Clinical Practice Guidelines for Conservative Management of Lateral Elbow Tendinopathy

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Purpose
• Describe evidence-informed PT practice for LET—diagnosis, prognosis, intervention, and assessment of outcome
• Identify interventions supported by current best evidence to address—impairments, activity limitations, and participation restrictions
• Create reference for best practice for educators, policy makers, payers, and clinicians

Challenges
• Variety of nomenclature—-itis, -osis, -algia, tendinopathy, enthesis, common extensor tendon, lateral elbow pain
• No well developed operational definitions for time course
• Extensive amount of articles available for LET
• Variability in levels of evidence—Scientific commentary to systematic reviews

CPG Key Search Terms
• Tendonitis
• Tendinopathy
• Tendonopathy
• Tendinosis
• Tendinalgia
• Peritendinitis
• Enthesiopathy
• Elbow pain
• Tennis elbow
• Lateral Epicondylitis
• Lateral Epicondylitis

Structure of CPG
• Clinical Guidelines—Impairment-Function-Based Diagnosis
—Examination
—Interventions
• Summary of Recommendations
• Author/Reviewer Affiliations and Contacts
• References

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Levels of Evidence
I. Evidence obtained from high-quality diagnostic studies, prospective studies, or randomized controlled trials
II. Evidence obtained from lesser-quality diagnostic studies, prospective studies, or randomized controlled trials (e.g., weaker diagnostic criteria and reference standards, improper randomization, no blinding, less than 80% follow-up)
III. Case-control studies or retrospective studies
IV. Case series
V. Expert opinion

Grades of Evidence
A. Strong evidence: A preponderance of level I and/or level II studies support the recommendation. This must include at least 1 level I study
B. Moderate evidence: A single high-quality randomized controlled trial or a preponderance of level II studies support the recommendation
C. Weak evidence: A single level II study or a preponderance of level III and IV studies, including statements of consensus by content experts, support the recommendation
D. Conflicting evidence: Higher-quality studies conducted on this topic disagree with respect to their conclusions. The recommendation is based on these conflicting studies
E. Theoretical/foundational evidence: A preponderance of evidence from animal or cadaver studies, from conceptual models/principles, or from basic science/bench research supports this conclusion
F. Expert opinion: Best practice based on the clinical experience of the guidelines development team

Part 1: Introduction
- Pathoanatomical Features
  - Challenge: limited clinical utility
- Co-morbidities
- Time Course - challenge
- Risk Factors
- Prevalence/Incidence
- Epidemiology

Part 2: Tests/measures; outcome measures
- functional limitations/restricted activity, differential diagnosis, and prognosis
  - Objective findings that help direct patient specific care
  - Measures to support clinical decisions
  - Justify treatment goals
  - Tool for patient education

Challenge to Establish and Make Recommendations for Prognosis Due to Lack of Classification Schema

Part 3: Recommendations
- Challenge: Variety of treatment approaches for this condition; prioritized SRs and RCTs
- Goal is to provide evidence for the best available current research on specific topics
- Combined treatment approaches
  - Modalities: ultrasound
  - Manual techniques: TFM
  - Specific exercises: eccentric loading, isometrics, stretching
  - Bracing
  - Education

November 2015 Issue
Integrative Model of Lateral Epicondylalgia
Coombs, Bisset, Vincenzino, 2007

Morphologic changes; strength imbalance; motor control; upper limb use changes

Neovascularization
Fedorczyk, JOR, 2010

Location of Tendinosis
Enthesis = insertion/origin into bone = osteotendinous junction
• Tendon inserts into bone not covered by periosteum with hyaline cartilage interposed between bone and tendon
• Plantar fasciitis, lateral and medial elbow tendinopathy are common enthesiopathies

Location of Tendinosis
“Midsubstance” = musculotendinous junction or any where within the tendon just not the enthesis
• Nodules may be present
• Achilles, Patellar, Rotator Cuff

Collagen Type Varies by Location
Tendon: I
Myotendinous: I, III, IV, V
Junction: II
Enthesis: II

Part 1: Introduction
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Scott, et al. JOSPT, Nov. 15, p. 834
ECRB Most Commonly Implicated Tendon

CET slides against capitellum during elbow motion
ECRB vulnerable
Limited vascular supply to under surface of ECRB

Erak, 2004
Anatomical study: superficial head of supinator contributes significant tensile forces to the CET origin

Suggested Time Course
Scott, et al. JOSPT, Nov. 15, p. 834

Acute, less than 4 wk
Subacute, 5 to 12 wk
Chronic, greater than 12 wk
Acute on chronic

“rooted in evidence, but not validated”

Co-Morbidities
• Inflammatory Diseases
• Rheumatologic Disorders
• Diabetes Mellitus and other Metabolic Disorders
• Smoking
• Obesity
• Medications
  – Statins, Corticosteroids, Fluoroquinolones
• Cervical Radiculopathy

Physical Load Factors
• Repetitive Forceful Gripping or Elbow Motion
• Constrained position of upper limb
• Cold Temperatures
• Equipment changes
• Poor technique
Intrinsic Factors

Individual characteristics:
Age
Muscle Flexibility, Strength or Imbalances
Changes in practice (loading tendon)

Incidence (Smidt 2011)
• Annual incidence 1-3% of general population
• About 5% tennis players
• 5 to 8 per 1000 patients per year
• 12 -13 per 1000 patients per year for people between 40 to 50 years

