

Sindrome miofasciale

Salvatore Sardo

Università degli studi di Cagliari

salvatore.sardo@unica.it



Fisiopatologia

Lesione algogena: **trigger point**

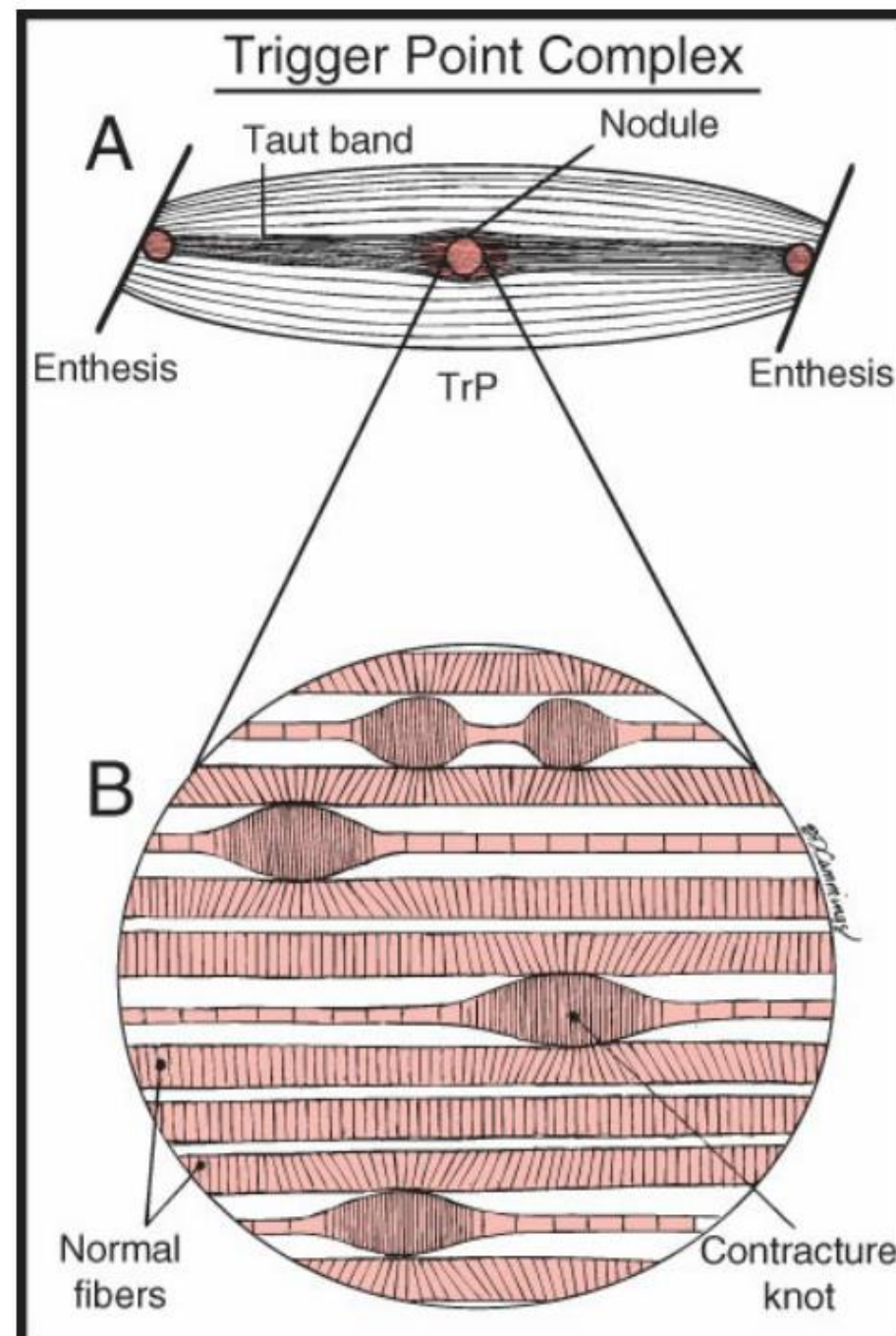
Trigger point risiede in una banda di **contrattura** muscolare

Taut band

Dolore primario: evocato dalla palpazione del trigger point

Dolore secondario somato-somatico: sulla **target area**

Trigger point: fisiopatologia patogenesi



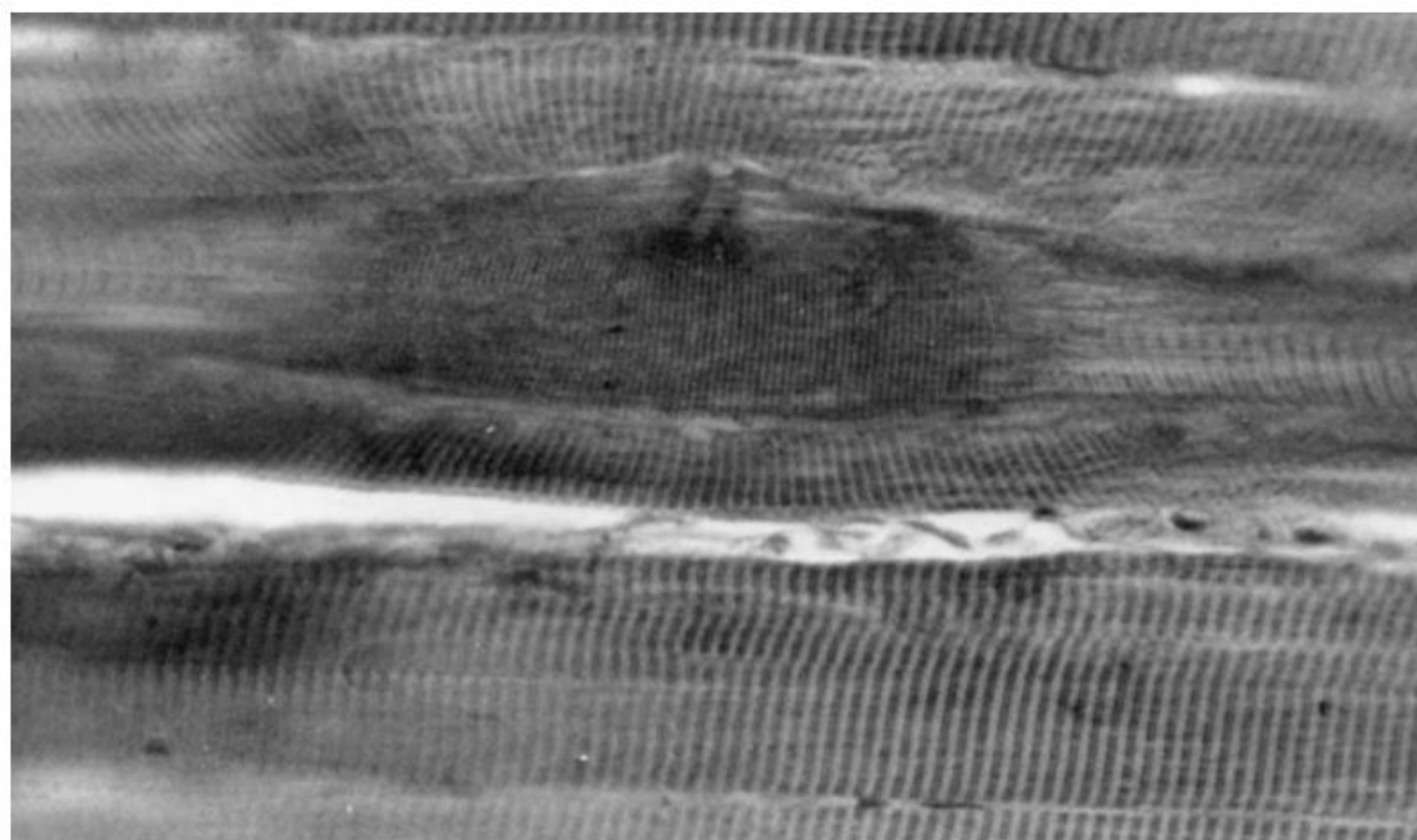
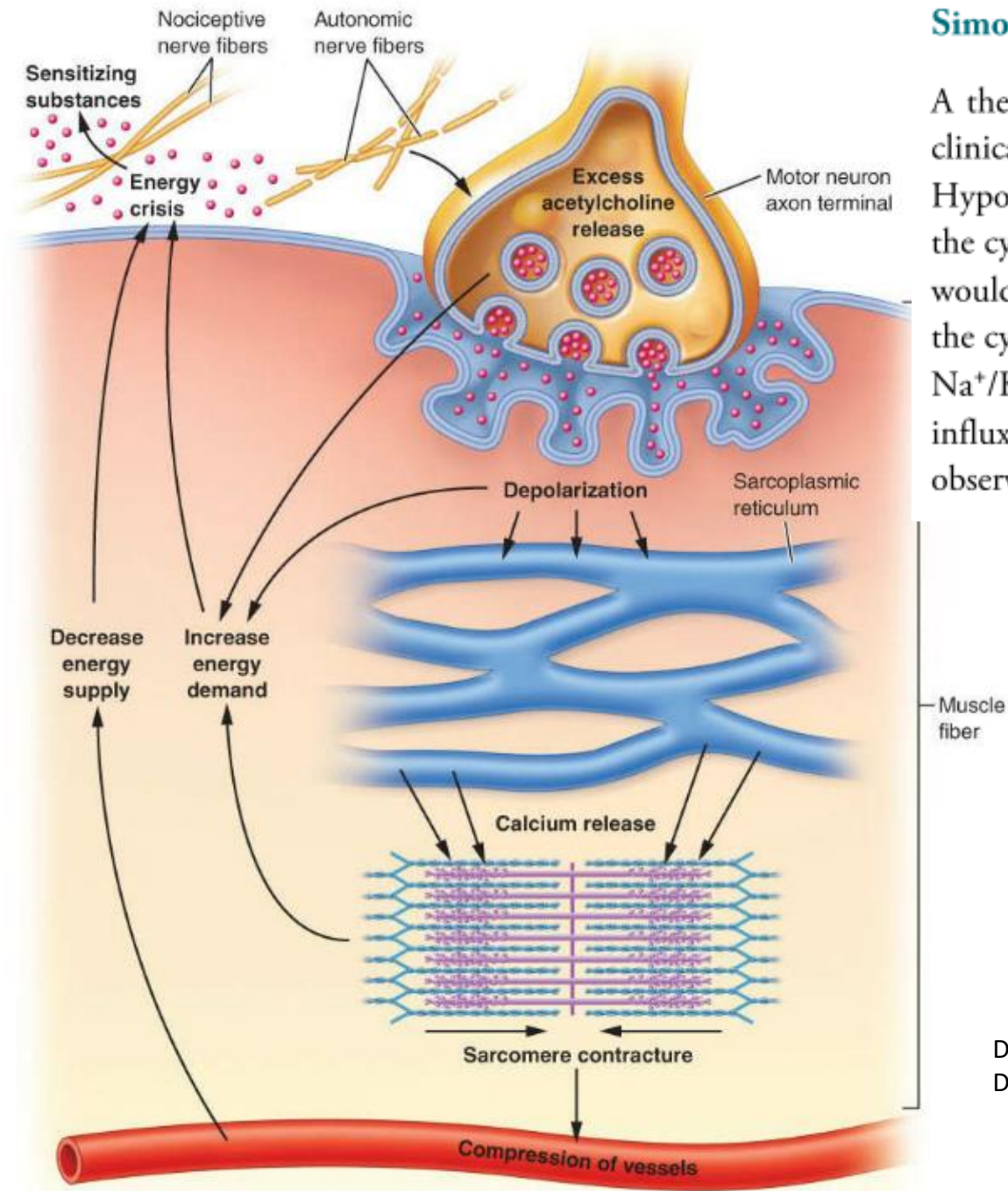


