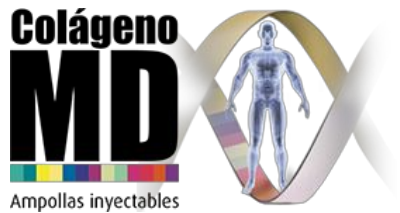




XVII CURSO AEMEF

ASOCIACIÓN ESPAÑOLA DE MÉDICOS DE EQUIPOS DE FÚTBOL · 25 ANIVERSARIO
SEVILLA · FUNDACIÓN CAJASOL · 19 Y 20 DE MAYO DE 2014

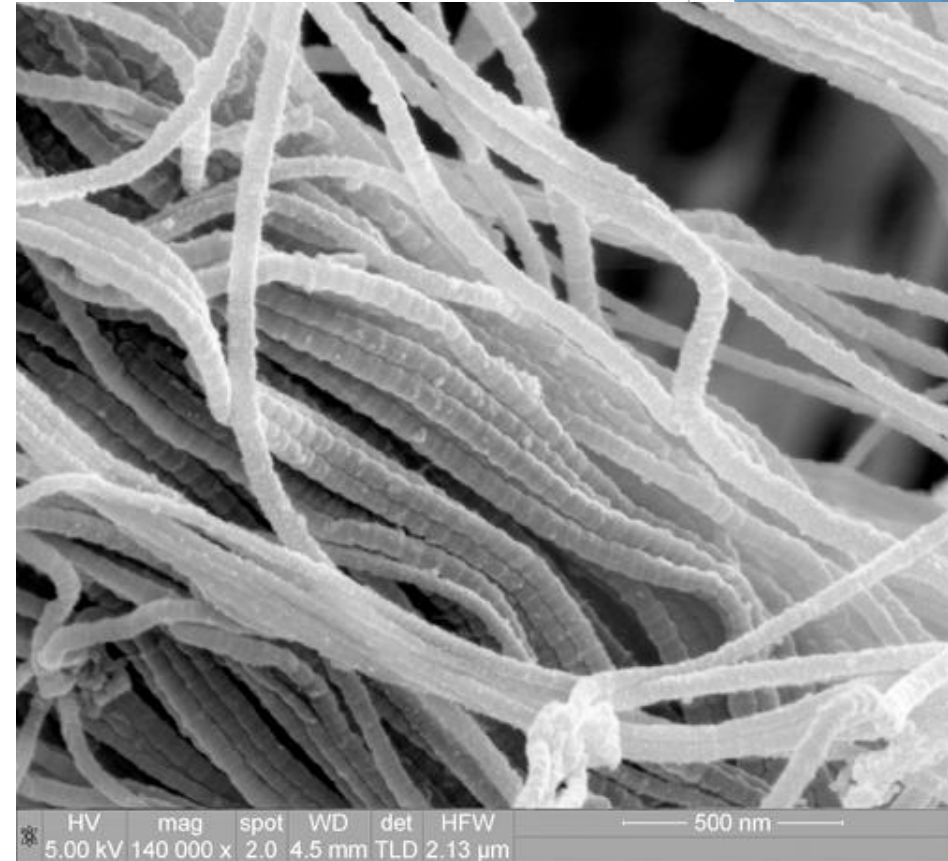
Collagen in Myofascial Treatment



Dr. Adolfo A. Muñoz Macho
Medical Officer Chief Villarreal CF SAD
@dradolfo Munoz

Table of contents

- ▶ Introduction
- ▶ What is myofascial muscle-tendon pain?
- ▶ Types of myofascial pain
- ▶ Causes and how it occurs in sports
- ▶ Usefulness of collagen in clinical practice
- ▶ Football
- ▶ Tennis
- ▶ Volleyball
- ▶ Athletics
- ▶ Conclusions



Introduction



What is myofascial and myotendinous pain?



Myofascial pain

What is it?

- ▶ Myofascial pain affects muscles, often those of back, neck and shoulder.
- ▶ It is associated with sensitive and stiff areas called points of transmission (Trigger Points).
- ▶ When transmission points are pressed, you can feel pain that radiates from these points.

Types of myofascial pain

Acute

Subacute

Chronic

Fibromyalgia

Do they suffer from myofascial pain?



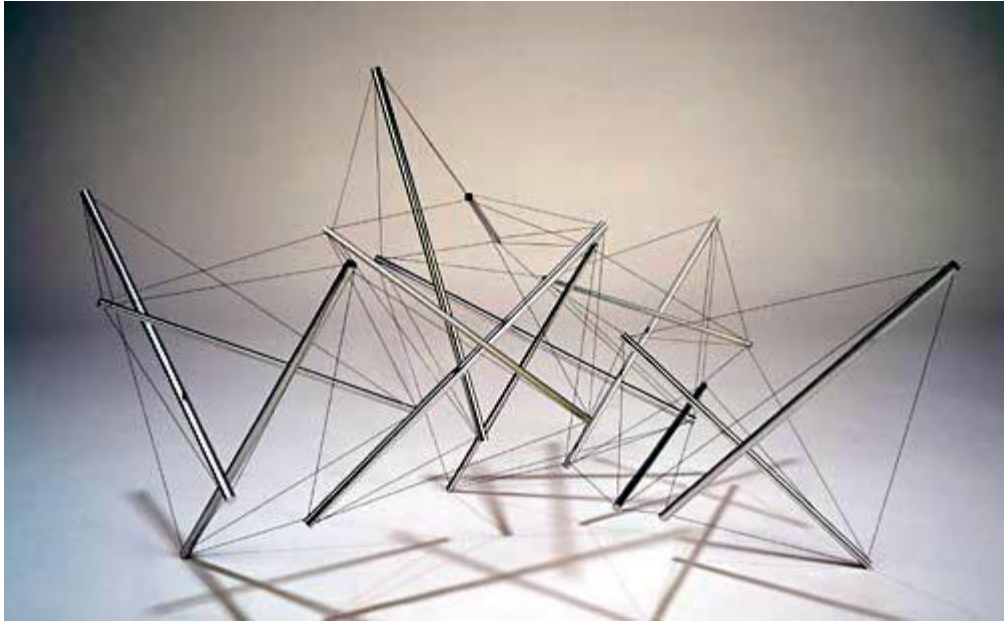
Do they suffer from myofascial pain?



Definition of Fibromyalgia



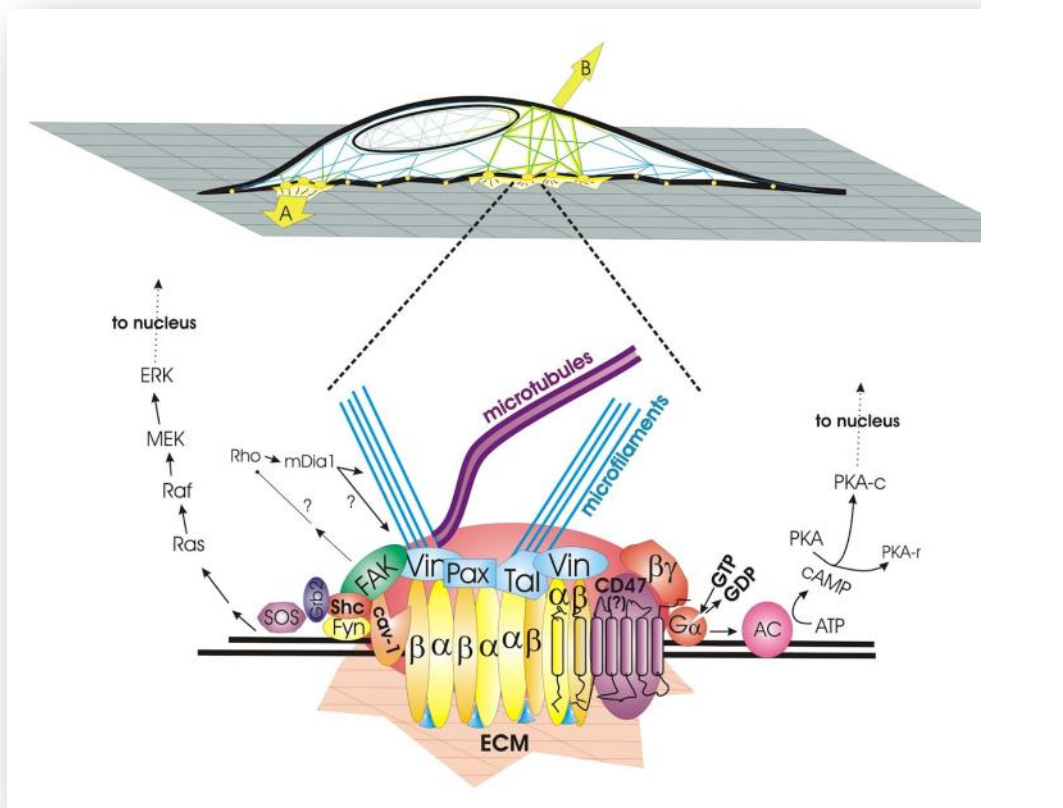
- ▶ The word fibromyalgia (FM) means pain affecting muscles and fibrous tissue (ligaments and tendons).
- ▶ Fibromyalgia is characterized by general musculo-skeletal pain and painful sensation when pressing specific points (trigger points).
- ▶ This is similar to pain originating within the joints but it is not a joint disease.



Tensegrity, is islands of compression inside an ocean of tension.
-Richard Buckminster Fuller



Mechanotransduction



JOURNAL OF CELLULAR PHYSIOLOGY 207:767-774 (2006)

Subcutaneous Tissue Fibroblast Cytoskeletal Remodeling Induced by Acupuncture: Evidence for a Mechanotransduction-Based Mechanism

HELENE M. LANGEVIN,^{1*} NICOLE A. BOUFFARD,¹ GARY J. BADGER,²
DAVID L. CHURCHILL,¹ AND ALAN K. HOWE³

¹Department of Neurology, ²Department of Medical Biostatistics,
³Department of Pharmacology, Vermont Cancer Center,
University of Vermont College of Medicine, Burlington Vermont



Direct Analgesic Effects through interaction between Acupuncture points and connective tissue.