Intervention Recommendations

Exercise alone

A Strong Evidence
• Clinicians should use therapeutic resisted exercises to the forearm wrist extensors
  – All types of resistance exercises appear to have a positive effect on pain intensity, grip strength, and function. 1-4
  – There is not sufficient evidence to confidently outline the optimal dosage parameters

Intervention Recommendations

Exercise as part of a multimodal treatment approach

A Strong Evidence
• Clinicians should use therapeutic resisted exercises to the forearm wrist extensors
  – All types of resistance exercises appear to have a positive effect on pain intensity, grip strength, and function. 1-4
  – There is not sufficient evidence to confidently outline the optimal dosage parameters

Intervention Recommendations

Exercise

C Weak Evidence
• Strengthening of the entire upper extremity kinetic chain may be beneficial in improving outcomes in patients with lateral elbow tendinopathies.9
• Insufficient clear evidence supporting or refuting the benefit of a stretching component to the exercise program.

Intervention Recommendations

Manual Therapy - Local Joint Mobilization/Manipulation

0 Conflicting Evidence
• Local mobilization or manipulation of the elbow seems to have a positive effect as a stand-alone or adjunctive treatment in improving pain, grip strength and function in the short term. 1,4,7,10,11,14
Intervention Recommendations

**Manual Therapy - Distant Joint Mobilization/Manipulation**

**Conflicting Evidence**
- Cervical and thoracic spine manipulation appear to be a useful add on to local treatment. 1,10,15
- Wrist manipulation may have a positive effect on pain in the short term 1,10,11

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**Manual Therapy - Soft Tissue Mobilization**

**Conflicting Evidence**
- Conflicting evidence exists regarding the use of soft tissue mobilization for the treatment of lateral elbow tendinopathy. 7,16-19
  - The isolated effect of transverse friction massage has not been examined in the literature.
  - Weak evidence supports the use of myofascial release techniques to decrease pain and functional disability.18

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**Orthoses**

**Conflicting Evidence**
- Based on conflicting and low level evidence, the use of a wrist, elbow or forearm orthosis may be of benefit in improving pain free grip strength and function in the short term in individuals with lateral elbow tendinopathy.4,20-25

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**Taping**

**Weak Evidence**
- Therapist may use taping early. In the short term, rigid diamond taping technique can be used to increase pain free grip strength and wrist extension force 26-27

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**Modalities - Thermal**

**Moderate Evidence**
- Clinicians may consider the use of cryotherapy, which seems to be as effective as exercise in reducing pain within the first 6 weeks of symptom onset, depending on patient preferences.28-29
  - There is no evidence to suggest that the use of cryotherapy or heat has any adverse effect when used with patients who have lateral elbow tendinopathy.

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**Modalities - Ultrasound**

**Conflicting Evidence**
- Evidence exists supporting the effectiveness of ultrasound in improving pain, pain-free grip strength and increasing function1,5,26,31-33
  - Study designs varied in terms of whether ultrasound was performed in isolation or as an adjunct to exercise, orthotic or massage
Intervention Recommendations

**Modalities - Phonophoresis**

- **D Conflicting Evidence**
  - Until further evidence supports its use, therapists should not use phonophoresis for the treatment of lateral elbow tendinopathy.
  - Based on moderate evidence against and weak evidence for using phonophoresis [4, 26, 34-36].

**Modalities - Iontophoresis**

- **C Weak Evidence**
  - Therapists the use iontophoresis with an anti-inflammatory drug may be effective in the short-term (2 weeks), but does not seem to have a positive effect after 4 weeks. [5, 12, 26, 38].

**Modalities - TENS**

- **C Weak Evidence**
  - Clinicians may use high or low frequency TENS to acupuncture points in the short term [31, 39].
  - High frequency TENS over area of pain does not appear to be effective.

**Modalities - Low Level Laser**

- **D Conflicting evidence**
  - There is evidence both for and against the use of low-level laser for the management of lateral elbow tendinopathy for short-term (6-8 weeks) effects on pain, grip strength and global improvement. [5, 26, 31, 40-42].
  - Parameters of 904nm wavelength and 2-100m W/cm² power density may be associated with positive results. [4, 40].

**Dry Needling**

- **C Weak Evidence**
  - Clinicians may consider the use of dry needling in the context of a multimodal treatment program to improve short and mid-term pain, painfree grip strength, and function [45-47].

**Ergonomics**

- **C Weak Evidence**
  - Clinicians may consider the use of ergonomic instructions, frequent work breaks, and work station modifications to reduce stresses on the lateral elbow. [32-36].
Relative REST
• Rest from aggravating activities not from movement
• Activity Modification
  – Self selected
  – Patient Education
  – Secondary to orthotic intervention or limb positioning

“The consensus is that management of tendinopathy should optimally involve addressing loading of the tendon.”
Bill Vicenzino, JOSPT, Nov. ’15, p. 816

Wait and See?

Corticosteroid Injection
Therapy: pulsed US, DFM, exercise (9 visits, 30min)
Wait and See: patient education about aggravating activities

6 week follow up  92%  > 47%  > 32%
1 year follow up  69%  > 91%  > 83%

Summary Statement
• “Multiple interventions have been investigated for the treatment of lateral elbow tendinopathy. Despite multiple randomized control trials, systematic reviews and meta-analyses of this literature, there is not one intervention that stands out as superior to others. The need for multiple interventions seems to reflect the multifactorial etiology of the condition.”