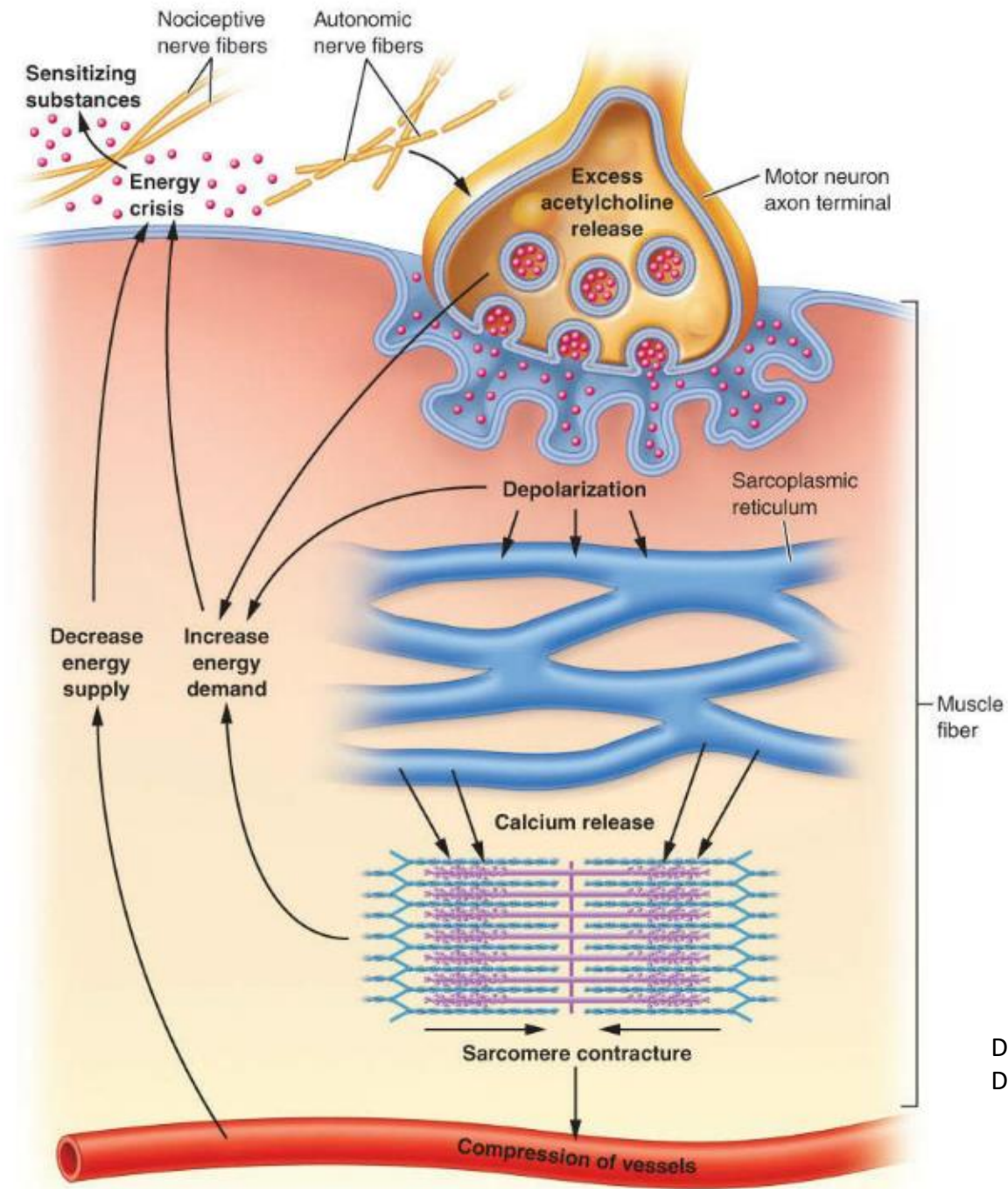
Figure 2-1. Longitudinal section of an example of the contraction knots seen in biopsies of canine muscles, in this case the gracilis. An exquisitely tender spot in a taut band of the muscle was selected as the biopsy site. These are two essential TrP criteria. The striations (corresponding to sarcomere length) indicate severe contracture of the approximately 100 sarcomeres in the knot section of the muscle fiber. The sarcomeres on both sides of the knot show compensatory elongation compared with the normally spaced sarcomeres in the muscle fibers running across the bottom of the figure. The fiber diameter is markedly increased in the region of the knot and abnormally decreased on either side of it. The irregularity of the sarcolemma along the upper border of the fiber (in the center of the contraction knot) may represent an endplate. The distortion of the sarcomere alignment in adjacent muscle fibers represents sheer stresses in those fibers that may, in time, play a part in the propagation of this dysfunction to neighboring muscle fibers.

Simons' Integrated Hypothesis

A theory of persistent sarcomere contraction underlying the TrP phenomena that we see clinically occurring from ACh excess at endplates has some limitations. Simons' Integrated Hypothesis (Figure 2-10) postulated an energy crisis such that Ca^{2+} is not removed from the cytosol, so that muscle actin and myosin cross-bridging persist; muscle fibers, therefore, would not relax. Release of actin–myosin cross-bridging requires that Ca^{2+} is removed from the cytosol, primarily by reuptake into the SR. This energy-requiring process occurs via the Na^+/K^+ -ATPase (sarcoendoplasmic reticulum ATPase [SERCA]) system that supports influx of Ca^{2+} into the SR, thereby lowering the $[\text{Ca}^{2+}]_c$. The theory is based on several observations, refer to Box 2-2.



Donnelly JM, de las Peñas CF, Finnegan M, Freeman JL. Travell, Simons & Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual. Wolters Kluwer Health; 2018.

