APPENDIX G

Treatment of Lateral Elbow Tendinopathy: Medical and Surgical Interventions

The purpose of this document is to provide information for physiotherapists of common medical and surgical interventions used by physicians in the management of lateral elbow tendinopathy strategies (see “Lateral Elbow Tendinopathy: Summary of the Evidence for Physical Therapy Interventions”).

### Pharmacological Approaches

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<th>Intervention</th>
<th>Method</th>
<th>Proposed Mechanism</th>
<th>Benefit: Pros/Cons</th>
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</thead>
</table>
| NSAIDs       | Oral or topical application | Interrupts the main pathway of inflammation by inhibiting the action of cyclooxygenases. | **PROS:**  
- Inexpensive, easily accessible.  
**CONS:**  
- Precautions and contra-indications that accompany specific medications.  
- Increased risk of gastrointestinal complications. | Weak evidence for temporary pain relief in lateral elbow tendinopathy.  
Insufficient evidence to make a recommendation  
Relative effectiveness of oral vs. topical application has not been examined. | General knowledge of commonly used NSAIDS is important for treatment planning. NSAIDs are not curative for this condition and there is no evidence of sustained benefit in the long term. |

**References:**

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| Corticosteroid (injection) | Peritendinous injections | Applied locally to interrupt the inflammatory process. Reduces tendon blood flow and tissue thickening. | **PROS:**  
- Easily accessible.  
- Careful administration outside the structure of the tendon is considered ‘safe’ i.e., in the paratendon sheath.  
**CONS:**  
- Worse long-term outcomes.  
- Risk of infection (1%) ‘Universal precautions’ required.  
- Destructive; impairs tissue repair mechanism.  
- Intra-tendon injection may weaken tissue structure, with risk of tendon rupture.  
- Skin depigmentation.  
- Sub-cutaneous atrophy.  
- Post injection pain. | There is high quality evidence that local corticosteroid injections are effective for short term pain relief, but are inferior to multimodal physiotherapy in the long term (6 and 12 months).  
Repeated injections (3-6 times in 18 months) has poorer outcome than a single injection on pain reduction.  
The benefit of early pain reduction to assist in return to activity may be counter-productive due to increased risk of recurrence. | Corticosteroid injections provide short-term relief but are associated with worse long-term outcomes with a high rate of recurrence. |

**References:**
**Glycerol Trinitrate (GTN)**

Nitro-glycerine patches (1.25mg/24 hrs) applied over tendon to enhance healing.

Nitric oxide may stimulate repair by enhancing collagen synthesis in tenocytes.

**PROS:**
- GTN + exercise improve outcomes compared to exercise alone.
- Increased compliance because of ease of application. Self-applied.
- Non-invasive.

**CONS:**
- Requires repeated applications over 12 weeks.
- Potential headache as a side-effect of nitro patch.

A small amount of RCT level evidence suggests that GTN patches combined with exercise achieve clinically significant benefits compared to exercise alone.

Use of GTN may enhance exercise outcomes. If prescribed by a physician, it may be applied by a physiotherapist and used in conjunction with a multimodal exercise program.

**References:**

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**Injection Therapies**

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| Polidocanol  | Originally developed as an anaesthetic and widely used as a sclerosing agent in the treatment of varicose veins. | Ablation of neurovascular proliferation in painful tendon. | **PROS:**
- May be less damaging than corticosteroid injections.
**CONS:**
- Evidence suggests lack of efficacy. | 1 RCT: demonstrated no superiority to placebo (anaesthetic only). | PTs should have knowledge of various injection techniques to help to facilitate referral of patients to other procedures when conventional treatment fails to result in a sufficient positive response. |

**References:**
| Prolotherapy | Most common injectant is hyperosmolar dextrose with small amount of anaesthetic to induce a ‘pro-inflammatory’ proliferative cell response to assist in tissue repair. | New viable tissue is hypothesized to result from the local release of cell growth factors. Medical dextrose also has a weak sclerosing effect on vessels. | **PROS:**  
- Non-surgical option.  
- Can be performed with or without US-guided localization. US-guided technique permits localization to a specific target site. However, injections without US imaging may also be effective, even in a sub-cutaneous approach superficial to the target tissue.  
- **CONS:**  
  - Not covered by medical plans (BC); usually requires a private fee that reflects the expertise of the practitioner.  
  - Requires three or more repeated treatments, similar to other injection therapies.  
  - Expensive sonography equipment requiring an experienced operator.  
| A small amount of evidence demonstrates superiority to placebo injections. | Prolotherapy may enhance outcomes compared to using exercise alone. |

### References:

| Platelet Rich Plasma (PRP) | Centrifuge of autologous blood to collect a concentrate of the platelets and plasma. This is then injected back into the patient’s tendon. | Cellular and humoral (blood) mediators promote healing in areas of tendon degeneration. | **PROS:**  
- Non-surgical option.  
- **CONS:**  
  - Requires expensive blood processing equipment and centrifuge. Also, it is a US-guided technique requiring sonography and an experienced operator.  
| A small amount of evidence suggests that PRP injection is no more effective than placebo.  
Studies also suggest that PRP injections for lateral elbow tendinopathy are superior to corticosteroid outcomes at 1 year follow-up, due to the fact that corticosteroid injection leads to worse long-term outcomes. | General knowledge of PRP is important to assist patients in decision-making. |

### References:
### Botox (Botulinum toxin A)

| Injection of botox into the wrist extensors | Paralysis of the extensor muscles causes a period of unloading, reducing the irritation of injured tendon tissue and allowing healing to proceed. | **PROS:**  
- Non-surgical option. | **CONS:**  
- Can cause paralysis with loss of finger extension. | A small amount of evidence suggests that Botox injection is superior to placebo. | Provides another treatment option when conservative treatment has been unsatisfactory. |

### References:


### Surgical Approaches

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| Denervation   | Open incision and resection of posterior cutaneous nerve of the forearm. | Interrupts pain transmission and potential influence of nerves on failed healing response in the tendon (neurogenic inflammation) | **PROS:**  
- Short recovery compared to more invasive surgery.  
- Faster return to work.  
- Improved pain relief compared to surgical debridement. | Small amount of evidence (retrospective case series) indicates superiority to standard technique | PT may be involved in the post-op rehabilitation following surgery. |
|               |                                             |                                                                                    | **CONS:**  
- Risk of infection.                               |                                                                                      |                                                                              |

### References:


| Surgical Debridement | Incision to expose the tendon, with excision of disorganized and fibrotic tendon tissue and adhesions. | Surgery creates granulation and repair, and removes fibrotic tissue. | **PROS:**  
- High success rates reported by some centres. | Open surgery may be a successful option for patients that have failed to respond to conservative treatment. | PT may be involved in the post-op rehabilitation following surgery. |
|----------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------|
|                      |                                                                                                      |                                                                     | **CONS:**  
- Risk of infection.  
- Long post-op recovery of 3-6 months.  
- Limited data on outcomes with this procedure. |                                                                                      |                                                                              |

### References:
