

Sports Massage – Indications and Effects

Learning Outcomes

- By the end of today students should be able to:
- Explain general effects of Massage
- Be able to explain the Travell and Simmons model for TrP?
- Know the presentation and causative factors involved with TrP?
- Describe and communicate the effects of DIP?

What are general effects of massage?

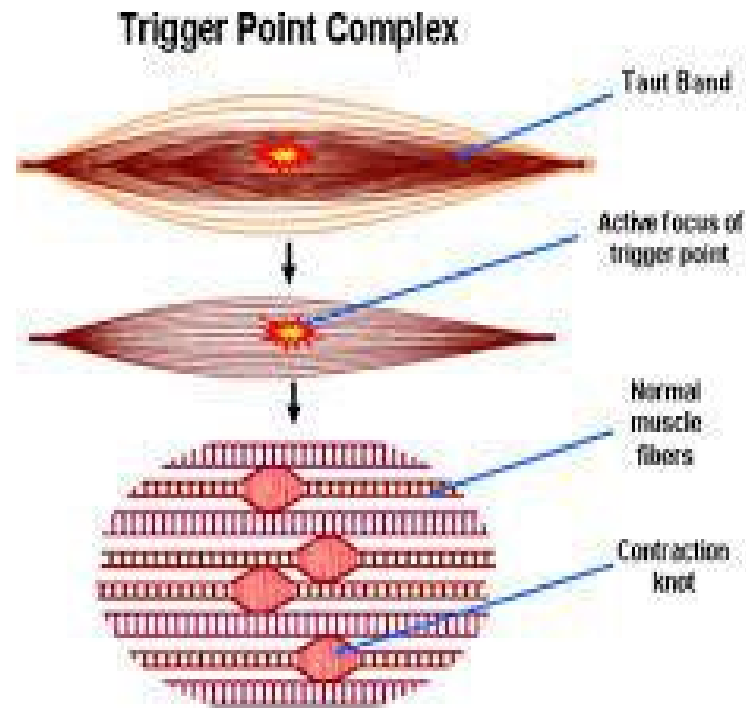
- Effleurage
 - Stimulate parasympathetic nervous system (promotes relax)
 - Enhance venous return
- Petrissage
 - Mobilise deep muscle tissue
 - Increase local circulation
 - Assist venous return
- Friction
 - Treat spasm and break up adhesions
- Tapotement
 - Stimulate tissues by force or reflex action (sympathetic nervous system)

What are mechanisms of massage?

- Biomechanical
 - Reduced adhesion, improved compliance, improved ROM, reduced stiffness
- Physiological
 - Improved blood circulation, improved parasympathetic and endocrine response
- Neurological
 - Reduced excitability of tissue, changes to tone of muscles
- Psychological
 - Relaxation increased

What are trigger points?

- Trigger Points (TrP) are focal, discrete, hyperirritable spots located in a taut band of skeletal muscle
- Spots are painful on compression of the site of the TrP and can reproduce pain locally (latent) or send/refer pain to another location (active)
- They can also produce motor disturbances such as weakness and loss of control in that muscle
- Local Twitch Response (LTR)
- Sometimes called 'knots'



Travell and Simons (1999)