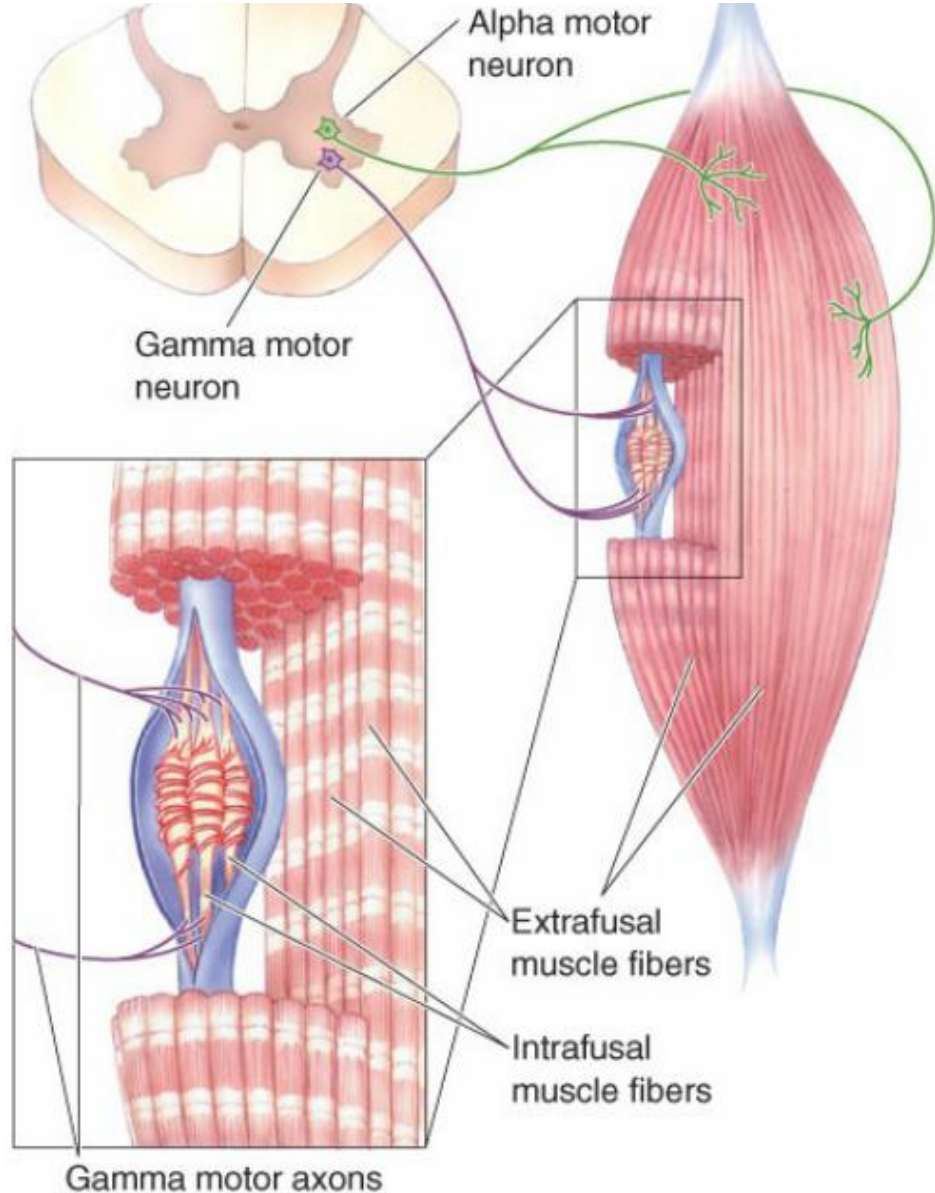


IPOTESI NON DIMOSTRATA

1. ↑↑↑↑↑↑ incremento di produzione e rilascio di ACh a riposo
2. ↑↑ miniature endplate potentials
3. ↑↑ ciclo del Ca^{2+} intracellulare
4. Contrattura dei sarcomeri
5. ↓ della perfusione ematica locale
6. ↑↑ consumo di energia
7. Energy crisis e ischemia
8. Sensibilizzazione dei nocicettori
9. Ulteriore rilascio di ACh

Donnelly JM, de las Peñas CF, Finnegan M, Freeman JL. Travell, Simons & Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual. Wolters Kluwer Health; 2018.

The Muscle Spindle Hypothesis



Endplate noise deriva dall'attività delle fibre intrafusali a catena nucleare e dalle fibre a sacco nucleare

Attività elettrica dei Trigger point attivi = EPS dei fusi neuromuscolari

Attività elettrica dei fusi in condizioni fisiologiche localizzata

1. Affaticamento muscolare $\uparrow\uparrow$ l'attività delle fibre sensitive gruppo 3 e 4 (meccano- e chemo-sensibili)
2. Sovraccarico del muscolo induce infiammazione e sensibilizzazione
3. $\uparrow\uparrow$ riflesso della attività delle fibre motorie $A\beta$ e $A\gamma$
4. Energy crisis
5. Contrazione delle fibre extrafusali $A\beta$ mediata
6. Formazione taut band
7. Estensione dell'attività aberrante ai fusi vicini
8. Local twitch mediato da un riflesso: afferenza fibre gruppo 3-4, efferenza $A\beta$

Caratteristiche del Trigger Point

1. Taut band
2. Punto trigger caratterizzato da allodinia meccanica (“dolorabile”) / Jump sign / latenza 10-15 s
3. Riconoscimento delle caratteristiche del dolore da parte del paziente
4. Local twitch response all’infiltrazione (patognomico ma non sempre presente)

Box 1-1 Clinical characteristics of trigger points

	Common Findings of TrPs	
Simons, Simons and Travell ⁴⁹	<ul style="list-style-type: none"> ■ Palpable taut band with cross-fiber flat or pincer palpation ■ Hypersensitive spot within the taut band ■ Local twitch response when adequately stimulated ■ May produce motor and autonomic phenomena ■ May prevent full lengthening of the muscle (restricts range of motion) ■ May cause inhibition weakness of the muscle 	
	Active TrPs <ul style="list-style-type: none"> ■ Refers or produces a patient's recognized pain ■ Spontaneous local or referred pain 	Latent TrPs <ul style="list-style-type: none"> ■ Local or referred unrecognized pain ■ Painful only when palpated or needled
Expert opinion Delphi study ⁵²	<ul style="list-style-type: none"> ■ Reproduce any symptom(s), not just pain, experienced by the patient ■ Patient recognizes the symptom as familiar ■ The symptom(s) may be absent at the moment of the examination, but will appear during manual palpation 	<ul style="list-style-type: none"> ■ Do not reproduce symptoms experienced by the patient ■ Patient does not recognize symptoms caused by cross-fiber flat or pincer palpation

Fattori influenti sul dolore

Fattori aggravanti

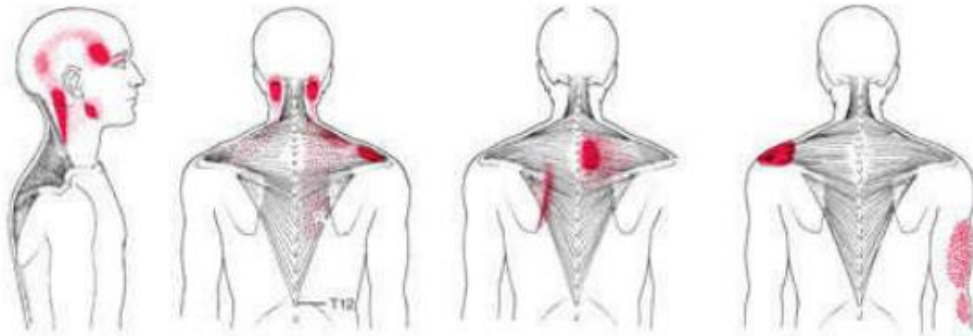
- Stimolazione ortosimpatica
- Freddo
- Attività del muscolo

Fattori allevianti

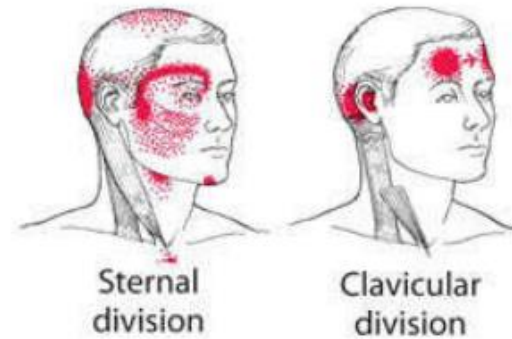
- Amitriptilina
- Infiltrazione anestetici locali
- Caldo
- Massaggio

