## 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

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Method</th>
<th>Proposed Mechanism</th>
<th>Benefit: Pros/Cons</th>
<th>Take Home Message</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NSAIDs</strong></td>
<td>Oral or topical application</td>
<td>Interrupts the main pathway of inflammation by inhibiting the action of cyclooxygenases, providing temporary pain relief.</td>
<td><strong>PROS:</strong> • Inexpensive, easily accessible.</td>
<td>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.</td>
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<tr>
<td></td>
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<td></td>
<td><strong>CONS:</strong> • Precautions and contra-indications that accompany specific medications. • Increased risk of gastrointestinal complications.</td>
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<tr>
<td><strong>Glycerol Trinitrate (GTN)</strong></td>
<td>Nitro-glycerine patches (1.25mg/24 hrs) applied over tendon to enhance healing.</td>
<td>Nitric oxide may stimulate repair by enhancing collagen synthesis in tenocytes.</td>
<td><strong>PROS:</strong> • GTN + exercise improve outcomes compared to exercise alone. • Increased compliance because of ease of application. Self-applied. • Non-invasive.</td>
<td>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.</td>
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<tr>
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<td><strong>CONS:</strong> • Requires repeated applications over 12 weeks. • Potential headache as a side-effect of nitro patch.</td>
<td></td>
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</tbody>
</table>

**References:**
### Injection Therapies

Injection therapies may 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.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Method</th>
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<th>Benefit: Pros/Cons</th>
<th>Take Home Message</th>
</tr>
</thead>
</table>
| **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. | Corticosteroid injections provide short-term relief but are associated with worse long-term outcomes and a high rate of recurrence. |
|                       |                         |                                                                                  | **CONS:**  
- Destructive; impairs tissue repair mechanism.  
- Skin depigmentation.  
- Sub-cutaneous atrophy. |                                                                                  |
| **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. | Not widely used in many countries. |
|                       |                         |                                                                                  | **CONS:**  
- Evidence suggests lack of efficacy. |                                                                                  |

**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 for recalcitrant cases.  
**CONS:**  
• May not be covered by medical plans; usually requires a private fee that reflects the expertise of the practitioner.  
• Requires three or more repeated treatments, similar to other injection therapies.  
| 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 typically an US-guided technique requiring sonography and an experienced operator.  
• Efficacy has not been established  
| Current evidence base is controversial and limited by low quality studies with high potential for bias. |

**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.
  - Efficacy has not been established

**References:**

### Surgical Approaches

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Method</th>
<th>Proposed Mechanism</th>
<th>Benefit: Pros/Cons</th>
<th>Take Home Message</th>
<th>Implications for Physiotherapy</th>
</tr>
</thead>
</table>
| **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.
  
  **CONS:**
  - Risk of infection. | PT may be involved in the post-op rehabilitation following surgery. |

**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.
  
  **CONS:**
  - Risk of infection.
  - Long post-op recovery of 3-6 months.
  - Limited data on outcomes with this procedure. | PT may be involved in the post-op rehabilitation following surgery. |

**References:**
| Percutaneous ultrasonic tenotomy for chronic elbow tendinosis | Ultrasonic energy rapidly oscillates tip of needle at the pathology site in order to emulsify the tissue. | Surgery removes degenerated tissue in order to stimulate a healing response. | **PROS:**  
- Technique involves precise removal of tissue.  
- Can be performed in a variety of practice settings.  
- Well tolerated and significantly lowers pain.  
- Equally applicable to both medial and lateral tendinopathy. | Appears to be a safe and suitable treatment for individuals with tendinopathy.  
- Currently research cannot provide relative efficacy in comparison to other interventions.  
- Therapeutic mechanism of treatment is unclear.  
- Further research should be conducted on a more diverse population. |

**References:**