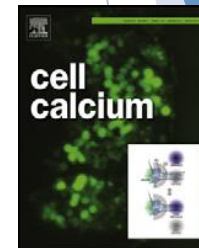
Cell Calcium 53 (2013) 297–301



Contents lists available at SciVerse ScienceDirect

Cell Calcium

journal homepage: www.elsevier.com/locate/ceca



Purine receptor mediated actin cytoskeleton remodeling of human fibroblasts

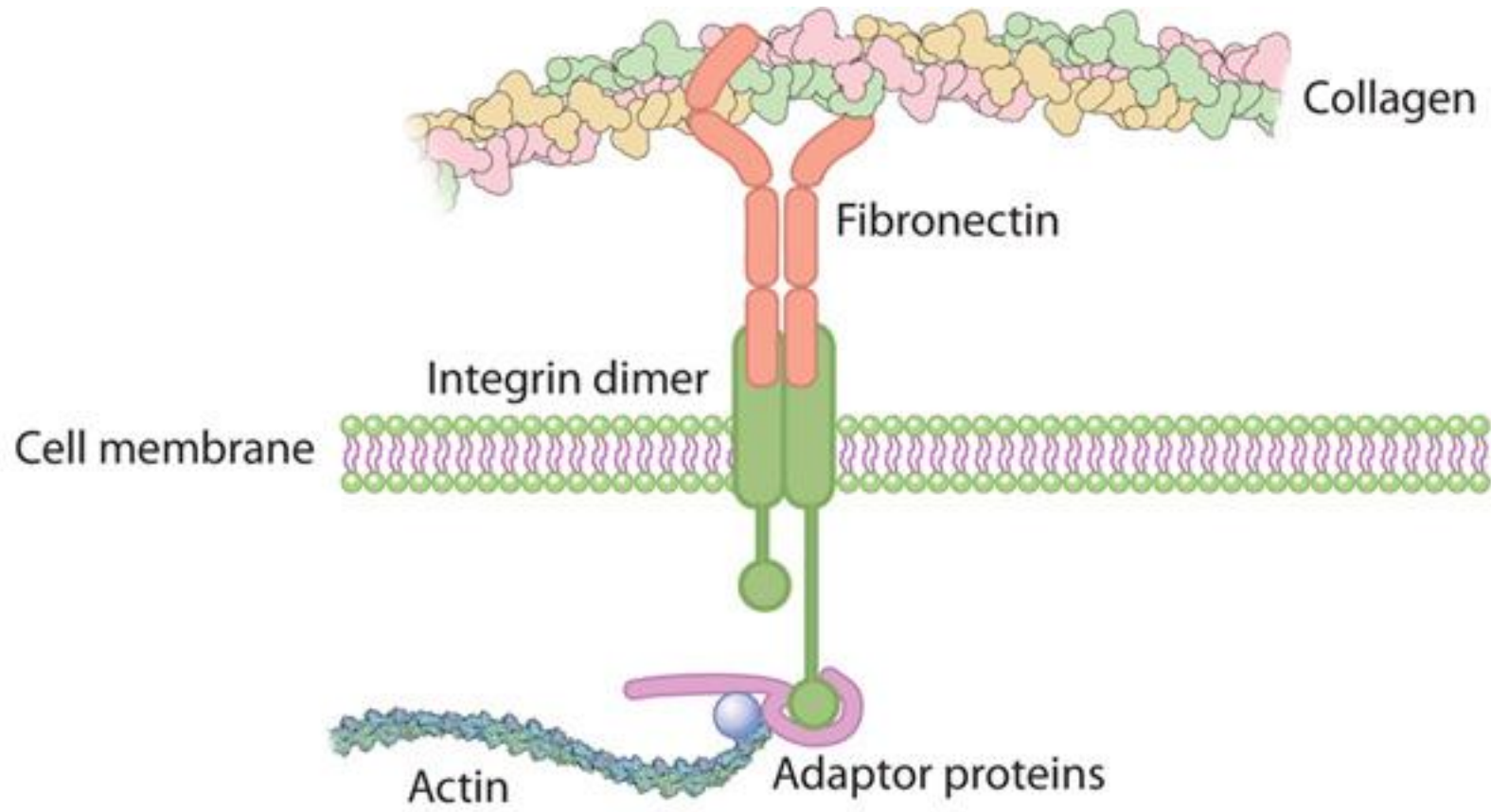
Nanna Goldman^a, Devin Chandler-Militello^b, Helene M. Langevin^c,
Maiken Nedergaard^a, Takahiro Takano^{a,*}

^a Division of Glial Disease and Therapeutics, Center for Translational Neuromedicine, University of Rochester, Rochester, NY 14642, United States

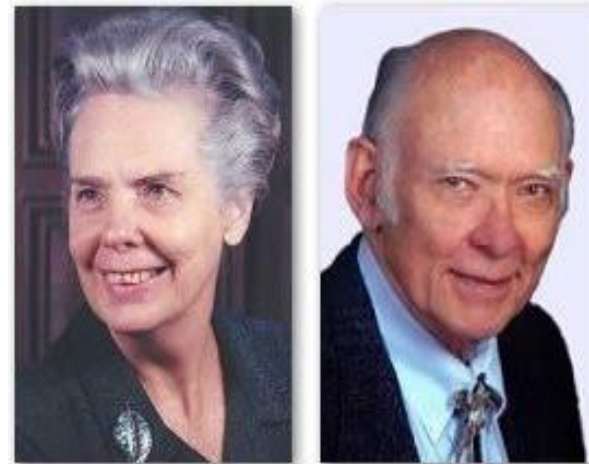
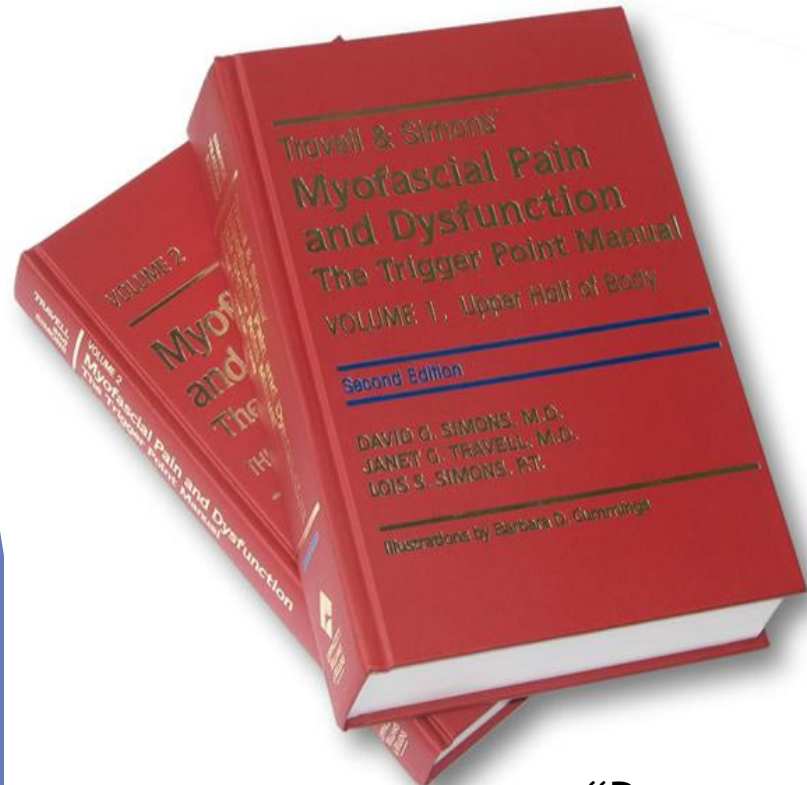
^b Division of Cell and Gene Therapy, Center for Translational Neuromedicine, University of Rochester, Rochester, NY 14642, United States

^c Department of Neurological Sciences, University of Vermont, Burlington, VT 05405, United States

Mechanotransduction



Myofascial Trigger Points



Dr Janet Travell, left, and Dr David Simons

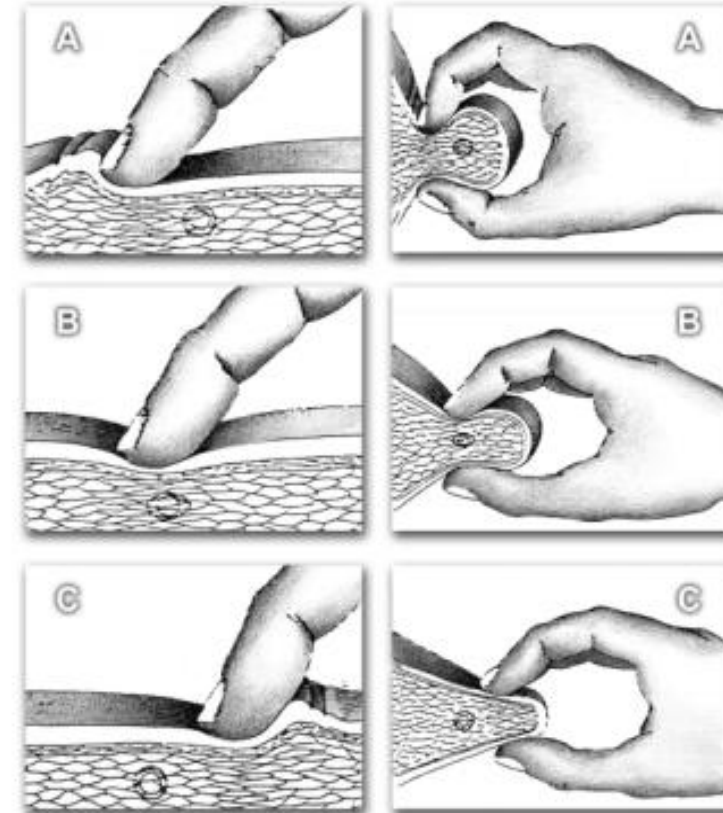
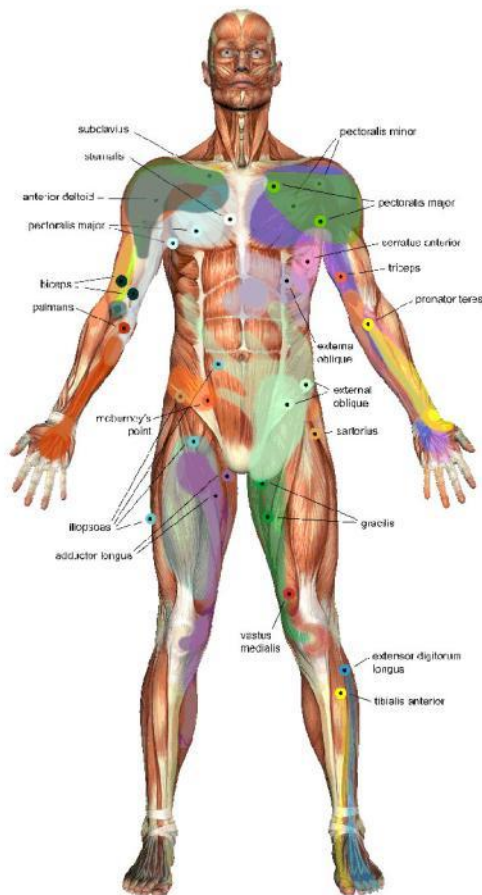