Pattern delle sindromi miofasciali

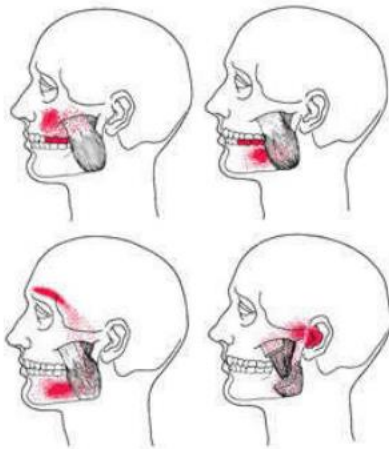
Trapezius



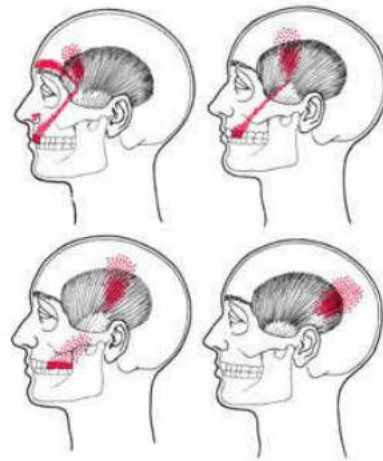
Sternocleidomastoid



Masseter



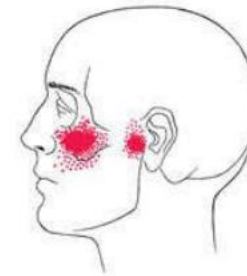
Temporalis



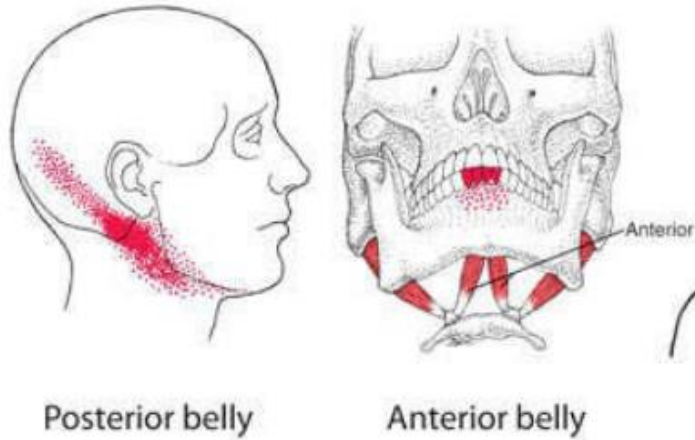
Medial pterygoid



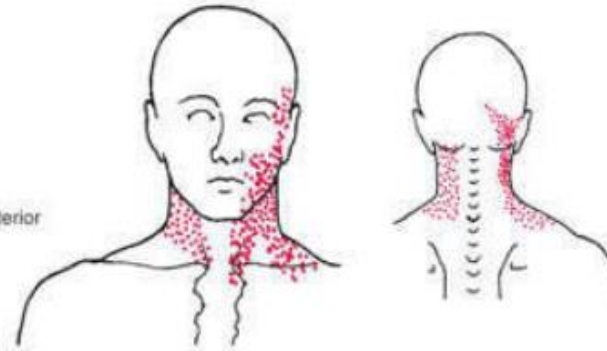
Lateral pterygoid



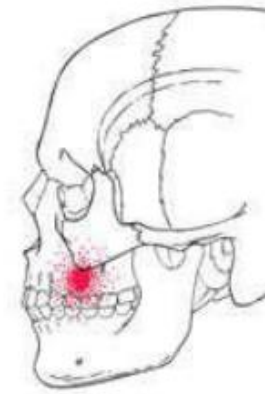
Digastric



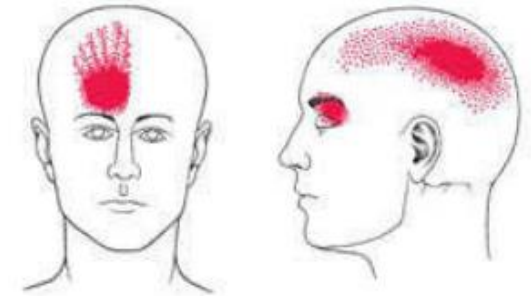
longus colli



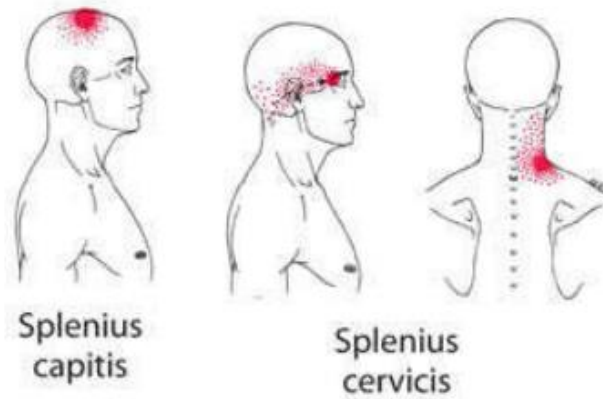
Buccinator



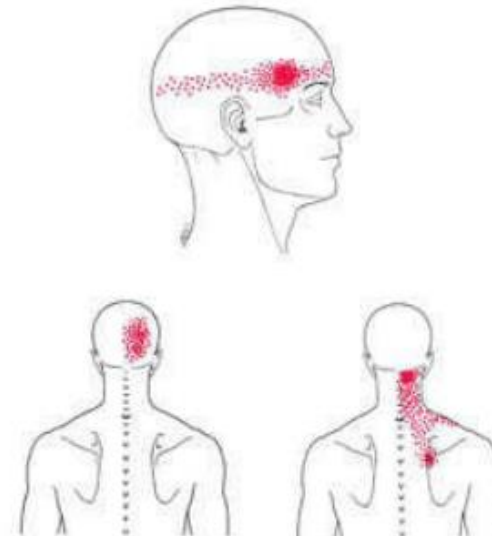
Occipitofrontalis



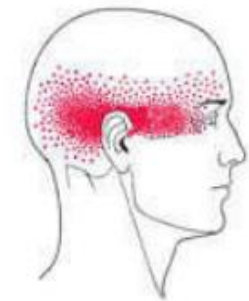
Splenius capitis and splenius cervicis



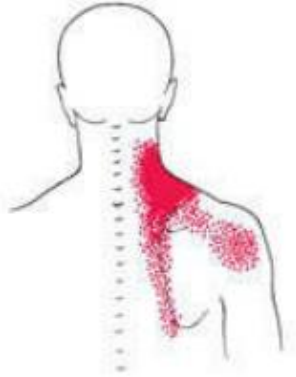
Posterior cervical muscles



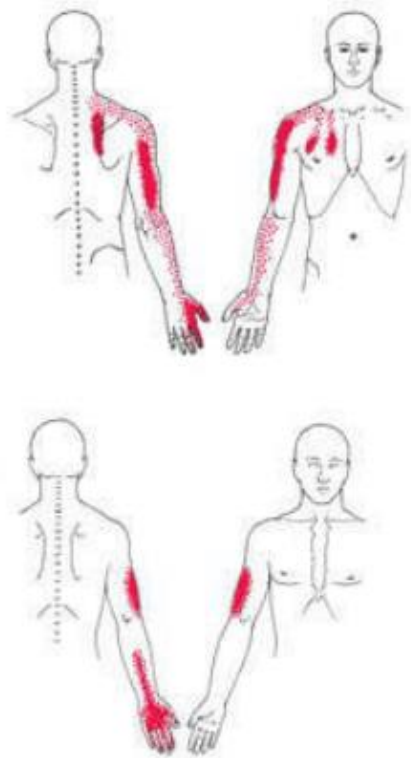
Suboccipital muscles



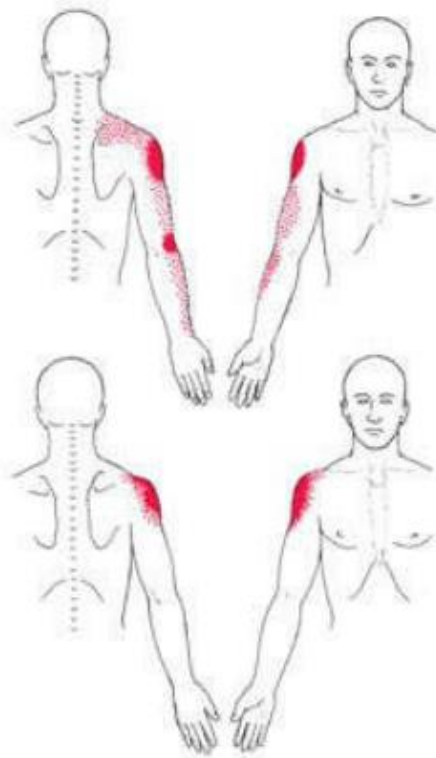
Levator scapulae



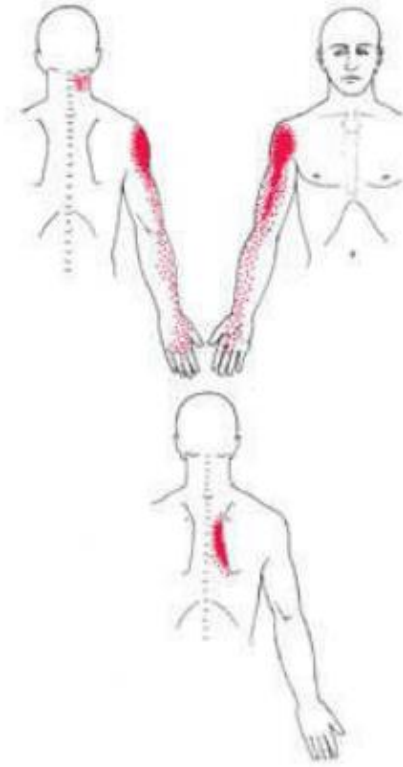
Scalenes



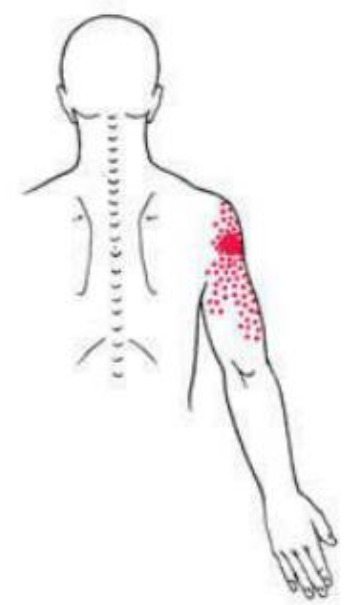
Supraspinatus



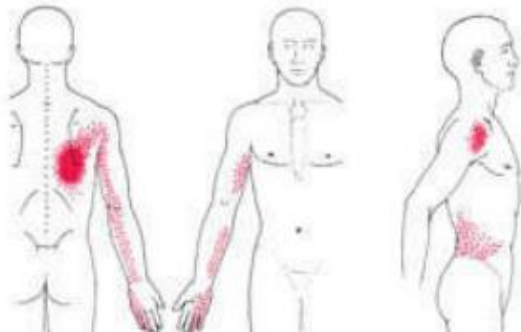
Infraspinatus



Teres minor



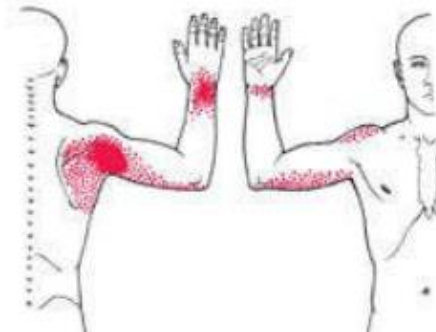
Latissimus dorsi



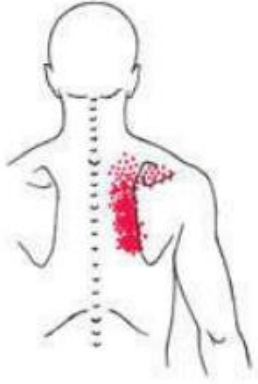
Teres major



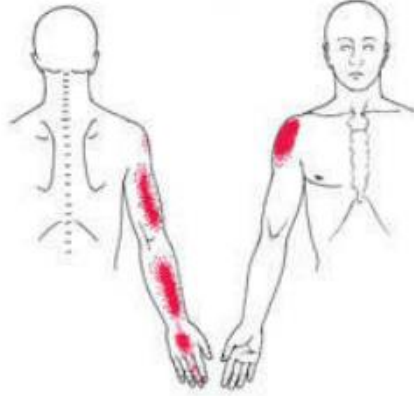
Subscapularis



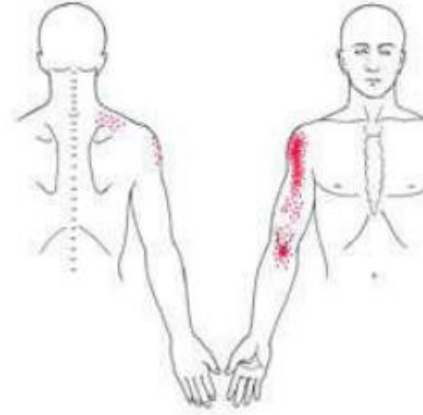
Rhomboid



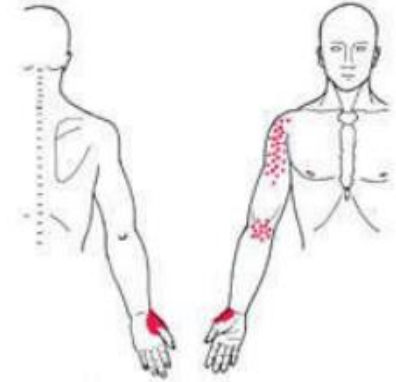
Coracobrachialis



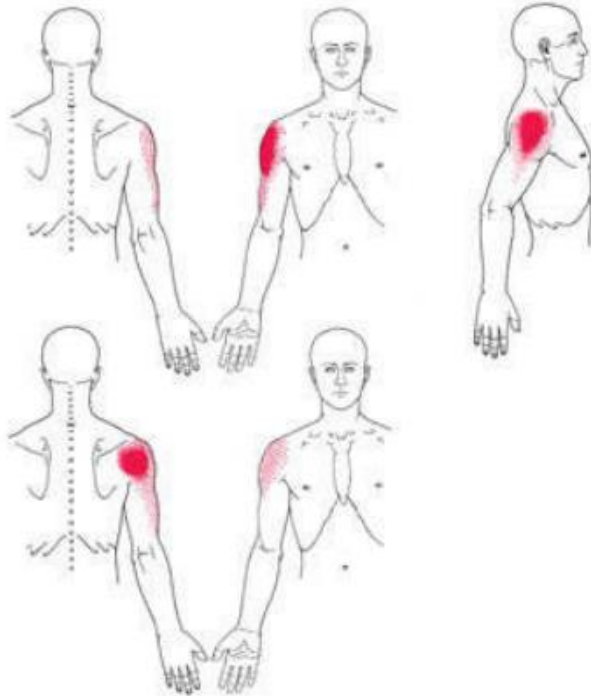
Biceps brachii



