



BACK PAIN OF ARTICULAR ORIGIN – PART 2

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Lumbar Pain is one of the most frequent reason, for people to visit the rehabilitation and traumatology area. It is characterized as a syndrome capable of developing chronic pain(1) which may persist for a year or more in patients after the initial episode of lumbago (3,2). Being the articular capsule structure and facet joint, often symptomatic, the intervertebral disc and the contractile structures like muscles, tendons and fascias, involved in the painful picture.

The current focus of treatment should be multifactorial, involving not only the biomedical factors (anatomical and pathological), but also emphasize the social and psychological aspects, this model is called BIO-PSYCHOSOCIAL of chronic low back pain (weinner, 2008), (Gatchel and Turk , 2008), (O'Sullivan, 2005); which advises clinicians and researchers to optimize application results (Kent and Keating, 2008).

The application of the bio-psycho-social model in the treatment of low back pain associated with specific methods of clinical reasoning has proved highly effective in the short- and long-term chronic LBP. (Nicholas and George, 2011), (Higgs and cols., 2008).



Among the theories for generating the chronicity of low back pain, where the facet joint capsule and the intervertebral disc may be engaged and symptomatic, I find three important mechanisms: The Mechanics Theory; (Refer to article JOINT BACK PAIN OF ORIGIN Part I, Pathophysiology, published in February, 2016, www.lilianarozo.cl) in which the lumbar spine is in the wrong position, which is called out of its neutral physiologic lordosis, generating therefore compressive overload, constant friction and pain. In the case of nociceptive mechanism, joint mechanoreceptors and nociceptors are triggered as maintained; due to changes in tension, position and joint movement, (4.5) and also if the patient has intersegmental lumbar mobility dysfunctions (hypo-mobile in segments and hyper-mobility in others), asymmetry deflect the dynamic movement, altering the alignment and muscle activation patterns and control situations that become in a vicious circle and repeated sequentially, producing inflammation, irritation, joint and surrounding structures.

Therefore, it is essential to establish the dysfunctional diagnosis, cause or possible causes of pain, so that they can be addressed during therapeutic intervention, which; It should include at least three major aspects: (Image 1)

1. Correction of posture: backbone and pelvis
2. Correction of lumbar spinal intersegmental motion and pelvis
3. Correction of muscle activation patterns



*Richardson, C.A.,Hodges, P. , Hides. J. Lumbopelvic Stability, 2004.Churchill livingstone, Edinburgh, 13-28
*Paul Hodges, CCRES SPINE UQ, 2011

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Image 1
Therapeutic Approach Chronic Low Back Pain



1. POSTURE CORRECTION

The vertebral column is designed so that with normal physiological curves (cervical lordosis, dorsal kyphosis and lumbar lordosis with pelvic anteversion) can better dissipate the loads produced during normal daily activity, therefore postural abnormalities and vertebral misalignments will generate overloads held on joints and intervertebral discs, which will result in premature wear articular disc disease, osteoarthritis, etc.

The ideal posture is called physiological rest position (Image 2), in which; the joint ligaments (joint passive structures) and muscles (contractile structures) have minimum load, minimum friction and minimum tension. (Rocabado, 2000).

To position each vertebral and pelvic segment to a physiological rest, it becomes a priority. (Image 2)



REPOSO FISIOLÓGICO

*Richardson, C.A., Hodges, P., Hides, J. Lumbopelvic Stability, 2004. Churchill Livingstone, Edinburgh, 13-28
*Paul W Hodges, Concepts in managing sport and exercise injuries. 2007, 108 a 109.
* Hodges PW, Moseley GL: Pain and motor control of the lumbopelvic region: effect and possible mechanism. Journal of electromyography and Kinesiology 2003, 13, 361-370.

Image 2
Physiological rest spinal-Treatment Strategies

To achieve postural correction there are several treatment strategies:

LUMBAR-PELVIC REALIGNMENT

The anatomical position of the lumbar-pelvic junction extension is in the L4 and L5 vertebrae and bending or nutation of the sacrum. Getting the patient to recognize the defective position and achieved voluntarily positioned in the right position, it is important to retrain the proprioceptors and mechanoreceptors and neural pathways, that has been kept continuously during their daily activities, avoiding the overhead of all structures and therefore pain.



