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#### לגעת בכאב Touching the pain

החברה הישראלית לרפואת שריר שלד The Israeli Society of Musculoskeletal Medicine



#### **Myofascial Pain Syndrome** Introduction Clinical presentation Neurophysiology

- Aharon (Roni) Finestone
- Orthopaedics, Assaf HaRofeh MC, Zeriffin, Israel





#### Purpose of the workshop

#### <u>Yes:</u>

Taste of myofascial theory and treatment Exposure to a new field Interest <u>No:</u>

Ability to use, clinically

Certificate



1. Rivner, Curr Pain Headache Rep. 2001 Oct;5(5):432-40.

2. Hong-You et al., Pain Medicine 2012; 13: 957–964

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#### **PAIN – CLASSIFICATION**

#### **Timeline Classification**

- Acute pain < 3 months
- Chronic pain >3 months •

#### Pathophysiology Classification

- Nociceptive pain Pain that arises from actual or threatened damage to non-neural tis and is due to the activation of nociceptors by a noxious
- Neuropathic pain Pain caused on or disease of the somatosensory nervous system (central
- Myofascial pain is a subtype Dysfunctional pain - Pain without any noxious nociceptors or involvement of the somatosensory nervol
- Cancer pain Any of the above types of pain caused its treatments



#### Touching the pain a

of Nociceptive pain





#### What is the biggest organ in the body?



1. Rivner, Curr Pain Headache Rep. 2001 Oct;5(5):432-40.

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#### Muscles, the forgotten organ

- Skeleton: 30-40 % of total body weight
- Muscles 42% total body wight (males)
- 36% in females
- 366 muscles in the body





#### Dry needling

- Intra-muscular Stimulation (IMS)
- Western needling / acupuncture



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#### **Doctor: Do I have inflammation?!!!**



Rubor	0	/	20
Calor	0	/	20
Tumor	0	/	20
Dolor (pain)	20	/	20
Functio laesa	10	/	20

Total





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#### **Doctor: Do I have inflammation?!!!**





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# Where is your **Pain?**



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Jonas Kellgren 1911-2002 First Professor of Rheumatology Manchester

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#### Jonas H. Kellgren



Clinical cases: Pain referred from SSP, ISP Successfully treated with novocain.

#### hypertonic 6% saline



Clinical Science 1938; 3: 175-190.

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#### **Referred Pain**

<u>Somites</u> Dermatome Myotome Sclerotome



#### Full Dermatome Map





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#### **Myofascial Pain Classification**

Local (superficial to...)
 Referred
 To area over tendons

Other pattern



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#### **Myofascial Pain Classification**





#### **Myofascial Pain Classification**



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#### **Janet Travell**

#### 1901-1997

First woman & first civilian ever to hold the post of White House physician.





Trovell & Simons' Myofascial Pain and Dysfunction The Trigger Point Manua VOLUME 1. Upper Holl of Body

Second Editio

DAVID G. SIMONS, M.D. JANET G. TRAVELL, M.D. LOIS S. SIMONS, P.T.

Illustrations by Darleara D. Cummings

Treated senator J.F. Kennedy, crippled from back pain

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#### Pain Maps, Pain Patterns



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#### **Trigger Points**

- 1. A palpable nodular or band-like hardness in the muscle.
- 2. A highly localized spot of extreme tenderness in the band.
- Reproduction of the patient's distant pain complaint by digital pressure on that spot [referred pain].
- 4. Relief of the pain by massage or injection of the tender spot.



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#### What are Trigger Points?

Electrophysiological characteristics:

- Low amplitude spontaneous firing on EMG<sup>1</sup>.
- Early fatigability on isometric contraction<sup>2</sup>.



#### Typical spontaneous electrical activity (SEA) at a trigger point.

*From: Travell & Simons' Myofascial Pain and Dysfunction. Vol 1* 



Rivner, Curr Pain Headache Rep. 2001 Oct;5(5):432-40.
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David G Simons 1957, 32 hrs, 30 km altitude, helium balloon.



Dr. Janet Travell & Dr. David G Simons 1977 Photo courtesty of Dr. David G. Simons

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#### **Energy crisis theory**



Simons DG, Travell J. Myofascial trigger points, a possible explanation. Pain 1981; 10: 106-9.

