

# Collaborative Chiropractic Care

Tom Arnold, DC, APC, DAAML

UNM Pain Center & Private Practice Albuquerque, New Mexico

No disclosures

# Presentation Objectives

At the conclusion of this presentation and hands-on demonstration of a few chiropractic treatment techniques to address spinal joint dysfunction/fixation, participants will be able to:

- Recognize the complexity of manual and instrument chiropractic adjustment techniques
- Describe the underlying theoretical mechanism of action...how chiropractic adjustment techniques activate spinal segmental stabilization
- Integrate and/or recommend chiropractic referral relationships and co-management of acute and chronic musculoskeletal pain/function patterns

# Spinal Joint Dysfunction: A Contemporary Model

Old terminology of the mysterious problem:

- Malposition
- Misalignment
- Subluxation (biomechanical vs. anatomical)
- Nerve impingement
- Bone out of place
- Somatic joint dysfunction/fixation
- Hypomobile joint
- Loss of joint play
- Etc.

# Other terms used by DCs, MDs, DOs and PTs:

Functional spinal lesion

Joint complex dysfunction

Joint dysfunction with hypomobility

Fixation

Somatci Dysfunction

Loss of joint play

Is it strictly static and structural?

**Or could it involve:**

Kinesiopathology?

Neuropathology?

Myopathology?

Connective Tissue Pathology?

Vascular Abnormalities?

Inflammatory response?

Histopathology?

Biochemical Abnormalities?

Whatever it is and whatever you call it, it responds to manipulation/adjustment type procedures.

# A Working Dynamic Model of Joint Dysfunction

Panjabi offers a unique model of joint dysfunction with disturbed kinematics (motion), loss of spatial and temporal integrity of received receptor signals, and corrupted motor programs.

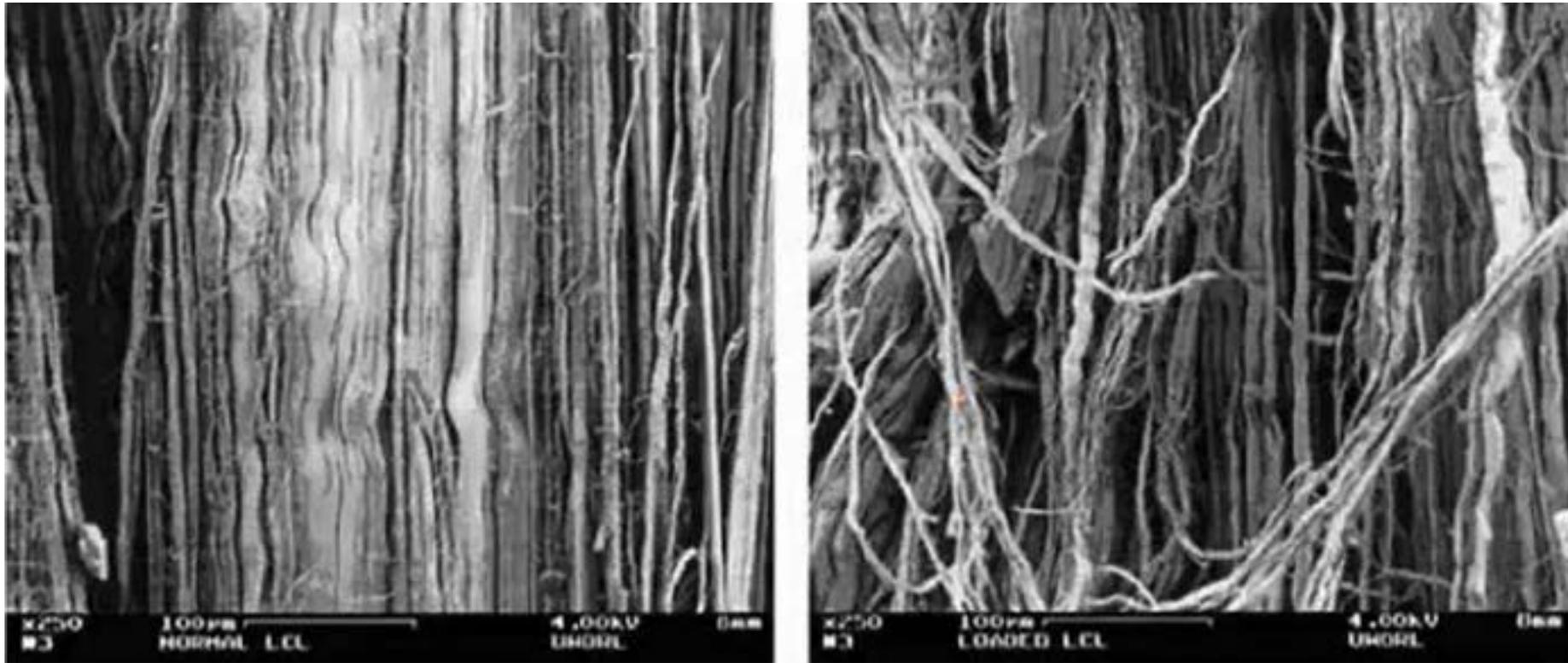
Panjabi MM. A hypothesis of chronic back pain: ligament subfailure injuries lead to muscle control dysfunction. *Eur Spine J*, 2006;15(5):668-76.

