LASER MULTIFREQUENZA NELLA LOMBALGIA NEL TRATTAMENTO DELLE ZIGOAPOFISI

Dott.ssa Maria Conforti

Bergamo, 17 Novembre 2012

DIFFERENTIAL DIAGNOSIS OF BACK PAIN (Deyo NEJM 2000)

MECHANICAL BACK PAIN (97%)

Common low back pain (70%)
It's not 'almost never possible etiological diagnosis

Degenerative facet joints (8 %)

Clinical research has shown the pain starts from the facets
in 54-67% of patients with neck pain
in 48% of patients with chest pain
and in 10-45% of patients with LOW BACK PAIN

MECHANICAL BACK PAIN

biomechanical static and dynamic imbalance lumbar spine

dysfunctional

structural

PREVALENCE:Figure skating dance,gymnastic

10% to 15% of young athletes

Contact sports like football
or rugby players (27%)

Artistic gymnasts (50%)

Dance (60%)

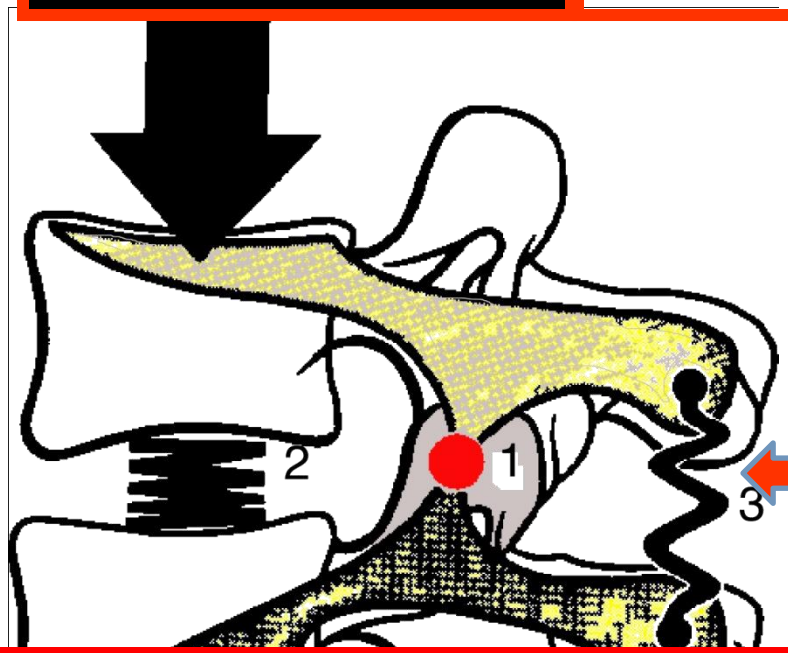
Figure skating (75%)

Rhythmic gymnasts (86%)

Sports Health. 2009 May; 1(3): 212–222.
Low Back Pain in Young Athletes Laura Purcell, MD[†*] and Lyle Micheli, MD[‡]

THE FUNCTIONAL UNIT

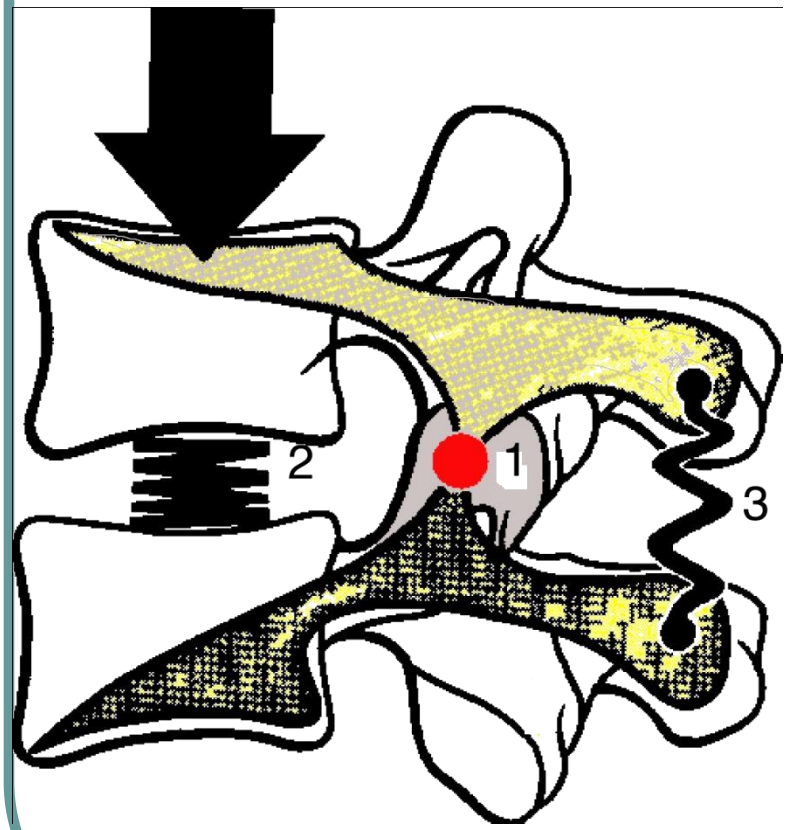
anterior column | Posterior column

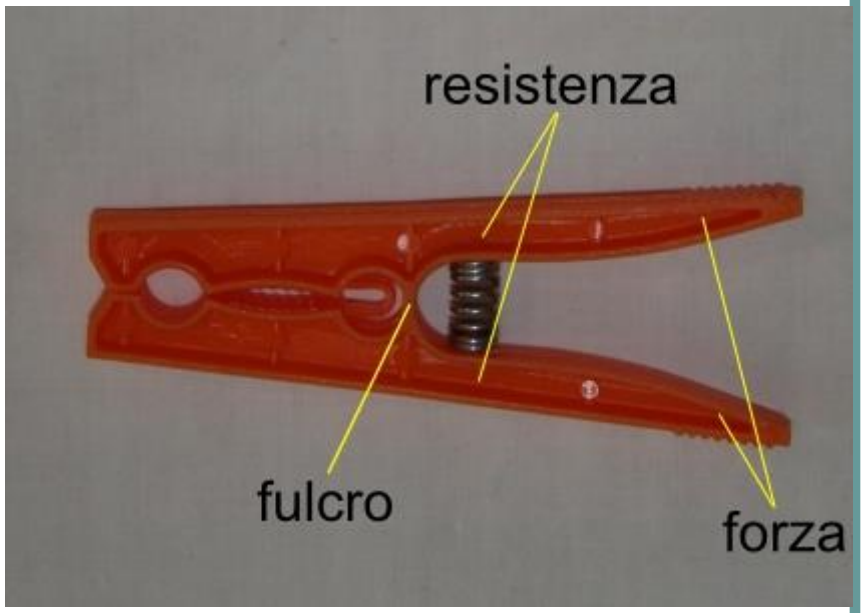


30% of load up facet joints,vertically oriented , that allow the flessio-extension but not rotation and lateral tilt forces .
risk of degeneration and spondylolisthesis, if already present a spondylolysis

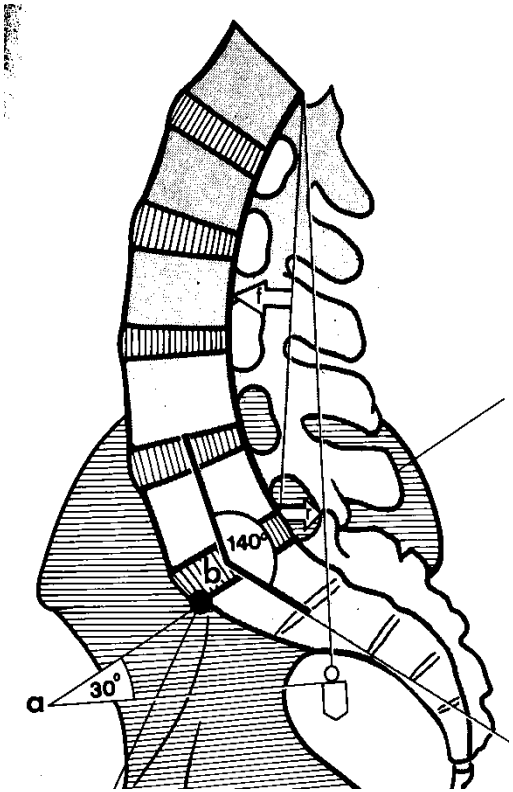
Standing up 70 % of compression, torsion and flexion triplanar forces