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#### **The Energy Crisis Model**





Berne and Levy, Physiology 6<sup>th</sup> edition

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#### **The Energy Crisis Model**

#### Muscle contraction

- Motor neuron action potential
- Release of acetylcholine into the neuromuscular junction
- Release of calcium ions into the cytoplasm
- Activation of motor proteins

#### Muscle relaxation

- Removal of ACh from the NMJ
- Removal of cytoplasmic calcium
- Disengagement of the motor proteins





Berne and Levy, Physiology 6<sup>th</sup> edition

#### What are Trigger Points?

**Biochemical characteristics:** 

• Micro-dialysis of clinically active

trigger points shows<sup>1</sup>:

- $\downarrow$  O<sub>2</sub> saturation
- 🕹 ATP
- ↓ pH
- 1 Ca++
- ↑ ACh



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1. Shah et al., Journal of Applied Physiology, 2005, 99:1977-1984.

#### Pathophysiology



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#### **The Energy Crisis Model**





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#### **KAREL LEWIT**, 1916-2014

#### The needle effect in the relief of myofascial pain.

#### Pain 1979;6:83-90.



#### Dry needling



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#### **CHAN GUNN**

## Founder and president of the Institute for the Study and Treatment of Pain

- Vancouver, British Columbia, Canada
- Intra Muscular Stimulation IMS
- acupuncture needles
- Subclinical neuropathy theory





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#### **Doral Root Ganglion**





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#### **Outcomes of Shortened Muscle**



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#### **Amir Minerbi & Simon Vulfsons**

### The local and referred pain patterns of the *longus coli* muscle





Minerbi A et al. J Bodywork & Movement Therapies 2016.

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#### **Methods of TrP De-activation**

#### **Dry Needling**





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#### **Methods of TrP De-activation**

# Manual Deactivation: ischaemic compression





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#### **Methods of TrP De-activation**

#### Manual Deactivation: soft tissue release







Mary Sanderson

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#### How does it work?



#### **Electrical component**

Reflex (neurological) component Touching the pain / patient



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#### **Chronic Myofascial Pain**

# Primary insult Primary insult Chronic myofascial pain



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#### **Chronic Myofascial Pain**

#### Neuroplastic changes at several levels:





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Berne and Levy, Physiology 6<sup>th</sup> edition

#### **Neuroplastic Changes**

#### Primary insult Acute myofascial pain Perpetuating factors Chronic myofascial pain









METABOLIC

#### **The Effect of Perpetuating Factors**



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#### Pain is a global public health burden





Breivik H, Collett B, Ventafridda V & al, Survey of chronic pain in Europe: prevalence, impact on daily life, and treatment. Eur J Pain, 2006;10:287-333

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#### Importance of dry needling - 2016

#### Choosing wisely

- High prevalence of musculoskeletal complaints
- Low level of understanding of public and clinicians of musculoskeletal medicine
- Abundancy & availability of diagnostic tests
- High public demand for tests
- High rate of false positive results when not indicated wisely

#### Need to empower primary practitioners

- To be able to communicate with the patient regarding musculoskeletal complaints
- Knowledge
- Touch



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#### What is dry needling relevant for?

Localized muscle pain / cramp Referred muscle pain Low back pain Cervical pain Shoulder pain Heel pain (plantar fasciitis) Achilles pain (tendinitis) Groin pain (sportsman's hernia)

**Trigger finger** Carpal tunnel syndrome Piriformis syndrome Elbow pain ("epicondylitis") **Osgood Schlatter** Trigger finger Carpal tunnel syndrome Knee pain (patellofemoral / chodromalacia Osteoarthritic pain

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#### **Dry needling technique**

Single use, Disposable needles





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Dry needling technique

<u>Safety</u>

Cleanse hands Disposal of sharps Single use of needles Supervision Call out if a needle falls / is lost





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#### TRADITIONAL CHINESE MEDICINE ???

#### A wide variety of treatment options including:

#### Traditional acupuncture

- o based on 12 meridians
- Qi (energy) pathways of the body
- o divided into Yin & Yang.
- Acupoints.







Baldry P. The integration of acupuncture within medicine in the UK - the British Medical Acupuncture Society's 25th anniversary. Acupunct Med. 23:2-12, 2005. לגעת בכאב Touching the pain







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