Exercise the realization of the Lumbar-Pelvic realignment in front of the mirror and it could help to do it with open and closed eyes, also to run in different positions: seated, standing and four supports.

Perform the adopting Lumbar-Pelvic realignment, support on different surfaces such as; unstable bases, dish freeman, seesaws and trampolines in bipedal position, seated, single-leg stance, and with both leg stance switching between open and closed eyes are effective for recognition of the new strategies lumbar position.

2. CORRECTION OF MOVEMENT INTERSEGMENTAL PELVIC LUMBAR SPINE

SPINAL UNIT FUNCTIONAL AND MOBILITY INTERSEGMENTAL:

Spinal functional unit consists of two adjacent vertebrae and the intervertebral disc, along with their capsular and ligamentous structures.

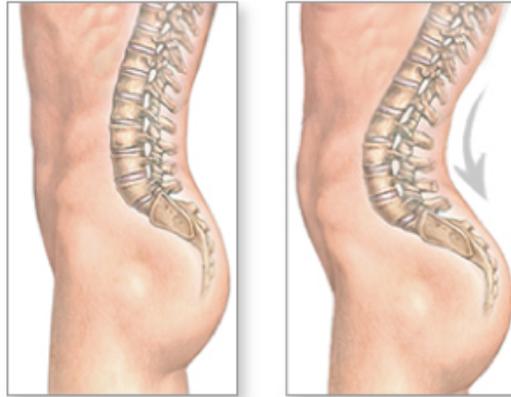
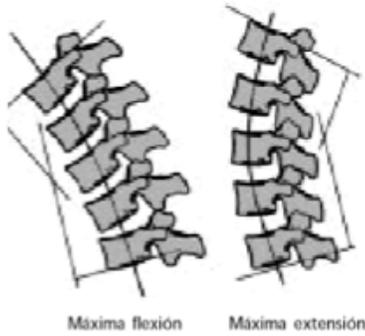
In this vertebral unit, presents a former pillar whose main function is the support therefore a function of static dominance occurs; and a rear pillar whose function is primarily dynamic.

Each lumbar vertebral functional unit (from T12-L1 to L5-S1) must be in neutral position lordosis; ie neutral or physiological rest segmental extension, for which the Professional or treating clinician must mobilize each segment to that position (if possible, as close to what the structure permits) and restore lordosis. (Increase extension or lordosis, for the case of lumbar rectifications or bending; or, decreasing the lordosis, in the case of hyperextension or increased lordosis). It can be done through techniques combined with proprioceptive orthopedic and postural exercises recognition or Lumbar-Pelvic realignment (referred to in the previous point) manual therapy.

Once the vertebral functional units are in neutral lordosis, must ensure the proper intersegmental dynamic movement, ie each vertebral segment should slide properly and in a normal proportion, in order to give capacity to each functional segment that move within its normal range or safe range, a concept known by Panjabi and (6) physiological neutral zone. (Image 3)



POSTURA-POSICION
Compresión-Tensión Articular



Zona Neutra Reposo Fisiológico

- Manohar M. Panjabi, Clinical Spinal instability and low back pain, Journal of electromyography and Kinesiology 13 (2003) 371-379.
- P. B. O'Sullivan, Lumbar segmental 'instability': clinical presentation and specific stabilizing exercise management, Manual Therapy (2000) 5(1), 2-12.

Image 3 Neutral Zone

The concept of neutral zone, refers to the "amount of range of safe movement" and provides stability to the spinal functional unit (6) and is accompanied therefore minimum joint loading, friction and muscular overload (Rocabado, M) (Image 4)