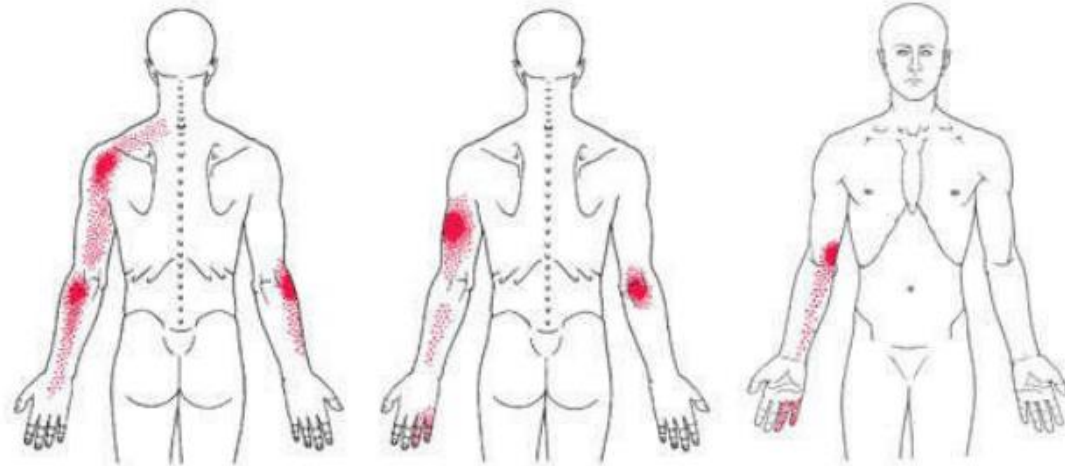
Brachialis



Deltoid



Triceps brachii



**Extensor
carpi ulnaris**



**Extensor carpi
radialis brevis**



**Extensor carpi
radialis longus**



brachioradialis



**Extensor digitorum
and indicis**



Middle finger extensor

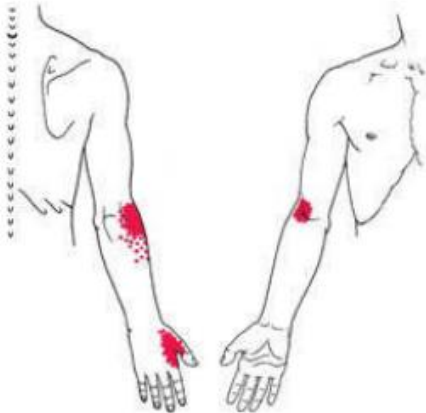


Ring finger extensor



Extensor indicis

Supinator



**Palmaris
Longus**



**Flexor
carpi radialis**



**Flexor
carpi ulnaris**



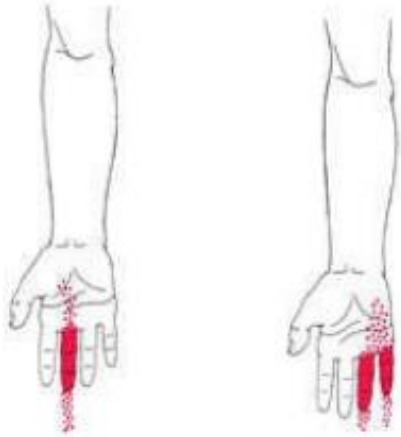
**Flexor
pollicis longus**



**Pronator
quadratus**



Flexor digitorum superficialis and profundus muscles



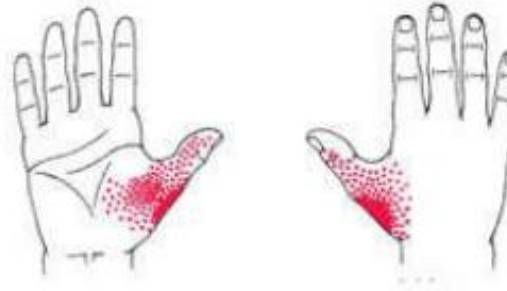
Radial head

Humeral head

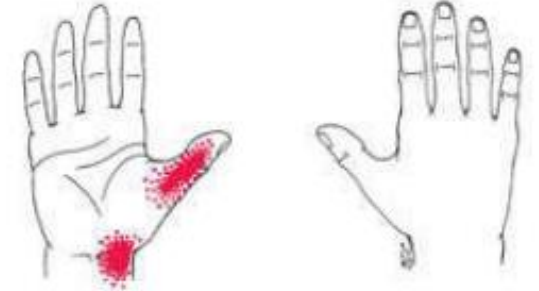
Pronator teres



Adductor pollicis



Opponens pollicis



First dorsal interosseous



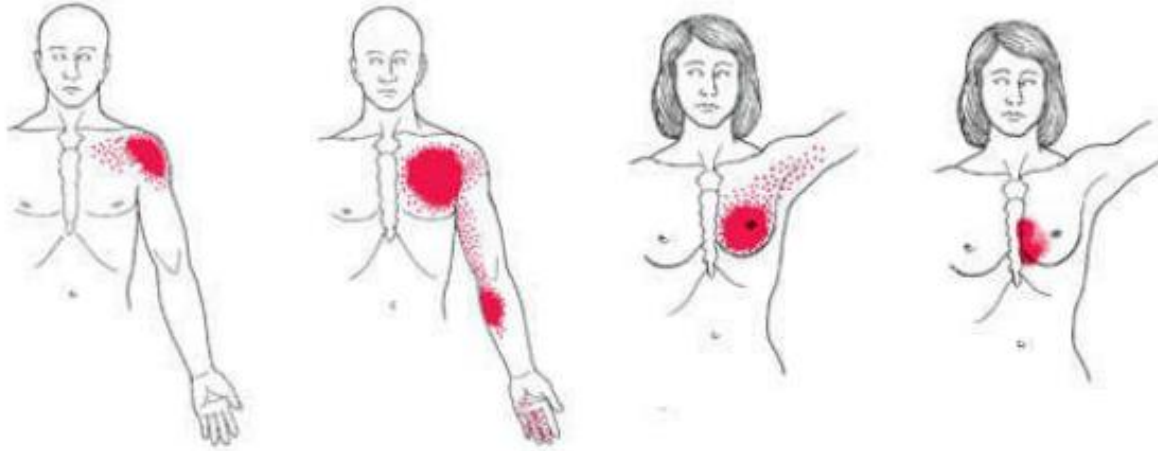
Abductor digiti minimi



Second dorsal interosseous



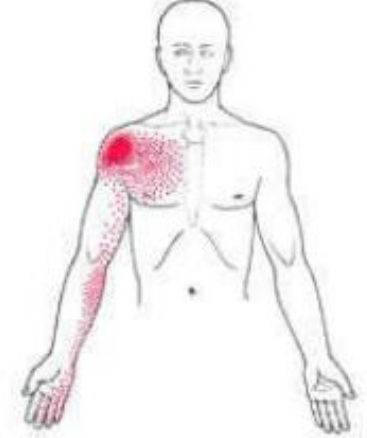
Pectoralis major



Sternalis



Pectoralis minor

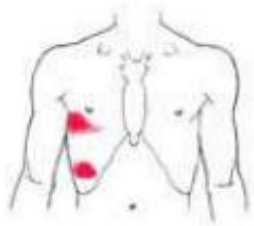


Serratus

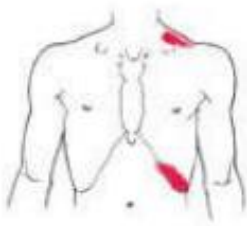
posterior interior



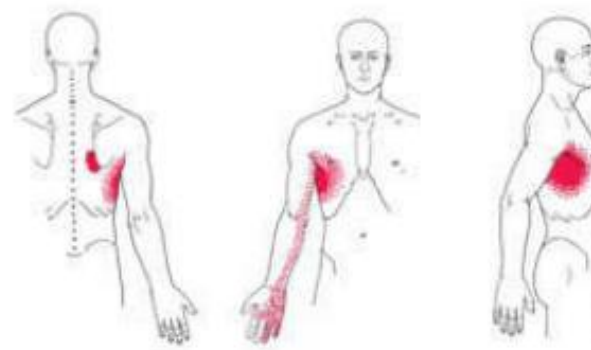
Intercostals



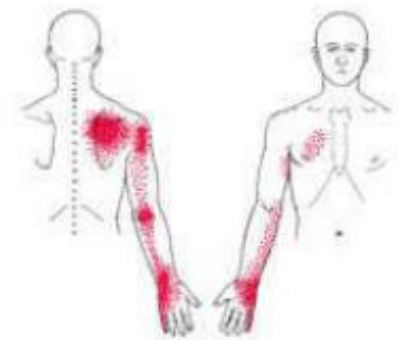
Diaphragm



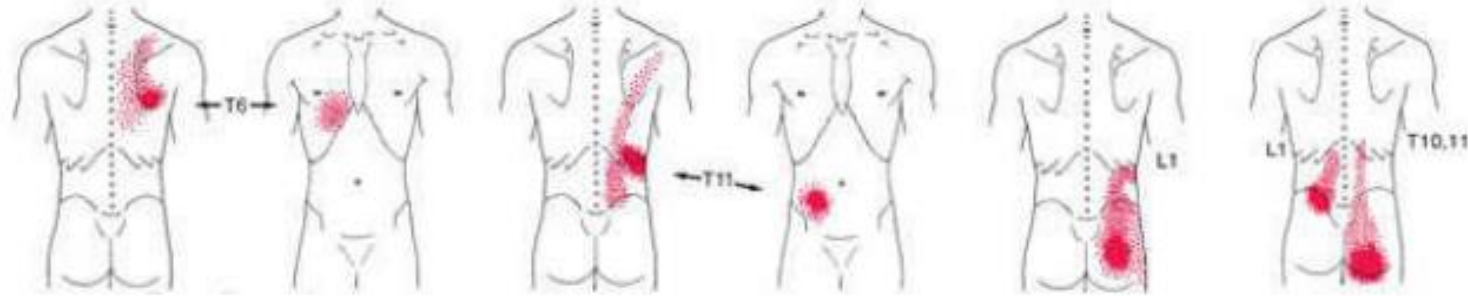
Serratus anterior



Serratus posterior superior



Erector spinae



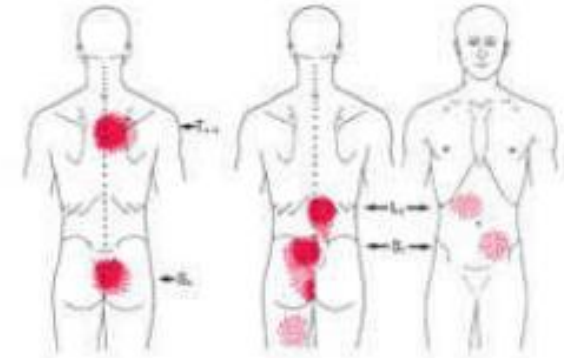
Iliocostalis
thoracis

Iliocostalis
