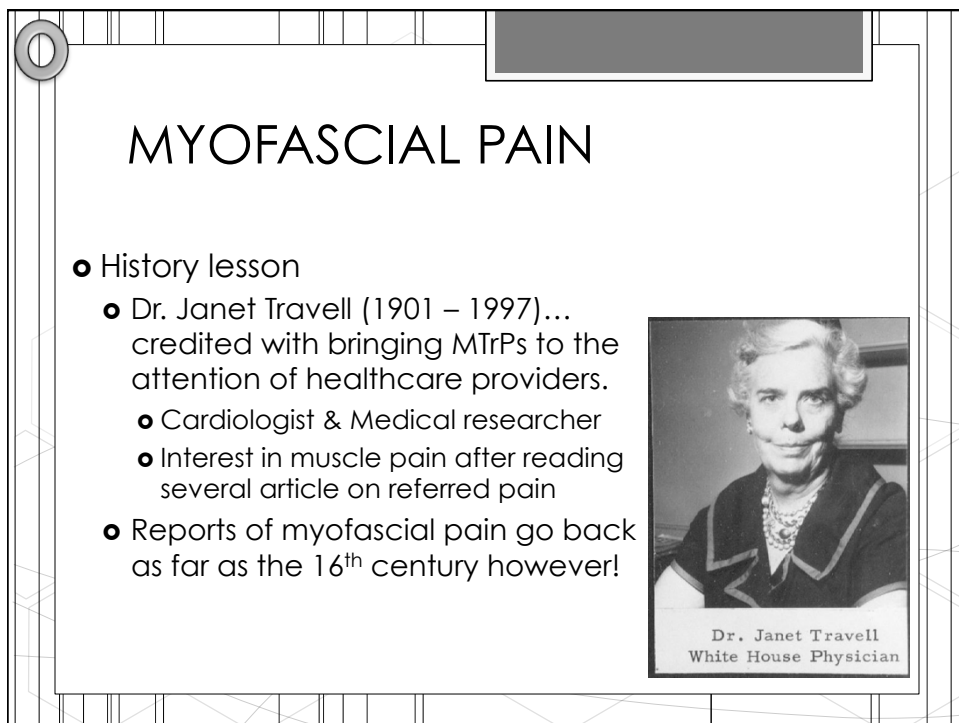


**Myofascial  
Trigger Points**


background info

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**MYOFASCIAL PAIN**

- History lesson
  - Dr. Janet Travell (1901 – 1997)... credited with bringing MTrPs to the attention of healthcare providers.
    - Cardiologist & Medical researcher
    - Interest in muscle pain after reading several article on referred pain
  - Reports of myofascial pain go back as far as the 16<sup>th</sup> century however!



Dr. Janet Travell  
White House Physician

## MYOFASCIAL PAIN

- History lesson
  - Dr. Janet Travell
    - 1940's developed and published injection techniques of MTrPs
    - 1952 described the myofascial genesis of pain... with detailed referred pain patterns for 32 muscles
    - (Note other clinicians had work that paralleled in describing the characteristics of MTrPs & effective manual therapies)

## MYOFASCIAL PAIN

- History lesson
  - Dr. Janet Travell
    - 1966 Travell + Dr. John Mennell founded the North American Academy of Manipulative Medicine.
    - She often promoted integrating myofascial treatment with articular treatments
    - 1960's collaboration with Dr. David Simons, which led to the Trigger Point Manuals (1983 & 1992 – 1<sup>st</sup> eds)

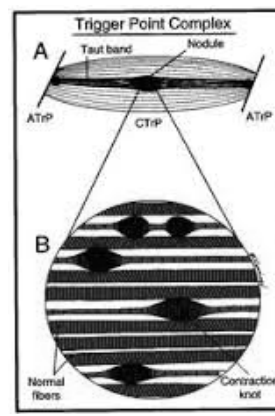


Fig. 1. Drs. Janet Travell and David Simons, co-authors of the 2-volume textbook Myofascial Pain and Dysfunction, The Trigger Point Manual. Photograph 1978.  
(Photo courtesy of the author. Reproduced by permission of the B.C. Massage Practitioners)

What is myofascial pain?  
What are trigger points?

## MYOFASCIAL PAIN

- Myofascial Pain Syndrome
  - A regional pain syndrome characterized by muscle pain caused by MTrPs.
- Myofascial Trigger Point
  - A tender point located in the endplate zone, and characterized by a taut band of muscle, referred pain, & a local twitch response.