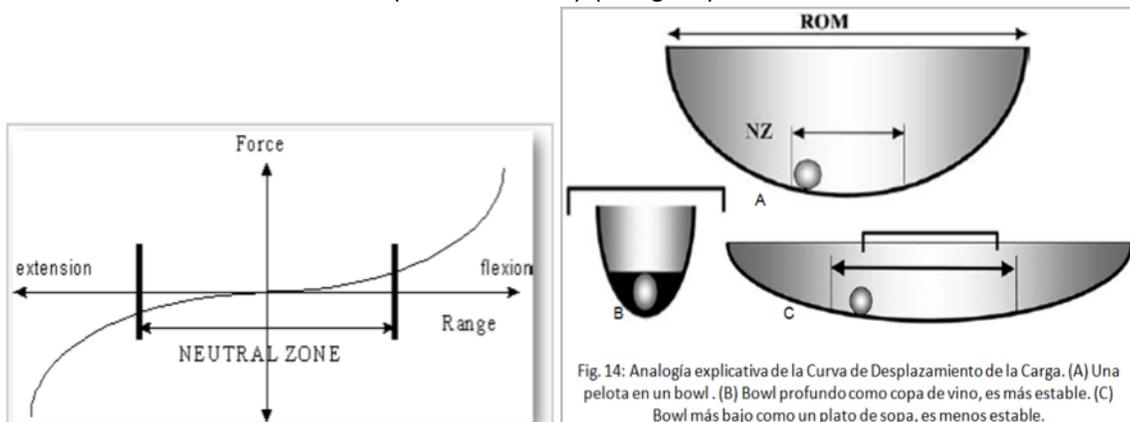


Image 4 Physiological Neutral Zone



"Instruct the patient to move and how it feels when he moves" (8 and 9) is one of the specific objectives of treatment so that once adopted the normal movement in the normal posture; you can proceed to the deep muscle activation.

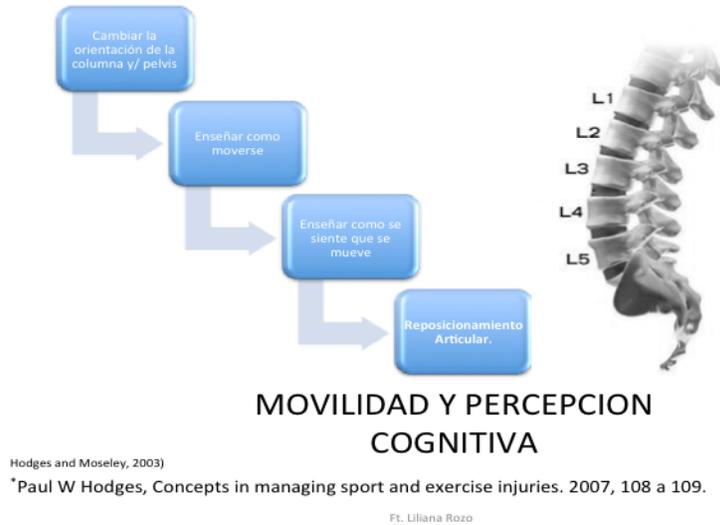


Image 5

Treatment strategies to regain mobility and cognitive perception in low back pain

The procedure for earning these intervertebral joint ranges will be made through the artrokinemati range with specific manual mobilizations and then progress to osteokinematic ranges liabilities and assets, involving functional activities that compromise the activity of the two belts; scapular and pelvic (activities such changes position, sitting, standing, walking).



Recuperar Movilidad Intervertebral segmentaria

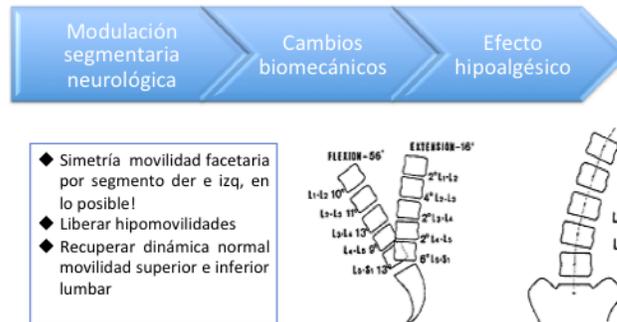


Image 6
Effects of Mobilization vertebral joint

3. MUSCULAR ACTIVATION

Lumbar muscle and spinal system control works into two groups: local muscle system or deep muscle control and overall muscular system.

In the absence of deep muscle control, the spine is very susceptible to injury, studies show that with only <4.5 pounds or 2 kg of load lifted (Stokes, 1995, McGill, 2002, Grenier and McGill, 2007, Janda, 2007) or simply taking turns or very small rotations (about 2 degrees) (Sahrmann, 2001) in the lumbar spine; repetitive microtrauma have been reported; that result in chronic inflammatory conditions, and Facet recurrent disc.