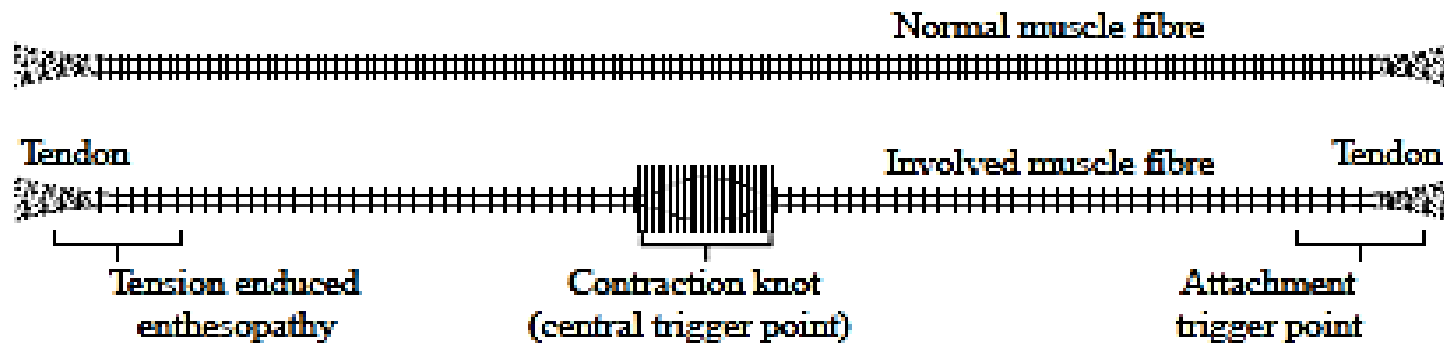
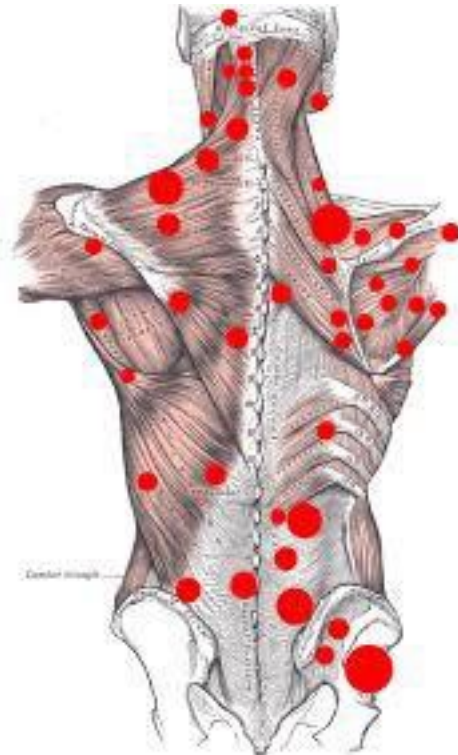


Fig. 1 Unequal sarcomere length: Comparison of the uniform, equal length of all sarcomeres of a normal muscle fiber compared to the severe shortening of a group of sarcomeres near the center of the fiber and the compensatory lengthening of the remaining sarcomeres. Note locations of central and attachment trigger points.

Diagnosis depends on accurate palpation with 2-4 kg/cm² of pressure for 10 to 20 seconds over the suspected trigger point to allow the referred pain pattern to develop

What causes TrP?

- Acute trauma
- Repetitive micro trauma
- Lack of exercise
- Cold exposure
- Prolonged poor posture
- Sleep disturbance
- Vitamin deficiency
- Occupational/ sporting overuse



How do patients present?

- Typical clinical presentation:
 - Onset of pain related to acute, chronic or repetitive load
 - Regional, persistent pain associated with movement or positioning
 - Pain may be constant but varies with exercise
 - Report referred shooting/radiating pain
 - NO imaging available to detect presence of TrP
- Active TrP cause clinical pain (and sensory disturbance) often referred and away from site of TrP
- Latent TrP feels taut but produces no clinical P+
 - May be uncomfortable in their locality



Compression

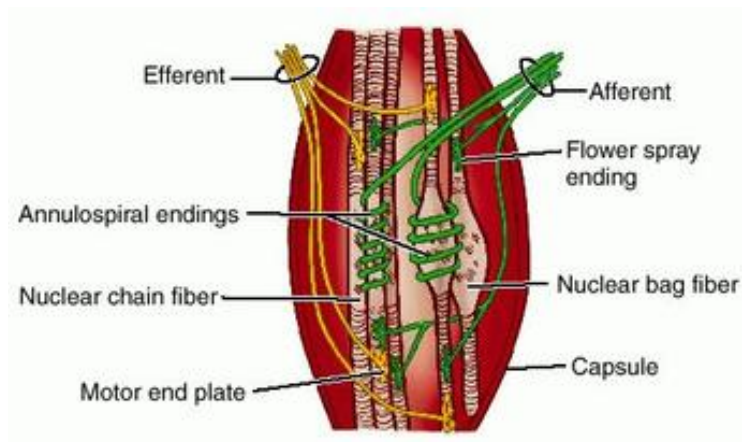
- Direct, usually static pressure, applied by thumbs, fingers, fist, heel and elbow into soft tissue
- Effects
 - Reduces muscle hypertone (Autogenic Inhibition)
 - Reduces adhered tissue
 - Decompression of tissue