thoracis

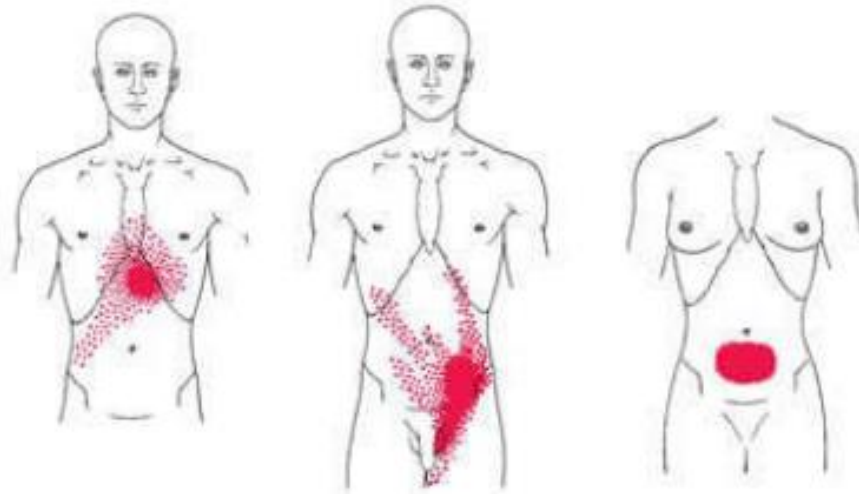
Iliocostalis
lumborum

Longissimus
thoracis

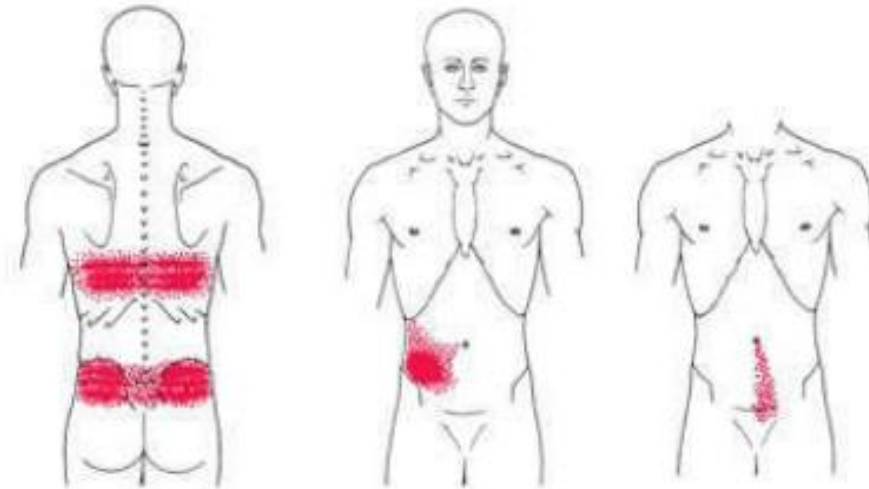
Deep paraspinal



Internal and external oblique abdominis



Rectus abdominis



Quadratus lumborum



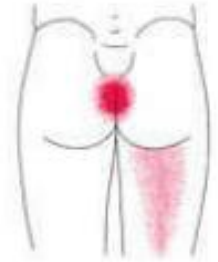
Iliopsoas



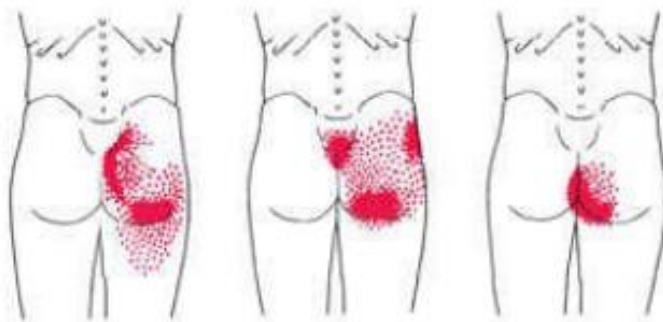
Pelvic floor muscles



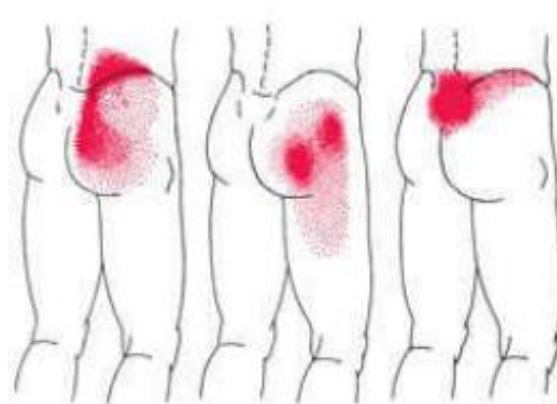
Obturator Internus



Gluteus maximus



Gluteus medius



Gluteus minimus



Tensor fasciae latae



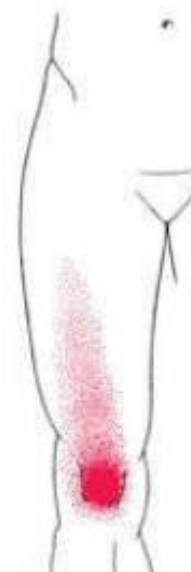
Vastus medialis



Vastus intermedius



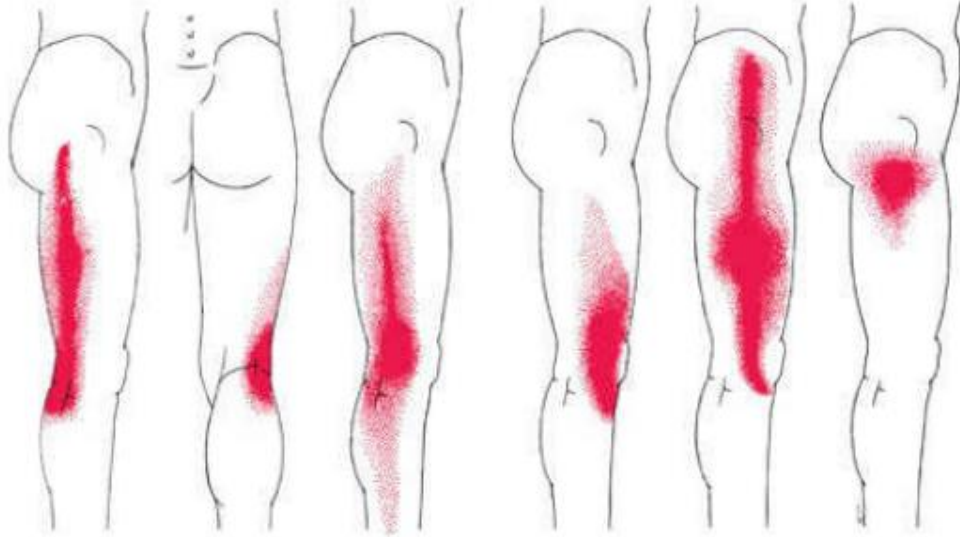
Rectus femoris



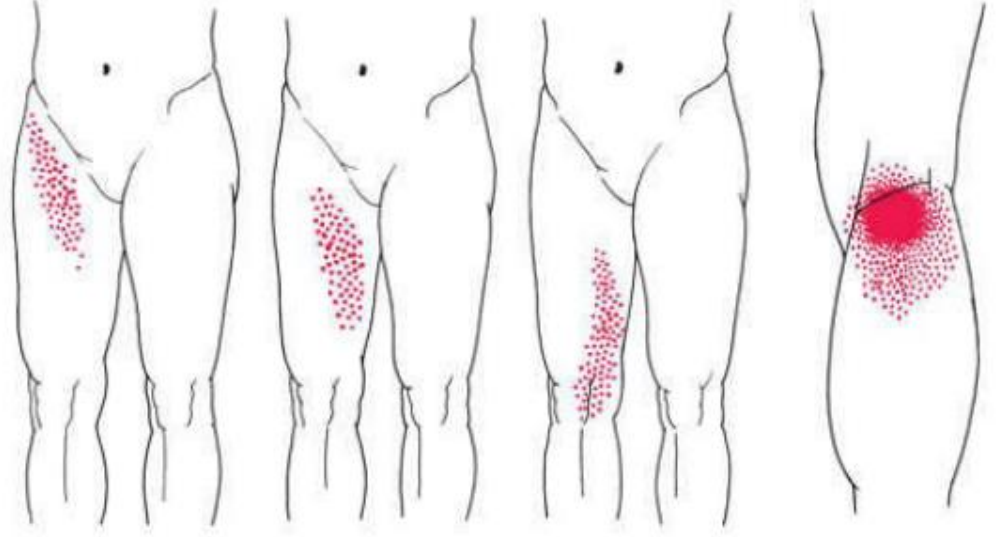
Piriformis



Vastus lateralis



Sartorius

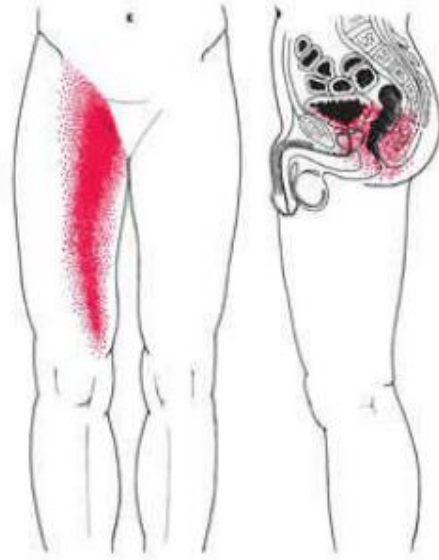


Popliteus

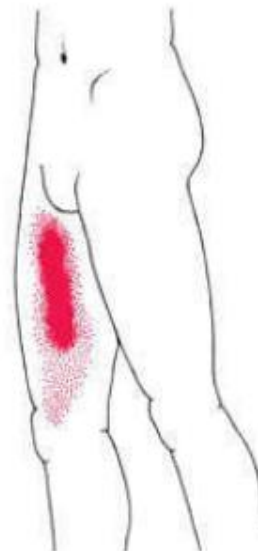
Adductor longus and adductor brevis



Adductor magnus



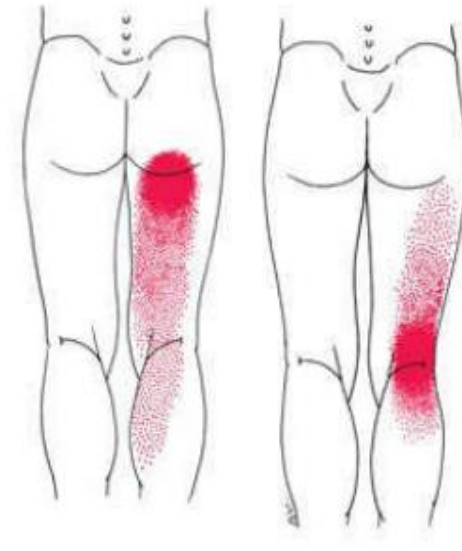
Gracilis



Pectineus



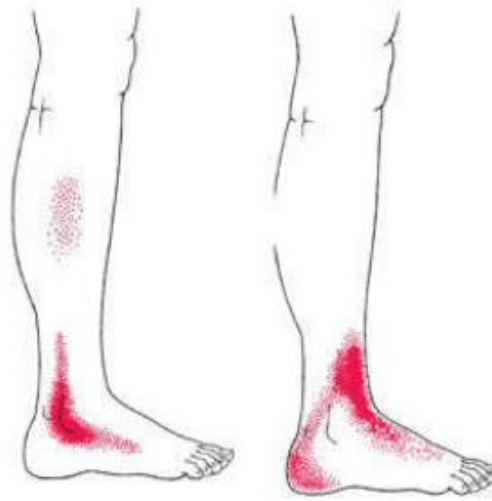
Hamstring



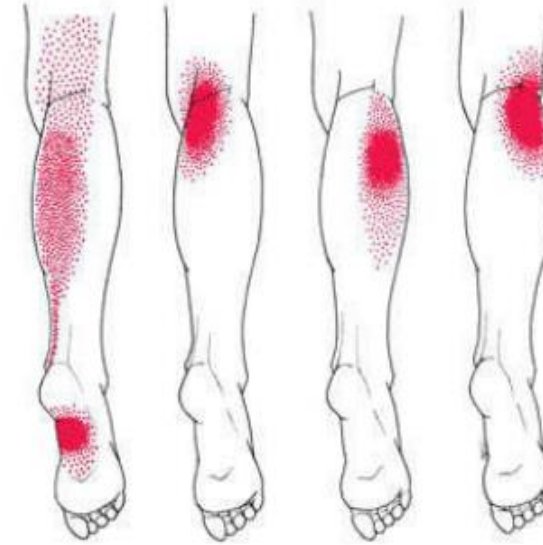
Tibialis anterior



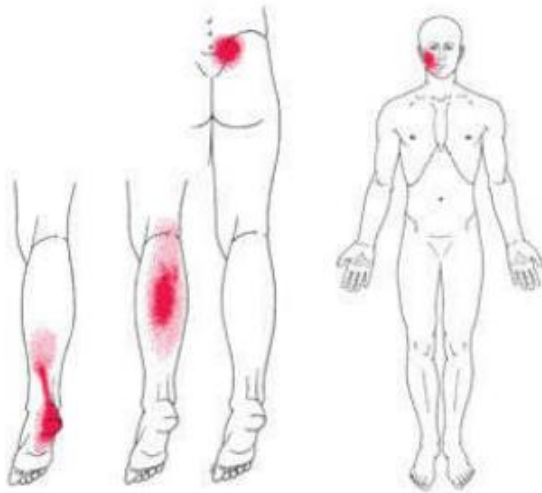
Fibularis



Gastrocnemius



Soleus



Plantaris



Tibialis posterior



Extensor digitorum longus



Extensor hallucis longus



Flexor hallucis longus



Flexor digitorum longus



Abductor hallucis



Abductor digiti minimi



Flexor accessorius



Adductor hallucis and flexor hallucis brevis