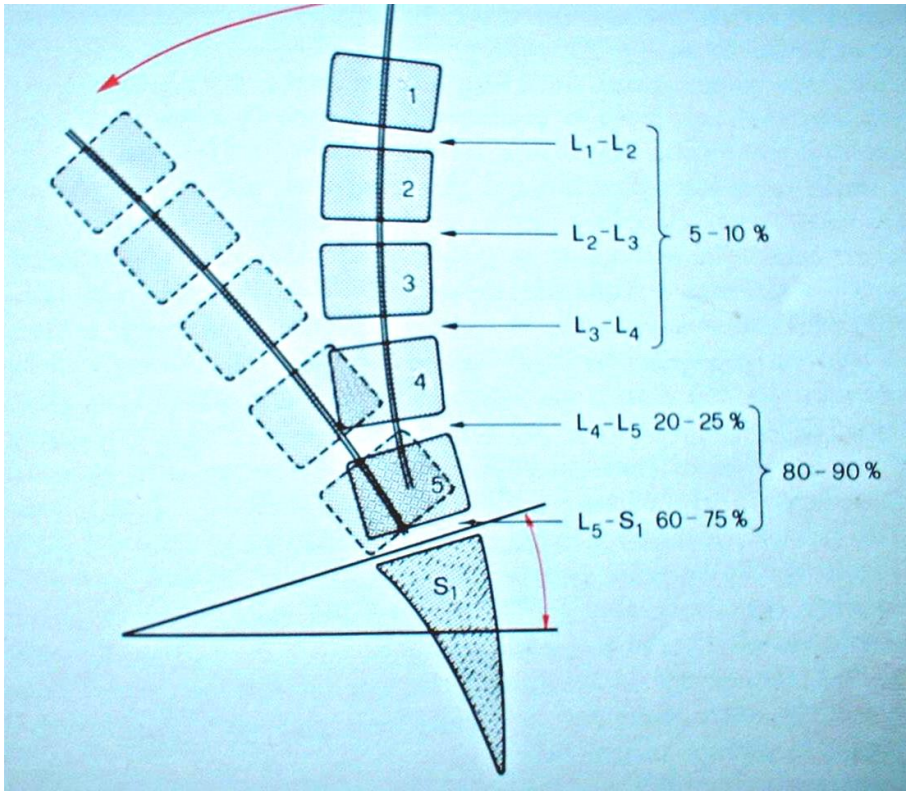
FUNCTIONAL UNITY 'SPINE is a LEVER TYPE 1(CORE LEVEL joint interapophyseal)





"CRITICAL POINTS STATIC DYNAMIC"





L5-S1

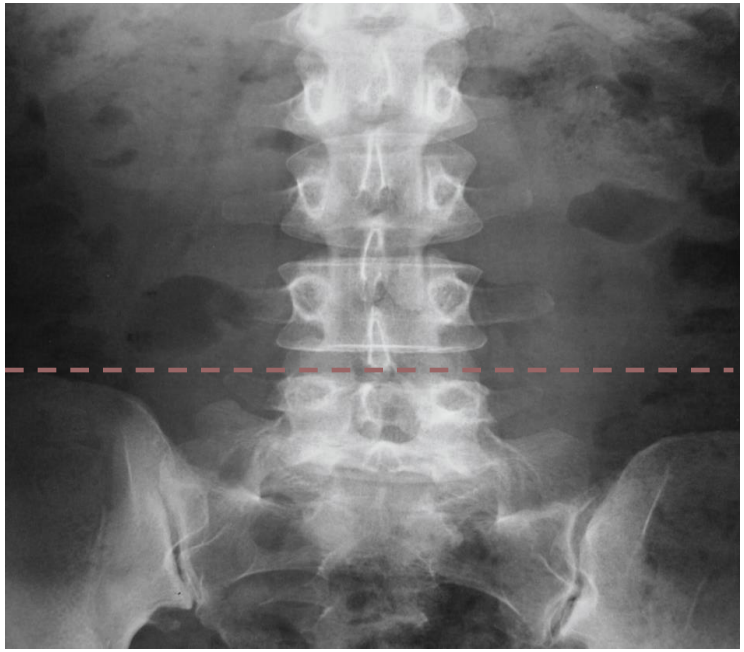
L4-L5

L3-L4

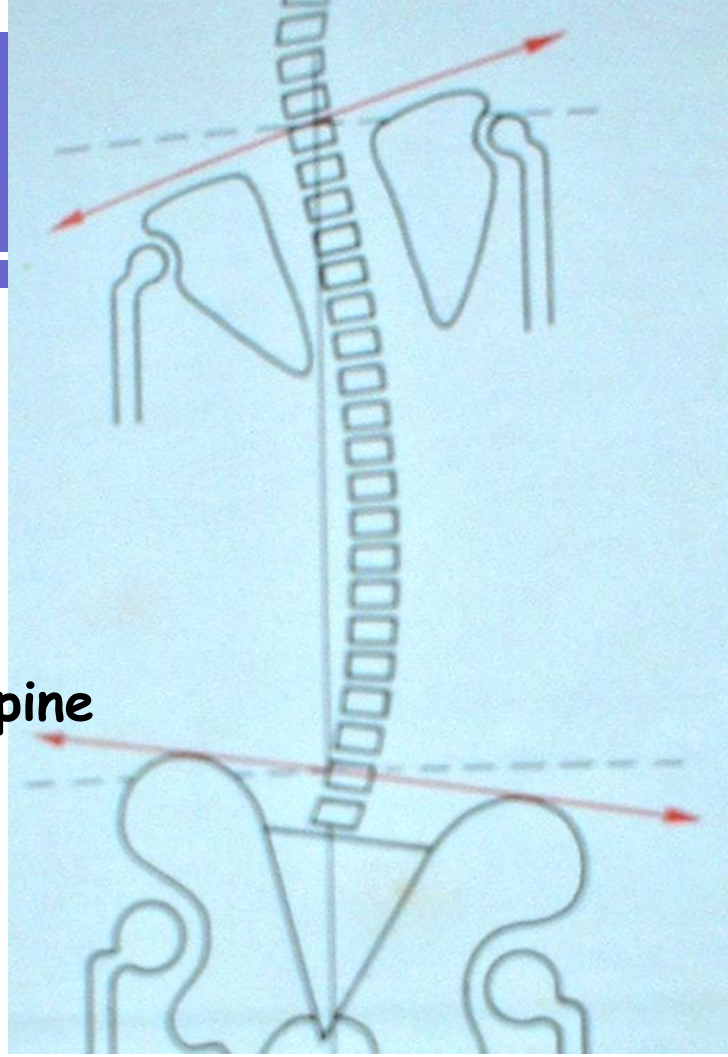
L2-L3 …

Anterior spine

PELVIC ALIGNMENT



Posterior spine



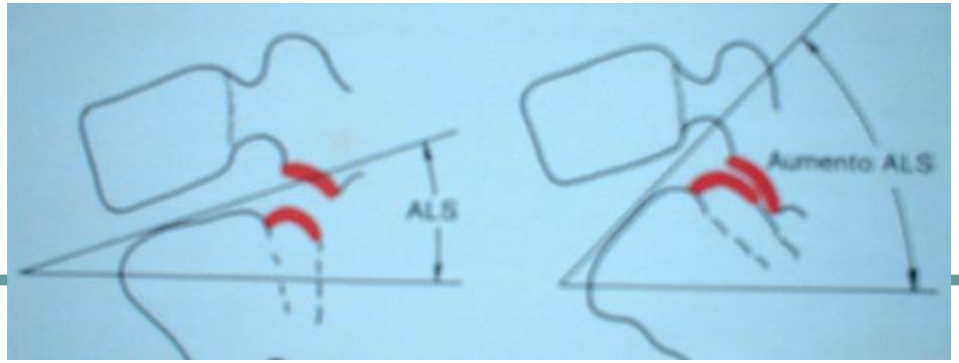
changes in the frontal plane pelvic alignment with postural imbalance of the spine, cause asymmetric loading of the facet joints

INJURIES IN POSTERIOR ELEMENTS

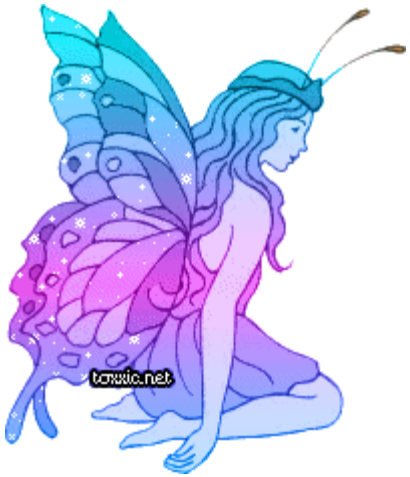
REPETITIVE MOVEMENT: extension, flexion, inclination and rotation.