**This dynamic explanation offers distinctive insights into the mechanism and progression of the lesion that chiropractors diagnose and treat**

# A WORKING DYNAMIC MODEL OF SUBLUXATION

Trauma and/or microtrauma cause *subfailure* injury (in ligaments, joint capsules, and discs).

This damages collagen fibers and destroys mechanoreceptors (MRs) embedded in injured passive ligamentous restraints.



Scanning electron micrograph of normal (left) and damaged (right) mature ligament. In the subfailure stretched tissue (right), collagen fiber damage was distributed the length of the tissue.

The result is partial deafferentation,  
disturbed kinesthesia, loss of spatial and  
temporal integrity.

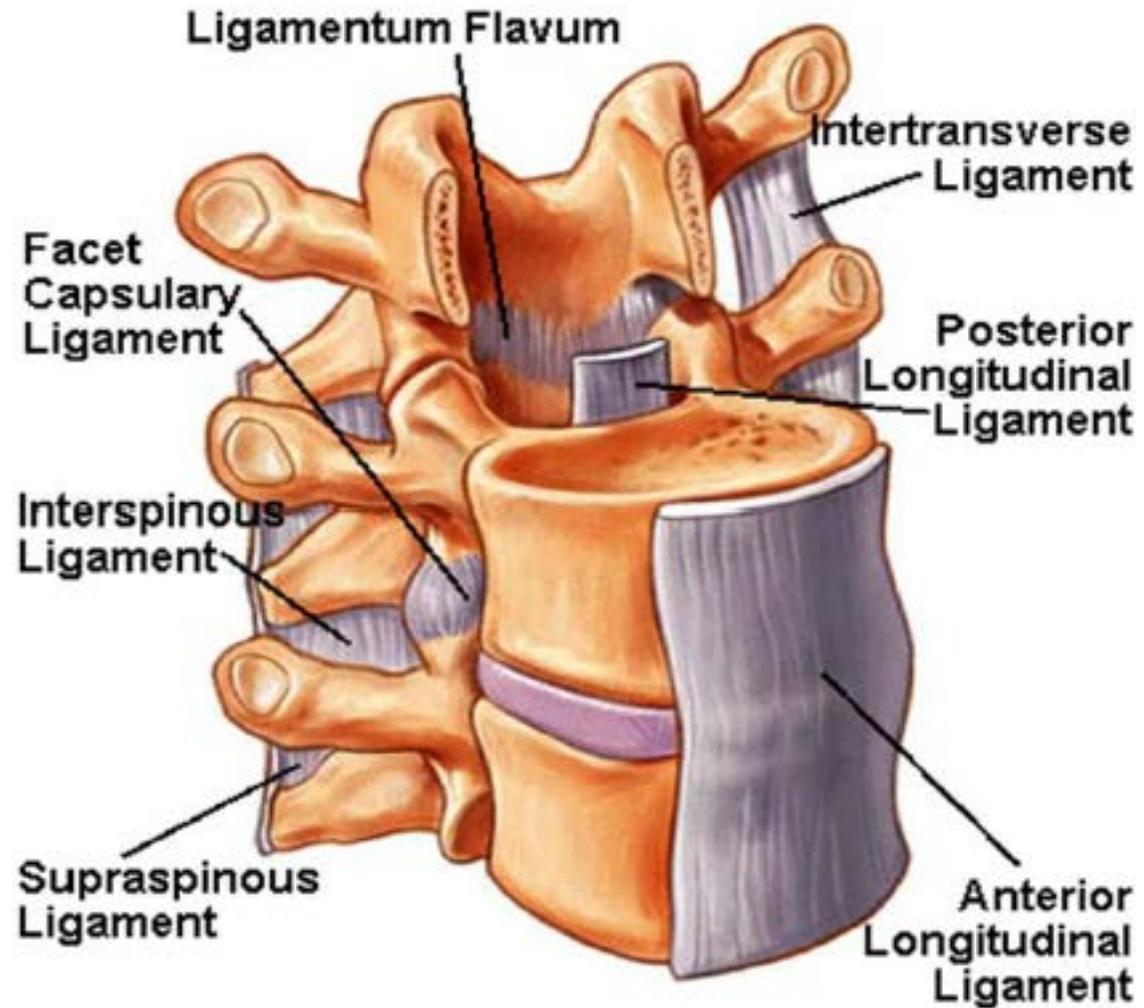
The neuromuscular control unit has difficulty interpreting the corrupted MRs signals.

