Dry Needling: Interventions and Clinical Application

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Objectives:

- Define Dry Needling (DN)
- Utilization of Intervention in Clinical Practice
- Proper and Safe Application of DN
- Indications and Contraindications
- Medical Oversight
What is Dry Needling (DN)?

- DN is a skilled intervention that uses a fine, solid filiform needle
  - Penetration of skin with therapeutic intent
    - Without the use of injectate
- Neuromusculoskeletal effects
- Targets deeper tissues
Dry Needling vs Acupuncture

- Acupuncture
  - Eastern medicine
  - Energy meridians

- Dry Needling
  - Western medicine
  - Muscle fiber orientation/origin/insertion

- Overlap in modern biomedical understanding
DN versus Acupuncture

- While terminology, theoretical constructs, and philosophies are different, the actual procedure of technical delivery and analgesic inducing mechanisms underpinning such are very similar (Butts 2016, Dunning 2014, Zhou 2015)

- Dorsher et al. reported the distribution of trigger points has a 93% overlap with acupuncture points in the treatment of pain disorders

- High quality RCT in acupuncture research
  - Vast majority use western medical diagnoses

- Acupuncture literature recently conducted by physiotherapists, physicians and PhD’s, not traditionalist Chinese acupuncturists
Use of DN in Clinical Practice

- Traditionally DN has focused on targeting “trigger points” and/or has been referred to as trigger point dry needling

- A Myofascial Trigger Point (MTrP) is defined as a ‘hyperirritable point located in taught bands of skeletal muscle’

- Trigger points are palpated and the needle is inserted into the trigger point numerous times to eliminate the twitches within the muscle
Use of DN in Clinical Practice

- However, the idea that we can target only MTrPs with this modality has been called into question.

- There is a theoretical and evidence base for the use of DN in the treatment of many neuromusculoskeletal conditions WITHOUT specifically targeting MTrPs:
  - Tendinopathies
  - Pain
  - Muscular restriction
Schematic diagram of the potential physiological effects of DN (Cagne 2013)

- **INCREASE IN BLOOD FLOW**
  - Release of SP and CGRP
  - Local microtrauma
  - Needle insertion
  - Mechanical stimulation
  - LTR
  - SEA

- **PLACEBO-EFFECT**
  - Pain matrix
  - Supraspinal sites

- **DESCENDING CONTROL PATHWAYS**
  - Serotonergic and noradrenergic
  - Release of endogenous opioids
  - CPM

- **SEGMENTAL INHIBITION**
  - (gate control)
  - Ascending pain pathways
Application of DN

• Safety

• Adverse Reactions

• Procedure
What is felt by the patient

- Small pin prick initially when the needle is inserted
- Local twitch response - muscle twitches when an active trigger point is treated
- Deep ache - associated with trigger point
- Possible burning sensation if nerve is contacted
- Possible soreness for 24-48 hours following treatment
- Improved ROM, mobility, flexibility and decreased pain if trigger point is treated
Safety

- Per CDC for injections, don’t have to prep skin
  - Clean vs Sterile

- Acupuncture
  - 1 case of infection in 68.5 million cases

- Hand hygiene

- Clinician preparation
  - Universal precautions
Potential Adverse Events

- Pneumothorax
- Organ puncture
- Nerve Injury
- Infection
## Most Common Adverse Events

![Image](image_url)