HIGH INCIDENCE injuries in the posterior elements of the spine such as spondylolysis. Anterior element Disc-related pathology is much less common.

Simple muscle strains should be a diagnosis of exclusion only.



THE LUMBAR SPINE IN ARTISTIC GYMNASTICS



Sports Health | SAGE

Clinical Recommendations

SORT: Strength of Recommendation Taxonomy

A: consistent, good-quality patient-oriented evidence

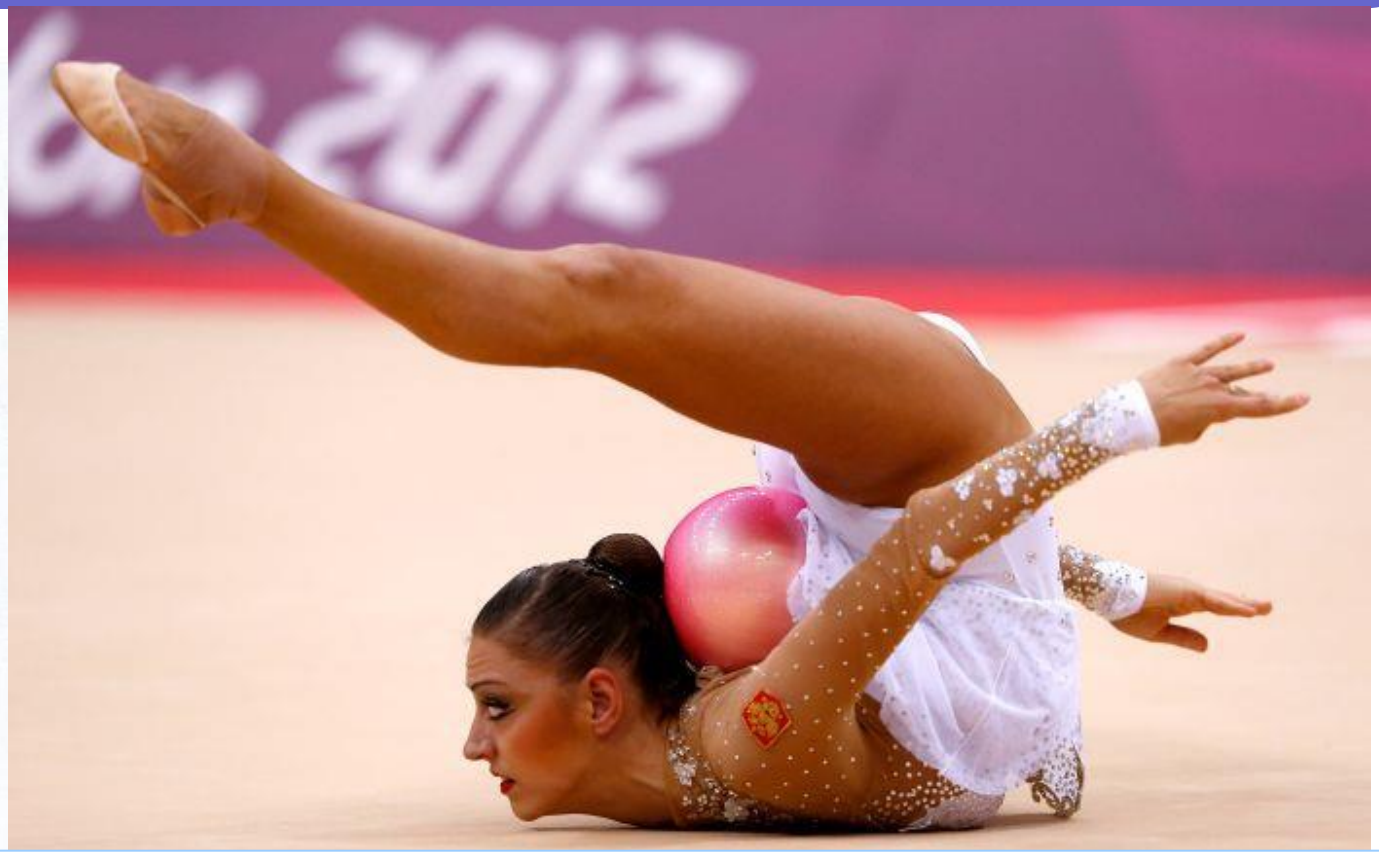
B: inconsistent or limited-quality patient-oriented evidence

C: consensus, disease-oriented evidence, usual practice, expert opinion, or case series

Clinical Recommendation	SORT Evidence Rating
Low back pain lasting longer than 3 weeks in a young athlete should be investigated to rule out structural injury.[16,25]	C
In athletes with extension-related back pain, investigations should begin with plain radiographs and SPECT bone scan to assess for spondylolysis.[2,3,15,16,22,25]	C
In athletes with disc-related low back pain, physical therapy should be initiated to help relieve pain and to establish an extension-based stabilization program.[1,2,19,24,25]	B
Systemic symptoms in the setting of low back pain should prompt investigations to rule out infection, malignancy, or spondyloarthropathies.[2,6,9,20,25]	C

For more information about the SORT evidence rating system, see www.aafp.org/afpsort.xml and Ebell MH, Siwek J, Weiss BD, et al. Strength of Recommendation Taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. *Am Fam Physician*. 2004;69:549-557.

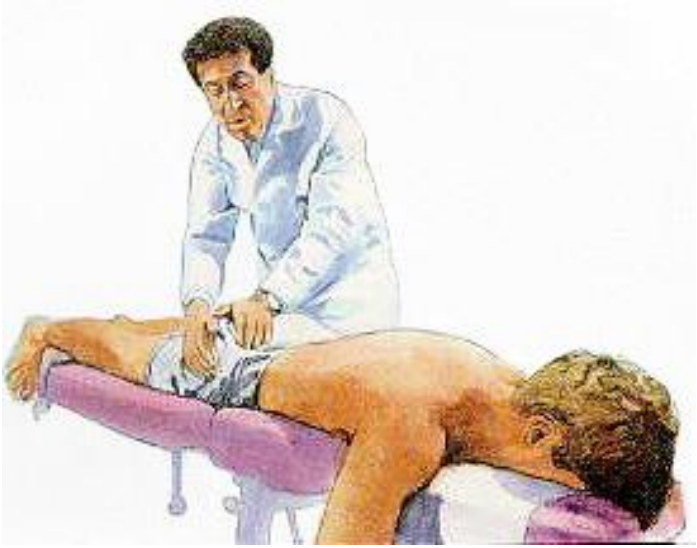
THE LUMBAR SPINE IN ARTISTIC GYMNASTICS



ENHANCEMENT the stabilizing muscles of the lumbar spine like transverse and internal oblique as well as abdominis rectus , maximus gluteus, And STRETCHING muscles ileo-psoas, spinae erector). CORE STABILITY is important for injury prevention and athletic performance, especially in sports with large demands for balance control, such as gymnastics

CHIROPRACTIC MANIPULATIVE THERAPY (CMT)

The results of this trial suggest that CMT in conjunction with standard medical care offers a significant advantage for decreasing pain and improving physical functioning when compared to standard care alone, for men and women between the ages of 18-35 with acute low back pain.