Figura 1. Técnica de palpación de bandas fibrosas

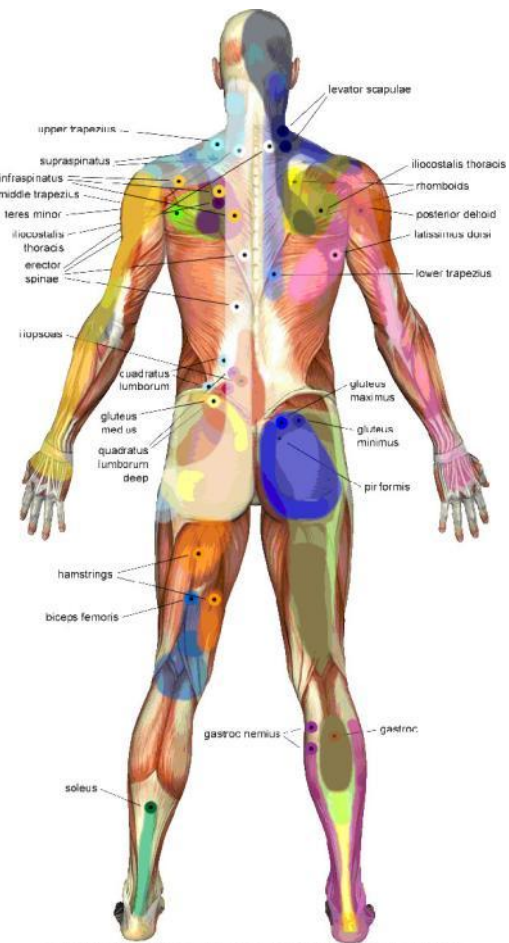
“Presence and persistence of painful points when pressed, which in turn cause referred pain to projected areas.”

Simons DG, Travell JG, Simons LS. Travell and Simon's Myofascial Pain and Dysfunction: The Trigger Point Manual, 2nd ed. Baltimore: Williams & Wilkins, 1998

Trigger Points

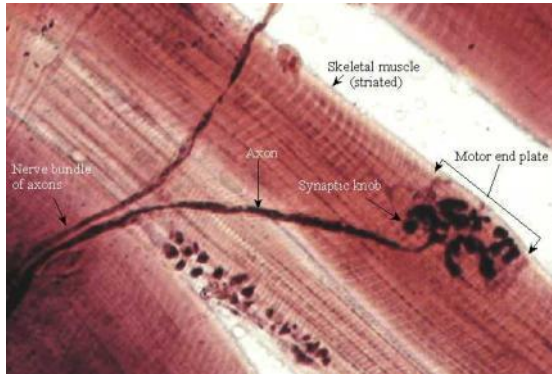


Copyright: Trigger Point Technologies, LLC. Based on findings by Travell and Simons, and by Julie Donnelly.



Copyright: Trigger Point Technologies, LLC. Based on findings by Travell and Simons, and by Julie Donnelly.

Trigger Points




European Journal of Pain

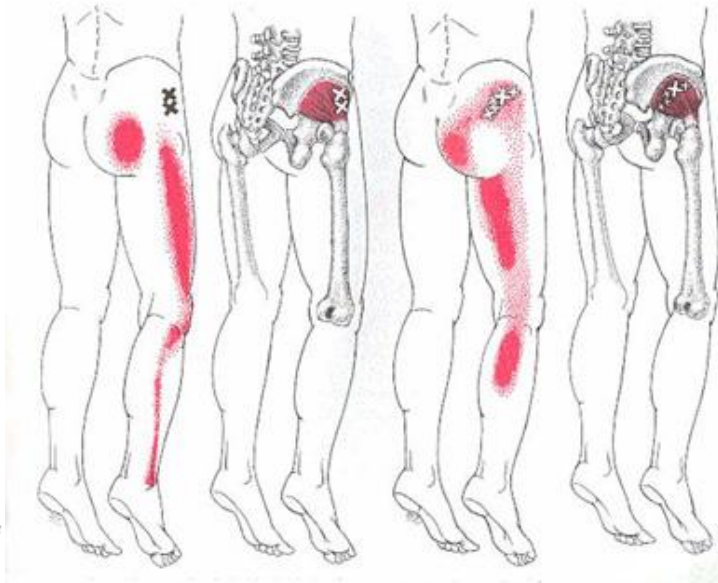
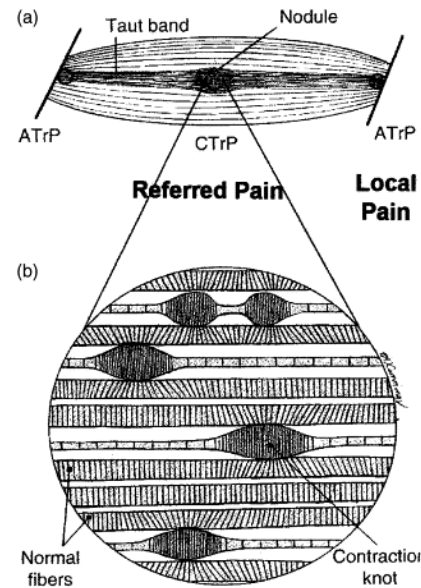
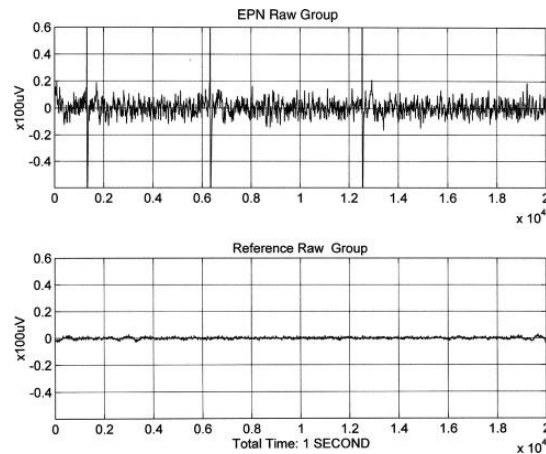
Volume 11, Issue 6, August 2007, Pages 624–634

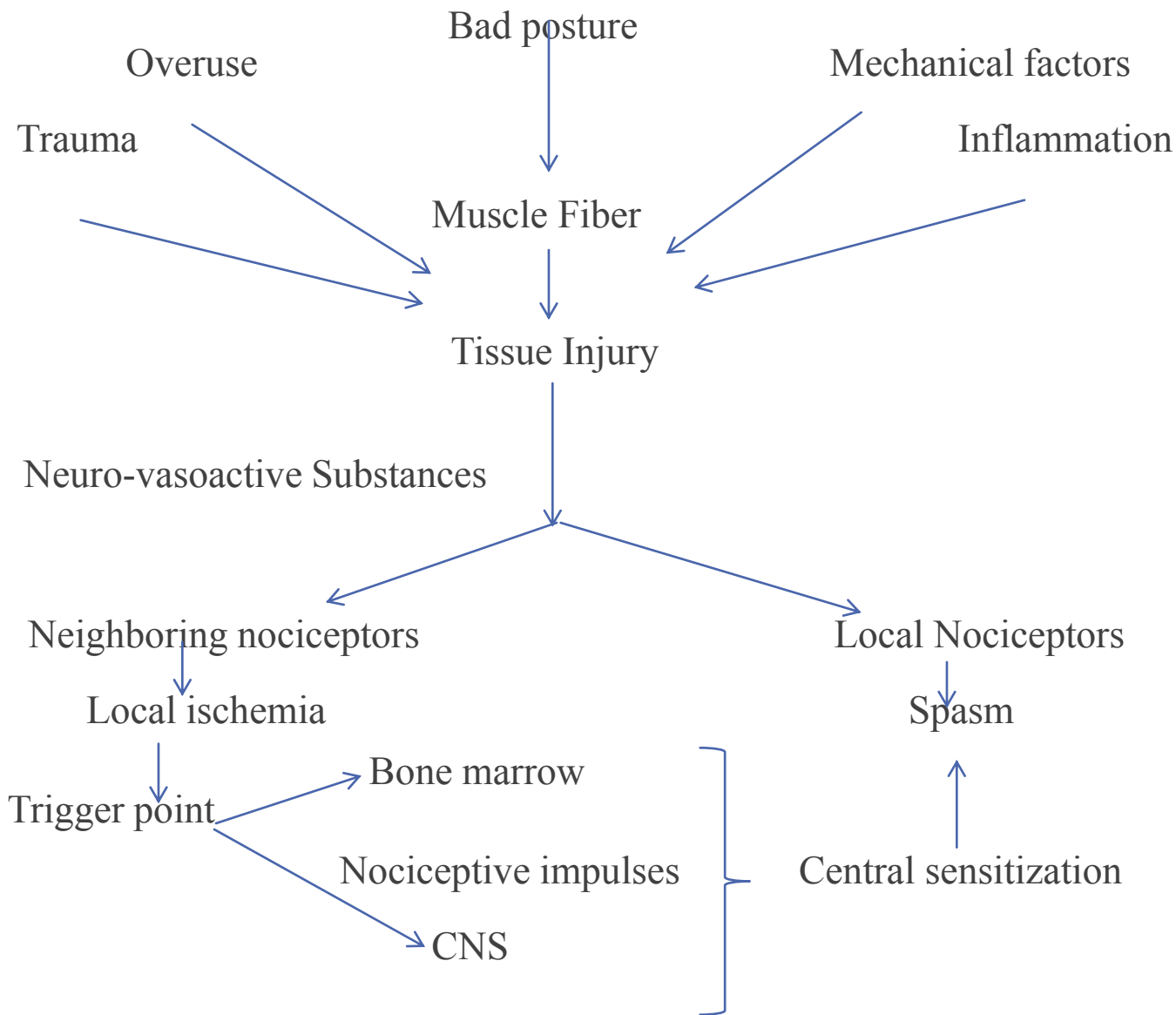


The spinal cord connections of the myofascial trigger spots ☆☆☆

Ta-Shen Kuan^a, Chang-Zern Hong^{a, c, d}, Jo-Tong Chen^a, Shu-Min Chen^a, Chi-Hsien Chien^b   