Thus the activation of deep muscle Control: abdominal transversus and multifidus mainly is a priority in treatment (11 and 12).

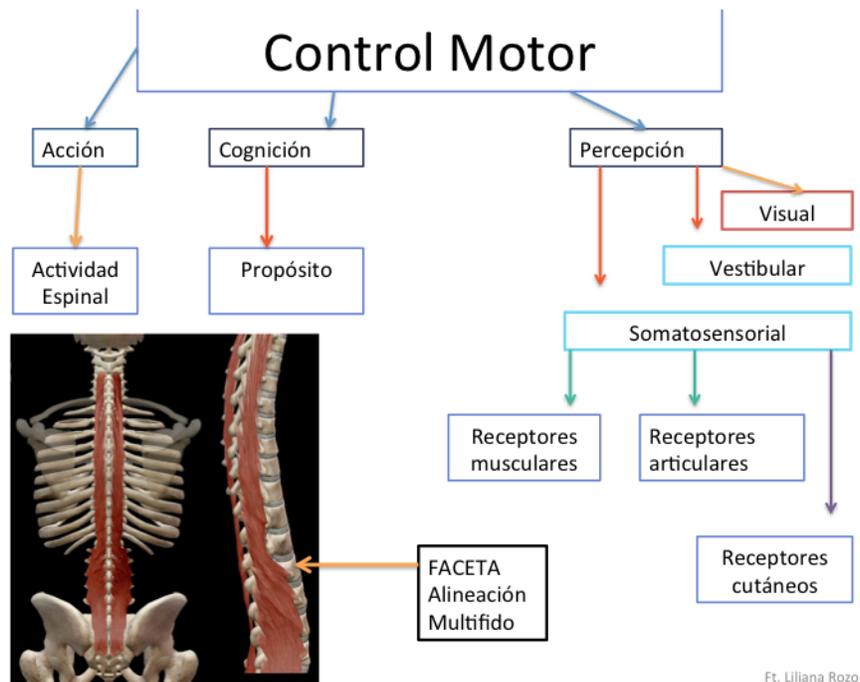
This muscle activation must be done having the lumbar curvature in the correct position of physiological rest and also with the vertebral intersegmental mobility restored or as close to normal as expected; if previous structural alterations exist on the column.

When the patient suffers from chronic lumbar pain, learn to perform the functions of everyday life; using muscles that are not appropriate to fulfill the role and this generates patterns called maladaptive (O 'Sullivan, 2005) or compensation; which become ineffective strategies that alter



normal patterns of muscle activation, generating muscle contractions load increases, rather than decrease, being predominant global musculature and even some respiratory muscles engaged as replacements of deep lumbar stabilizers and pelvic floor (13) and this results in joint inflammation, lumbar segmental instability clinical, chronic pain and functional disability.

It can be found a reduction in deep muscle activation (transversus abdominis and multifidus), there is a Timing early activation of compensatory muscle (14); therefore altered patterns, aberrant neuromuscular control and Dysfunctions Motor Control. (Image 7)



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Image 7
Fundamentals of Motor Control Lumbar Rehabilitation

During rehabilitation of segmental muscles of the lumbar, it must be trained in the concept of "cognitive exercise" (with a purpose), this implies that the exercise is functional, involving the central and peripheral control of neuromuscular receptors and therefore also of the cerebral cortex, which will result in a real change and aware of the pattern of muscle activation, ACCION-COGNITION-PERCEPTION, occupying the vestibular, visual, somatosensory systems (joint muscle receptors, and skin).



CONCLUSION

Addressing Chronic Low Back Pain Treatment involves not only the anatomical and biomechanical framework; but also the psychological and social aspects within the context of dysfunction and disability of the patient, Under Bio-psychosocial Orthopaedic Manual Therapy.

"It is essential in clinical practice to identify people at risk of developing chronic pain, knowing their biopsychosocial reality; taking into account the experience and the meaning of pain is unique to each individual. " (Stewart, J. Kempenaar, L, Lauchlan, D, 2011).

Each one experiences pain in different ways and means and each has a different dimension in the low back, therefore; multidisciplinary team, clinical reasoning, specific evaluation for individualized treatment, defined achievement goals in the short, medium and long term are essential.

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