Spine (Phila Pa 1976). 2012 Oct 10.

Adding chiropractic manipulative therapy to standard medical care for patients with acute low back pain: the results of a pragmatic randomized comparative effectiveness study.

Goertz CM, Long CR, Hondras MA, Petri R, Delgado R, Lawrence DJ, Owens EF, Meeker WC.Palmer Center for Chiropractic Research, 741 Brady St.,

SPINAL MANIPULATIVE THERAPY (SMT)

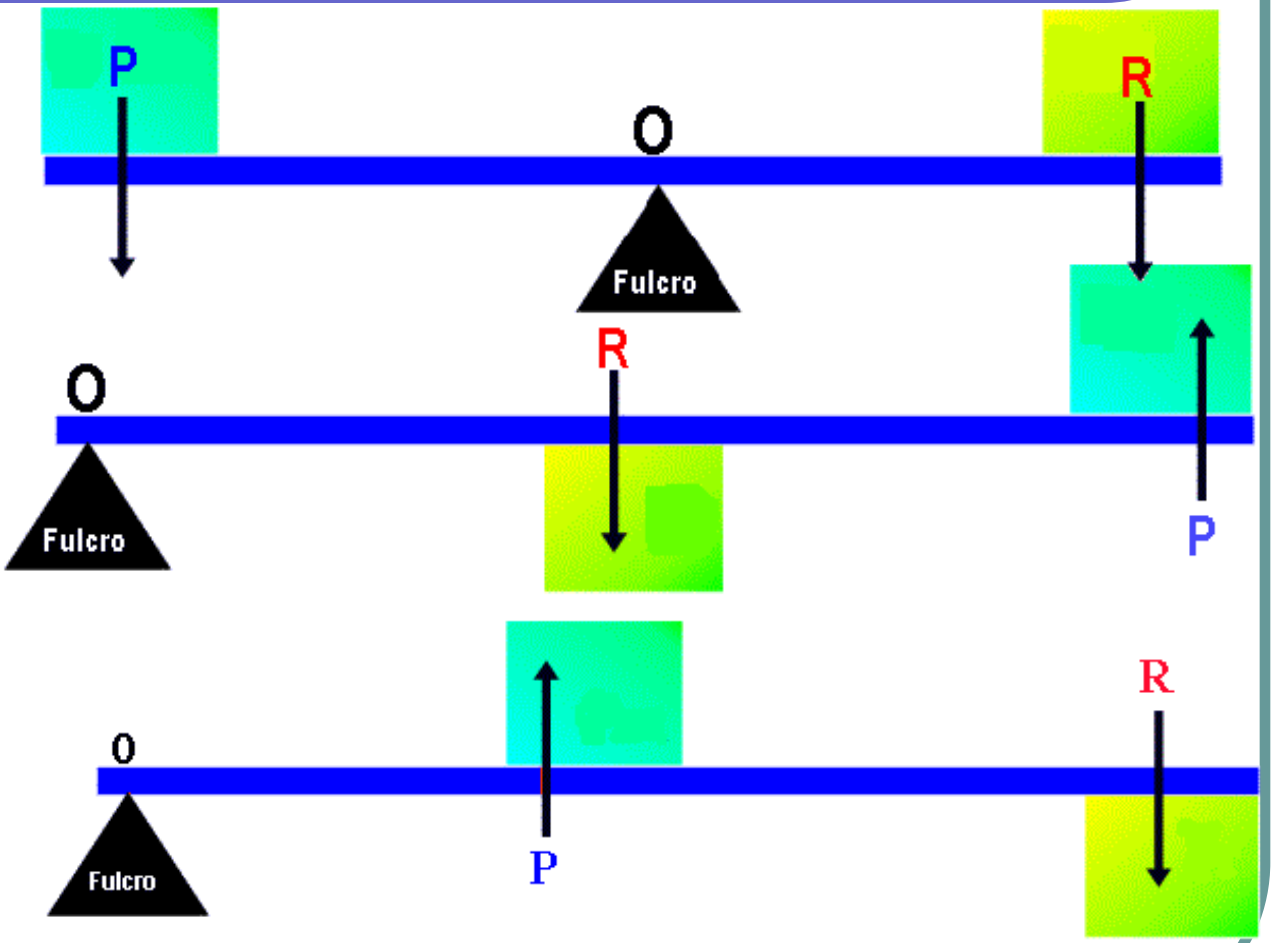
The decision to refer patients for SMT should be based upon costs, preferences of the patients and providers, and relative safety of SMT compared to other treatment options. Future Randomized controlled trials should examine specific subgroups and include an economic evaluation.

Cochrane Database Syst Rev. 2012 Sep 12;9:University Medical Center,Amsterdam, Netherlands.

Spinal manipulative therapy for acute low-back pain.

Rubinstein SM, Terwee CB, Assendelft WJ, de Boer MR, van Tulder MW.

NOT ONLY LEVERS…..



Dynamic Chiropractic™
THE CHIROPRACTIC NEWS SOURCE
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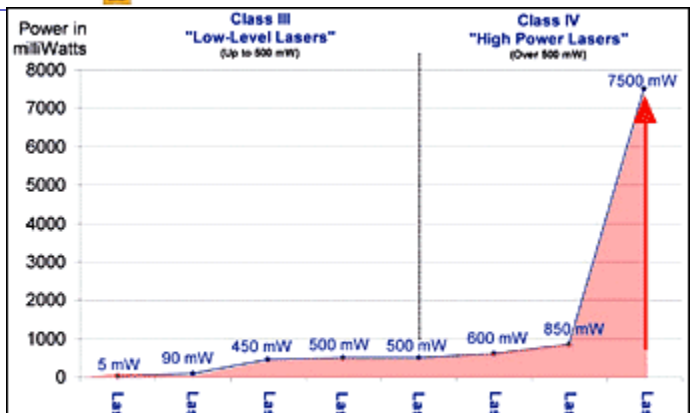
Class IV "High-Power" Laser Therapy in Chiropractic and Rehabilitation

By Robert L. Wertz, DC



Bogduk, et al., have reported that the zygapophyseal joints of the neck were implicated most frequently in acute (traumatic) and chronic neck pain conditions. the depth of algic structures necessitate that a **therapeutic laser device has the ability to penetrate in biological tissue**, while simultaneously providing **sufficient power to stimulate photoreceptors** responsible for triggering positive physiological events for pain/inflammation reduction and accelerated tissue healing. **Tuner** ,president of the Swedish Laser Medical Society , reported as: "For the moment, we must rely on our own clinical experience. It would appear that 'high-powered' therapeutic lasers will be able to further expand the scope of laser therapy."Given that the number one reason for poor clinical outcomes is low power and poor penetration, most health care providers utilizing low-powered devices agree with these pioneers in the field.

November 8, 2006, Vol. 24, Issue 23

Dynamic Chiropractic™
THE CHIROPRACTIC NEWS SOURCE
An MPA Media Publication

Laser Therapy for Disc Herniations

By Fred Kahn, MD, FRCS(c) and Michael Patterson, MSc *Dynamic Chiropractic* – July 15, 2009, Vol. 27, Issue 15

The Cochrane study they refer to found that "three high quality studies showed statistically significant pain relief with laser therapy in the short-term (less than three months) and intermediate term (less than 6 months) when compared with sham laser therapy." Histological investigations have shown,surrounding the fibrocartilaginous fragments, the presence of granulation tissue,in that prevailing cell types are macrophages with fibroblasts and endothelial cells. These cell types have been demonstrated to be positively affected by laser therapy. The stimulation of macrophages and fibroblasts could be the primary mechanism by which laser therapy heals disc herniations. Inflammatory markers such as IL-1, IL-6 and TNF-a are also present at the site of disc herniations, leading to higher prostaglandin E2 concentrations. Two studies have demonstrated that laser therapy is effective in reducing PG E2 concentrations.