^a Department of Physical Medicine and Rehabilitation, College of Medicine, National Cheng Kung University, Tainan, Taiwan,





Vision of CMT and Acupuncture

Revista Internacional de **Acupuntura**
En colaboración con Deutsche Zeitschrift für Akupunktur, Revista Alemana de Acupuntura y Técnicas Relacionadas

ORIGINALES | ORIGINAL ARTICLES
DOI: 10.1016/J.DZA.2008.07.004 | 15 | REV INT ACUPUNTURA. 3, ENE-MAR/2009

✉ P. T. Dorsher, MD¹; J. Fleckenstein, MD²

Puntos gatillo y puntos de acupuntura clásica
Primera parte: Relaciones anatómicas cualitativas y cuantitativas

Trigger Points and Classical Acupuncture Points
Part 1: Qualitative and quantitative anatomic correspondences*

ORIGINALES | ORIGINAL ARTICLES

Revista Internacional de **Acupuntura**
En colaboración con Deutsche Zeitschrift für Akupunktur, Revista Alemana de Acupuntura y Técnicas Relacionadas

DOI: 10.1016/J.DZA.2008.10.001 | 62 | REV INT ACUPUNTURA. 3, ABR-JUN/2009

✉ P. T. Dorsher¹, J. Fleckenstein²

Puntos gatillo y puntos de acupuntura clásica
Parte 2: Correspondencias clínicas en el tratamiento del dolor y las disfunciones somatoviscerales

Trigger points and classical acupuncture points
Part 2: Clinical correspondences in treating pain and somatovisceral disorders



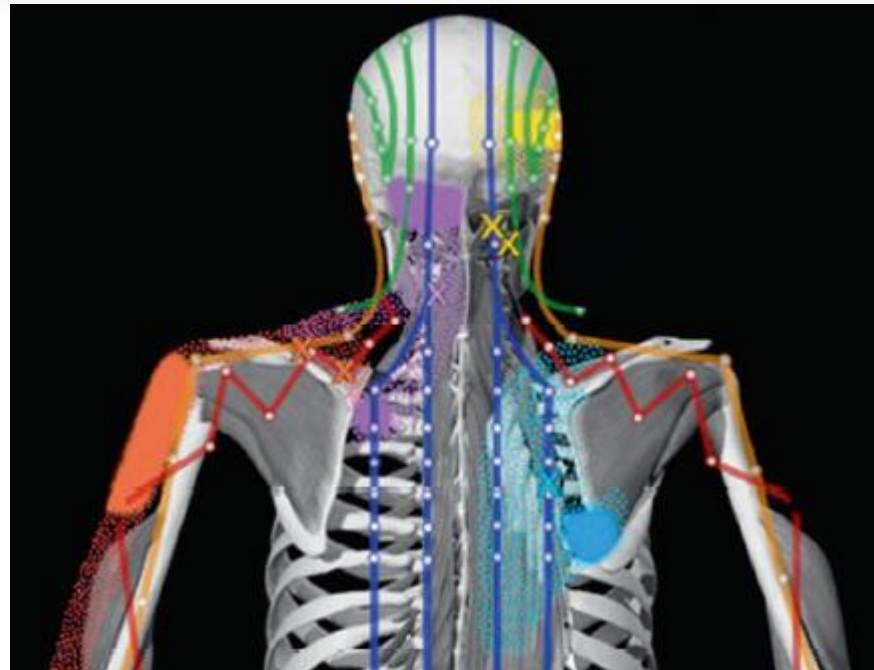
✉ P. T. Dorsher¹, J. Fleckenstein²

Puntos gatillo y puntos de acupuntura clásica

Tercera parte: Relación entre los patrones de dolor miofascial referido
y los meridianos de acupuntura

Trigger Points and Classical Acupuncture Points

Part 3: Relationships of myofascial referred pain patterns to acupuncture meridians



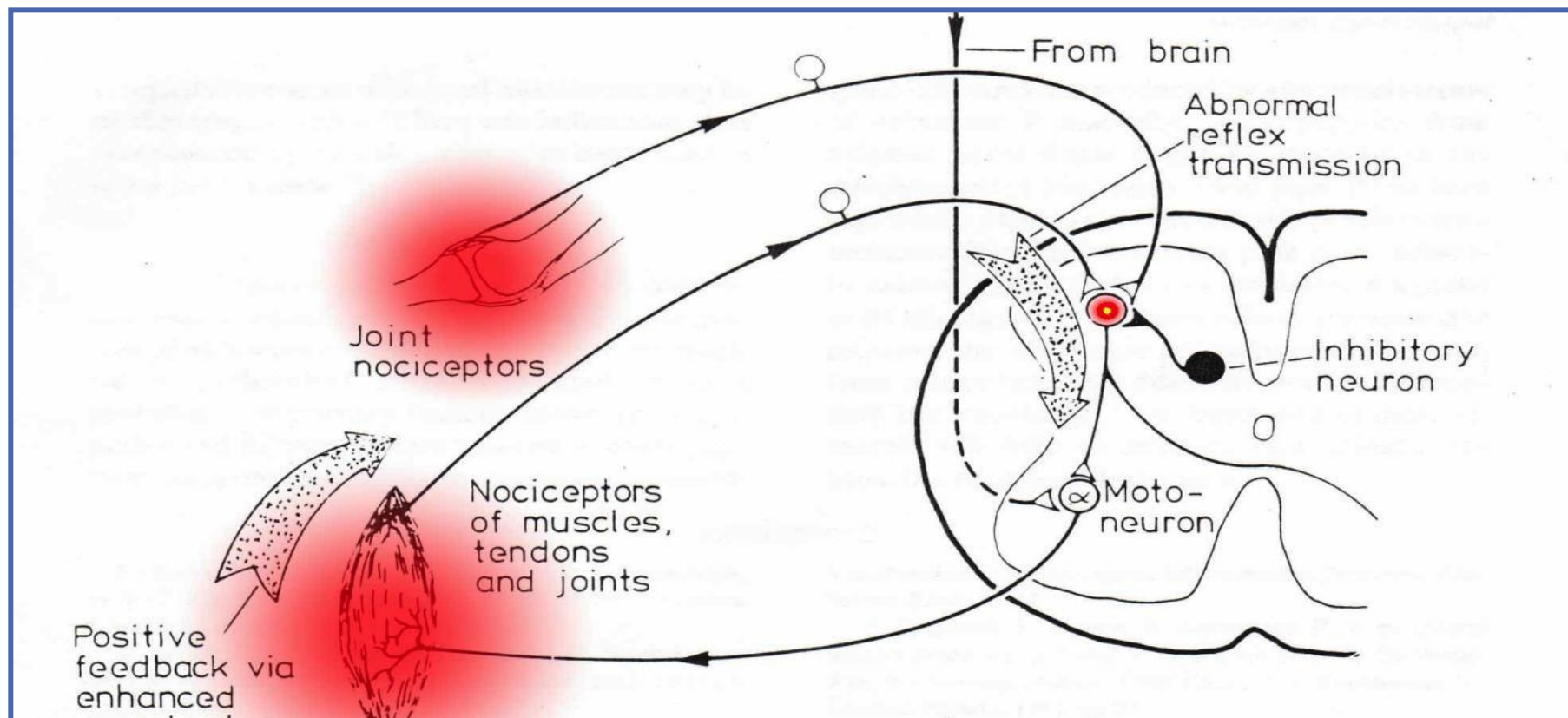
Abstract

- 221 out of 238 areas of common trigger points anatomically connected with standard acupuncture points are described in patterns of myofascial referred pain.
- 81.5% of the areas of trigger points and standard acupuncture points anatomically related showed complete or almost complete correspondence in the distribution of their patterns of myofascial referred pain and associated acupuncture meridians, and 9.5% of the couple of points showed a partial correspondence.
- Only 9% of the couple of points showed little or no correspondence between referred pain patterns and acupuncture meridians.

The high consistency in the distribution of myofascial referred pain patterns and acupuncture meridians suggests a fourth line of evidence according to which the areas of MTP and standard acupuncture points are probably the same physiological phenomenon applied to pain management.



Trigger points



Applied Physiology



Helene M. Langevin
University of Vermont

Active remodeling of the cytoskeleton.
Interconnection Network

Mechanotransduction

- Local, remote and long-term effects

Impedance in connective tissue,
meridians and acupuncture points

"qi" Feeling in acupuncture

DIFFERENT CELL TYPES

Neurons transmission

- Electric
- Chemical
- Mechanical ?
- (neurodynamics)
- Light ?
- Temperature?

Muscle Contraction

- Electric
- Chemical
- Mechanical ?
- Light ?
- Temperature?

