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# Unit Specification

USP196 – Theory of dry needling practice

Unit reference number: L/650/4322

**Level: 4**

**Guided Learning (GL) hours: 5**

## Overview

The aim of this unit is to provide the learner with the relevant knowledge and understanding of the theories of dry needling techniques. Learners will also explore the concepts of myofascial pain syndrome and how the mechanisms of dry needling can be used in the treatment of this condition.

## Learning outcomes

On completion of this unit, learners will:

LO1 Know the difference between dry needling, acupuncture and Chinese medicine

LO2 Understand myofascial pain and trigger points

LO3 Understand the theory and mechanisms of dry needling

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# Unit content

## LO1 Know the difference between dry needling, acupuncture and Chinese medicine

### Acupuncture and Traditional Chinese Medicine (TCM)

#### Taught content

The learner is directed to the information that this section is not intended to be a detailed review of Chinese medicine, or acupuncture, but rather to demonstrate the connection between acupuncture and TCM.

- Overview of acupuncture:
  - A therapeutic process considered to be one of the basic pillars of TCM. Possibly dating back to the 3rd century BC
  - An invasive needling technique used to re-establish energy balance of meridians for the purpose of improving a person's health
  - According to TCM, health and wellbeing are dependent on the body's vital energy. Needles are inserted at specific, determined points, grouped into a system of channels. These points are said to influence the flow of vital energy through these channels
  - Acupuncture methods arrived in Europe around the 17th century
  - Current interest in acupuncture linked to its role in complementary and alternative medicine (CAM)
- Currently used by a number of western health professionals, for example, by physiotherapists, osteopaths, chiropractors, manual therapists. Sometimes referred to as modern acupuncture or medical acupuncture and based on modern interpretations of anatomy, physiology and pathology

## Dry needling

### Taught content

The learner is directed to the information that dry needling is not acupuncture but a therapeutic modality which is part of modern western medicine principles and supported by research. However, the similarity between traditional and modern acupuncture techniques may exist due to the evidence that many MTrPs correspond to acupuncture points when used to treat pain (Dorsher 2009).

- Overview of dry needling:
  - Introduction/description – application of needles through the skin for mechanical purposes and without injection or extraction of substance or fluid, to stimulate underlying myofascial trigger points
  - A technique used to treat dysfunctions in skeletal muscle, fascia, and connective tissue and reduce peripheral pain
  - Travell, Simons, & Simons pioneered work into musculoskeletal pain and the development of myofascial trigger points (MTrP), defining myofascial pain and dysfunction in modern western medicine
  - Early research by Dr. Janet Travell and Karel Lewit proposed the benefits of injections for the treatment of MTrPs
  - Lewit's needle effect (Lewit 1979) suggested that the effect of injections were primarily attributed to the mechanical stimulation of a MTrP by the needle
  - More recently the wider use of dry needling linked to the general indications for treating myofascial pain syndrome and myofascial trigger points. Various terminology used including: Functional Dry Needling (FDN), Intramuscular Manual Therapy (IMT), Intramuscular Stimulation (IMS), Trigger Point Dry Needling (TDN), Dry Needling (DN)
  - Debate as to whether dry needling can have an impact on conditions other than musculoskeletal pain. Evidence other than anecdotal appears to be lacking. Generalised stimulation involves using specific points for which there is no consensus. For example LR3 situated between 1<sup>st</sup> and second metatarsals is a common generalised acupuncture point