Reflex actions



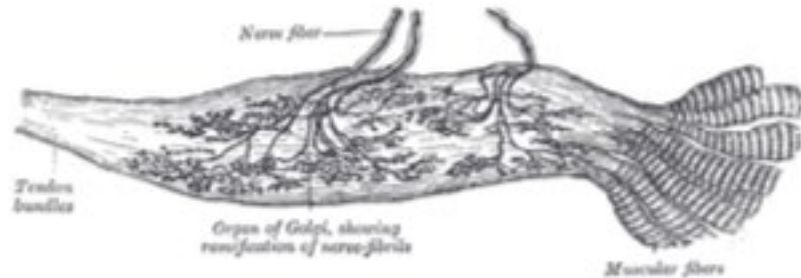
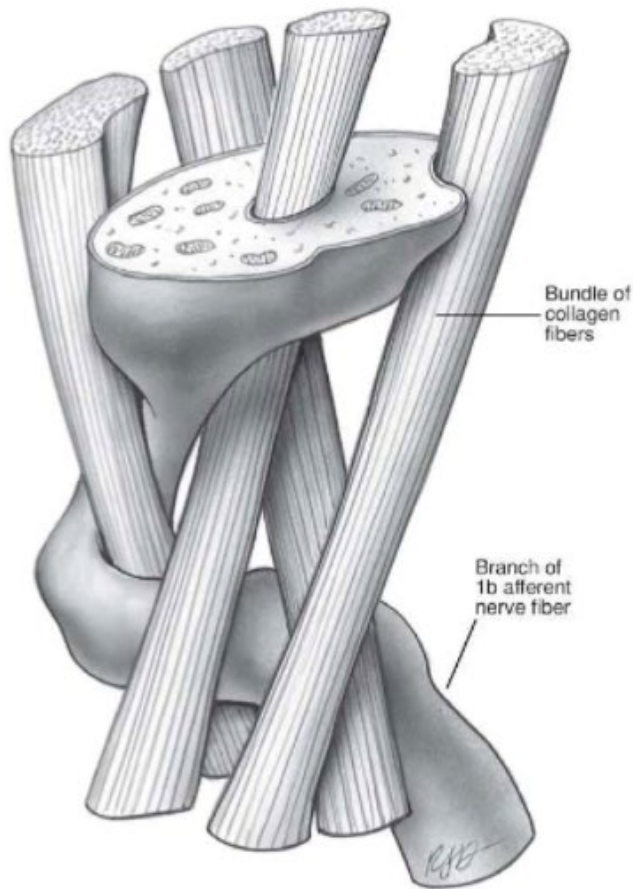
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The Muscle Spindle



Muscle spindles are sensory receptors within the belly of a muscle that primarily detect changes in the length of the muscle. CONTRACTION.

Golgi Tendon Organ



GTO's are a proprioceptive sensory receptor organ that is at the origins and insertion of skeletal muscle fibers into the tendons of skeletal muscle. They sense changes in muscle tension
RELAXATION

The Stretch Reflex

- Not a massage concept!
- When the muscle is stretched, so is the muscle spindle
- The muscle spindle records the change in length (and how fast) and sends signals to the spine
- This triggers the 'stretch reflex' which attempts to resist the change in muscle length by causing the stretched muscle to **contract**.
- The more sudden the change in muscle length, the stronger the muscle contractions will be
 - Plyometric, or "jump", training is based on this fact
- This basic function of the muscle spindle helps to maintain muscle tone and to protect the body from injury.