First dorsal interosseous



Extensor digitorum brevis and extensor hallucis brevis



Flexor hallucis longus



Flexor digitorum longus



Abductor hallucis



Abductor digiti minimi



Flexor accessorius



Adductor hallucis and flexor hallucis brevis



First dorsal interosseous



Extensor digitorum brevis and extensor hallucis brevis





Figure 55-7. Cross-fiber flat palpation for TrPs in the gluteus medius muscle. A, Anterior portion. B, Middle and posterior portion.

Local twitch response

La penetrazione dell'ago nel Trigger point induce una contrattura fugace e dolore da ipereccitabilità delle fibre motorie.



Terapia

Dry needling

Wet needling (anestetico locale \pm corticosteroidi/
Botox)

Terapia manuale

- Manipolazioni articolari
- Stretching attivo/passivo
- Rilassamento postisometrico
- Tecniche neuromuscolari

Massoterapia

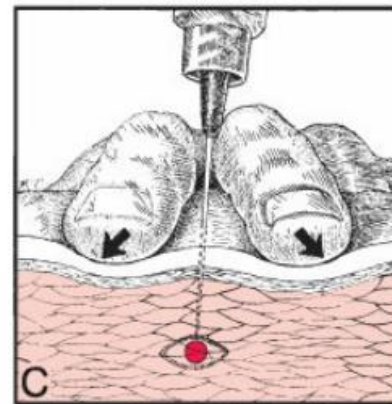
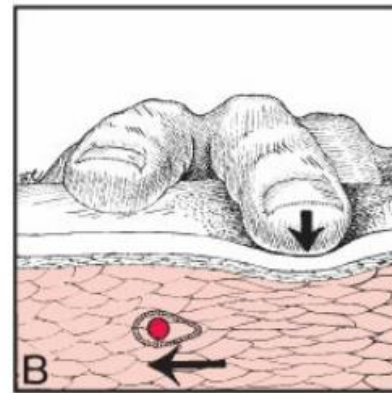
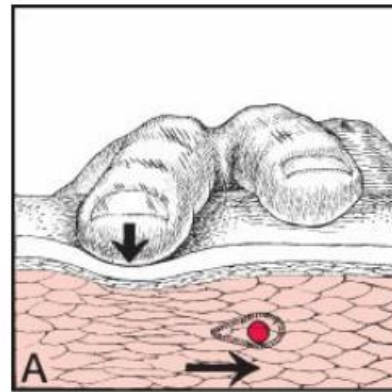
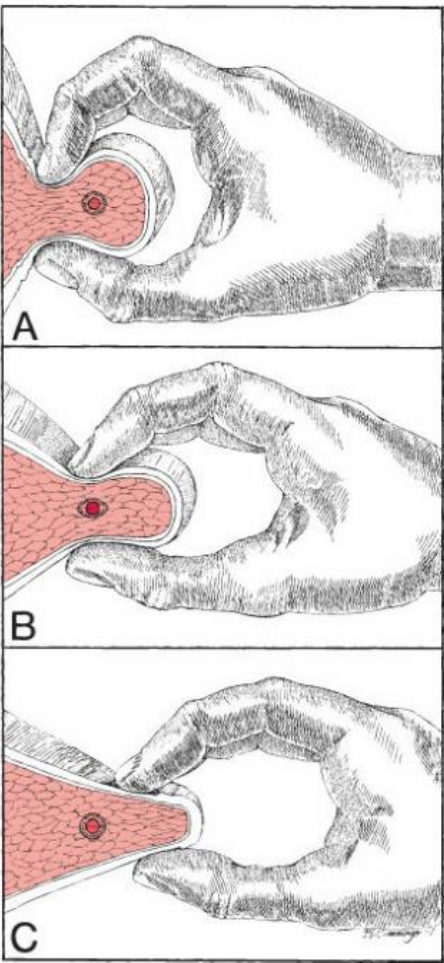
Rieducazione neuromuscolare

- Facilitazione neuromuscolare propriocettiva
- Allenamento della flessibilità
- Allenamento aerobico
- Esercizi funzionali

Iontoforesi

TENS

Rieducazione posturale



Donnelly JM, de las Peñas CF, Finnegan M, Freeman JL. Travell, Simons & Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual. Wolters Kluwer Health; 2018.