Laser in acute low back pain (LBP)

The aim of this study was to investigate the effects of three different energy doses of LLLT length 904 nm ,diode power 25 mW, in patients with acute LBP and radiculopathy. Patients treated 5 times weekly, for a total of 10 treatments.The dose of 4 J per point seemed to be more effective in improving the activities of daily living and lumbar mobility.VAS,Schober test and the modified North American Spine Society-Low Back Pain Outcome Instrument-NASS LBP

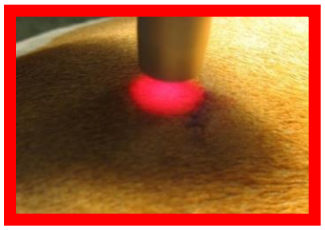
Vojnosanit Pregl. 2012 Aug;69(8):656-62.

Clinical and functional evaluation of patients with acute low back pain and radiculopathy treated with different energy doses of low level laser therapy.

Jovicić M, Konstantinović L, Lazović M, Jovicić V.
Institute for Rehabilitation, Belgrade, Serbia. medi@eunet.rs

COMBINATION OF CHIROPRACTIC JOINT MANIPULATION THERAPY AND LLLT

Sixty ambulatory women between the ages of 18 and 40 years with cervical facet joint pain of more than 30-day duration and normal neurologic examination were randomized to receive 1 of 3 treatment options: (1) CMT of the cervical spine, (2) LLLT applied to the cervical facet joints, or (3) a combination of CMT and LLLT. Each participant received 6 treatments in 3 weeks.



+

A combination of CMT and LLLT was more effective than either of the 2 on their own.Further studies are needed to explore optimal treatment procedures for CMT and LLLT and the possible mechanism of interaction between therapies.

J Manipulative Physiol Ther. 2011 Mar-Apr;34(3):153-63.

Chiropractic manipulative therapy and low-level laser therapy in the management of cervical facet dysfunction: a randomized controlled study.

Saayman L, Hay C, Abrahamse H.

Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, Doornfontein, South Africa.

SUCH INVESTIGATIONS BEFORE A LASER SESSION

Rx ?

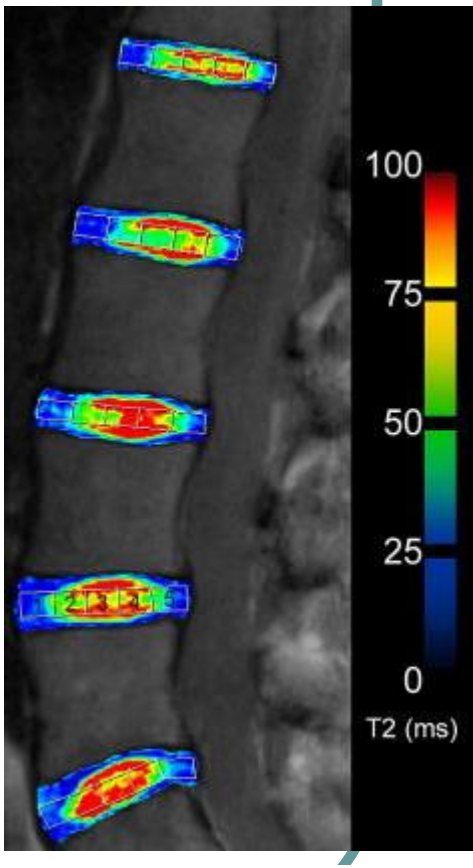
MRI ?

TC ?

New Methods …..?
New Theraphy…..!

DYNAMIC MAGNETIC RESONANCE IMAGING, FUNCTIONAL MAGNETIC RESONANCE IMAGING, AND MAGNETIC RESONANCE SPECTROSCOPY.

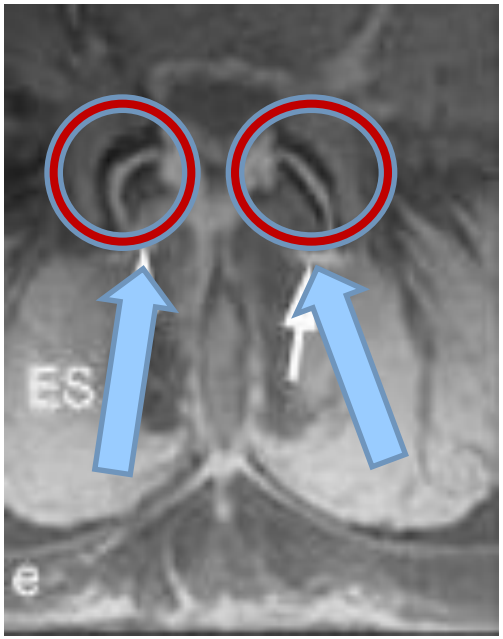
The development of functional imaging strategies of the spine will likely improve the management of patients with back pain. Quantitative MR methods have the potential to assess biochemical changes of spinal structures in vivo. Early diagnosis of intervertebral disc and facet joint changes in young to middle aged patients allows the use of a specific therapy and preventative measures. Potential techniques are T2 and T2* mapping, diffusion-weighted imaging, magnetization transfer imaging, T1ρ mapping, sodium imaging and MR spectroscopy. Well designed longitudinal therapy studies, which assess biochemical and clinical parameters, are necessary. High-field MR systems (3 Tesla) are needed for high resolution biochemical MRI and clinically reasonable scan times.



Radiologe. 2010 Dec;50(12):1115-9.
[Biochemical magnetic resonance imaging of intervertebral discs and facet joints].
Stelzeneder D, Trattnig S.
Exzellenzzentrum Hochfeldmagnetresonanz, Klinik für Radiodiagnostik, Medizinische Universität Wien.

M R IMAGES OF ENTHESES

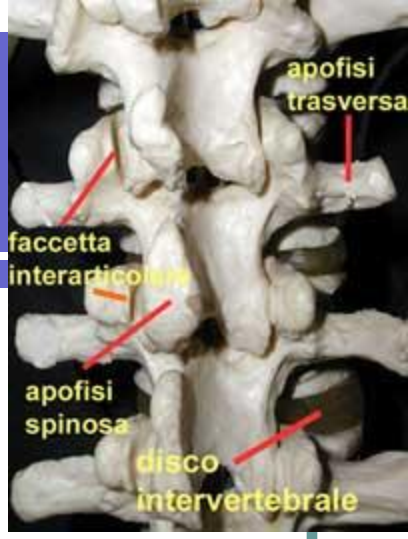
The UTE sequences offer new options for visualizing discs, scar tissue, ligaments and other structures of the lumbar spine in health and disease.



(e) **Tranverse UTE(ultrashort echo time) image of the lumbar spine in a patient with degenerative spine disease. High signal is seen in the region of the dorsal capsule of the lumbar facet joints (arrows ⇨). ES, erector spinae.**

Benjamin M, Toumi H, Ralphs JR, Bydder G, Best TM, Milz S.School of Biosciences, Cardiff University, UK.
benjamin@cardiff.ac.uk

'FUNCTIONAL ENTHESIS' SYNOVIO-ENTHESEAL COMPLEX (SEC)

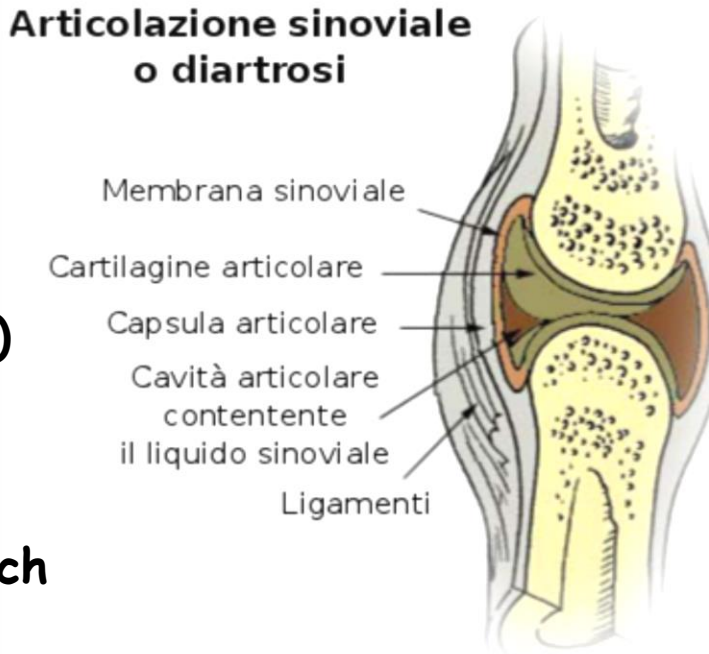


The concept of a synovio-entheseal complex (SEC) or'functional enthesis' has important implications for understanding spondyloarthropathy.It serves to emphasise anatomical, biomechanical and pathological features that are shared between true fibrocartilaginous entheses and regions proximal to the attachment sites themselves where tendons or ligaments wrap around bony pulleys

MRI findings, including facet joint orientation, facet joint osteoarthritis, and the presence of synovial cysts, have all been linked with degenerative spondylolisthesis (DS). MRI can also detect facet joint effusion; however, there has not been a study specifically addressing the association of facet fluid signal to degenerative spondylolisthesis (DS).