Muscle response pattern is corrupted thereby disturbing coactivation, recruitment of spinal muscles, range of motion, and kinematics).

Disturbed motor control results in abnormal loads, stresses and strains leading to further subfailure injury of spinal ligaments and MRs.

Subsequent subfailure injury produces inflammation of spinal tissues abundant in nociceptors. This may result in chronic pain, recurrences, and reduced functional capacity.

## Vertebral Intersegmental Motion Unit



## How Does It Work?

What is the proposed mechanism of action of the chiropractic adjustment (manipulation)?

Tissue injury and pain results in reflex inhibition and progressive atrophy of the segmental multifidus.

Seaman D, Winterstein J. Dysafferentation: a novel term to describe the neuropathophysiological effects of joint complex dysfunction. JMPT, 1998;21(4):267-80. Hodges P, et al. Rapid atrophy of the lumbar multifidus follows experimental disc or nerve root injury. Spine, 2006;31(25):2926-33.

The HVLA manipulative thrust rapidly stretches ligaments, joint capsules, and intervertebral discs, stimulating stretch receptors and initiating a ligamentomuscular reflex, which activates the segmental multifidus to stabilize and protect passive ligamentous restraints from injury.

The segmental multifidus that has been reflexively inhibited and atrophying is stimulated to contract.

# Multifidi



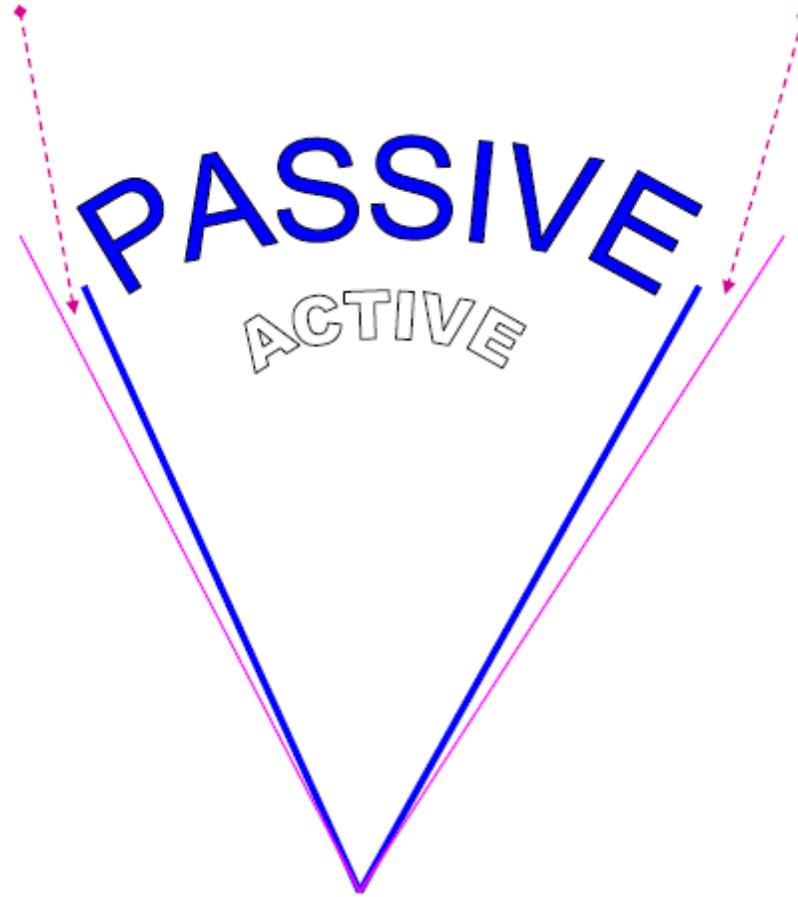
This may reverse the reflex inhibition, progressive atrophy, and delayed muscle response in the segmental multifidus, and restore contractility and improve dynamic joint function.

