beneficial in early stages of treatment. No long term benefit is proven. Studies generally are designed with other concurrent treatment, so that the effects of iontophoresis of these drugs are inconclusive. In addition, studies of iontophoresis using NSAID involved a high number of treatments.</p>	<p>May consider a trial of iontophoresis with NSAIDs or Lidocaine for short term pain control for acute LET.</p> <p>Physician prescription required.</p> <p>Gel forms of NSAIDS should not be used for iontophoresis.</p>
<b>Chronic</b>				
		Yes	<p>The studies using iontophoresis to deliver NSAID or Lidocaine do not adequately differentiate acute versus chronic conditions of LET. The physiological rationale for using NSAID may be applicable in the acute phase, but inflammatory cells are not considered part of the pathology in chronic LET.</p>	<p>May consider a trial of iontophoresis with NSAID's or Lidocaine for the treatment of chronic LET for short term pain control.</p> <p>Physician prescription required.</p> <p>Gel forms of NSAIDS should not be used for iontophoresis.</p>
ORTHOTIC DEVICES				
<b>Acute</b>				
	<ul style="list-style-type: none"> <li>• 4 RCT</li> </ul>		<p>There is some clinical evidence to support the use of splinting for pain relief for patients with acute LET.</p>	<p>Consider the use of splinting for patients with acute LET.</p>
<b>Chronic</b>				
	<ul style="list-style-type: none"> <li>• 2 SR (7)</li> <li>• 4 RCT</li> </ul>		<p>There is some clinical evidence and expert advice to support the use of a counterforce brace in patients with chronic LET.</p>	<p>Consider the use of a counterforce brace for patients with chronic LET. <i>(See Appendix E for details)</i></p>
TAPING				
<b>Acute</b>				
		No	<p>There is no clinical evidence or expert opinion on the use of taping for patients with acute LET.</p>	<p>There is no direction provided by the literature on the use of taping in the management of acute LET.</p>
<b>Chronic</b>				
	<ul style="list-style-type: none"> <li>• 2 RCT</li> <li>• 2 experimental studies</li> </ul>		<p>There is clinical evidence to support the use of taping for patients with chronic LET.</p>	<p>May consider a trial of taping for patients with chronic LET.</p>

<b>RELEVANT OUTCOME MEASURES</b> (See Appendix E for details)	<b>EXPLANATION OF CLINICAL IMPLICATIONS</b>
<p data-bbox="86 125 1236 178"><i>Note: The following outcome measures have been selected as they are commonly reported in the literature, supported by expert clinical opinion and used extensively clinically.</i></p> <p data-bbox="86 203 1236 227">Performance based impairment measures such as:</p> <ul data-bbox="136 235 1236 332" style="list-style-type: none"> <li>• Pain-free grip strength</li> <li>• Pain with isometric wrist extension (Thomsen test)</li> <li>• Pain with isometric middle finger extension (Maudsley test)</li> </ul> <p data-bbox="86 365 1236 389">Pain rating outcome measures such as:</p> <ul data-bbox="136 397 1236 462" style="list-style-type: none"> <li>• Numeric Pain Rating Scale (NPRS)</li> <li>• Visual Analog Scale (VAS)</li> </ul> <p data-bbox="86 487 1236 511">Self-report questionnaires such as:</p> <ul data-bbox="136 527 1236 836" style="list-style-type: none"> <li>• The Upper Limb Functional Index (ULFI) <a href="http://www.users.muohio.edu/smithdl2/images/articles/UpperLimbFunctionalIndex.pdf">http://www.users.muohio.edu/smithdl2/images/articles/UpperLimbFunctionalIndex.pdf</a></li> <li>• Patient Rated Tennis Elbow Evaluation (PRTEE) <a href="http://www.srs-mcmaster.ca/Portals/20/pdf/research_resources/PRTEE.pdf">http://www.srs-mcmaster.ca/Portals/20/pdf/research_resources/PRTEE.pdf</a></li> <li>• QuickDASH (Disabilities of the Arm Shoulder and Hand) <a href="http://www.dash.iwh.on.ca/conditions-use">http://www.dash.iwh.on.ca/conditions-use</a></li> <li>• Patient Specific Functional Scale (PSFS)** <a href="http://www.tac.vic.gov.au/upload/Patient-specific.pdf">http://www.tac.vic.gov.au/upload/Patient-specific.pdf</a></li> </ul>	<p data-bbox="1241 170 2009 235"><b>Strongly consider:</b> High level/high quality evidence that this should be included in treatment.</p> <p data-bbox="1241 284 2009 349"><b>Consider:</b> Consistent lower level/lower quality or inconsistent evidence that this should be included in treatment.</p> <p data-bbox="1241 397 2009 495"><b>May consider:</b> No clinical evidence but expert opinion and/or plausible physiological rationale that this should be included in treatment.</p> <p data-bbox="1241 544 2009 609"><b>Consider NOT:</b> High level/high quality evidence that this should not be included in treatment.</p>

\*\*Although the Patient Specific Functional Scale has not yet been validated for lateral epicondylalgia, it has been shown to be valid, reliable and responsive to change in other conditions such as knee dysfunction, cervical radiculopathy, acute low back pain, mechanical low back pain, and neck dysfunction.

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### MANUAL THERAPY

#### *Elbow MWM*

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## EXERCISE

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## LOW LEVEL LASER THERAPY (LLLT)

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