Spine (Phila Pa 1976). 2007 Aug 1;32(17):1883-7.
The significance of increased fluid signal on magnetic resonance imaging in lumbar facets in relationship to degenerative spondylolisthesis.
Chaput C, Padon D, Rush J, Lenehan E, Rahm M.
Department of Orthopedic Surgery, Scott and White Clinic and Memorial Hospital, Temple, TX 76508, USA

LASER AND SUBSTANCE P (SP)



the facet joints are synovial joints(Diartrodia) that ,when subjected to compressive loads, undergo osteoarthritis The fibrous capsule of the facet joints contains nerve endings encapsulated, non-encapsulated and free ,which release neuropeptides that mediate and modulate nociception (for example, SP, CGRP, VIP). The Substance P (SP) has been proposed as being involved in the transmission of nociceptive information in the dorsal horn of the spinal cord. "The increase in SP in diartrosis with initial arthrosis accelerates the degenerative process by activation of proteolytic enzymes and collagenolytic that cause the degradation of cartilage matrix

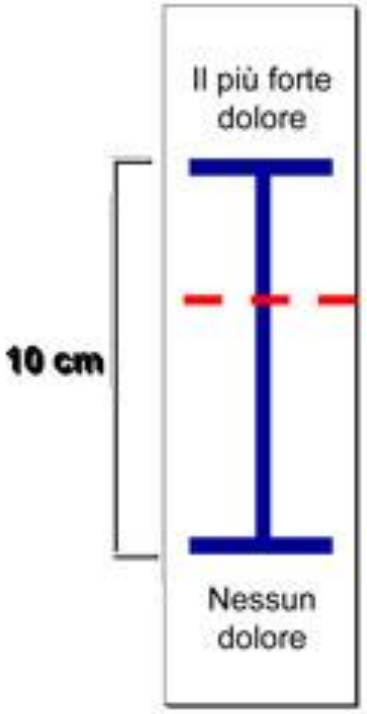
J Pain. 2009 Apr;10(4):436-45.
Joint distraction magnitude is associated with different behavioral outcomes and substance P levels for cervical facet joint loading in the rat. Lee KE, Winkelstein BA.
Department of Bioengineering, University of Pennsylvania, Philadelphia, PA 19104-6392, USA.

PAIN

- Pain at compression of the facets
- Exacerbation at extension and ipsilateral rotation, torsion toward the painfull side
- continuous and localized in depth
- Unilateral
- not radicular irradiation
- irradiation to the iliac crest,groin and buttock
- Standing or sitting along
- With segmental instability with consequent orientation anomalies of the facets articular surfaces (Lumbar hyperlordosis, scoliosis, clinical signs of spondylolisthesis, etc..).

BACK PAIN

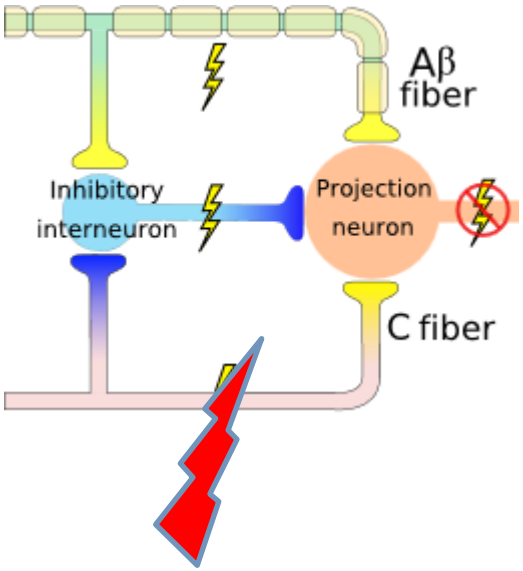
nociceptors are present in all the structures of the spine (ligaments, joint capsule, tendons, muscles).
pain stimula by nociceptors organs or structures without cerebral representation, often give rise to a type pain refered or located, but without a precise correspondence with the structure in question



Not only uni dimensional VAS……
Multi dimensional MG Gill Pain Questionaire….

Gate control

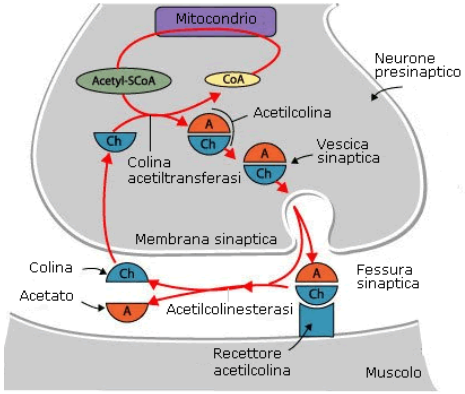
These results suggest that the laser irradiation suppresses the excitation of the unmyelinated C-fibers in the afferent sensory pathway.



Nihon Ika Daigaku Zasshi. 1997 Oct;64(5):395-400.
[Pain suppressive effect of low power laser irradiation. A quantitative analysis of substance P in the rat spinal dorsal root ganglion].
Ohno T.Department of Orthopaedic Surgery, Nippon Medical School, Tokyo, Japan.

NEURAL MECHANISM

Low-level laser therapy (LLLT) has been shown in clinical trials to relieve chronic pain and the World Health Organization has added LLLT to their guidelines for treatment of chronic neck pain. 650 nm and 808 nm decreased somatosensory-evoked potentials (SSEP) and decrease compound muscle action potentials (CMAPs) amplitudes .These results strengthen the hypothesis that a neural mechanism underlies the clinical effectiveness of LLLT for painful conditions. All LI changes for both wavelengths returned to baseline by 48 h



J Peripher Nerv Syst. 2011 Jun;16(2):130-5. doi: 10.1111/j.1529-8027.2011.00337.x.

Inhibitory effects of visible 650-nm and infrared 808-nm laser irradiation on somatosensory and compound muscle action potentials in rat sciatic nerve: implications for laser-induced analgesia.

Yan W, Chow R, Armati PJ.