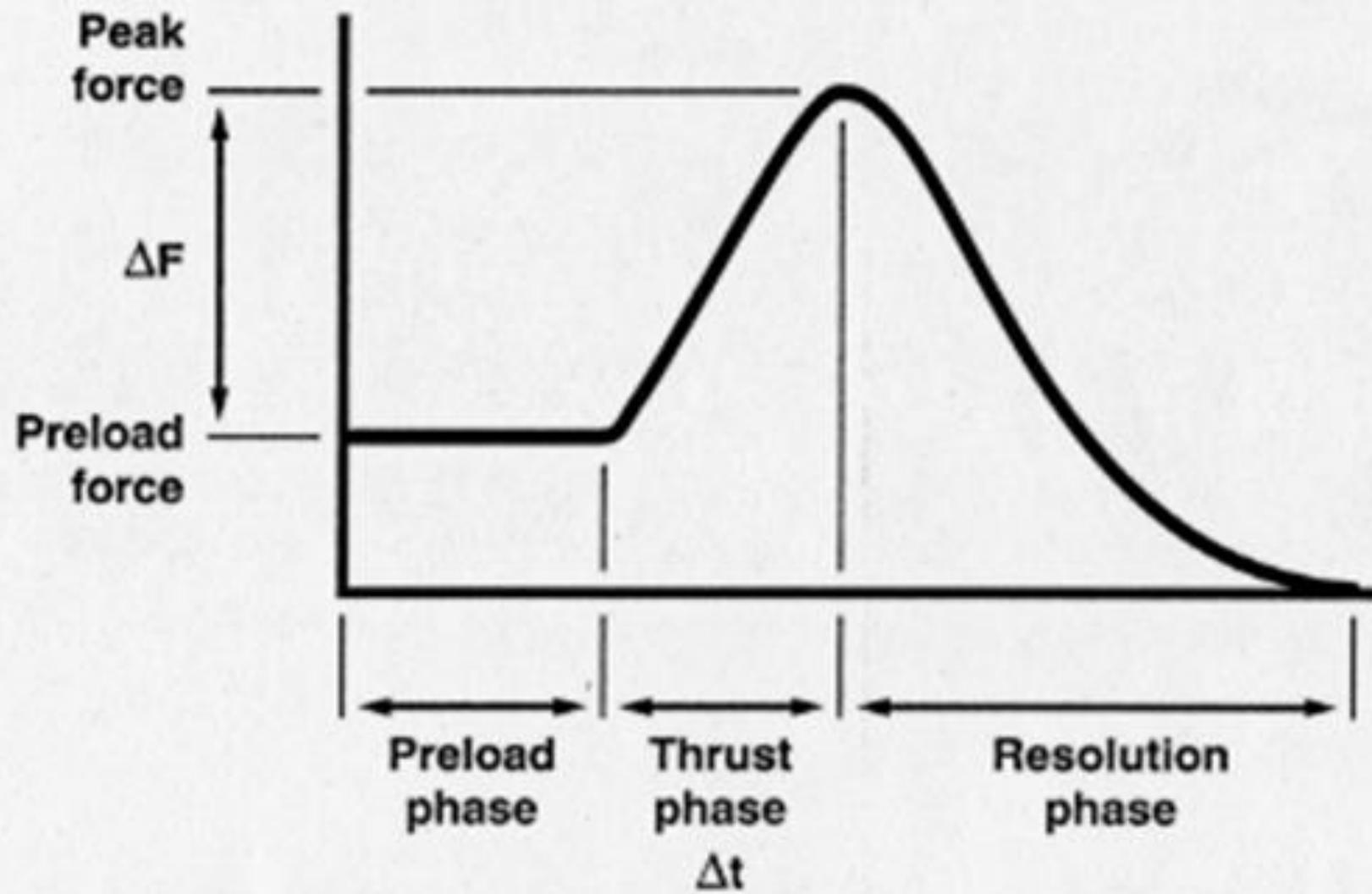
MacDonald D, Moseley GL, Hodges PW. Why do some patients keep hurting their back? Evidence of ongoing back muscle dysfunction during remission from recurrent back pain. *Pain*, 2009;142:183-8.

**Therefore, spinal manipulation provides precise high-velocity, yet non-injurious stretch of ligaments that appear to stimulate mechano-receptors to reflexively activate the segmental stabilizing multifidus to unload rapidly stretched ligaments and joint capsules.\***

**\*Le B, Davidson B, Solomonow D, et al. Neuromuscular control of lumbar instability following static work of various loads. Muscle Nerve, 2009;39(1):71-82.**

# Paraphysiological Joint Space





## Tissues response to force of treatment is related to their relative stiffness/viscoelastic properties