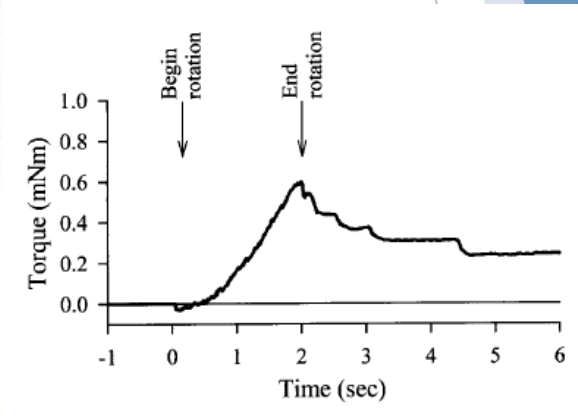
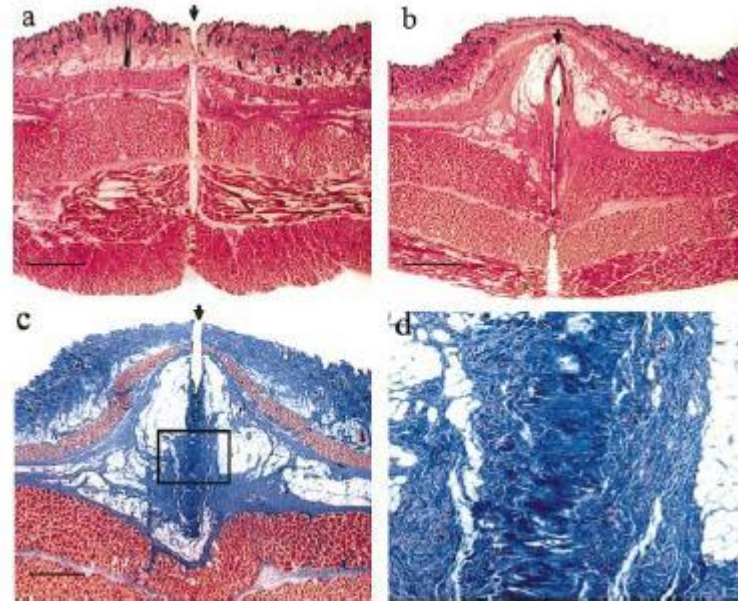
Connective Tissue support

- Electric?
- Piezoelectric?
- Mechanical?
- Chemical?
- Temperature
- Laser (Prof. Schikora)

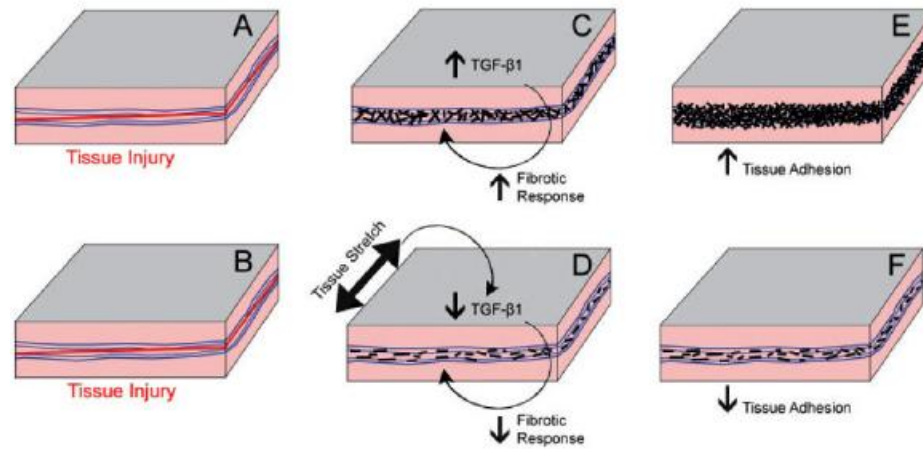
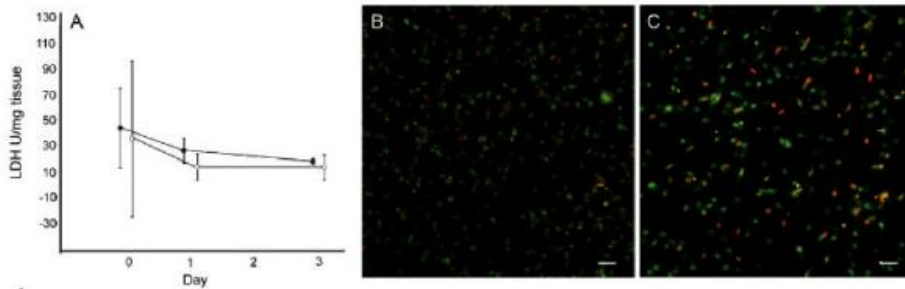
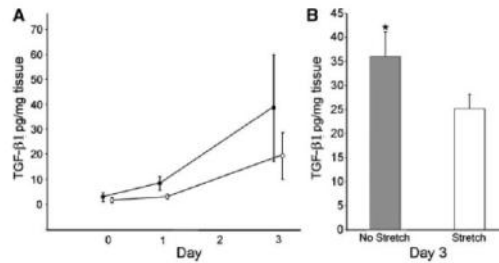
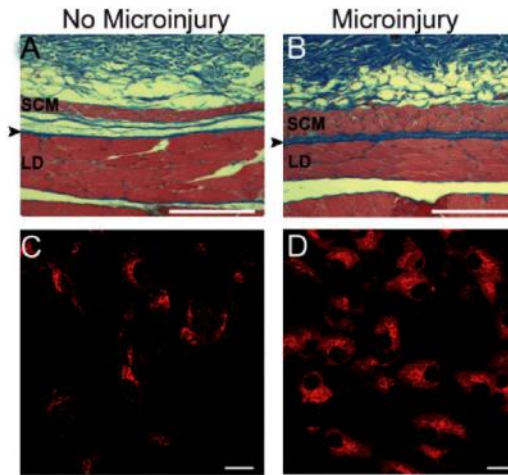
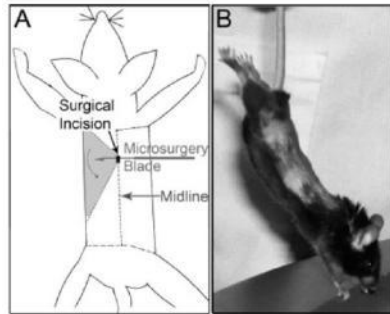
- Mechanosensorial
- Regulator
- Signaling

Stem cells

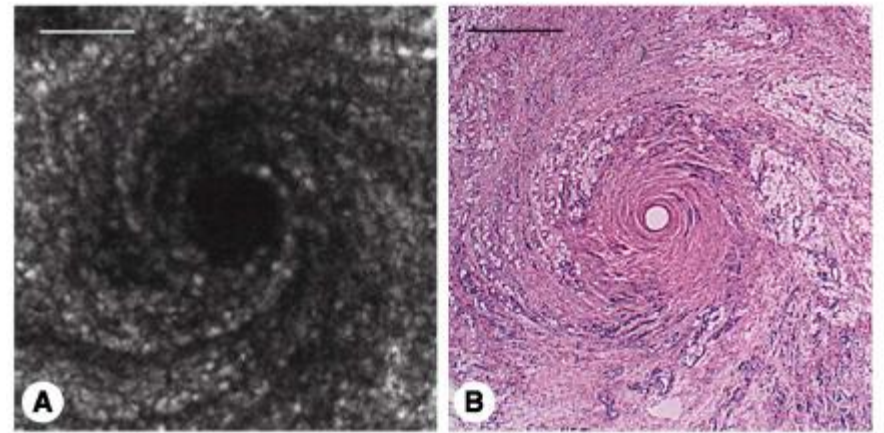
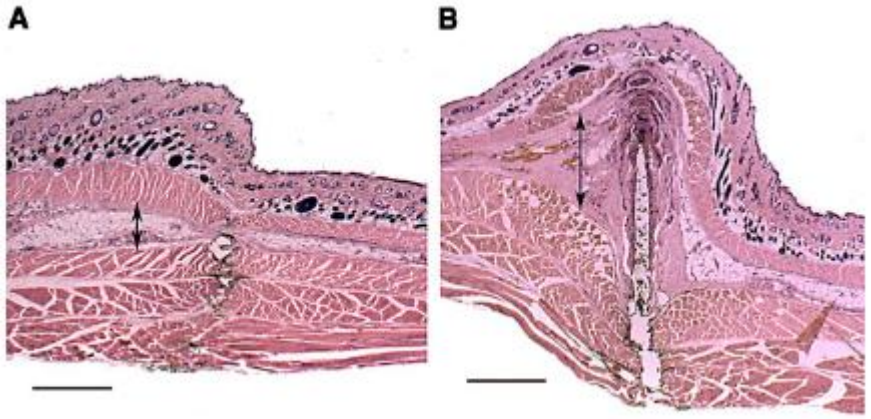
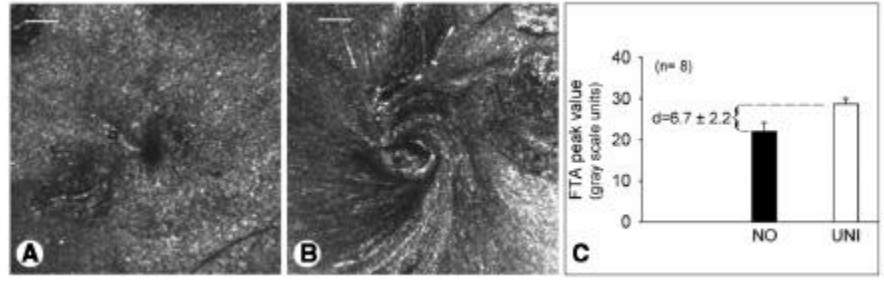
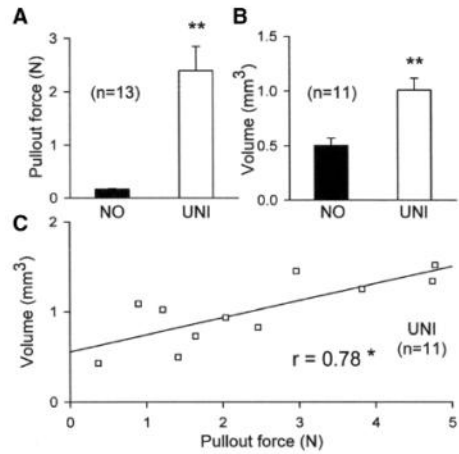
Winding - Grasping - Rotation



Tissue Stretching -> TGF Beta1 and Procollagen



Winding - +/- Rotation



What is the Cause?