**Table 3: Types of Adverse Events (AEs) reported in 7629 treatments**

<table>
<thead>
<tr>
<th>Event</th>
<th>Cases reported</th>
<th>Number per 100 treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleeding</td>
<td>576</td>
<td>7.55</td>
</tr>
<tr>
<td>Bruising</td>
<td>355</td>
<td>4.65</td>
</tr>
<tr>
<td>Pain during treatment</td>
<td>230</td>
<td>3.01</td>
</tr>
<tr>
<td>Pain after treatment</td>
<td>167</td>
<td>2.19</td>
</tr>
<tr>
<td>Aggravation</td>
<td>67</td>
<td>0.88</td>
</tr>
<tr>
<td>Drowsiness</td>
<td>20</td>
<td>0.26</td>
</tr>
<tr>
<td>Feeling faint</td>
<td>17</td>
<td>0.22</td>
</tr>
<tr>
<td>Headache</td>
<td>11</td>
<td>0.14</td>
</tr>
<tr>
<td>Nausea</td>
<td>10</td>
<td>0.13</td>
</tr>
<tr>
<td>Fatigue</td>
<td>3</td>
<td>0.04</td>
</tr>
<tr>
<td>Emotional</td>
<td>3</td>
<td>0.04</td>
</tr>
<tr>
<td>Shaky</td>
<td>1</td>
<td>0.01</td>
</tr>
<tr>
<td>Itching</td>
<td>1</td>
<td>0.01</td>
</tr>
<tr>
<td>Claustrophobia</td>
<td>1</td>
<td>0.01</td>
</tr>
<tr>
<td>Numbness</td>
<td>1</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Brady 2014
Most Common Adverse Events

- **Bruising**
- **Bleeding**
Application of DN

- Dosing
- Depth
- Width
Application of DN

- Large variability of dosing and intensity of DN in the literature

- Needles left in situ anywhere from 5-40 minutes

- Some low level evidence to conclude that specific to low back pain there is a greater effect when needles are left in for 10' vs. removed immediately
Application of DN

• One variable that we can adjust is the intensity of each session

• This can be done in a number of ways
  - # of needles per anatomical region
  - Depth of needles
  - Gauge (width) of needles
  - Additional techniques (pistoning, winding)
Application of DN

- Optimal dosage, frequency, depth and intensity of DN have yet to be determined
- Lack of high quality RCTs to establish a specific regimen for any of these factors
- Should follow reasonable guidelines as with any manual therapy that is likely to cause short-term soreness and/or moderate to severe
<table>
<thead>
<tr>
<th>Indications</th>
<th>Precautions</th>
<th>Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Acute and chronic conditions</td>
<td>- Apprehension regarding needles</td>
<td>- Altered sensation</td>
</tr>
<tr>
<td>- Altered muscle tone</td>
<td>- Malignancy (away from site)</td>
<td>- Pregnancy</td>
</tr>
<tr>
<td>- Fascial restriction</td>
<td>- Infection (away from site)</td>
<td>- Malignancy (local)</td>
</tr>
<tr>
<td>- Tendinous and ligamentous pathology</td>
<td>- Post-operative</td>
<td>- Blood clotting disorders</td>
</tr>
<tr>
<td>- Contusion</td>
<td></td>
<td>- Blood disease</td>
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<tr>
<td>- Neuromusculoskeletal pain</td>
<td></td>
<td>- Integument compromise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Infection (local)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Needle phobia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Known bloodborne pathogen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Metal allergy</td>
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<td></td>
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<td>- LB (Spina bifida, scoliosis)</td>
</tr>
</tbody>
</table>
Indications for DN

- Common patient presentation?
When to recommend

- Chronic pain patient and have tried other options
- Patient is eager to return at a faster rate
- Pain that appears to be referred pain
Outcome Measures

• Clinician-Rated Outcomes
  - ROM
  - Functional Testing

• Patient-Rated Outcomes
  - Immediate change vs long-term progress

• Test-Retest
Medical Oversight

- Federal regulations do not prohibit the performance of dry needling by physical therapists or athletic trainers; however, state regulation varies.

- Credentialing and privileging in relation to the implementation of DN
  - Policy and procedure development
Clinical Take-Home Points

- Should be used in conjunction with rehab and other treatments
- Relatively inexpensive comparatively
- Can target deeper tissues
- Consider its use for neuromusculoskeletal pain and conditions
- Within scope of practice if properly trained in intervention
References

- Description of Dry Needling in Clinical Practice: An Educational Resource Paper. APTA 2013
Questions?

[Image of Albert Einstein writing "Question everything" on a blackboard.]

[Image of a question mark made up of words like "what", "why", "how", "where", "when", "who", "whose".]