## MYOFASCIAL PAIN

- Myofascial Trigger Point Region

- Sensory Component:

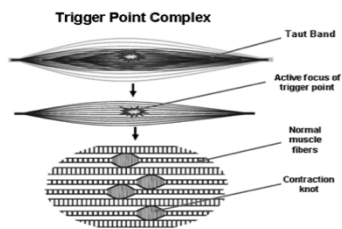
- Local pain, referred pain, and local twitch response when the locus is mechanically stimulate with pressure

- Motor Component:

- Spontaneous electrical activity
    - & Endplate noise

- Physical Component

- TOGETHER = the taut band

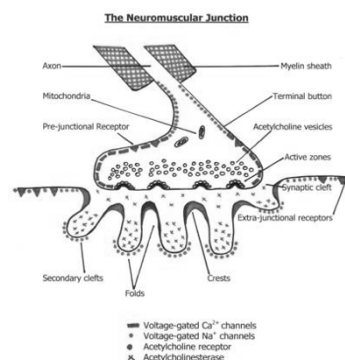


## MYOFASCIAL PAIN

- Myofascial Trigger Point Region

- Thoughts:

- Endplate Noise is the result of excessive ACh leakage.
    - Combined with sarcomere shortening & release of sensitizing substances... can lead to an energy crisis
    - = local ischemia & hypoxia



## MYOFASCIAL PAIN

- Myofascial Trigger Point region
- **Etiology:**
  - Low-level continual muscle contraction (i.e. poor posture)
  - Direct trauma
  - Unaccustomed eccentric contractions
  - Over-use of unconditioned muscles
  - Arthritis / pain in an adjacent joint
  - Stress / Pain
  - Spinal DJD & nerve root compression

## MYOFASCIAL PAIN

- Myofascial Trigger Point Region
- **Spinal Cord Mechanisms**
  - A strong noxious stimulus can send an impulse to the corresponding dorsal horn neurons... causing release of substance P & calcitonin gene-related peptide.
  - Which increases pain signaling of other receptors supplied by the same dorsal horn neurons...
  - = Central Sensitization

## MYOFASCIAL PAIN

- Myofascial Trigger Point Region
- Central Sensitization:
  - Increased responsiveness to nociceptive neurons in the central nervous system to their normal or sub-threshold afferent input



## MYOFASCIAL PAIN

- Myofascial Trigger Point Region
- **Altered Nerve Conduction** (NR compression)
  - Decreased sympathetic outflow to muscles
    - Motor Signs
      - Increase in ACTH receptors in a zone of degeneration & supersensitivity
      - Alignment & Postural Affects (banding or tightening)
    - Muscle tissue changes
      - Hypertonicity, Muscle fasciculation, Tight bands of muscle, Trigger points
    - ROM deficits (due to tight bands / shortened muscles)
    - Altered Reflexes
      - BRISK (not necessarily hyper-reflexic)

## MYOFASCIAL PAIN

- Myofascial Trigger Point Region
- **Altered Nerve Conduction** (NR compression)
  - Autonomic Nervous System Changes
    - Vasomotor (cold & clammy skin)
    - Sudomotor (increased sweating)
    - Cutaneous circulatory changes
    - Pilomotor effect (goosebumps along dermatomes)
  - Tropic changes
    - Skin dystrophy & edema
    - Skin rolls, denting, peau d'orange
    - Match stick sign, reduced skin rolling
    - Increased skin creases,
    - Dermatomal hair loss

## MYOFASCIAL PAIN

- Myofascial Trigger Point Region
- **Neural Mechanosensitization** (Peripheral origin)
  - Peripheral neuritis occurs with minimal peripheral nerve injury, with no axonal loss or changes in nerve conduction
  - Nerve sheath inflammation can cause pain behaviours, hyperalgesia, and allodynia on sensory testing
  - The lesion site shows an increase in mechanosensitization of  $A\beta$  fibres, C-fibres, and deep nociceptor axons.
  - = PERIPHERAL Sensitization

## MYOFASCIAL PAIN

- Myofascial Trigger Point Region
- Peripheral Sensitization:
  - Increased responsiveness and reduced threshold of nociceptors to stimulation of their receptive fields



## MYOFASCIAL PAIN

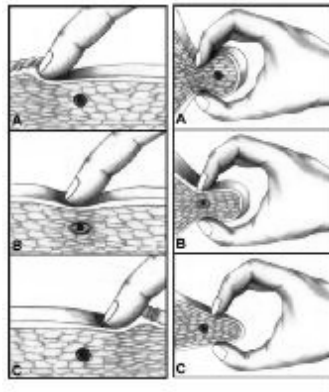
- Myofascial Trigger Point Region
- **Neural Mechanosensitization** (Peripheral origin)
  - The inflammation and resultant mechanosensitization may cause spontaneous firing of the  $A\beta$  fibres & C-fibres
  - Subsequently, can result in spontaneous firing from the associated dorsal root ganglia
  - Spontaneous firing triggers a cascade of events in the CNS that can lead to chronic pain
    - (and Central Sensitization...)



## Diagnosis

## MYOFASCIAL PAIN

- Myofascial Trigger Points
  - **Diagnosis**
    - Manual Palpation & Clinical Judgment
    - Spot tenderness, taut band, pain recognition
    - Confirmed by referred pain and local twitch response



## MYOFASCIAL PAIN

- Myofascial Trigger Points
  - **Diagnosis**
    - Interrater reliability?
      - Most reliable was referred pain sensation & Jump sign on testing
      - Least reliable were finding a nodule in a taut band, and eliciting a local twitch response
    - Where to look next in research?
      - Biochemical measurements
      - Sonography
      - MRI
      - EMG



## MYOFASCIAL PAIN

- Myofascial Trigger points – clinically
  - Test on yourself...
    - Trapezius
    - Extensor muscles of your forearm
    - Lateral or medial head of gastrocs
    - Lateral side of your thigh