Bursitis, tendinopathy and other syndromes of soft tissues, such as myofascial pain, are the result of one or various factors.

These include:

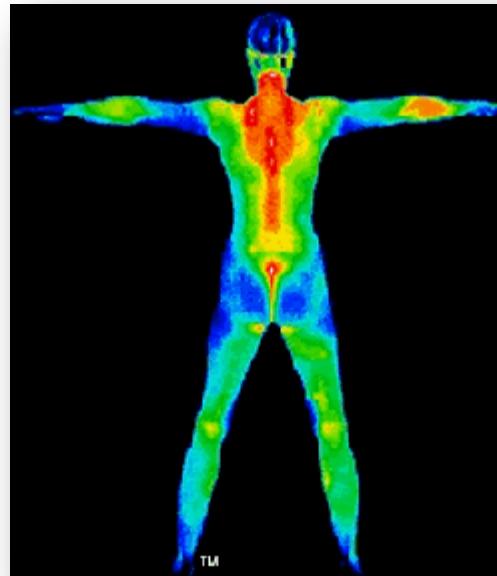
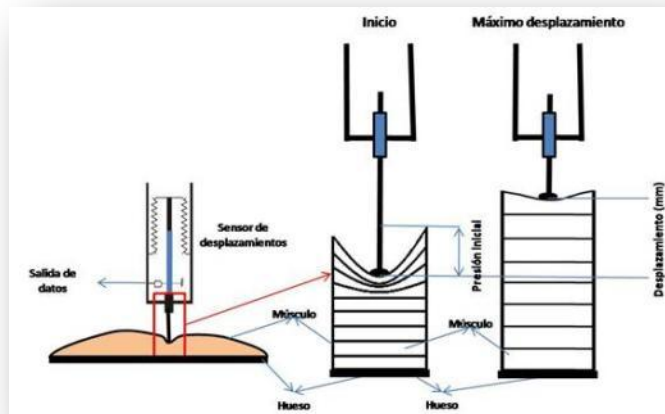
- Recreational or working activities that cause overuse or joint damage.
- **Bad postural attitude** or bad posture for long periods (airplane)
- Soft tissue tension due to **joints or bones positioned abnormally or incorrectly** (such as differences in the length of the legs or joint arthritis)
- Other diseases or conditions (rheumatoid arthritis, gout, psoriasis, thyroid disease or adverse drug reaction)
- Infections

What are the symptoms?

- ▶ The myofascial pain is characterized by a firm knot or band within the affected muscle.
- ▶ Myofascial back pain is a dull and continuous pain affecting the connective tissue (fascial) or muscles of the lower back and buttocks.
- ▶ The causes may be small injury or back strain without fracture or herniated disc. This condition may be associated with shoulder osteoarthritis.
 - ▶ Minor intervertebral disorder /cellular-teno-myalgic syndrome (Dr. R.Maigne)
- ▶ Symptoms include painful muscle and fibrous protrusions that, when pressed, can induce pain that radiates to other points.

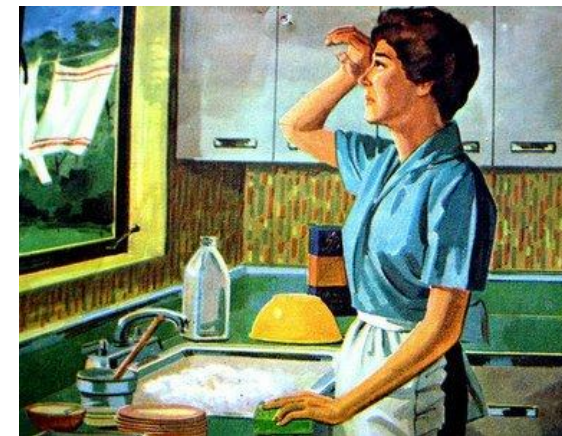
How is it diagnosed?

- ▶ Diagnosis is based on medical history and good physical examination.
- ▶ Conventional complementary tests do not show it!!!!



Who is at risk?

- ▶ Since many soft tissue conditions are due to overuse, the best treatment is prevention
- ▶ **It is important to avoid or change the situations that cause the problem**
- ▶ Triggering conditions must be corrected
- ▶ Incorrect neuromuscular recruitment standards, dysmetria, bad posture, too much sport or work and /or bad techniques



Treatment Options

- ▶ Many syndromes disappear by themselves over time. **CHRONOTHERAPY**
- ▶ The treatment is based on pain and inflammation reduction, preservation of mobility, prevention of disability and recurrence.
- ▶ You can combine rest, orthopedic devices, heat and cold therapies, medications, physical or occupational therapy.

- ▶ **ETIOLOGICAL Diagnosis**

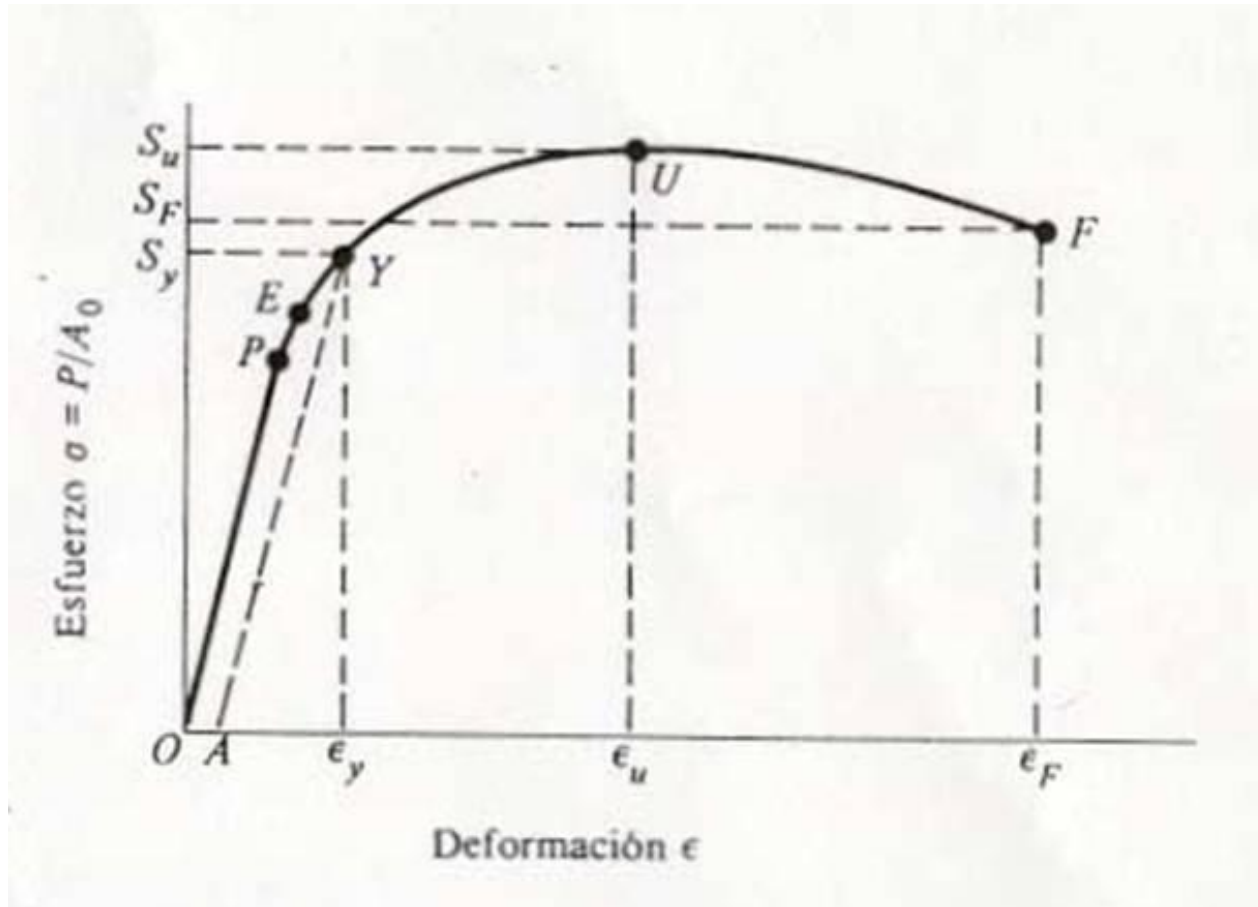
Standard treatments

- ▶ Rest and orthopedic devices
- ▶ Cold
- ▶ Heat
- ▶ Medications
- ▶ Physical Therapy
- ▶ Occupational Therapy
- ▶ Surgery

Possible Treatments

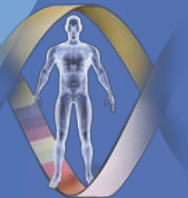
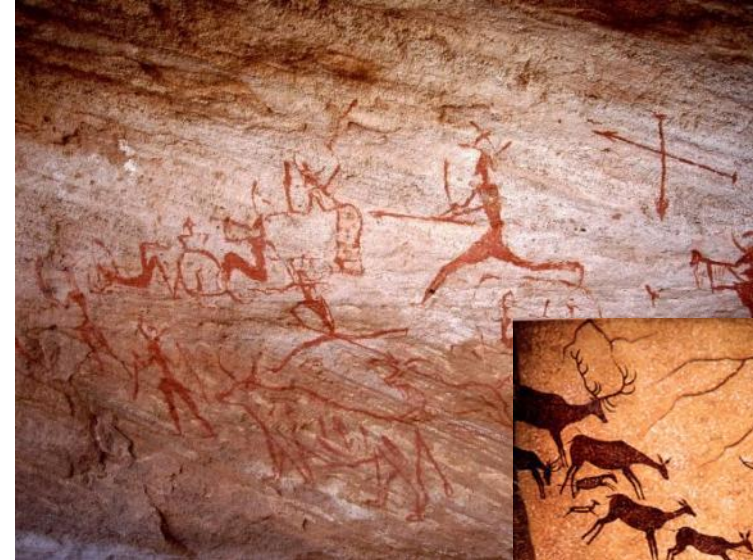
"My simple experience"

- ▶ Assistance and Prescription of rehabilitation exercises to correct muscle recruitment of the "vague" muscles and "voluntary" muscles.
- ▶ More "refined" acupuncture techniques
- ▶ Manual Orthopedic and Osteopathic Techniques to achieve a correct position of the bone segments
- ▶ Injections with Collagen MDs and/or other substances according to individual cases



Clinical Cases

- ▶ What are the special implications of treatment of athletes?
- ▶ They cannot stop
- ▶ They should feel that you are doing your best
- ▶ Recovery and rehabilitation must be fluid
- ▶ How can Collagen MDs help us?