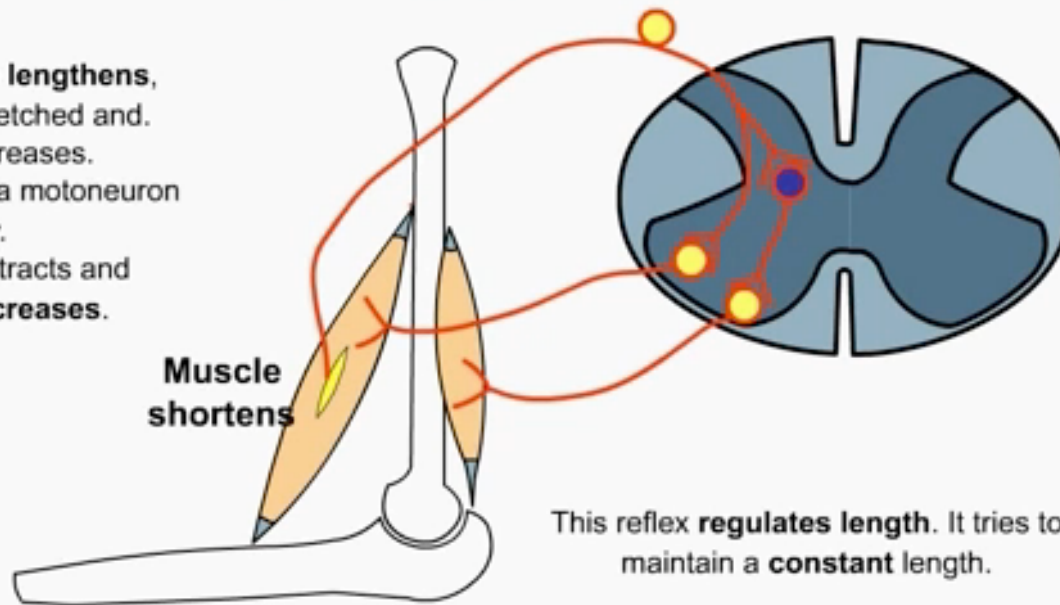
The Inverse Stretch Reflex

- When muscles contract (possibly due to the stretch reflex), they produce tension at the point where the muscle is connected to the tendon, where the GTO is located.
- The GTO records the change in tension, and the rate of change of the tension, and sends signals to the spine
- When this tension exceeds a certain threshold, it triggers the lengthening reaction which **inhibits** the muscles from **contracting** and causes them to **relax**.
- Other names for this reflex are the **autogenic inhibition**.
- This basic function of the golgi tendon organ helps to protect the muscles, tendons, and ligaments from injury.
- The lengthening reaction is possible only because the signaling of GTO to the spinal cord is powerful enough to overcome the signaling of the muscle spindles telling the muscle to contract.

The Stretch & Inverse Stretch Reflex

The monosynaptic stretch reflex is activated by spindle (Ia) afferents.

When the **muscle lengthens**, the spindle is stretched and Ia activity increases. This increases alpha motoneuron activity. The muscle contracts and its **length decreases**.



This reflex **regulates length**. It tries to maintain a **constant** length.

Because this reflex is **monosynaptic** and is carried by **large fibers**, it has the **shortest latency** of all spinal reflexes.



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Take Home Message

- If you apply a force to a muscle QUICKLY you will stimulate the muscle spindle and trigger a protective STRETCH REFLEX
- However if you apply the same amount of force GRADUALLY , you will stimulate the Golgi Tendon Organs and initiate an Inverse Stretch Reflex

Compression Application RECAP

- Use thumb, finger, heel, fist or elbow
- Gently apply pressure over 8-10 seconds
- VAS up to 7/10
- Obey the inverse stretch reflex!
- Autogenic inhibition
- Stretch (compression) = relaxation