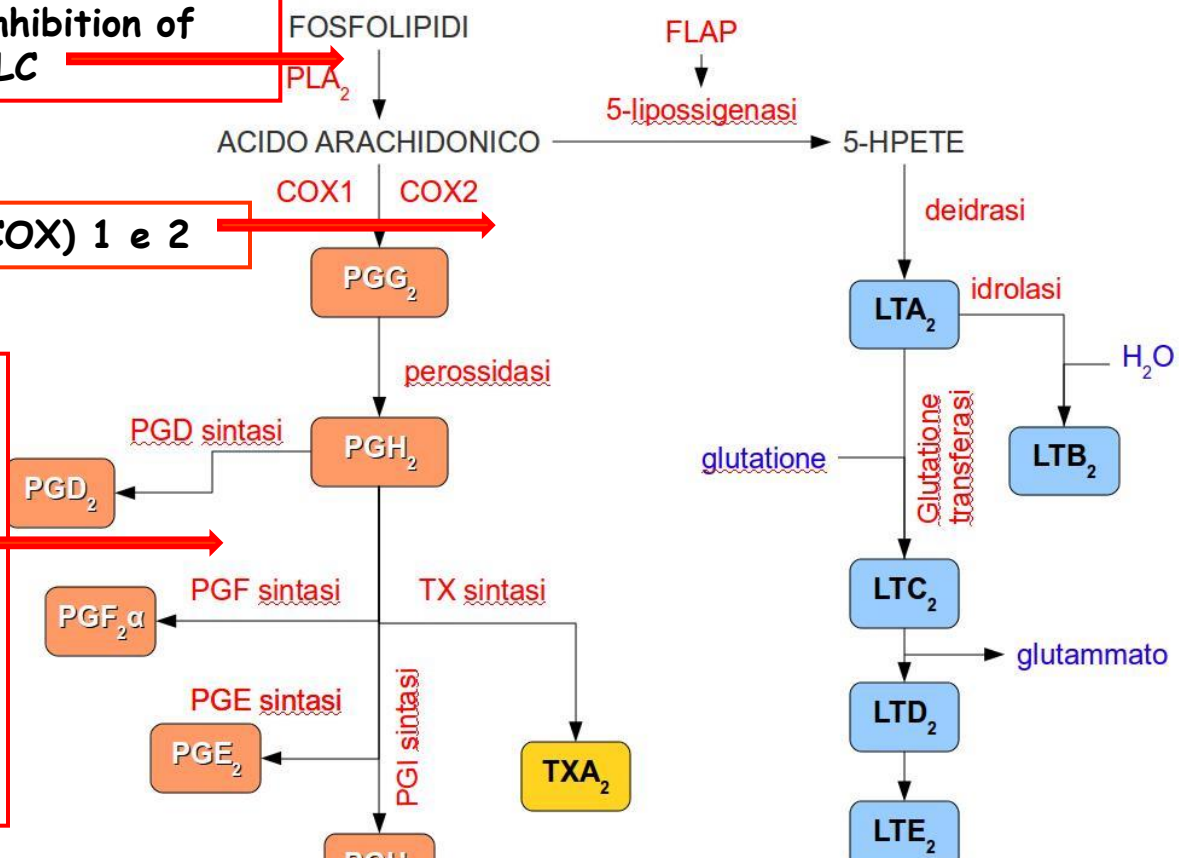
Neuroinflammation Laboratory, Nerve Research Foundation, Brain and Mind Research Institute, University of Sydney, Camperdown, NSW, Australia. weixing@med.usyd.edu.au

laser therapy (808 nm) reduces inflammatory response

Corticosteroids block the release of arachidonic acid from phospholipids through the inhibition of the activity of phospholipase LA2 e PLC

NSAIDs inhibit the cyclooxygenase (COX) 1 e 2

LLLT reduced oxidative and nitrative stress in injured muscle, decreased lipid peroxidation, nitrotyrosine formation and NO production, Moreover, LLLT increased SOD gene expression, and decreased the inflammatory response as measured by gene expression of NF-kβ and COX-2 and by TNF-α and IL-1β concentration.



Lasers Surg Med. 2012 Nov;44(9):726-35. doi: 10.1002/lsm.22077. Epub 2012 Sep 21.

Low-level laser therapy (808 nm) reduces inflammatory response and oxidative stress in rat tibialis anterior muscle after cryolesion.

Assis L, Moretti AI, Abrahão TB, Cury V, Souza HP, Hamblin MR, Parizotto NA.

Laboratory of Electrothermophototherapy, Department of Phisiotherapy, University of São Carlos, São Carlos, SP, Brazil.

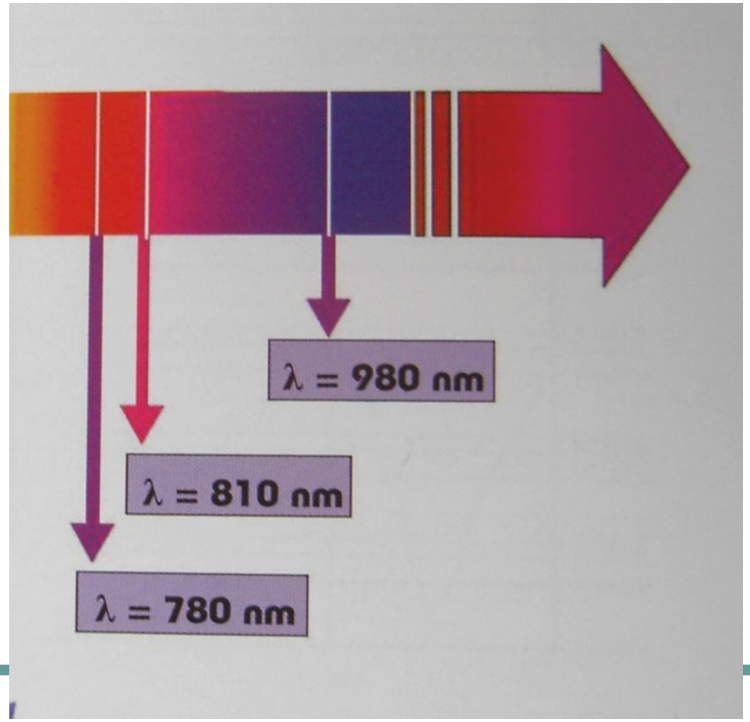
LASER IN low back PAIN

is more and more frequently used with success the technique of multifrequency train sessions with cold transfers of high energies of bistimolation.
The technology is defined as FP3 SYSTEM ®

FP3System

FP3 New methodologies for sport and free time

Minimum heat and possibility to transfer energy of biostimulation to the desired depth.



Protocollo FP3®

1)indicates anatomical "gates"
2) delivers total energy required for biostimulation in relation to the anatomical features of the patient automatically correct emission considering real-time skin pigmentation, its hydration and the content of fat mass
4) Contains pre-established protocols "assisted mode"
5) recommended treatment of trigger points with radiation laser and micro-current with polarizing effect

Multifrequence power laser

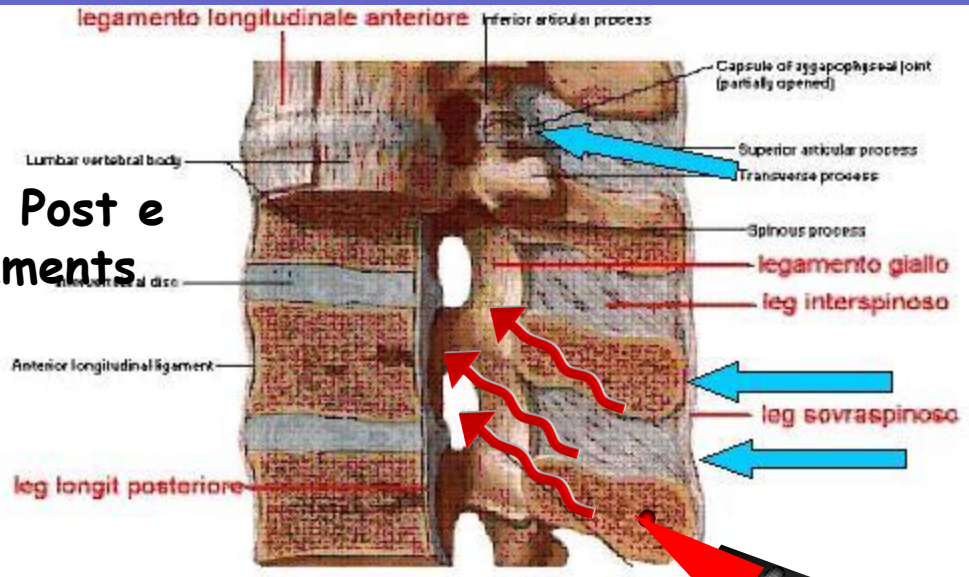
Dolore da irritazione faccette articolari