Guide of Clinical Practice of Muscle Injuries.

Epidemiology, diagnosis, treatment and prevention
Version 4.5 (9 February, 2009)

Table 4 Description of the number and relevant percentage of all injuries reported in UEFA study in the seasons 2003-2007.

Type of injury	Number	Percentage
1 Hamstrings	396	14
2 Adductor muscles	260	9
3 Ankle Sprains/ankle ligament tear	203	7
4 Quadriceps muscle	160	6
5 Knee Sprains / knee ligament tear	153	5
6 Sural triceps muscle	124	4
7 Low back pain	100	4
8 Achilles tendinopathy	82	3
9 Muscle contusion	82	3
10 Foot	74	3

CASE 1

- Professional football player
- All League football games played 38
- Acute tendinopathy
- Use of Collagen MDs injections
- Immediate recovery without relapse, being able to keep on playing without stopping



CASE 2

Professional tennis player <30 ATP

Predominant forearm overload and acute
tendinopathy
Use of Collagen MDs injections







Almost complete recovery in 3 sessions, waiting to
continue treatment, without stopping competition.








CASE 3

- Professional Volleyball Player
- Painful points in the tendon area before pain management
- Injections of Collagen MDs

- Full recovery after 10 sessions every 3 weeks, without recurrence, being able to continue without stopping.

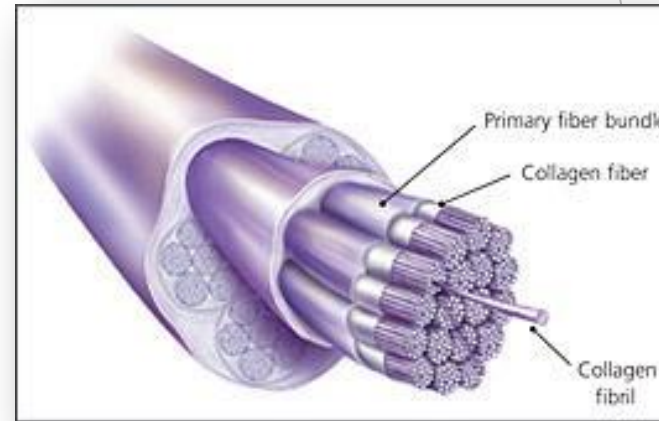


	MD-Hip hip	Collagen Calcium phosphate
	MD-ISCHIAL sciatic nerve	Collagen Rhododendron
	MD-KNEE knee	Collagen Arnica
	MD-LUMBAR lumbar	Collagen Hamamelis
	MD-NECK neck	Collagen Silica
	MD-SHOULDER shoulder	Collagen Iris

	MD-SMALL JOINTS small joints	Collagen Viola
	MD-THORACIC thorax	Collagen Cimicifuga
	MD-MATRIX extracellular matrix	Collagen Citric acid
	MD-MUSCLE muscles	Collagen Hypericum
	MD-NEURAL nerves	Collagen Colocynthis
	MD-POLY joints	Collagen Drosera
	MD-TISSUE connective tissue	Collagen Ascorbic acid, Magnesium gluconate, Pyridoxine hydrochloride, Riboflavin, Thiamine hydrochloride



- ▶ New therapeutic strategy
- ▶ Possible combination with other treatments
- ▶ Action on perilesional extracellular matrix
 - ▶ Mechanotransduction Phenomena
 - ▶ Tensegrity
 - ▶ Modulating effect of the response of cytokines that regulate inflammation



Consent Document

Artículo original

Consenso sobre utilización de la vía parenteral en el deporte. Utilización de medicación homeopática, terapias biológicas y biorreguladoras. Documento de Consenso de la Federación Española de Medicina del Deporte

**Miguel del Valle Soto¹ (coordinador), Fernando Jiménez Díaz², Pedro Manonelles Marqueta³,
Christophe Ramírez Parenteau⁴, José M^a Rodríguez Vicente⁵, Luis Serratosa Fernández⁶**

¹Vicepresidente de la Federación Española de Medicina del Deporte. Especialista en Medicina de la Educación Física y el Deporte. ²Miembro de la Junta de Gobierno de la Federación Española de Medicina del Deporte. Especialista en Medicina de la Educación Física y el Deporte. ³Presidente de la Federación Española de Medicina del Deporte. Especialista en Medicina de la Educación Física y el Deporte. ⁴Servicios Médicos Real Federación Española de Atletismo. Especialista en Medicina de la Educación Física y el Deporte. ⁵Tesorero del Consejo General de Colegios Oficiales de Médicos de España. ⁶Servicios Médicos Sanitas Real Madrid. Especialista en Medicina de la Educación Física y el Deporte

Consent Document

- ▶ Original article
Consent Document on the use of the parenteral route of administration in sport.
Use of homeopathic medicines, biological and bioregulation therapies.
Consent document of the Spanish Federation of Sports Medicine
- ▶ Vice president of the Spanish Federation of Sports Medicine. Physical Education and Sport Medicine Specialist. Member of the Governing Board of the Spanish Federation of Sports Medicine. Physical Education and Sports Medicine Specialist. President of the Spanish Federation of sports medicine. Physical Education and Sport Medicine Specialist. Medical Services of Spanish Royal Athletics Federation. Treasurer of the General Council of Spanish Medical Associations. Real Madrid Sanitas Medical Services. Physical Education and Sports Medicine Specialist.

Types of Collagen

- ▶ Collagen is considered as a family of molecules which are strictly interconnected even if genetically distinct. Please find various types of collagen as follows:
- ▶ **type I Collagen** can be found abundantly in derma, bone, tendon, dentine and cornea. It is composed of striated fibrils from **20 to 100 nm** of diameter, which cluster and form larger collagen fibers. Its major subunits consist of alpha chains of two types, which differ slightly in their amino acid composition and sequence. One type is known as alpha 1 chain and the other type is known as alpha2 chain. It is synthesized by fibroblasts, chondroblasts and osteoblasts. Its main function is resistance to stretching.
- ▶ **type II Collagen** can be found primarily in cartilage, but is also present in the embryonic cornea and in the notochord, nucleus pulposus and the vitreous humor of the eye. In the Cartilage it forms fine fibrils from **10 to 20** nanometers, but in other microenvironments it can form larger fibrils, which cannot be morphologically distinguished from type I collagen. They consist of three alpha-2 chains of a single type. It is synthesized by chondroblasts. Its main function is resistance to intermittent pressure.
- ▶
- ▶ **Collagen type XXI**: found in gums, heart and skeletal muscle and other human tissues composed of type I collagen fibrils.

Brand name	Natural ancillary substances	Anatomical Area
1) MD-NECK	Silica	Neck
2) MD-THORACIC	Cimicifuga	Thorax
3) MD-LUMBAR	Hamamelis	Lumbar Area
4) MD-SHOULDER	Iris	Shoulder and Elbow
5) MD-HIP	Calcium phosphate	Hip
6) MD-KNEE	Arnica	Knee
7) MD-SMALL JOINTS	Viola	Small Joints
8) MD-ISCHIAL	Rhododendron	Sciatic Nerve
9) MD-MUSCLE	Hypericum	Muscles
10) MD-NEURAL	Colocythis	Nerves
11) MD-POLY	Drosera	Joints
12) MD-MATRIX	Citric acid	Extracellular Matrix
13) MD-TISSUE	Ascorbic acid, Magnesium gluconate, Pyridoxine Hydrochloride, Riboflavin, Thiamine Hydrochloride	Connetive Tissue - N.B. QUI NELLA NOSTRA BROCHURE C'E' SOFT TISSUES

Local Anesthetics

Eur J Orthop Surg Traumatol
DOI 10.1007/s00590-013-1202-5

ORIGINAL ARTICLE

Bupivacaine and levobupivacaine induce apoptosis in rat chondrocyte cell cultures at ultra-low doses

Irfan Gungor · Akin Yilmaz · Akif Muhtar Ozturk ·
Mehmet Ali Ergun · Sevda Menevse ·
Kadir Kaya

Received: 25 December 2012 / Accepted: 25 February 2013
© Springer-Verlag France 2013

Eur J Orthop Surg Traumatol

Conclusions

At even smaller doses; continuous infusion of bupivacaine into joint space for the purpose of pain relief may trigger chondrolysis which eventually could lead to the development of osteoarthritis.

Materials and methods

Cell culture and drug treatment

Chondrocytes were isolated from rat articular cartilage tissues after incubating with collagenase in RPMI-1640 medium. Cells were then cultured in DMEM supplemented with 10 % fetal calf serum, 1 % penicillin/streptomycin, and 200 mM L-glutamine, in humidified air atmosphere of 5 % CO₂ at 37 °C. Cell viability was determined by trypan blue dye exclusion method. Cells were treated with bupivacaine and levobupivacaine at 7.69, 76.9, and 384.5 μM concentrations for 6, 24, and 48 h.