Box 72-1 General guidelines for TrP injection or dry needling

- Palpate and identify anatomic landmarks
- Palpate the taut band with cross-fiber flat or pincer palpation
- Identify the TrP and fix with either a pincer grasp or flat palpation
- Needle with straight in and out motions
- Elicit a local twitch response (or referred pain)
- Draw the needle back to the subcutaneous tissue and re-redirect the needle to treat other TrPs in the same or nearby areas
- Provide hemostasis immediately upon withdrawal of the needle
- Apply a postneedling intervention for reducing postneedle soreness

Box 72-2 Contraindications to TrP injection or dry needling

- Inadequately trained practitioner
- Needle phobia
- Cognitive impairment
- Patient's unwillingness to be treated
- Patient's inability to give consent
- Local skin lesions
- Local or systemic infections
- Needling directly over implants

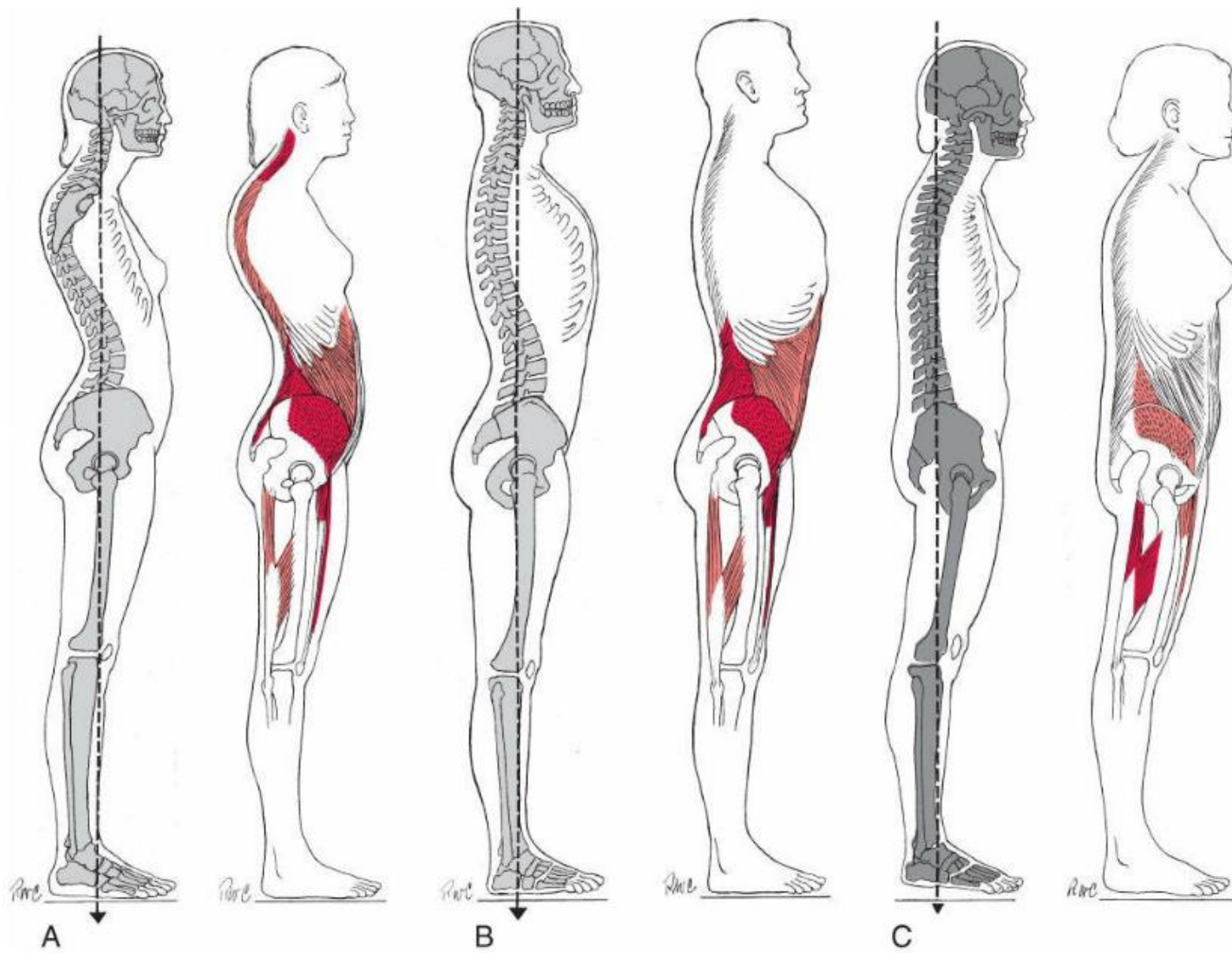


Figure 76-2. Common postural dysfunctions affecting muscle lengths and strength. A, Flat back posture. B, Lordotic posture. C, Kyphotic forward head posture.²

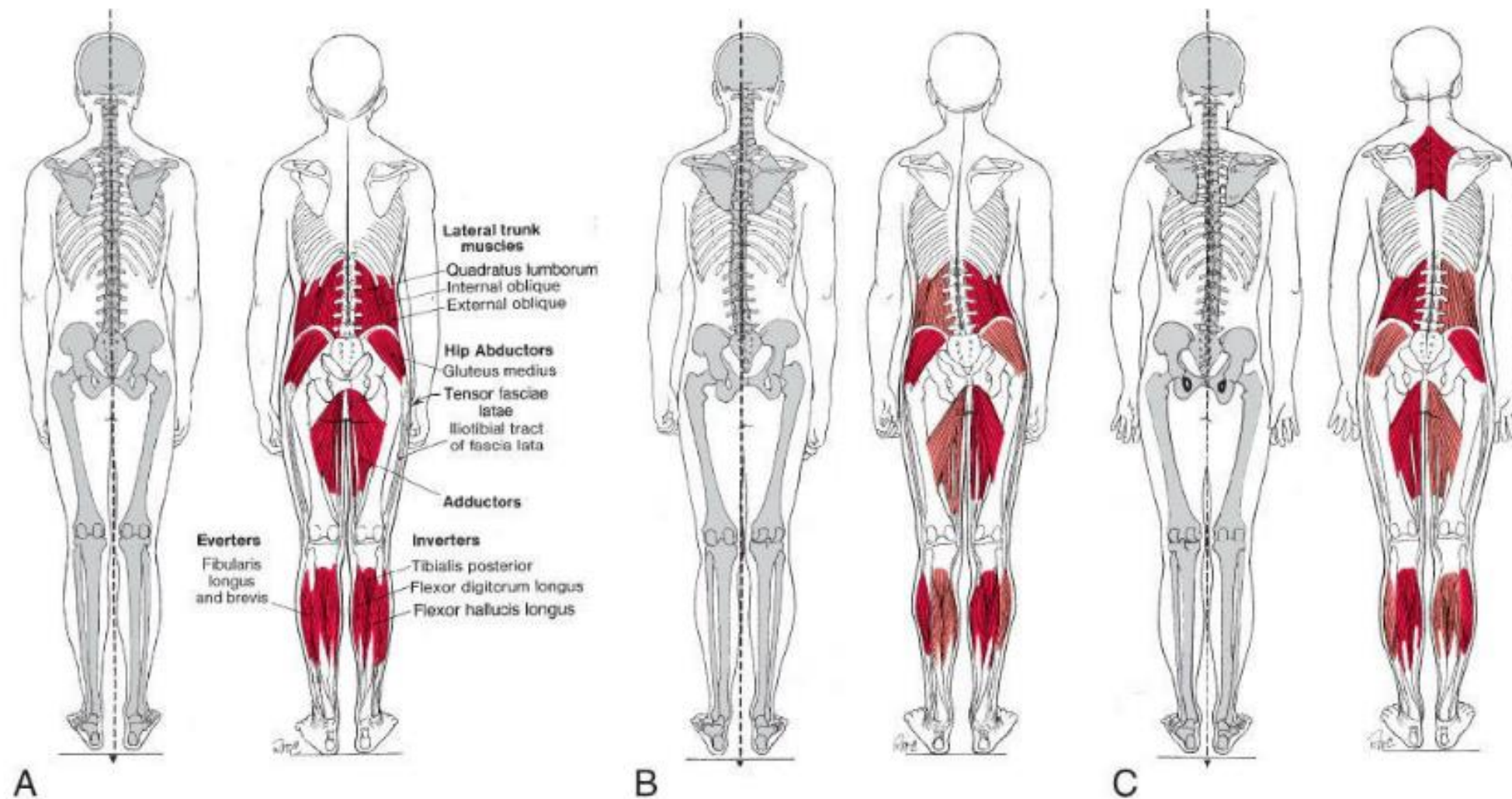


Figure 76-7. Effects of scoliosis on muscle length. A, Typical spinal alignment from a posterior view. B, Left thoracolumbar curve. C, Right slight thoracolumbar curve. Dark red depicts muscles that are shortened and light red are those that are typically elongated.²