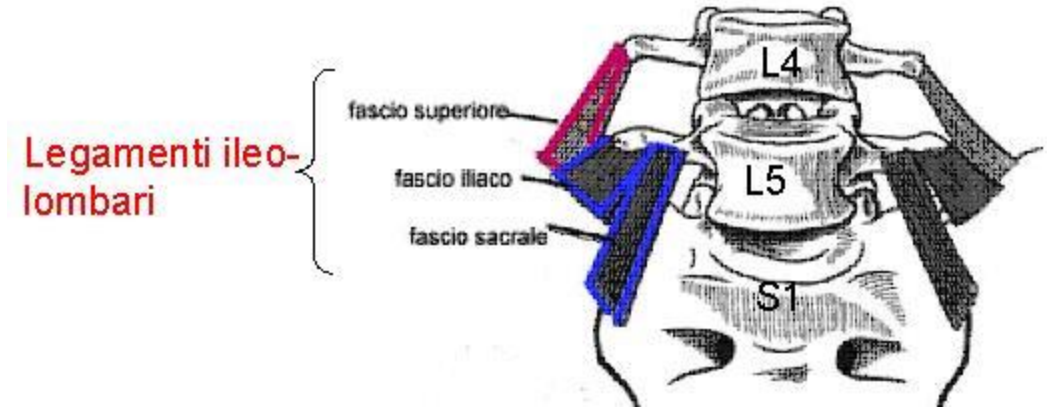
MODALITÀ ASSISTITA

Longitudinal Ant e Post e Interspinosus Ligaments

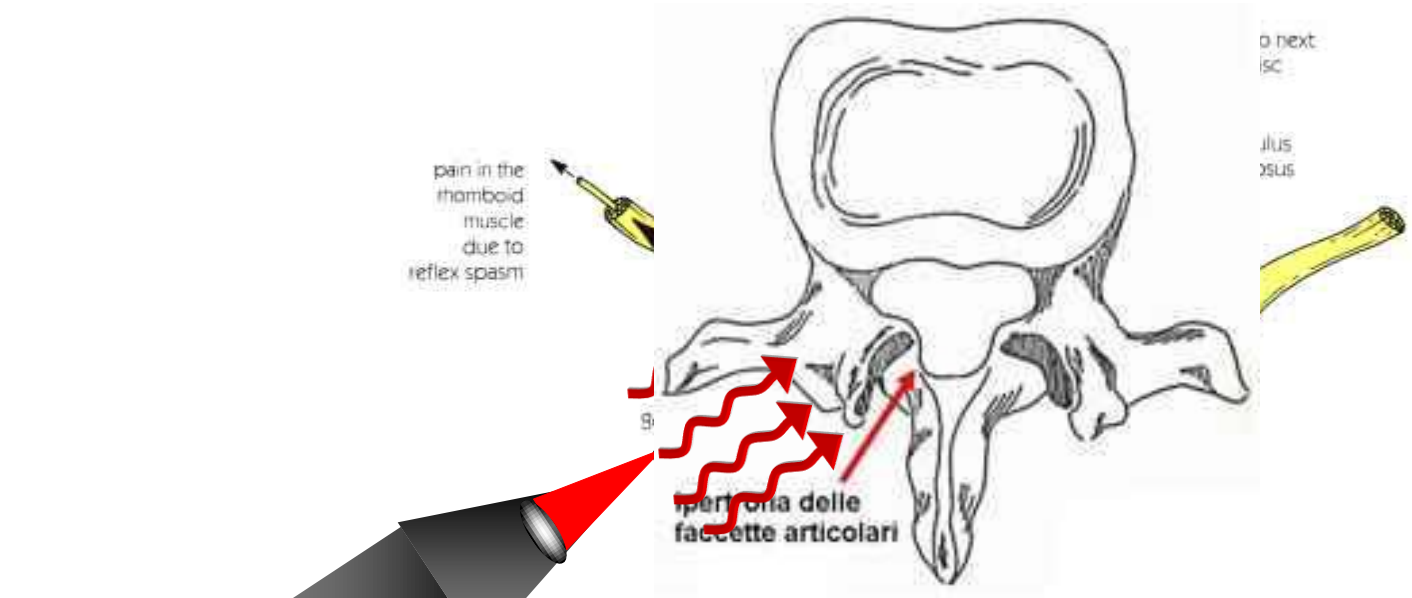
Anulus

facet joints

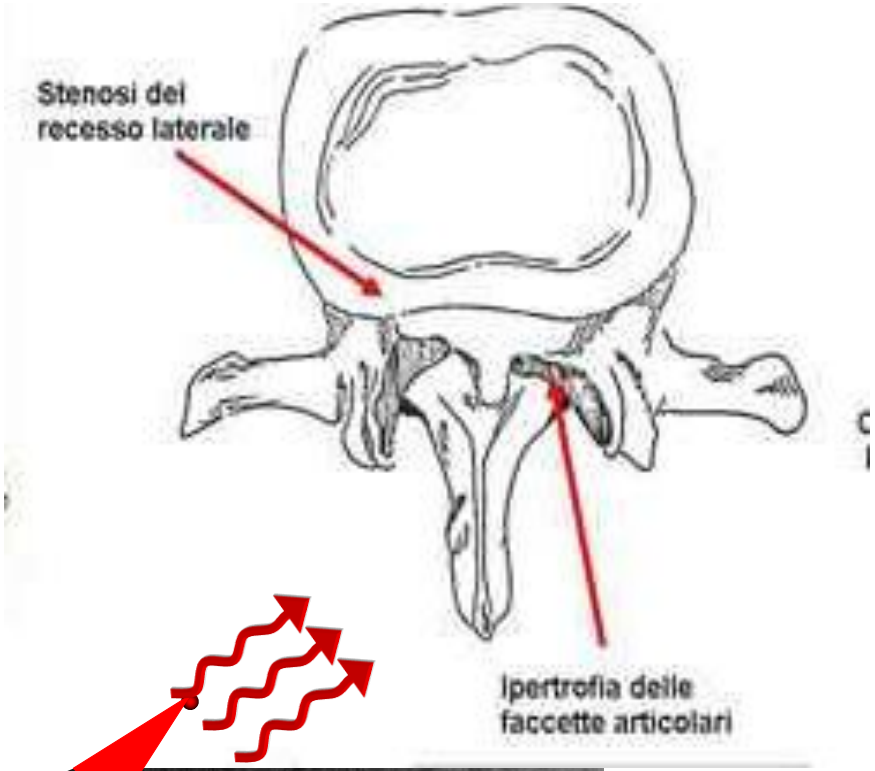




ACCESS ROADS SIDE WITHOUT FEAR OF IRRITATING NERVES AND DISC



SAFE TREATMENT EVEN WITHOUT MRI

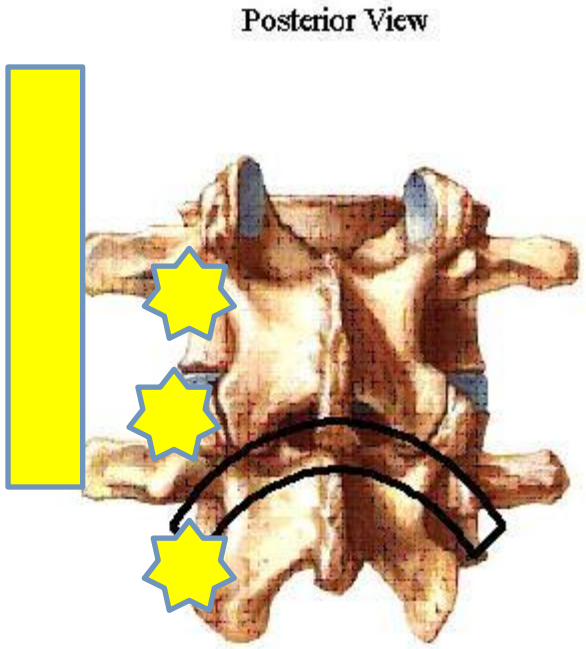


I.A.L.T.

PROBE

3 elettrodes that provides microcurrents

TRIGGER POINTS



PHYSICAL THERAPY…. DIRETTIVA CE 93/42

GINNASTICA RITMICA ITALIANA

STAFF TECNICO..

95/96

GIOCHI OLIMPICI ATLANTA 1996 7^ classificata con la Squadra Italiana