Ultra-Low Dose

Ann Thorac Cardiovasc Surg Advance Published Date: February 28, 2013

doi: 10.5761/atcs.0a.12.02003

*Original
Article*

Prevention of Atrial Fibrillation with Ultra-Low Dose Landiolol after Off-Pump Coronary Artery Bypass Grafting

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individual basis. Landiolol or diltiazem was given under single-blinded conditions from a perspective of safety. The dosage of landiolol was restricted to 0.5 to 2 $\mu\text{g}/\text{min}/\text{kg}$ to allow evaluation of the efficacy of landiolol at an ultra-low dose. The dose was varied within this prescribed

Conclusion

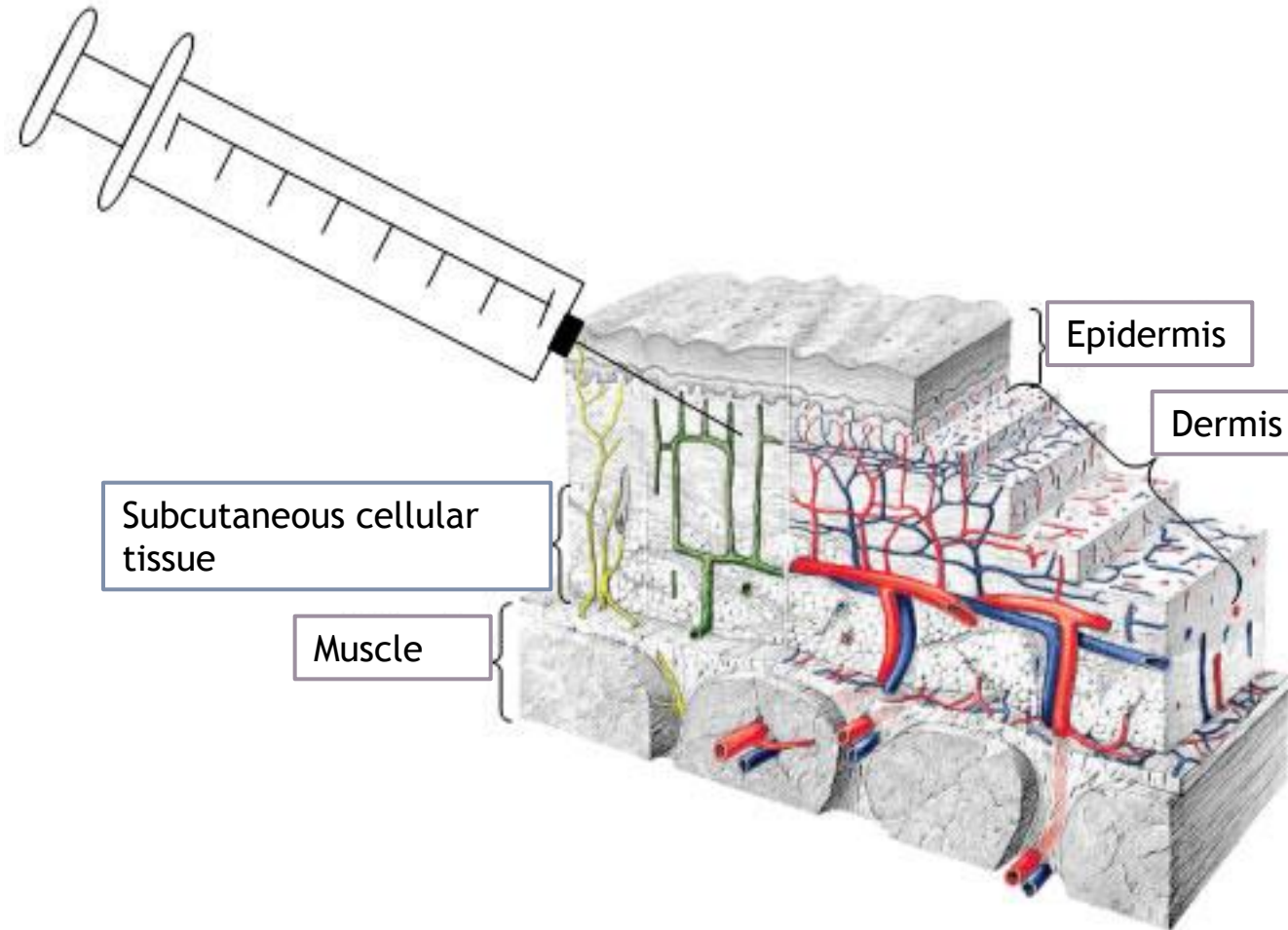
Within the limitations stated above, we conclude that ultra-low dose landiolol administration is effective for preventing AF after CABG without causing worsening of hemodynamics.



International System

1000^n	10^n	Prefijo	Símbolo	Escala corta	Escala larga	Equivalencia decimal en los Prefijos del Sistema Internacional
1000^8	10^{24}	yotta	Y	Septillón	Cuatrillón	1 000 000 000 000 000 000 000 000
1000^7	10^{21}	zetta	Z	Sextillón	Mil trillones	1 000 000 000 000 000 000 000
1000^6	10^{18}	exa	E	Quintillón	Trillón	1 000 000 000 000 000 000
1000^5	10^{15}	peta	P	Cuatrillón	Mil billones	1 000 000 000 000 000
1000^4	10^{12}	tera	T	Trillón	Billón	1 000 000 000 000
1000^3	10^9	giga	G	Billón	Mil millones / Millardo	1 000 000 000
1000^2	10^6	mega	M	Millón		1 000 000
1000^1	10^3	kilo	k	Mil / Millar		1 000
$1000^{2/3}$	10^2	hecto	h	Cien / Centena		100
$1000^{1/3}$	10^1	deca	da	Diez / Decena		10
1000^0	10^0	ninguno		Uno / Unidad		1
$1000^{-1/3}$	10^{-1}	deci	d	Décimo		0,1
$1000^{-2/3}$	10^{-2}	centi	c	Centésimo		0,01
1000^{-1}	10^{-3}	mili	m	Milésimo		0,001
1000^{-2}	10^{-6}	micro	μ	Millonésimo		0,000 001
1000^{-3}	10^{-9}	nano	n	Billonésimo	Milmillonésimo	0,000 000 001
1000^{-4}	10^{-12}	pico	p	Trillonésimo	Billonésimo	0,000 000 000 001
1000^{-5}	10^{-15}	femto	f	Cuatrillonésimo	Milbillonésimo	0,000 000 000 000 001
1000^{-6}	10^{-18}	atto	a	Quintillonésimo	Trillonésimo	0,000 000 000 000 000 001
1000^{-7}	10^{-21}	zepto	z	Sextillonésimo	Miltrillonésimo	0,000 000 000 000 000 000 001
1000^{-8}	10^{-24}	yocto	y	Septillonésimo	Cuatrillonésimo	0,000 000 000 000 000 000 000 001

Extra and Periarticular



Materials - Needles

20G X 38mm Yellow



20G X 32mm Yellow



21G X 32mm Green



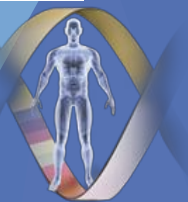
22G X 32mm Black



23G X 25mm Blue



25G X 16mm Orange



Syringes



Since we have to apply a certain pressure when using 30 G needles, we recommend using 5 cc. syringes, Luer-Lock type.



Application Guidelines

- ▶ “General Guidelines”:
 - ▶ 1 injection weekly (10 consecutive weeks)
- ▶ “Acute diseases”:
 - ▶ 2 injections weekly for 2 consecutive weeks. If necessary, continue with 1 injection weekly until symptoms disappear
- ▶ “Chronic Diseases”:
 - ▶ 1/2 injection/s weekly for 2 consecutive weeks. If necessary, continue treatment with 1 injection weekly, during the following weeks

Combinations

Somatic Factor

MD-Tissue

MD-Matrix

MD-Poly

MD-Muscle

MD-Neural

Anatomical Area

MD-Neck

MD-
Thoracic

MD-
Lumbar

MD-
Shoulder

MD-Hip

MD-Knee

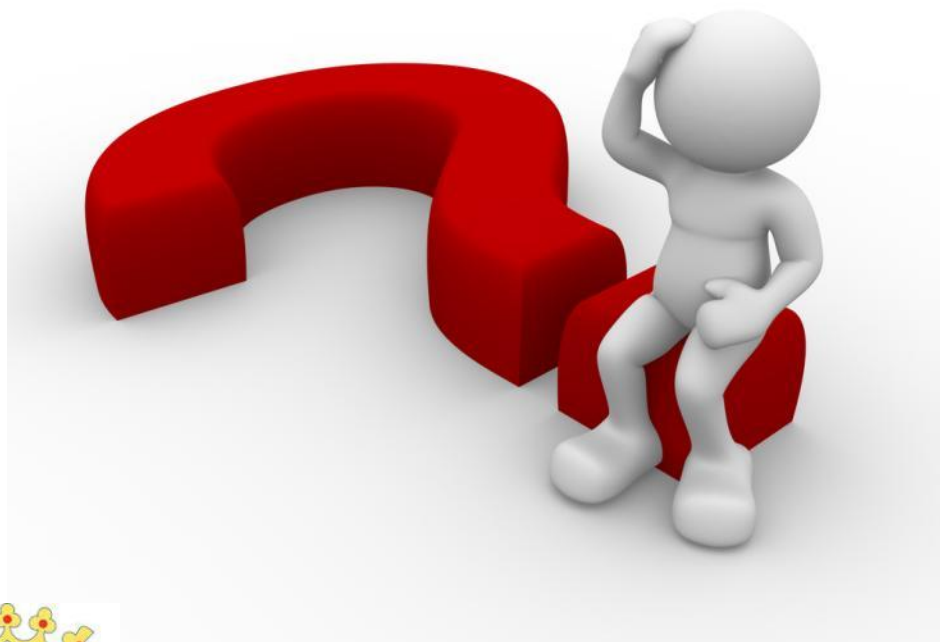
MD-
Small
Joints

MD-
Ischial



Questions and Answers

Thank you very much for your attention



Dr. Adolfo A. Muñoz Macho

- ▶ Thank you very much for your attention
- ▶ @dradolfofomunoz