## LO2 Understand myofascial pain and trigger points

### Myofascial pain and trigger points

#### Taught content

- Myofascial pain syndrome (MPS)
  - MPS can be described as a collection of symptoms and signs caused by myofascial trigger points (Mayoral del Moral and Salvat 2016), often characterised by localised muscle tenderness and pain
- Myofascial trigger point (MTrP)
  - MTrPs are characterised by 'a hypersensitive spot, usually within a taut band of skeletal muscle or in the muscle's fascia (Travell and Simons 1999b). They are typically characterised by strong focal points of tenderness, can be found at multiple sites in muscle tissue and which produces signs of hyperalgesia
- General characteristics of a MTrP
  - Tender spot within a taut band of muscle/fascia
  - Local twitch response (LTR) – an involuntary, localised contraction of muscle fibres that is both rapid and transient. It can be elicited with mechanical palpation, particularly with the dry needling technique
  - Spontaneous electrical activity (SEA) – increase electrical activity at dysfunctional motor end plate
  - Biochemical changes – Biochemicals associated with pain & inflammation are elevated in sites near to & remote from active myofascial trigger points
  - Central Sensitisation – an increase in the excitability of neurons within the central nervous system, leading to abnormal pain responses
- Active vs latent MTrP's
  - An active MTrP is a hypersensitive area which causes a pattern of referred pain at rest/or on motion, which is clinically associated with a local twitch response (Travell and Simons 1999b)
  - A latent MTrP is a hypersensitive area which causes a pattern of referred pain only when palpated and or mechanically stressed (Travell and Simons 1999b)
- Clinical presentations of MTrP's (Gerwin et.al. 1997)
  - A tender spot found within a taut band of muscle
  - Presence of a LTR and or referred pain pattern on manual palpation or needling of the tender spot
  - Restricted/reduced ROM
  - Reproduction of patient's pain compliant through pressure on the MTrP
  - Regional muscle weakness
- Autonomic symptoms
  - Increased sympathetic activity and reduced parasympathetic activity
  - Sweating, vasoconstriction and piloerection in MTrP regions
  - Exacerbation of spontaneous local pain in MTrP regions
- Trigger point development hypothesis – the integrated hypothesis
  - Summary of integrated hypothesis – currently the most accepted theory of MTrP development
  - MTrPs are small sustained sarcomere contractures caused by dysfunction of the motor end plates. This occurs through:
    - Abnormal release of acetylcholine (ACh)
    - Increase in the number of end plate potentials
    - Sustained depolarisation at muscle membrane and release of calcium ions
    - Reduced AChE
    - Inadequate uptake of calcium ions
    - Sustained contracted sarcomeres
    - Local ischemia and ATP shortage leading to an 'energy crisis'
    - Release of sensitising and nociceptive substances
    - Altered autonomic response back to motor end plate

## LO3 Understand the theory and mechanisms of dry needling

### Mechanisms of action of dry needling

#### Taught content

- Exact mechanism of action underlying effects of acupuncture is not fully clarified. Many hypotheses exist but unified theory based on scientific evidence is lacking
  - Basic classification of dry needling modalities
    - Superficial dry needling (SDN) – techniques, in which the needle does not reach the MTrP and stays in the tissues immediately overlying it
    - Deep dry needling (DDN) – techniques, in which the needle reaches the MTrP and passes through it
- Most theories are heavily focused on neurophysiological effects. Dry needling has effects at multiple levels in the nervous system, including: Peripheral, Segmental and Central neural levels
  - Peripheral pain – Nociceptors modulated by chemical mediators. Biochemical milieu associated with MTRP's is restored to normal (Shah. 2008, 2005)
  - Microtrauma from needle may stimulate a healing response
  - Segmental – mediates primary afferent nerve fibres (A-beta fibres, A-delta fibres and C-fibres)
    - Inhibition of nociceptive input (Gating mechanism)
    - Changes in motor output reduces reflex activity in muscles and enhances muscle relaxation
    - Alterations in sympathetic outflow presumed to produce strong analgesic effects
  - Central neural levels
    - Mediates mechanoreceptors sending afferent signals to CNS which activate area of brain that modulate analgesia. This results in activation of the descending pain inhibitory systems
  - Stimulation of LTR through DDN techniques leading to:
    - mechanical rupture of muscle fibre and/or affected motor end plate
    - local stretch of the shortened cytoskeletal structures leading to normalisation of muscle length
    - pain relief/removal of the source of irritation through stimulation of LTR

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# Assessment requirements

Learners are required to complete **all** assessment requirements related to this unit:

1. Knowledge outcomes

## 1. Knowledge outcomes

Learners must complete all the assessment requirements related to this unit. The knowledge content in LO1-LO3 should be evidenced in a **portfolio of evidence** which contains assessed evidence covering all the assessment criteria in this unit.

Evidence in the portfolio may take the following forms:

- Observed work
- Witness statements
- Audio-visual media
- Written questions
- Oral questions
- Assignments
- Case studies

The pass criteria relate to the proficient demonstration of skills and knowledge.

Learning Outcome	Assessment Criteria
LO1 Know the difference between dry needling, acupuncture and Chinese medicine	1.1 Summarise the difference between dry needling and acupuncture

Learning Outcome	Assessment Criteria
LO2 Understand myofascial pain and trigger points	2.1 Describe the main features and clinical presentations of myofascial trigger points
	2.2 Summarise the role of myofascial trigger points in myofascial pain syndrome

Learning Outcome	Assessment Criteria
LO3 Understand the theory and mechanisms of dry needling	3.1 Summarise the mechanisms of action of dry needling in the treatment of myofascial pain syndrome

## Document History

Version	Issue Date	Changes	Role
V1.0	21/11/2022	First published	Product and Regulation Coordinator